



Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects

Scenarios Statement

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Glossary of Acronyms

AC	Alternating Current
BEIS	Department for Business, Energy and Industrial Strategy
CfD	Contract for Difference
DCO	Development Consent Order
DEFRA	Department for the Environment and Rural Affairs
DEL	Dudgeon Extension Limited
DEP	Dudgeon Offshore Wind Farm Extension Project
DOW	Dudgeon Offshore Wind Farm
EIA	Environmental Impact Assessment
ES	Environmental Statement
FID	Final Investment Decision
HDD	Horizontal Directional Drilling
HVAC	High-Voltage Alternating Current
Km	Kilometre
MW	Megawatts
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
Ofgem	Office of Gas and Electricity Markets
OSP	Offshore Substation Platform
OTNR	Offshore Transmission Network Review
OWIC	Offshore Wind Industry Council
SEL	Scira Extension Limited
SEP	Sheringham Offshore Wind Farm Extension Project
SoS	Secretary of State
SOW	Sheringham Offshore Wind Farm
TCE	The Crown Estate
UK	United Kingdom
WTG	Wind Turbine Generator

Glossary of Terms

Dudgeon Offshore Wind Farm Extension Project (DEP)	The Dudgeon Offshore Wind Farm Extension onshore and offshore sites including all onshore and offshore infrastructure.
DEP offshore site	The Dudgeon Offshore Wind Farm Extension consisting of the DEP wind farm site, interlink cable corridors and offshore export cable corridor (up to mean high water springs).
DEP onshore site	The Dudgeon Offshore Wind Farm Extension onshore area consisting of the DEP onshore substation site, onshore cable corridor, construction compounds, temporary working areas and onshore landfall area.
DEP North array area	The wind farm site area of the DEP offshore site located to the north of the existing Dudgeon Offshore Wind Farm
DEP South array area	The wind farm site area of the DEP offshore site located to the south of the existing Dudgeon Offshore Wind Farm
DEP wind farm site	The offshore area of DEP within which wind turbines, infield cables and offshore substation platform/s will be located and the adjacent Offshore Temporary Works Area. This is also the collective term for the DEP North and South array areas.
DCO boundary	The area subject to the application for development consent, including all permanent and temporary works for DEP and SEP.
Grid option	Mechanism by which SEP and DEP will connect to the existing electricity network. This may either be an integrated grid option providing transmission infrastructure which serves both of the wind farms, or a separated grid option, which allows SEP and DEP to transmit electricity entirely separately.
Horizontal directional drilling (HDD) zones	The areas within the onshore cable route which would house HDD entry or exit points.
Infield cables	Cables which link the wind turbine generators to the offshore substation platform(s).
Interlink cables	Cables linking two separate project areas. This can be cables linking: <ul style="list-style-type: none"> 1) DEP South array area and DEP North array area 2) DEP South array area and SEP

	<p>3) DEP North array area and SEP</p> <p>1 is relevant if DEP is constructed in isolation or first in a phased development.</p> <p>2 and 3 are relevant where both SEP and DEP are built.</p>
Interlink cable corridor	This is the area which will contain the interlink cables between offshore substation platform/s and the adjacent Offshore Temporary Works Area.
Offshore cable corridors	This is the area which will contain the offshore export cables or interlink cables, including the adjacent Offshore Temporary Works Area.
Offshore export cable corridor	This is the area which will contain the offshore export cables between offshore substation platform/s and landfall, including the adjacent Offshore Temporary Works Area.
Integrated Grid Option	Transmission infrastructure which serves both extension projects.
Jointing bays	Underground structures constructed at regular intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	The point at the coastline at which the offshore export cables are brought onshore and connected to the onshore export cables.
Offshore export cables	The cables which would bring electricity from the offshore substation platform(s) to the landfall. 220 – 230kV.
Offshore substation platform	A fixed structure located within the wind farm area, containing electrical equipment to aggregate the power from the wind turbine generators and convert it into a more suitable form for export to shore.
Onshore cable corridor	The area between the landfall and the onshore substation sites, within which the onshore cable circuits will be installed along with other temporary works for construction.
Onshore export cables	The cables which would bring electricity from the landfall to the onshore substation. 220 – 230kV.
Onshore Substation	Compound containing electrical equipment to enable connection to the National Grid.
Separated Grid Option	Transmission infrastructure which allows each project to transmit electricity entirely separately.



Sheringham Shoal Offshore Wind Farm Extension Project (SEP)	The Sheringham Shoal Offshore Wind Farm Extension onshore and offshore sites including all onshore and offshore infrastructure.
SEP offshore site	Sheringham Shoal Offshore Wind Farm Extension consisting of the SEP wind farm site and offshore export cable corridor (up to mean high water springs).
SEP onshore site	The Sheringham Shoal Wind Farm Extension onshore area consisting of the SEP onshore substation site, onshore cable corridor, construction compounds, temporary working areas and onshore landfall area.
SEP wind farm site	The offshore area of SEP within which wind turbines, infield cables and offshore substation platform/s will be located and the adjacent Offshore Temporary Works Area.
The Applicant	Equinor New Energy Limited. As the owners of SEP and DEP, Scira Extension Limited and Dudgeon Extension Limited are the named undertakers that have the benefit of the DCO. References in this document to obligations on, or commitments by, 'the Applicant' are given on behalf of SEL and DEL as the undertakers of SEP and DEP.
Transition joint bay	Connects offshore and onshore export cables at the landfall. The transition joint bay will be located above mean high water.



EXECUTIVE SUMMARY

“The Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Project will double the generation capacity of the existing assets by 2030, making a meaningful contribution to the UK’s offshore wind and decarbonisation targets.

As a result of our long-term presence in Norfolk, Equinor has identified the need to take a coordinated approach to the development of the two projects, to minimise impacts on local communities and to maximise benefits for the area. As a result of this coordinated planning, the Project has proposed utilising a shared transmission asset through Norfolk, and has been selected as a Pathfinder project in coordinated offshore transmission development under the UK Government’s Offshore Transmission Network Review. The design of the shared transmission asset will enhance the environment and create lasting value for local people and communities in Norfolk.”

1. The Applicant has prepared this Scenarios Statement to provide an overview and explanation of the project development scenarios within the Development Consent Order (DCO) Application for the proposed Sheringham Shoal Offshore Wind Farm Extension Project (SEP) and Dudgeon Offshore Wind Farm Extension Project (DEP).
2. The two extension projects are owned by different legal entities and joint venture partners; Equinor as a partner in both projects is the manager of the development of SEP and DEP and the Applicant for the DCO application which it is submitting on behalf of the owners.
3. Following The Crown Estate opportunity in 2017 to lease an area of seabed for the purpose of developing extension projects to existing United Kingdom (UK) offshore wind farm assets, Equinor and its partners took the strategic decision to seek to coordinate the development of SEP and DEP with the ambition of delivering an integrated transmission system (which serves both wind farms (as opposed to a separated grid option which allows each Project to transmit electricity entirely separately)). Area rights were awarded to SEP and DEP in 2019 and Agreements for Lease signed in 2020.
4. Building on its previous experience in Norfolk and engagement with local communities over the last decade related to the construction and operation of the existing Sheringham Shoal and Dudgeon offshore wind farms, it was clear to the Applicant from the outset that the most preferable development of SEP and DEP would be to coordinate the two projects, with an integrated transmission system scenario also being preferable from a technical and economic perspective. This ambition was reflected in the Scoping Report submitted to the Secretary of State via the Planning Inspectorate in October 2019.

5. Department of Business, Energy & Industrial Strategy (BEIS) initiated the Offshore Transmission Network Review (OTNR) in July 2020 to undertake ‘a review into the existing offshore transmission regime to address the barriers it presents to further significant deployment of offshore wind, with a view to achieving net zero ambitions’. SEP and DEP have since been identified as a ‘Pathfinder’ project in recognition of its potential to deliver benefits on better coordinated offshore transmission systems in the near-term, and provide important learnings for the other parts of the OTNR process.
6. The delivery of SEP and DEP will yield a number of important benefits including its contribution to climate change targets and the urgent need for renewable energy in the UK; a range of employment opportunities and investment in skills and talent locally; and wider environmental enhancements with a commitment to biodiversity net gain in Norfolk. The coordination of SEP and DEP has however also resulted in additional benefits; a single planning process and DCO application is intended to provide for consistency in the approach to the assessment, consultation and examination, as well as increased transparency for a potential compulsory acquisition process.
7. Whilst current planning legislation provides a mechanism for consenting two projects together within one DCO, an approach which has been adopted by other previous offshore wind developments in the UK, wider regulatory regimes do not currently enable the delivery of the integrated transmission system. The key barriers relate to:
 - the inability to submit shared, or dependent, Contract for Difference (CfD) bids into the same allocation round; and
 - the lack of an appropriate mechanism for investment risk to be accommodated for developments with shared transmission assets i.e. an Anticipatory Investment model.
8. Without the necessary evolution of the regulatory regime it is not possible to guarantee that SEP and DEP can be delivered under the preferred development scenario.
9. The Applicant has engaged extensively with key stakeholders including BEIS, Office of Gas and Electricity Markets (Ofgem), National Grid ESO and the Offshore Wind Industry Council (OWIC) Offshore Transmission Group workstream throughout the pre-application phase of the projects to advocate for the necessary changes.
10. Whilst the Applicant is encouraged by the ‘minded-to’ decision announced by Ofgem with respect to Anticipatory Investment in April 2022, the overall position on the CfD regime and the Anticipatory Investment position is not fully clarified at this point in time.
11. It has therefore been necessary to continue to incorporate flexibility within the consent application to enable the further development of SEP and DEP under a range of potential scenarios. The Applicant has been open and transparent about the possible project development scenarios to enable a robust Environmental Impact Assessment (EIA) of the two projects to be undertaken, and to ensure the Draft DCO submitted with the application is precise and enforceable irrespective of the ultimate scenario under which the projects are developed.



