



# Hornsea Project Four: Preliminary Environmental Information Report (PEIR)

## Volume 1, Chapter 1: Introduction

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Doc. Number: A6.1.1  
Version: A

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## Glossary

Term	Definition
Agreement for Lease (AfL)	An agreement for lease (AfL) is a non-binding agreement between a landlord and prospective tenant to grant and/or to accept a lease in the future. The AfL only gives the option to investigate a site for potential development. There is no obligation on the developer to execute a lease if they do not wish to.
the Applicant	Orsted Hornsea Project Four Ltd.
Commitment	A term used interchangeably with mitigation. Commitments are Embedded Mitigation Measures. Commitments are either Primary (Design) or Tertiary (Inherent) and embedded within the assessment at the relevant point in the EIA (e.g. at Scoping or PEIR). The purpose of Commitments is to reduce and/or eliminate Likely Significant Effects (LSE's), in EIA terms.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Projects (NSIP).
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of the impact with the importance, or sensitivity, of the receptor or resource in accordance with defined significance criteria.
EIA Directive	European Union Directive 85/337/EEC, as amended by Directives 97/11/EC, 2003/35/EC and 2009/31/EC and then codified by <a href="#">Directive 2011/92/EU</a> of 13 December 2011 (as amended in 2014 by <a href="#">Directive 2014/52/EU</a> ).
EIA Regulations	The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended).
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Directive and EIA Regulations, including the publication of an Environmental Statement (ES).
Environmental Statement (ES)	A document reporting the findings of the EIA and produced in accordance with the EIA Directive as transposed into UK law by the EIA Regulations.
Export Cable Corridor (ECC)	The specific corridor of seabed (seaward of Mean High Water Springs (MHWS)) and land (landward of MHWS) from the Hornsea Four array area to the Creyke Beck National Grid substation, within which the export cables will be located. The final route will be located within the ECC search area and will be defined via a site selection process considering technical, physical and environmental constraints.
Hornsea Four	The proposed Hornsea Four offshore wind farm project; the term covers all elements within the Development Consent Order (i.e. both the offshore and onshore components).
Mitigation	A term used interchangeably with Commitment(s) by Hornsea Four. Mitigation measures (Commitments) are embedded within the assessment at the relevant point in the EIA (e.g. at Scoping or PEIR).

Term	Definition
The Secretary of State (SoS) for Business, Energy and Industrial Strategy	The ultimate decision maker with regards to Hornsea Four's application for Development Consent.
Planning Inspectorate (PINS)	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects (NSIPs).
Wind turbine generator	All the components of a wind turbine, including the tower, nacelle, and rotor.

## Acronyms

Acronym	Definition
AFL	Agreement for Lease
A/S	Aktieselskab (Danish: Joint Stock Company)
DBEIS	Department for Business, Energy and Industrial Strategy
DCO	Development Consent Order
EC	European Community
EIA	Environmental Impact Assessment
EIA Report	Environmental Impact Assessment Report (note that the new EIA Directive refers to an EIA Report and not an Environmental Statement)
ES	Environmental Statement
NSIP	Nationally Significant Infrastructure Project
PEIR	Preliminary Environmental Information Report
SoS	Secretary of State
TCE	The Crown Estate
UK	United Kingdom

## Units

Unit	Definition
Km	Kilometre
GW	Gigawatt (power)
MW	Megawatt (power)

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## 1. Introduction

### 1.1 Introduction to Hornsea Four

1.1.1.1 This Chapter comprises the Introduction of the Preliminary Environmental Information Report (PEIR) for the Hornsea Project Four Offshore wind farm project (hereafter Hornsea Four), promoted by 'Ørsted Hornsea Project Four Ltd' (the Applicant). Hornsea Four will comprise of several different elements located both off- and onshore, with the generating structures located approximately 65 km east of Flamborough Head off the coast of the East Riding of Yorkshire within the UK's Exclusive Economic Zone. A full project description is given in [Chapter 4: Project Description](#).

1.1.1.2 Hornsea Four will consist of an offshore generating station with a capacity greater than 100 MW and is therefore a Nationally Significant Infrastructure Project (NSIP), as defined under Section 15(3) of the Planning Act 2008 (the '2008 Act'). As such there is a requirement to apply for a Development Consent Order (DCO) to the Planning Inspectorate (PINS), who administer the examination of applications on behalf of the Secretary of State (SoS) ([Section 1.2](#)).

### 1.2 Purpose of the Preliminary Environmental Information Report

1.2.1.1 This PEIR constitutes the Preliminary Environmental Information for Hornsea Four and sets out the preliminary findings of the Environmental Impact Assessment (EIA) to date to support pre-application consultation activities required under the 2008 Act. The EIA will be finalised following completion of pre-application consultation and the Final Environmental Statement (ES) will accompany the Development Consent Order (DCO) application to the Planning Inspectorate (PINS). The DCO application is currently scheduled to be made during the first quarter of 2020 and more details on the requirements of the DCO application is provided in [Section 1.6](#).