12. An important variable in the project development scenarios is one of timings. The projects, if developed separately and not with an integrated transmission system, may be constructed sequentially (one after the other) or concurrently (at the same time). This will be influenced by CfD and Final Investment Decision outcomes for each project. Regardless of project development scenario, the Order Limits are such that a degree of coordination will be required between the two project companies given the shared export cable corridor and onshore substation site. This coordination would need to be carefully managed and would be governed by a Commercial Agreement between the owners.
13. The application therefore seeks consent for SEP and DEP under the following project development scenarios:
 - In isolation – where only SEP or DEP is constructed;
 - Sequential – where SEP and DEP are both constructed in a phased approach with either SEP or DEP being constructed first; or
 - Concurrent – where SEP and DEP are both constructed at the same time.
14. The EIA has been undertaken on the basis of a Rochdale Envelope approach in accordance with relevant guidance and best practice, and has considered where different scenarios could give rise to different potential impacts.
15. The Applicant is mindful that the approach to SEP and DEP is novel in some respects, and necessarily so. If delivered under the preferred option, the projects will be an industry first, and will be delivered in direct response to the government ambition for greater coordination in offshore wind with respect to transmission systems whilst limiting the impacts on the environment and local community.
16. In light of this, the Applicant has given careful consideration to the need for multiple project development scenarios within the draft DCO and how these are reflected throughout the DCO application, ensuring that a robust EIA has been undertaken and that an appropriate mechanism is in place to confirm which scenario SEP and DEP will be developed under prior to construction.



1 INTRODUCTION

1.1 Introduction

17. This Scenarios Statement provides an overview and explanation of the project development scenarios included in the consent application for the Sheringham Shoal Offshore Wind Farm Extension Project (SEP) and Dudgeon Offshore Wind Farm Extension Project (DEP).

1.2 Purpose of Document

18. The purpose of this Scenarios Statement is to provide background to the need for including a range of project development scenarios within the Development Consent Order (DCO) application for SEP and DEP; and to explain how those scenarios are reflected in key application documents including the **Draft DCO** (document reference 3.1) and the **Environmental Statement** (ES) (document reference 6.1).

19. This document should be read in conjunction with other application documents, in particular:

- **Project Vision** (document reference 9.27);
- **Planning Statement** (document reference 9.1);
- **Draft DCO** (document reference 3.1);
- **Explanatory Memorandum** (document reference 3.2);
- **Onshore Works Plans** (document reference 2.6);
- **Offshore Works Plans** (document reference 2.7);
- **Chapter 4 Project Description** of the ES (document reference 6.1.4);
- **Chapter 5 Environmental Impact Assessment Methodology** of the ES (document reference 6.1.5); and,
- **Statement of Reasons** (document reference 4.3).

1.3 Project Background

20. The Applicant is seeking a DCO for SEP and DEP which are extensions to the existing Sheringham Shoal Offshore Wind Farm (SOW) and Dudgeon Offshore Wind Farm (DOW), located in the southern North Sea off the north Norfolk Coast, with the closest point to the coast being 15.8 kilometre (km) from SEP and 26.5km from DEP.

21. SEP and DEP will each have an export capacity greater than 100 megawatts (MW) and therefore are Nationally Significant Infrastructure Projects (NSIPs) under the Planning Act 2008 (the 2008 Act). The projects will have up to 23 wind turbines at SEP and up to 30 wind turbines at DEP.

1.4 Key Components of SEP and DEP

Offshore

22. SEP and DEP would comprise the following main offshore components:



- Wind turbines and their associated foundations;
- Offshore substation platform/s (OSP/s) and associated foundation/s; and
- Subsea cables and cable protection – offshore export cables, infield cables and interlink cables.

23. Electricity would flow from the wind turbines via infield (array) cables to offshore substation platform(s). There will be up to two offshore substations with one in SEP and one in DEP, located to optimise the length of the offshore cables. Interlink cables will link the separate project areas. At the offshore substation/s, the generated power will be transformed to a higher alternating current (AC) voltage. The power will be exported through two export cables, in two separate trenches, to a landfall east of Weybourne on the north Norfolk coast. At the landfall the offshore export cables will meet and be joined up with the onshore export cables in a transition joint bay.

Onshore

24. The onshore export cables would then travel approximately 60km inland to a high voltage alternating current (HVAC) onshore substation near to the existing Norwich Main substation. The onshore substation would be constructed to accommodate the connection of both SEP and DEP to the transmission grid.

25. The main onshore components of SEP and DEP include:

- Landfall including transition joint bay;
- Up to two ducts installed under the beach at the landfall by Horizontal Directional Drilling (HDD);
- Onshore cable corridor, including:
 - Onshore export cables laid within open cut trenches or installed in ducts, and associated infrastructure including joint bays and link boxes;
 - Temporary construction access roads and haul roads;
 - Construction compounds; and
 - Trenchless crossings at sensitive features and habitats (e.g. A roads, main rivers and sites designated for nature conservation).
- Onshore substation, including:
 - Substation operational access road; and
 - Associated earthworks, surface water attenuation and/or landscaping.

26. Further details of the key components of offshore and onshore infrastructure can be found in **Chapter 4 Project Description** of the ES (document reference 6.1.4).

2 BACKGROUND

2.1 The Applicant

27. Equinor New Energy Limited (incorporated under company number 06824625 and registered in England) is the Applicant applying to the Secretary of State for a DCO for the construction, operation and decommissioning of SEP and DEP.
28. Equinor New Energy Limited is indirectly wholly owned by Equinor ASA, which is an international energy company present in more than 30 countries. The company employs 22,000 people globally, and over 650 in the United Kingdom (UK). As a broad energy company, Equinor is committed to long term value creation in a low carbon future and aims to reach net zero emissions globally by 2050.
29. Equinor has been operating in the UK for over 35 years. It is the UK's leading energy provider and supports the UK economy by investing billions in crucial energy infrastructure, working with over 700 suppliers across the country.
30. In the UK, Equinor currently powers around 750,000 homes through its three wind farms; SOW and DOW, and the world's first floating offshore wind farm, Hywind Scotland which is partnered with Batwind, the world's first battery for offshore wind.
31. Whilst Equinor is a partner, and the lead operator, for both SOW and DOW, the existing assets are owned by different joint partner entities.

2.2 Scira Extension Limited and Dudgeon Extension Limited

32. Two companies are named as undertakers in the **Draft DCO** (document reference 3.1):
 - Scira Extension Limited ("SEL") (company number 12239260), which is registered in England and is a wholly owned subsidiary of the Applicant; and
 - Dudgeon Extension Limited ("DEL") (company number 12148301), which is registered in England and is owned by three entities:
 - the Applicant (35%);
 - Masdar Offshore Wind UK Limited (35%); and
 - CR Power (UK) Limited (30%).
33. SEL are the owners of the Sheringham Shoal Extension Project and DEL are the owners of the Dudgeon Extension Project.
34. An Option Agreement is in place granting rights for the partners of SOW, Equitix (40%) and Green Investment Group (20%), to rejoin co-ownership of SEL at pre agreed terms after final investment decision (FID).
35. A Cooperation Agreement is in place between SEL and DEL which governs the cooperation and sharing of costs between the two entities.



2.3 The Crown Estate Lease Opportunity

36. In February 2017 The Crown Estate (TCE) launched an opportunity for existing wind farms to apply for project extensions. The Crown Estate proposed criteria to consider any formal applications for wind farm extensions which included that ‘the application must be from the tenant of the existing wind farm’.
37. The Applicant, on behalf of the owners of SOW and DOW, submitted Agreement for Lease (AfL) applications to extend the existing operational wind farms.
38. Key TCE criteria that influenced the site selection process included that wind farm extensions must share a boundary with the existing wind farm; and that other than the existing wind farm, the proposed extension must not encroach within a distance of 5km of any other wind farm. In addition, the TCE application criteria required that the proposed wind farm to be extended must be constructed and fully operational at the date of the application and the capacity in MWs of the proposed extension must not exceed that of the existing wind farm. Equinor also took into account the requirement for the size of the proposed extension to be of an appropriate scale to the existing site, and to only apply for an area that was necessary and proportionate to the existing installed capacity, taking account of necessary flexibility. Further information relating to the onward site selection and design of SEP and DEP is set out in **Chapter 3 Site Selection and Assessment of Alternatives** of the ES (document reference 6.1.3), the **Onshore Design and Access Statement** (document reference 9.3) and the **Offshore Design Statement** (document reference 9.26).

3 OFFSHORE TRANSMISSION NETWORK REVIEW

39. The Offshore Transmission Network Review (OTNR) was initiated in July 2020 by the Department of Business, Energy & Industrial Strategy (BEIS) with support from a range of government and industrial bodies including TCE, Department for the Environment and Rural Affairs (Defra), the Marine Management Organisation (MMO) and Office of Gas and Electricity Markets (Ofgem) (UK Government, 2022) to connect projects in a more cost-efficient way and to respond to pressure from local communities and MPs for more coordination of transmission systems for offshore wind farms connecting to the national grid in the UK.
40. The scope of the review is described as ‘... a review into the existing offshore transmission regime to address the barriers it presents to further significant deployment of offshore wind, with a view to achieving net zero ambitions.’
41. The UK Government launched a consultation in September 2021 on revised energy National Policy Statements (NPSs). The proposed new draft policies strongly encourage the move towards greater coordination for transmission systems connecting to the national grid. The **Planning Statement** (document reference 9.1) submitted with the DCO application sets out a full appraisal of relevant current and emerging policies. The new draft NPSs are considered to be "important and relevant" considerations (under section 104 of the Planning Act 2008) in the determination of the DCO application for SEP and DEP.



42. The Applicant is a member of the Offshore Wind Industry Council (OWIC) Offshore Transmission Group (OTG) workstream, and the OTNR Expert Advisory Group. The OWIC OTG has published two papers setting out the long-and short- term parameters that they consider need to be addressed to mitigate the grid transmission barriers to deployment and the timescales required to enable 2030 targets:
 Offshore wind sector deal: Enabling efficient development of transmission networks for offshore wind targets (November 2019); and
 Offshore wind sector deal: Transmission review Short-term solutions (November 2019).
43. The Applicant has also been proactively engaged directly with BEIS and Ofgem with regards to the OTNR process and regulatory changes required to enable greater coordination in offshore wind. **Section 6** sets out the consultation undertaken with key stakeholders relating to the proposed coordination of SEP and DEP, and the enablement of delivering the projects under the preferred option with an integrated transmission system (described further in **Section 8**).
44. In July 2022 SEP and DEP was officially designated as an OTNR ‘Pathfinder’ project, and as such Equinor is committed to initiatives to encourage coordination in the sector. Pathfinder projects are early opportunity projects that are developing ways to further offshore wind coordination as part of the OTNR, working closely with BEIS and Ofgem to identify and overcome barriers to coordination.
45. In light of the Government initiative to see greater coordination in offshore wind, and reduce disruption to the local community, the Applicant reinforced the strategic decision to develop SEP and DEP together from an early stage of the projects. The strategy is to coordinate the two separately owned projects as far as possible, with the ambition to deliver the two projects with an integrated transmission system if possible.
46. The development scenario of delivering the integrated transmission system is therefore the preferred option for SEP and DEP, and is described in more detail in **Section 7** and **Section 8**.

4 PROJECT VISION, NEED CASE AND BENEFITS

47. The **Project Vision** (document reference 9.27) sets out the overall strategy toward developing SEP and DEP, with the ambition to deliver both projects with an integrated transmission system at the core of the strategy. The Vision sets out the Project Objectives and Design Objectives which are fundamental to the overall framework within which the Applicant has sought to develop the projects.
48. It is the project vision that “The Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Project will double the generation capacity of the existing assets by 2030, making a meaningful contribution to the UK’s offshore wind and decarbonisation targets.



49. *“As a result of our long-term presence in Norfolk, Equinor has identified the need to take a coordinated approach to the development of the two projects, to minimise impacts on local communities and to maximise benefits for the area. As a result of this coordinated planning, the Project has proposed utilising a shared transmission asset through Norfolk, and has been selected as a Pathfinder project in coordinated offshore transmission development under the UK Government’s Offshore Transmission Network Review. The design of the shared transmission asset will enhance the environment and create lasting value for local people and communities in Norfolk”.*
50. Section 3 of the **Planning Statement** (document reference 9.1) sets out the need case for SEP and DEP. It describes the key benefits of the project as:
- Climate benefits – delivering renewable energy in response to climate change;
 - Employment, skills and investment value benefits; and
 - Environmental, biodiversity and place benefits.
51. The coordinated approach to developing SEP and DEP has resulted in additional benefits; a single planning process and DCO application is intended to provide for consistency in the approach to the assessment, consultation and examination, as well as increased transparency for a potential compulsory acquisition process and a lower overall burden on all stakeholders engaging in the process, compared to two parallel applications.

5 LEGISLATIVE CONTEXT

52. Whilst it is the ambition to develop SEP and DEP under the preferred option, together with an integrated transmission system, the current regulatory regime does not guarantee the ability to secure funding for both projects at the same time; or provide the commercial framework to enable Anticipatory Investment. At present it is therefore necessary to retain flexibility in how the two projects might be delivered to ensure that each project can be developed under the DCO post consent should the necessary changes to the regulatory regime that have been sought by the Applicant not be achieved.
53. This section provides an overview of the key regulatory regimes which are relevant to SEP and DEP and the project development scenarios.

5.1 Nationally Significant Infrastructure Projects

54. NSIPs are consented in England and Wales under the 2008 Act regime. Under sections 14(1)(a) and 15(3) and (4) of the 2008 Act the construction or extension of a generating station is a NSIP where;
- it is in waters in or adjacent to England up to the seaward limits of the territorial sea; and
 - its capacity is more than 100MW.
55. SEP and DEP both qualify as NSIPs as they are offshore generating stations within the territorial sea waters adjacent to England and each generating station will have a capacity of more than 100MW.

56. As the authorised development comprises two NSIPs, development consent must be obtained from the Secretary of State to authorise them, and an application for a DCO must be made to the Secretary of State under section 37 of the 2008 Act.
57. The electrical transmission systems do not qualify as NSIPs in themselves however, as set out in Section 1.5 of the **Explanatory Memorandum** (document reference 3.2), can be consented together with the generation assets as Associated Development under the provisions of section 115(4A) of the 2008 Act. Consenting the generation and transmission assets together in one DCO is commonplace for offshore wind farm developments in England.
58. As the **Draft DCO** (document reference 3.1) seeks development consent for two NSIPs within the same DCO, regard has been had to previous DCOs where a similar approach has been taken such that consent has been granted for more than one NSIP within the same DCO. In particular, The Dogger Bank Creyke Beck Offshore Wind Farm Order 2015 (Creyke Beck), The Dogger Bank Teesside A and B Offshore Wind Farm Order 2015 (as amended) (Teesside A and B) and The Hornsea Two Offshore Wind Farm Order 2016 (Hornsea Two) have been considered.
59. **Section 7** explains how the different development scenarios have been expressed within the **Draft DCO** (document reference 3.1) for SEP and DEP.

5.2 Contracts for Difference

60. Offshore wind farms are typically developed based on support under the existing Government-led Contracts for Difference (CfD) scheme. These are awarded through annual auctions under the Contracts for Difference (Allocation) Regulations 2014 (as amended) (the CfD regulations).
61. When awarded a CfD, the contract places obligations and milestones on the developer to ensure delivery of a project within agreed timeframes. For example, following the initial conditions precedent, the milestone delivery requirement is the next contractual milestone which must be fulfilled by the developer. The milestone delivery requirement in the CfD is designed to demonstrate commitment and progression of the project(s) to achieve generation by the dates stated in the CfD contract.
62. Developing SEP and DEP under the preferred scenario, with an integrated transmission system, or developing SEP and DEP with separate transmission systems but constructing them at the same time (concurrent build), will require SEP and DEP to submit separate bids into an allocation round and for CfDs to be awarded to each project in the same round.
63. Under the current CfD regime, two projects with separate ownerships are not allowed to submit shared or dependent bids, as the CfD regime in the UK is fundamentally constructed to secure competition to drive down the cost of offshore wind and ensure timely delivery of offshore wind developments. This means that, within the current CfD regulations, there is no guarantee that both SEP and DEP may be awarded a CfD in the same allocation round, which creates a barrier to ensuring that SEP and DEP can be constructed at the same time (concurrently).

64. Without changes to the CfD regulations, there is no mechanism to guarantee that both SEP and DEP can secure CfDs at the same time with the same milestone delivery dates, for delivery within the same commissioning window. It is therefore necessary to retain flexibility to develop the projects in isolation, i.e. only one project is progressed, or sequentially (where one project is constructed ahead of the other).
65. **Section 8** explains how sequential and/or concurrent construction are relevant in the different development scenarios for SEP and DEP.

5.3 Anticipatory Investment

66. As the current CfD regulations do not allow for shared or dependent bids, there is no mechanism to ensure both projects may be awarded a CfD in the same allocation round. This disincentivises offshore wind developers from taking on additional development risks which may put them at a competitive disadvantage due to factors such as cost and timescale. In particular, the risk for offshore wind developers in making anticipatory investment in offshore transmission infrastructure to support the later connection of other offshore development(s).
67. As SEP and DEP are owned by two different legal entities, SEL and DEL, each owned by separate joint venture partnerships, the delivery of the integrated transmission system if developed sequentially would require pre-investment by one entity early and at risk. The commercial risk of doing so without assurance that the other project will definitely proceed is not acceptable to the owners of the projects.
68. The Applicant has therefore, on behalf of SEL and DEL, undertaken extensive engagement with Ofgem, BEIS and National Grid ESO directly and via the OTNR 'Early Opportunities' workstream, to advocate for an Anticipatory Investment model.
69. Ofgem launched a consultation in April 2022 on '*Offshore Coordination - Early Opportunities: Consultation on our Minded-to Decision on Anticipatory Investment and Implementation of Policy Changes*'. The consultation set out Ofgem's 'minded-to' decision on changes to policy which support the needs of SEP and DEP being delivered under the preferred solution.
70. The main outcomes from the minded-to decision of relevance are:
- The consumer bears the Anticipatory Investment risk until the second project starts production and bears the risk if the second project does not materialise;
 - Early Stage Assessment of the proposed arrangements and costs to give certainty that the arrangement will be approved;
 - User Commitments for the later project to ensure it is committed to the Anticipatory Investment that is made on their behalf; and
 - Anticipatory Investment will be available for projects that apply for a CfD in the same round but will not be applicable if both projects are successful (as then they are expected to coordinate via commercial agreement).
71. Qualification of SEP and DEP for Anticipatory Investment will remain unclear until full details are published and an Early Stage Assessment has been made by Ofgem.

6 CONSULTATION

72. The Applicant has engaged with key stakeholders throughout the project development and the pre-application process to lobby for the required changes to current regulatory regimes, primarily to advocate for changes to the CfD regime and to introduce an Anticipatory Investment model, and to work collaboratively with those stakeholders to inform emerging thinking on the future of those regimes.
73. Engagement has also been undertaken with key stakeholders regarding the proposed approach to the DCO application, i.e. two projects consented together through a single application process.
74. Based on engagement with local communities over the last decade related to the construction and operation of SOW and DOW, it was clear that the most sensible development of SEP and DEP would be to coordinate the two projects, with an integrated transmission system scenario also being preferable from a technical and economic perspective. The stakeholder engagement with Ofgem and BEIS to change the regulatory regime to accommodate for this, started late 2019 and early 2020, once the Agreements for Lease were concluded.
75. Once the OTNR was initiated by BEIS in an open letter to developers of offshore wind generation and others, calling for views to support the OTNR in late August 2020, the Applicant was engaged in the 'Early Opportunities' workstream and proposed the potential coordinated development of SEP and DEP to be a Pathfinder project. National Grid ESO was set up to coordinate the OTNR engagement with the developers and the Applicant has had regular update meetings on a bi-weekly basis since March 2021 related to this. In summer 2022 Ofgem officially announced that SEP and DEP was one of four Pathfinder projects. The Applicant also has regular meetings with BEIS.
76. In relation to both the OTNR process and potential changes to CfD Allocation Rounds, Ofgem and BEIS have arranged a range of consultations which the Applicant has provided responses to. These responses have been focused toward the need for Anticipatory Investment and opportunities for linked CfD bids to secure that both projects are developed concurrently. In parallel with the OTNR process, the Applicant has engaged actively with both BEIS and Ofgem on a bilateral basis, to explain the need for regulatory change and the current barriers to coordinated development of SEP and DEP.
77. In relation to the OTNR process, the Applicant also arranged a webinar in July 2021 for the local stakeholders engaged in the project's consultations, to explain the OTNR process and the potential outcome of the process. Further engagement on this topic has also included engagement with local MPs, local authorities and relevant parish councils, as described in the **Consultation Report** (document reference 5.1).
78. **Table 6-1** provides a summary of the key engagement activities throughout the pre-application process.

Table 6-1: Summary of Key Engagement Relating to the Coordinated Approach to SEP and DEP.

Stakeholder	Date	Summary of engagement
Planning Inspectorate	15 November 2018	Inception meeting to introduce the projects and explain early thinking regarding coordination and shared infrastructure for the two projects
Planning Inspectorate	18 March 2019	Project meeting to provide an update on proposed approach to SEP and DEP including discussion on benefits of submitting a combined consent application.
Ofgem	24 October 2019 – present	Numerous meetings to discuss shared transmission solution between SEP and DEP, OFTO process for shared assets, barriers to shared OFTO, need for Anticipatory Investment or linked CfD bids.
BEIS	9 January 2020 – present	Numerous meetings to discuss project plans, barriers to coordinated development and opportunities for joint CfD bids.
Renewable UK	March/April 2020	Input to Renewables UKs Sector Deal Transmission Review.
Ofgem	24 August 2020	Open letter from BEIS/Ofgem to developers of offshore wind generation and others, calling for views to support the Offshore Transmission Network Review issued.
Ofgem	27 September 2020	Equinor submitted response to consultation on ‘Open letter to developers of offshore wind generation and others, calling for views to support the Offshore Transmission Network Review.’
BEIS	14 December 2020	Equinor submitted response to BEIS’ Call for Evidence related to CfD regime.
NG ESO	18 February 2021	Meeting with NG ESO introducing the project as potential pathfinder project.
NG ESO	5 March 2021 - present	Regular Pathfinder Project Fortnightly Catch Up meetings with National Grid ESO in relation to the OTNR process.
NG ESO	19 March 2021	Equinor submitted first version of detailed information about our pathfinder project in NGESO pathfinder template, several updates since (and this is still a live document).
BEIS	11 June 2021	Equinor participated in OTNR Teach-In: The local community perspective. Other participation from numerous authorities in and developers in UK and Scotland.
Ofgem	14 July 2021	Ofgem published consultation on ‘Changes intended to bring about greater coordination in the development of offshore energy network.’
OTNR, NG and others	22 July 2021	Equinor arranged webinar ‘OTNR Information Session to Local Stakeholders’. Presentations held by OTNR Advisory Board, National Grid and Equinor.



Stakeholder	Date	Summary of engagement
BEIS	2 September 2021	Equinor participated in an industry meeting arranged by BEIS on 'Opportunities for regional coordination in East Anglia'. Participants from wider groups of authorities and developers.
Ofgem	21 September 2021	Equinor submits response to the OTNR Consultation: 'Changes intended to bring about greater coordination in the development of offshore energy network.'
BEIS	9 February 2022	Equinor participated in meeting 'OTNR Regional East Anglia Pathfinder – Kick-off Round Table'.
NG ESO / BEIS / Ofgem	2 March 2022	Memo describing "Barriers to a Shared OFTO" shared with NG ESO. The memo was later shared with BEIS and Ofgem, too.
Ofgem	9 June 2022	Equinor submitted OTNR Consultation on Anticipatory Investment Early opportunities to Ofgem.
BEIS	29 June 2022	Letter from BEIS confirming SEP and DEP as a Pathfinder Project.
Planning Inspectorate	15 th June 2022	Meeting with the Planning Inspectorate to discuss feedback on draft application documents submitted for pre-application review (April 2022), with focus on approach to scenarios.
NG ESO	23 August 2022	Industry Code, Standard and Licence Recommendation Report User Commitment Workshop.

7 DEVELOPMENT CONSENT ORDER SCENARIOS

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

7.1 Draft Development Consent Order

80. The **Draft DCO** (document reference 3.1) therefore makes provision for the following scenarios:

- Scenario 1 means each project is constructed separately in any one of the following ways:
 - (i) the construction of SEP only where DEP does not proceed to construction;
 - (ii) the construction of DEP only where SEP does not proceed to construction;
 - (iii) sequential construction of SEP then DEP or vice versa; or



(iv) concurrent construction of the two projects.

- Scenario 2 means the two projects are constructed sequentially and whichever project is constructed first will install the ducts for the second project;
- Scenario 3 means either SEL or DEL constructs on behalf of both itself and the other project an integrated onshore substation and connection to National Grid's Norwich Main Substation (the relevant works are identified in the Order as the scenario 3 integrated onshore works) and all other onshore and offshore works are constructed either concurrently or sequentially; and,
- Scenario 4 means either SEL or DEL constructs on behalf of both itself and the other project both the onshore and offshore integrated works including the integrated offshore substation, the integrated onshore substation and the onshore and offshore cables (the relevant works are identified in the Order as the integrated offshore works and the scenario 4 integrated onshore works) and all other onshore and offshore works are constructed either concurrently or sequentially.

81. The scenarios are defined in Part 1 Article 2 Interpretation of the **Draft DCO** (document reference 3.1) and any novel drafting relating to the scenarios is explained within the **Explanatory Memorandum** (document reference 3.2).

7.2 Notification of development scenario prior to commencement

82. Requirement 9 of the **Draft DCO** (document reference 3.1) states:

Scenarios and Phases of authorised development —

(1) The authorised project must not commence until notification has been submitted to the relevant planning authority as to whether the undertaker intends to commence scenario 1, scenario 2, scenario 3 or scenario 4.

(2) The Sheringham Shoal Extension Project onshore works must not be commenced until a written scheme setting out the phases of construction of the Sheringham Shoal Extension onshore works has been submitted to and approved by the relevant planning authority, which scheme may subsequently be amended from time to time as notified to the relevant planning authority.

(3) The Dudgeon Extension Project onshore works must not be commenced until a written scheme setting out the phases of construction of the Dudgeon Extension onshore works has been submitted to and approved by the relevant planning authority, which scheme may subsequently be amended from time to time as notified to the relevant planning authority.

(4) Each scheme must be implemented as notified under sub-paragraphs (2), (3) and (4).

83. The Deemed Marine Licences (DMLs) at Schedules 10 – 13 of the **Draft DCO** (document reference 3.1) each contain a Condition as follows:

Scenarios and Phases of authorised project —

(1) The authorised project must not be commenced until a notification has been submitted to the MMO as to whether the undertaker intends to commence scenario 1, scenario 2, scenario 3 or scenario 4.

(2) The authorised project must not be commenced until a written scheme setting out with regards to the relevant scenario notified under sub-paragraph (1) the phases of construction of the authorised project has been submitted to and approved in writing by the MMO.

(3) The scheme must be implemented as approved.

84. The Applicant therefore considers that provision has been made to ensure that, prior to the commencement of the authorised development, notification must be provided to the relevant planning authority and the MMO as appropriate. It is considered that notification will, necessarily be provided prior to the discharge of further consent Requirements and Conditions as this information will need to be known in order for the projects to undertake detailed engineering work and reach FID.

8 DESCRIPTION OF DEVELOPMENT SCENARIOS

8.1 Development Scenario Concepts and Terms

85. In recognition of the complexity associated with including two projects in one DCO and the DCO application, and in response to pre-application advice from the Planning Inspectorate, the Applicant has prepared this Scenarios Statement to provide a fuller explanation of the development scenarios for which consent for SEP and DEP is sought.

86. **Section 8.5** provides a more detailed description of each development scenario. A number of concepts and terms are referred to within that description which are explained further here in **Section 8.2** to **Section 8.4**.

8.2 Integrated Transmission System

87. As detailed above the preferred option is to develop SEP and DEP with an integrated grid connection. The integrated grid connection could include the following:

- one integrated onshore substation which serves both projects; or
- both an integrated onshore substation and an integrated offshore substation that serve both projects.

88. In each of these scenarios, the same size and capacity of export cabling will be required. There is therefore no difference in the parameters of the export cable corridor onshore under the various scenarios. A description of the works is provided in **Chapter 4 Project Description** of the ES (document reference 6.1.4).



8.3 Shared Works

89. In several development scenarios there will need to be collaboration between the two Projects to optimise construction logistics and to share certain temporary works such as the haul road and construction compounds. This applies to a concurrent build, or may apply to a sequential build if there is an overlap in construction programmes, regardless of whether the transmission systems are integrated. The extent of coordination will be determined post consent and governed by a Cooperation Agreement.
90. Shared works are not defined in the **Draft DCO** (document reference 3.1) as such works are both SEP 'A' works and DEP 'B' works (and SEL and DEL as the undertakers of the DCO have the benefit of works in those areas) and will be governed via suitable commercial arrangements.

8.4 Development Scenarios

Scenario 1(a) and Scenario 1(b)

91. **Figure 8-1** represents Scenario 1(a) and Scenario 1(b) as described in the **Draft DCO** (document reference 3.1):
- the construction of the **Sheringham Shoal Extension Project only** where the Dudgeon Extension Project does not proceed to construction; and
 - the construction of the **Dudgeon Extension Project only** where the Sheringham Shoal Extension Project does not proceed to construction.

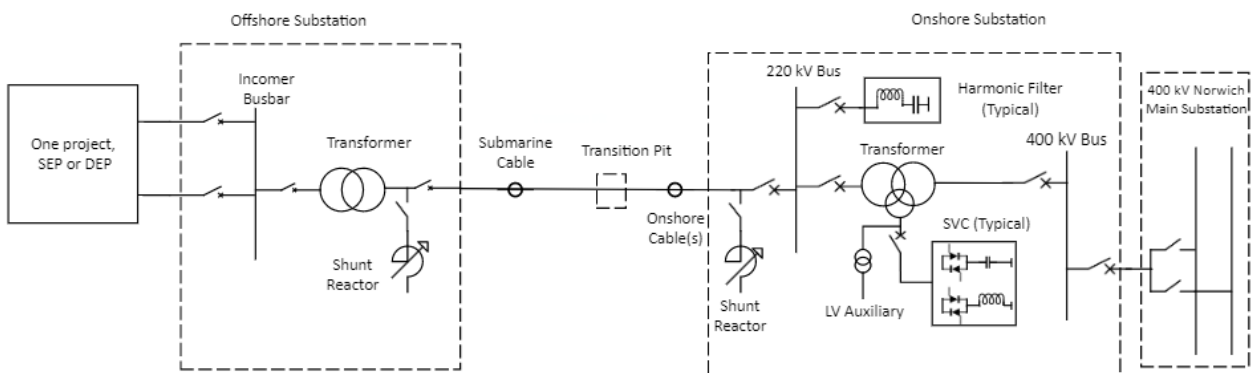


Figure 8-1: Scenario 1(a) and Scenario 1(b) SEP or DEP in Isolation – Preliminary Schematic, to be Updated During Detailed Design.

Sequential or concurrent construction

92. In development scenario 1(a) and 1(b) there is no consideration of concurrent or sequential construction as only one project would be developed. These scenarios are referred to elsewhere in the DCO application as 'in isolation', where only SEP or DEP is constructed.

Integration vs coordination

93. Separate or integrated transmission system only applies where both projects are developed. Likewise, coordination between the two projects is not required as only one project proceeds.

Scenario 1(c)

94. **Figure 8-2** represents Scenario 1(c) as described in the **Draft DCO** (document reference 3.1):
95. sequential construction of the Sheringham Shoal Extension Project then the Dudgeon Extension Project or vice versa.

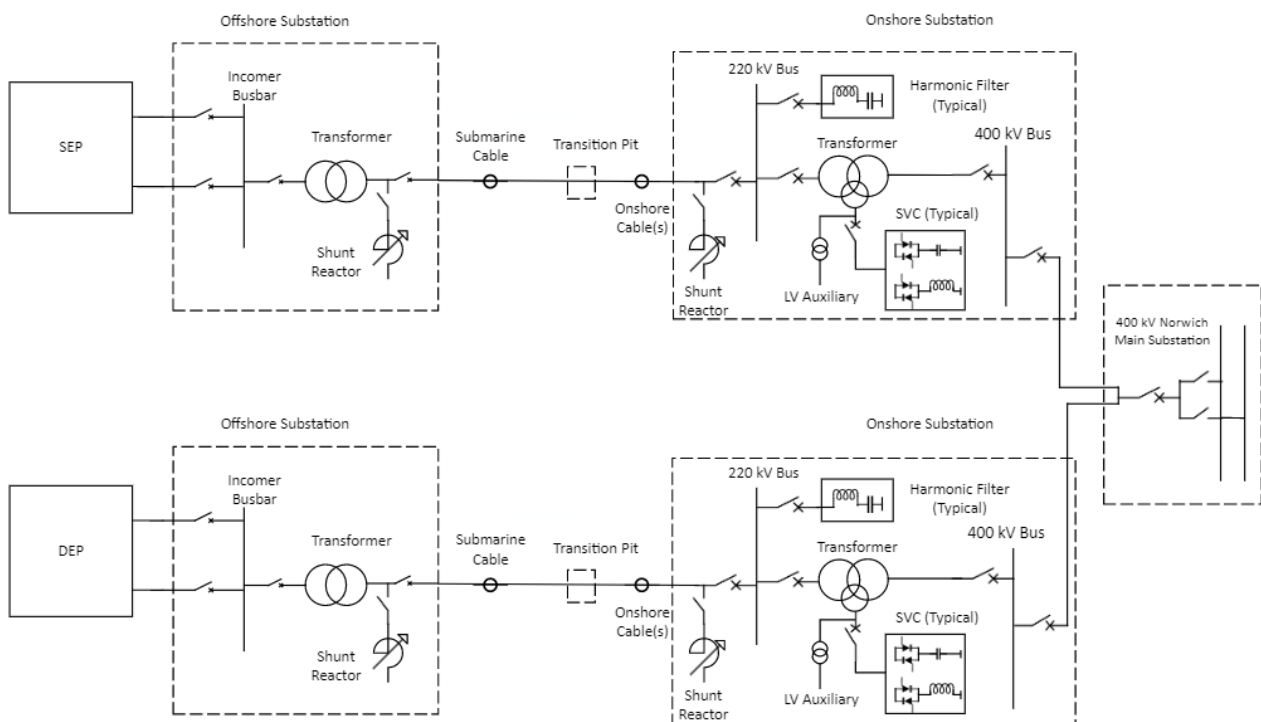


Figure 8-2: Scenario 1(c) SEP and DEP with Separate Transmission Systems Constructed Sequentially – Preliminary Schematic, to be Updated During Detailed Design.

Sequential or concurrent construction

96. In this scenario construction is **sequential**, where both projects are constructed but in a phased approach with either SEP or DEP being constructed first.
97. Section 4.7 of **Chapter 4 Project Description** of the ES (document reference 6.1.4) provides a description of the likely construction programme and indicative durations for key works. It sets out that there could be up to a 4 year gap between construction start dates for SEP and DEP when constructed sequentially.

Integration vs coordination

98. The transmission system in this development scenario is **separate** (i.e. in no way integrated) however coordination will be needed between SEL and DEL to deliver SEP and DEP. Depending on the nature of the gap between construction start dates it is possible that contractors may be on site constructing SEP and DEP at the same time.

Scenario 1(d)

99. **Figure 8-3** represents Scenario 1(d) as described in the **Draft DCO** (document reference 3.1):

- concurrent construction of the two projects.

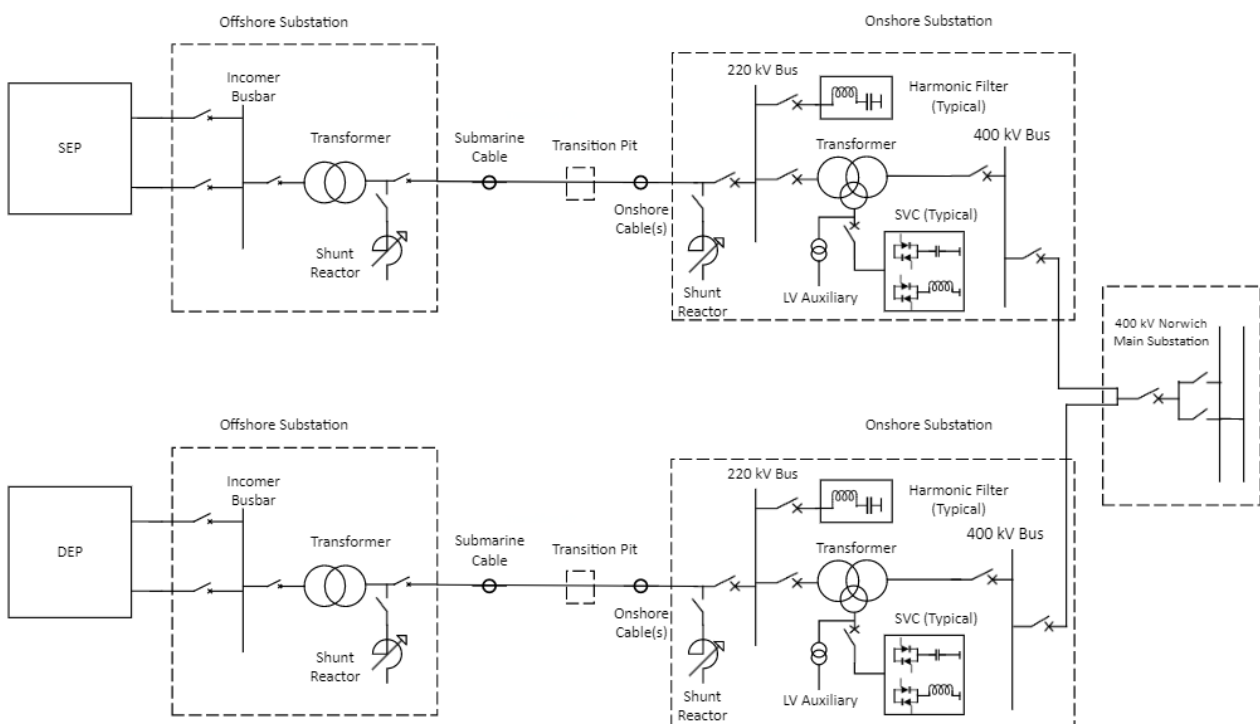


Figure 8-3: Scenario 1(d) SEP and DEP with Separate Transmission Systems Constructed Concurrently – Preliminary Schematic, to be Updated During Detailed Design.

Sequential or concurrent construction

100. In this scenario construction is **concurrent**, where SEP and DEP are both constructed at the same time.

Integration vs coordination

101. The transmission system in this development scenario is **separate** (i.e. in no way integrated) however coordination will be needed between SEL and DEL to deliver SEP and DEP.
102. It is anticipated that shared works will be required to enable two sets of contractors to construct within the Order Limits at the same time. The **Onshore Works Plans** (document reference 2.6) and description of the onshore works in the **Draft DCO** (document reference 3.1) together show that the SEP onshore 'A' works and DEP onshore 'B' works overlap (e.g. there is no centre line along the middle of the onshore export cable corridor, as has been the approach on previous DCOs that have granted consent for two offshore wind farm projects within one DCO (Dogger Bank Teesside A and B Offshore Wind Farm Order 2015¹)). Coordination would therefore be required to enable all works to take place concurrently within the Order Limits.
103. A Cooperation Agreement between SEL and DEL will govern the necessary cooperation between the two projects.

Scenario 2

104. **Figure 8-4** represents Scenario 2 as described in the **Draft DCO** (document reference 3.1):
 - the two projects are constructed sequentially and whichever project is constructed first will install the ducts for the second project.

¹ SI 2015 No. 1592



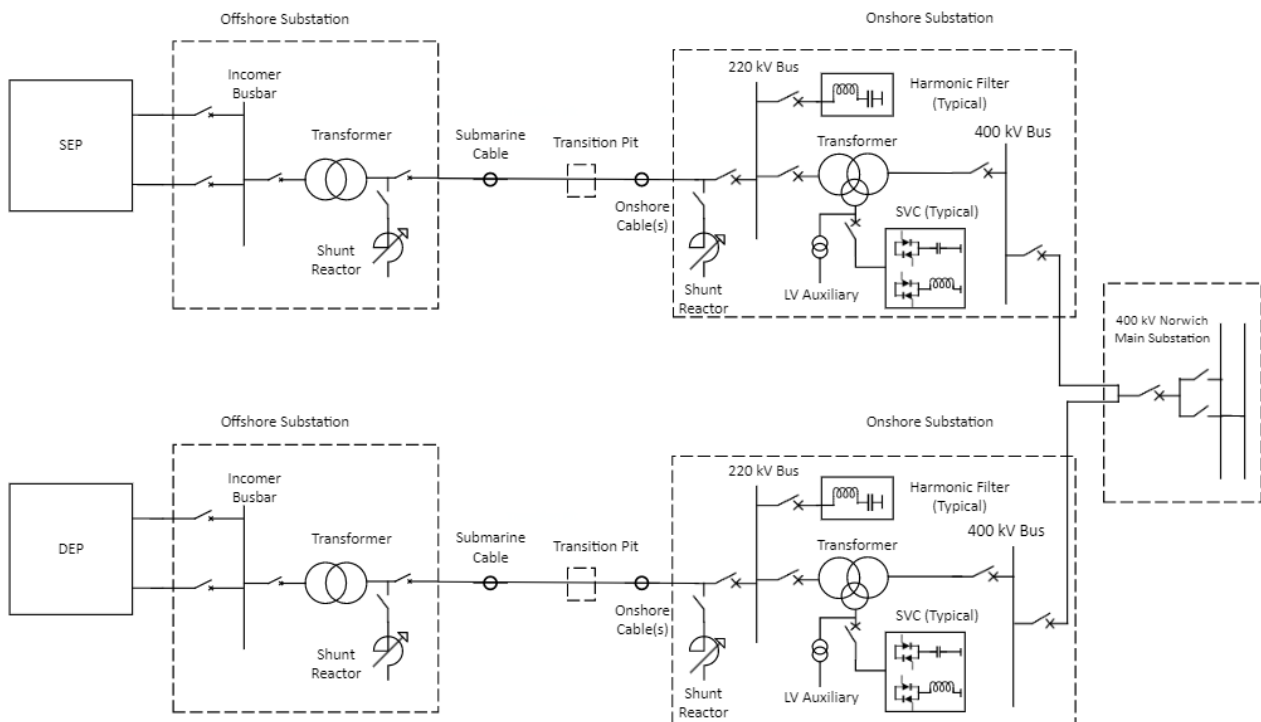


Figure 8-4: Scenario 2 SEP and DEP with Separate Transmission Systems Constructed Sequentially where One Project Installs Ducting for the Other – Preliminary Schematic, to be Updated During Detailed Design.

Sequential or concurrent construction

105. In this scenario construction is **sequential**, where both projects are constructed but in a phased approach with either SEP or DEP being constructed first, however in this scenario the first project to be constructed would at the same time install the ducts for the second project. This would shorten the construction period for the second project (as only cable pull and jointing would be required for the onshore works) and would avoid the need to re-instate sections of the onshore works areas twice.

Integration vs coordination

106. The transmission system in this development scenario is **separate** (i.e. in no way integrated) however coordination will be needed between SEL and DEL to deliver SEP and DEP. Depending on the nature of the gap between construction start dates it is possible that contractors may be on site construction SEP and DEP at the same time.

Scenario 3

107. **Figure 8-5** represents Scenario 3 as described in the **Draft DCO** (document reference 3.1):

- either SEL or DEL constructs on behalf of both itself and the other project an integrated onshore substation and connection to National Grid’s Norwich Main Substation (the relevant works are identified in the Order as the scenario 3 integrated onshore works) and all other onshore and offshore works are constructed either concurrently or sequentially.

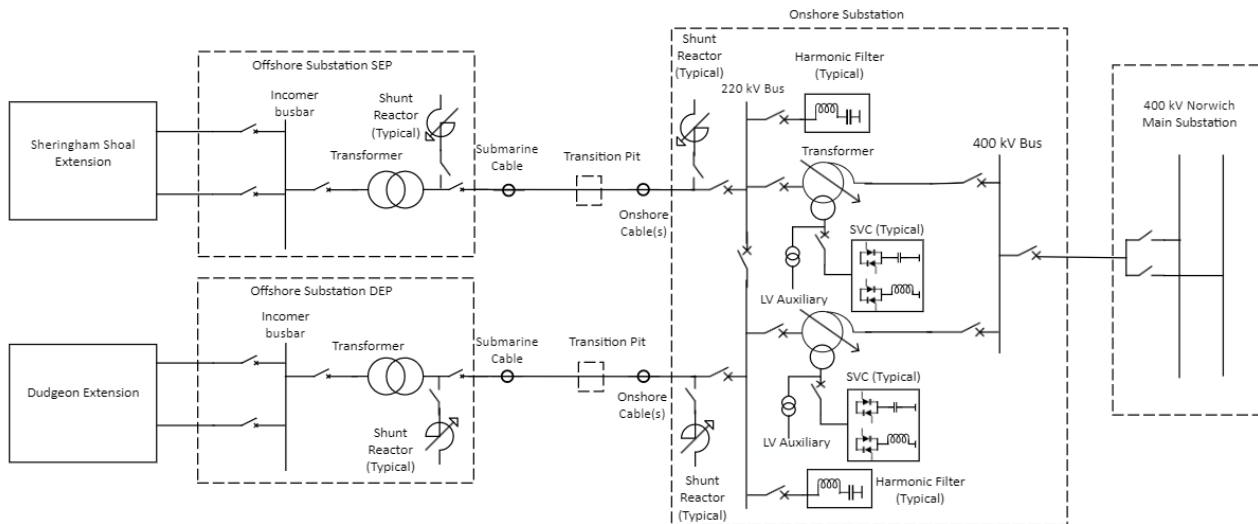


Figure 8-5: Scenario 3 SEP and DEP with an Integrated Onshore Substation Constructed Concurrently – Preliminary Schematic, to be Updated During Detailed Design.

Sequential or concurrent construction

108. In this scenario construction of the onshore substation is concurrent i.e. one onshore substation is built with shared infrastructure for both SEP and DEP. The rest of the onshore and offshore works may be constructed **sequentially or concurrently** as per Scenarios 1(c), 1(d) or 2.

Integration vs coordination

109. The transmission system in this development scenario is **integrated** at the onshore substation only. Two offshore substation platforms (one for SEP and one for DEP) would therefore still be required.

Scenario 4

110. **Figure 8-6** represents Scenario 4 as described in the **Draft DCO** (document reference 3.1):

- means either SEL or DEL constructs on behalf of both itself and the other project both the onshore and offshore integrated works including the integrated offshore substation, the integrated onshore substation and the onshore and offshore cables (the relevant works are identified in the Order as the integrated offshore works and the scenario 4 integrated onshore works) and all other onshore and offshore works are constructed either concurrently or sequentially.

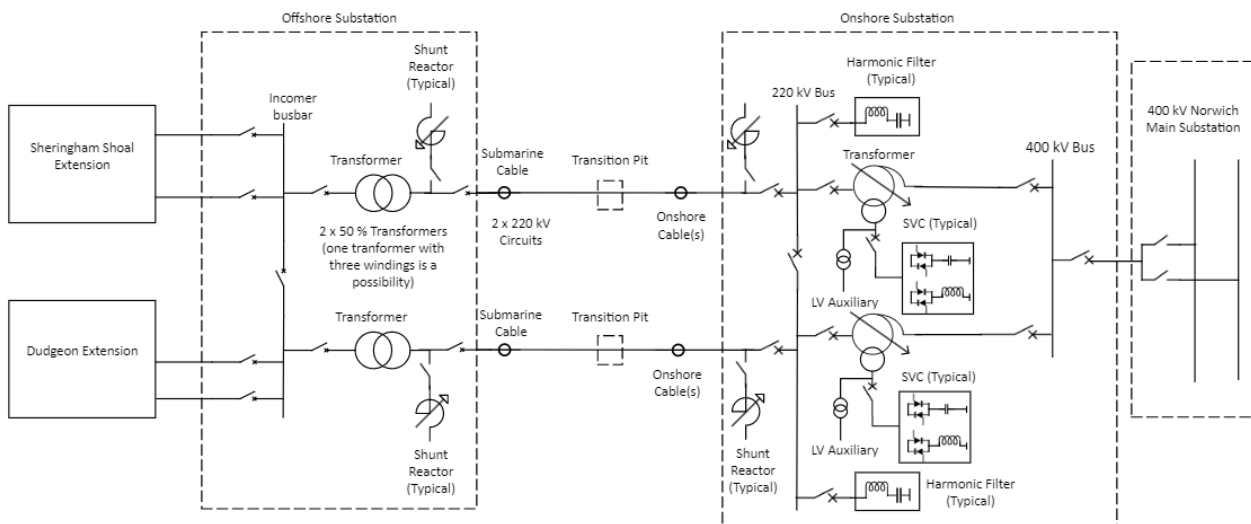


Figure 8-6: Scenario 4 SEP and DEP with an Integrated Transmission System Constructed Concurrently – Preliminary Schematic, to be Updated During Detailed Design.

Sequential or concurrent construction

111. In this scenario construction of the transmission system for both SEP and DEP is **concurrent** i.e. one offshore substation platform and one onshore substation are built with shared infrastructure for both SEP and DEP. Construction could be **concurrent** or **sequential** for the generation assets i.e. the wind turbine generators (WTGs) and in-field cables.

Integration vs coordination

112. The transmission system in this development scenario is **integrated** (onshore and offshore) and will have only one offshore substation platform which will be located in the SEP array area.

8.5 Design Options

113. Section 4.1.1 of **Chapter 4 Project Description** of the ES (document reference 6.1.4) sets out that the Environmental Impact Assessment (EIA) has been undertaken on the basis of the ‘Rochdale Envelope’ approach to allow flexibility within the consent for future detailed engineering and development work. A number of factors such as the evolution of technology, the need for flexibility in key commercial project decisions and the need for further detailed surveys, are required before a final design and layout can be determined. The EIA has been undertaken as described in **Chapter 5 EIA Methodology** of the ES (document reference 6.1.5) and in **Section 9** of this document based on the worst case scenario which allows for a number of overall design permutations (design options).

114. A key design decision for DEP is whether to use all of the DEP North and DEP South array areas, or whether to use the DEP North array area only. This will be determined based on a number of technical and commercial factors such as wind yield, wake losses and ground conditions. The DCO application is based on the possibility of using either both DEP North and DEP South array areas, or the DEP North array area only.
115. The DEP North only design option sits out with the selection of overall development scenario (i.e. DEP could be delivered as DEP North only or DEP North and DEP South irrespective of whether the integrated grid solution is brought forward), however given its importance in framing the worst case scenario for some assessment topics for the offshore environment it was considered prudent to identify this as a key design option within the ES, and be explicit about the worst case scenario as far as it relates to the DEP North only / DEP North and DEP South design option.

9 ENVIRONMENTAL IMPACT ASSESSMENT SCENARIOS

9.1 Overview

116. Section 4.1.1 of **Chapter 4 Project Description** of the ES (document reference 6.1.4) describes the project development scenarios and sets out how these have been expressed for the purpose of the ES, and how the worst case scenarios for each assessment topic have been determined to ensure a robust EIA has been undertaken and presented.
117. As described in **Chapter 5 EIA Methodology** of the ES (document reference 6.1.5) the SEP and DEP EIA is based on a project design envelope approach, also known as the ‘Rochdale Envelope’ approach. Planning Inspectorate Advice Note Nine (the Planning Inspectorate, v3 2018) recognises that, at the time of submitting an application, offshore wind developers may not know the precise nature and arrangement of infrastructure, and any associated infrastructure, which make up the proposed development.
118. It is acknowledged that the different project development scenarios could give rise to different potential impacts, magnitude of impact and/or different effects on receptors, therefore an assessment of potential impacts is provided against each scenario, where relevant.
119. For the purpose of the EIA the project development scenarios for SEP and DEP have been broadly categorised as:
- In isolation – where only SEP or DEP is constructed;
 - Sequential – where SEP and DEP are both constructed in a phased approach with either SEP or DEP being constructed first; or
 - Concurrent – where SEP and DEP are both constructed at the same time.
120. Under each scenario where SEP and DEP are both constructed it is possible that the electrical infrastructure could be integrated as described in **Section 8** which would offer technical and commercial benefits to the operation of the electrical infrastructure system.

121. An integrated transmission system would also offer the option to reduce from two offshore substation platform (OSPs) (one for SEP, one for DEP) to a single OSP serving both wind farms (located in SEP) (in Scenario 4). **Table 9-1** provides a summary of the development scenarios as set out and described in **Section 8**.

Table 9-1: Development Scenarios.

Development scenarios	OSP option	DCO Scenario (as described in Section 8)
The construction of SEP or DEP only (where the other Project does not proceed)	1 OSP only	Scenario 1(a) Scenario 1(b)
SEP and DEP sequential	2 OSFs, one for SEP and one for DEP	Scenario 2
	1 OSP, for both SEP and SEP (located in SEP)	Scenario 4
SEP and DEP concurrent	2 OSFs, one for SEP and one for DEP	Scenario 1(d)
	1 OSP, for both SEP and SEP (located in SEP)	Scenario 4

122. In the concurrent development scenario there will need to be collaboration between the two Projects to optimise construction logistics and to share certain temporary works such as the haul road and construction compounds. This applies to a concurrent build regardless of whether the transmission systems are integrated. The extent of coordination will be determined post consent.
123. Each of the development scenarios offer a range of benefits, with the preferred option (integrated transmission system built concurrently) particularly benefitting the planning and construction of the Projects, being likely to reduce the overall environmental impact and disruption to local communities, and responding to concerns regarding the lack of a holistic approach to offshore wind development in general. For example, the preferred option would only require one haul road for construction activities, half the number of work fronts, and a smaller onshore substation.

Development Scenario Options

124. Within the broad development scenarios there are also a number of options. **Table 9-2** describes the development options and how they have been considered within the assessment presented in the ES.

Table 9-2: Development Options.

Development option	Consideration in the ES worst case scenarios	DCO Scenario (as described in Section 8)
Either SEP is constructed first and installs the ducts for DEP, or	This option would result in an overall shorter construction duration than the sequential scenario (separate	Scenario 2

Development option	Consideration in the ES worst case scenarios	DCO Scenario (as described in Section 8)
DEP is constructed first and installs the ducts for SEP	transmission systems), and would result in lower overall peaks during construction than the concurrent scenario (separate transmission systems). As it does not reflect the maximum peak effects or maximum duration of effects it has not been assessed as a specific scenario but is covered by the envelope of parameters considered.	
Either SEL or DEL constructs on behalf of both itself and the other project an integrated onshore substation and connection to National Grid’s Norwich Main Substation (all other onshore and offshore works are constructed either concurrently or sequentially)	This option would result in an overall smaller onshore substation footprint than the sequential scenario (separate transmission systems), and the concurrent scenario (separate transmission systems). As it does not reflect the maximum parameters it has not been assessed as a specific scenario but is covered by the envelope of parameters considered.	Scenario 3

9.2 Worst case scenario

125. In order to ensure that a robust assessment has been undertaken, all development scenarios and options have been considered to ensure the realistic worst case scenario for each topic has been assessed.
126. The EIA considers the appropriate realistic worst-case associated with the different development scenarios and options, and presents the results accordingly. The information provided in **Chapter 4 Project Description** of the ES (document reference 6.1.4), and each topic specific ES chapter, is designed to clearly show how the project design envelope would differ depending on which scenario may be taken forward.
127. The impact assessments for onshore topics therefore consider the following development scenarios and sub-options in determining the worst-case scenario for each topic:
 - Build SEP or build DEP in isolation;
 - Build SEP and DEP sequentially with a gap of up to four years between the start of construction of each Project – reflecting the maximum duration of effects; and
 - Build SEP and DEP concurrently – reflecting the maximum peak effects.
128. The impact assessments for the offshore topics consider the following development scenarios and sub-options in determining the worst-case scenario for each topic:
 - Build SEP or build DEP in isolation – therefore one OSP only; and
 - Build SEP and DEP concurrently or sequentially – with either two OSPs, one for SEP and one for DEP, or with one OSP only to serve both SEP and DEP.



129. The project development scenarios, including the associated configurations of export and/or interlink cables, are illustrated in Figures 4.5 to 4.8 of **Chapter 4 Project Description** of the ES (document reference 6.1.4).

10 PRECEDENT

130. The Applicant is mindful that the approach to SEP and DEP is novel in some respects, and necessarily so. If delivered under the preferred option, the projects will be an industry first, and will be delivered in direct response to the government ambition for greater coordination in offshore wind with respect to transmission systems whilst limiting the impacts on the environment and local community.

131. However, similar approaches have been adopted for previous consented NSIPs. **Table 10-1** sets out examples where there is precedent for multiple NSIPs in one DCO, or a variety of construction scenarios consented in one DCO.

Table 10-1: Example Of Other Offshore Wind Farm Projects Where The DCO Has Included More Than One Generating Station, and Various Development Scenarios.

Development Consent Order	NSIPs	Development Description	Summary of approach and construction controls
The Hornsea One Offshore Wind Farm 2014	Hornsea One Area 1	Two or three offshore wind generating stations, with a combined installed capacity of 1.2GW located in the North Sea off the UK Yorkshire coast.	DCO (as amended) provides for construction of each generating station by separate undertakers, with one undertaker responsible for all associated works. Development of Wind Farm 3 was permitted only if the number of turbines constructed within Wind Farm Areas 1 and 2 was less than 81. Flexibility for either 5 or 7 offshore substations depending on the mode of transition, and in relation to the location of two offshore platforms across all three areas.
	Hornsea One Area 2		
	Hornsea One Area 3		
The Dogger Bank Teesside A and B Offshore Wind Farm Order 2015	Dogger Bank C (formerly Teesside A)	One or two offshore wind generating stations, each with an installed capacity of 1.2GW located in the North Sea off the UK north east coast.	DCO (as amended) provides for construction by separate undertakers, with flexibility for some works to be undertaken as shared works or project specific works. Requirements may be discharged on a stage by stage basis, so that the projects can be constructed sequentially or concurrently.
	Sofia (formerly Teesside B)		
The Dogger Bank Creyke Beck Offshore Wind Farm Order 2015	Dogger Bank A (formerly Creyke Beck A)	One or two offshore wind generating stations, each with an installed capacity of 1.2GW located in the North Sea off the UK north east coast.	DCO (as amended) provides for construction by separate undertakers, with some shared works. Flexibility was included for either two separate or one combined offshore converter platform. Requirements may be discharged on a stage by stage
	Dogger Bank B (formerly Creyke Beck B)		

Development Consent Order	NSIPs	Development Description	Summary of approach and construction controls
			basis, so that the projects can be constructed sequentially or concurrently.
The Hornsea Two Offshore Wind Farm Order 2016	Hornsea Two A	One or two offshore wind generating stations, each with a combined installed capacity of 1.8GW located in the North Sea off the UK Yorkshire Coast.	DCO (as amended) provides for construction by separate undertakers, with some shared works. Flexibility for either 3 or 5 offshore substations depending on the mode of transition. Flexibility for Hornsea Project One (consented separately) to use additional temporary construction compounds in the event of a simultaneous or overlapping construction programme.
	Hornsea Two B		

- 132. It is important to note that the project development scenarios do not provide for multiple project permutations with regards to parameters of each project i.e. certain parameters, such as maximum wind turbine generator height, are fixed for the purpose of the application and assessment irrespective of project development scenario.
- 133. Scenario 1 and scenario 2 are not novel in themselves, rather the draft DCO (document reference 3.1) openly sets out the ways in which two projects with overlapping Order Limits could be constructed. Scenario 3 and scenario 4 are novel in that they provide for different levels of electrical integration between the two projects which has not previously been done. The **Explanatory Memorandum** (document reference 3.2) provides further information on the drafting of the **Draft DCO** (document reference 3.1) and where novel forms of drafting are included.

11 LAND ACQUISITION

11.1 Land Agreements

- 134. The Applicant wishes to reach agreement with landowners and occupiers wherever possible to acquire land and rights in land necessary for the construction of SEP and DEP on a voluntary basis. The Applicant is seeking to negotiate agreements that are flexible and would allow the delivery of SEP and/or DEP under any of the scenarios outlined above. The Applicant is continuing to engage with landowners and occupiers in this regard. It is the intention that one agreement is entered into with each affected party on behalf of both SEP and DEP, with the resultant benefit that landowners and occupiers do not need to negotiate with two different project companies.



11.2 Compulsory Acquisition

- 135. The **Draft DCO** (document reference 3.1) provides both SEL and DEL with consent to construct, operate and maintain their cable circuit in any part of the onshore cable corridor and similarly to exercise powers of compulsory acquisition across the full width and length of the onshore cable corridor.
- 136. The DCO will grant consent for all of the development scenarios and the decision on which will be followed will be determined at a later date (and, as set out in **Section 7.2**, must be notified by the Applicant to the Secretary of State (SoS) and the MMO prior to commencement of development).
- 137. The development scenario that is chosen will have implications for the way in which the compulsory acquisition powers are exercised. For the avoidance of doubt, as SEP and DEP are being developed in coordination, there will be no change to the Order Land regardless of the scenario that is taken forwards. Instead, the differences will arise in the timing of when the compulsory acquisition powers need to be exercised.

Table 11-1: Impact of Different Development Scenarios on Use of Compulsory Acquisition Powers.

DCO Development Scenario	Impact on use of the compulsory acquisition powers
<p>Scenario 1 means each project is constructed separately in any one of the following ways:</p> <ul style="list-style-type: none"> i. the construction of SEP only where DEP does not proceed to construction; ii. the construction of DEP only where SEP does not proceed to construction; iii. sequential construction of SEP then DEP or vice versa; or iv. concurrent construction of the two projects; 	<p>SEL will exercise compulsory acquisition powers in respect of all the SEP landfall and onshore works (work nos. 7A to 22A).</p> <p>DEL will exercise compulsory acquisition powers in respect of all the DEP landfall and onshore works (work nos. 7B to 22B).</p> <p>There are no onshore integrated works in any of scenarios 1(i) to (iv).</p>
<p>Scenario 2 means the two projects are constructed sequentially and whichever project is constructed first will install the ducts for the second project;</p>	<p>SEL will exercise compulsory acquisition powers in respect of all the SEP landfall and onshore works (work nos. 7A to 22A).</p> <p>DEL will exercise compulsory acquisition powers in respect of all the DEP landfall and onshore works (work nos. 7B to 22B).</p> <p>Whilst there are no onshore integrated works in this scenario, the second entity to undertake its works will, for the purposes of the installation of the second projects' ducts, either consent to the exercise of compulsory acquisition powers by the first entity or exercise the powers itself and grant the other project consent to construct its ducts.</p>



DCO Development Scenario	Impact on use of the compulsory acquisition powers
<p>Scenario 3 means either SEL or DEL constructs on behalf of both itself and the other project an integrated onshore substation and connection to National Grid's Norwich Main Substation (the relevant works are identified in the Order as the scenario 3 integrated onshore works) and all other onshore and offshore works are constructed either concurrently or sequentially;</p>	<p>SEL will exercise compulsory acquisition powers in respect of Works Nos. 7A to 14A and 18A to 22A.. DEL will exercise compulsory acquisition powers in respect of Work Nos. 7B to 14B and 18B to 22B. SEL and DEL will agree which entity will exercise compulsory acquisition powers in respect of the scenario 3 integrated onshore works (work nos. 15C to 17C).</p>
<p>Scenario 4 means either SEL or DEL constructs on behalf of both itself and the other project both the onshore and offshore integrated works including the integrated offshore substation, the integrated onshore substation and the onshore and offshore cables (the relevant works are identified in the Order as the integrated offshore works and scenario 4 integrated onshore works) and all other onshore and offshore works are constructed either concurrently or sequentially.</p>	<p>SEL will exercise compulsory acquisition powers in respect of Works Nos. 10A, 11A, 13A, 14A and 18A to 22A. DEL will exercise compulsory acquisition powers in respect of Work Nos. 10B, 11B, 13B, 14B and 18B to 22B. SEL and DEL will agree which entity will exercise compulsory acquisition powers in respect of the integrated landfall works and the scenario 4 integrated onshore works (work nos. 7C, 8C, 9C, 12C, 15C, 16C and 17C).</p>

138. The **Statement of Reasons** (document reference 4.3) explains in more detail how any Compulsory Acquisition powers sought under the DCO are intended to have effect in the different scenarios.



References

UK Government (2022) <https://www.gov.uk/government/groups/offshore-transmission-network-review> [accessed July 2022]

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