1.2.1.2 The PEIR will form the basis for Statutory Consultation which will last for 42 days and conclude on 23<sup>rd</sup> September 2019. At this point, comments received on the PEIR will be reviewed and incorporated (where appropriate) into the Environmental Statement, which will be submitted in support of the DCO application.

1.2.1.3 The PEIR is available for download on the project's website:

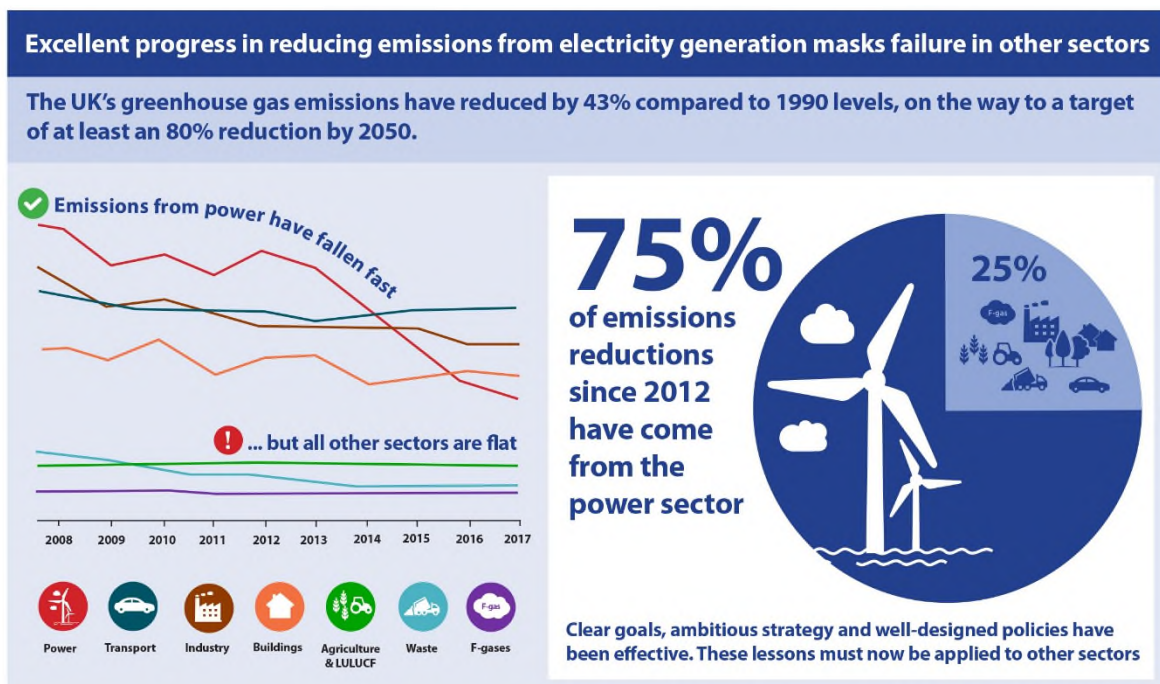
<https://hornseaprojects.co.uk/en/Hornsea-Project-Four/Documents-Library>

### 1.3 Purpose of Hornsea Four

1.3.1.1 Climate change is a global issue as a result of carbon emissions released into the atmosphere, in part due to human activity. Findings from the 2018 UK Climate Projections (UKCP18) show that on average the climate across the UK has been 0.3 °C warmer over the period between 1981 and 2010, with the top ten warmest years having been recorded since 1990 (MetOffice, 2018). It is predicted that this increase in warming will continue into the 21<sup>st</sup> century, with over a 50% probability of the UK experiencing hot summers comparable to that experienced

in 2018 through climate change and emissions. Climate change has synonymously driven changes in sea levels across the UK since the 20<sup>th</sup> century where an increase of up to 16 cm has been recorded this past decade (MetOffice, 2018). UK policies relating to climate change are explored in [Chapter 2: Planning and Policy Context](#).

- 1.3.1.2 Generating and harnessing energy from low carbon, renewable sources, such as offshore wind, is one of the solutions available to substantially reduce carbon emissions, whilst answering the challenges of meeting energy demand as part of the UK renewables policy framework (Directive 2009/28/EC). In 2017, more than 50% of the UK's electricity was generated by low carbon sources (Staffell *et al.*, 2017).
- 1.3.1.3 Through the Climate Change Act, the UK Government has committed to reducing greenhouse gas (GHG) emissions by 80% relative to 1990 levels by 2050 ([Figure 1.1](#), Committee on Climate Change, 2018). To reach this ambitious target, the UK Government has put in place five-yearly carbon budgets that will run until 2032 to restrict the amount of emission the UK can legally emit within each five-year period. The UK is currently in its third carbon budget (2018 – 2022), with a target to reduce emissions by 37% relative to 1990 levels by 2020 (Committee on Climate Change, 2018).



**Figure 1.1 Schematic of UK Carbon Emission from the Renewables Sector**

- 1.3.1.4 The UK has installed more offshore wind capacity than any other country and currently remains the leader in offshore wind generation in 2019. The Department for Business, Energy

and Industrial Strategy (DBEIS) advises the UK can reach the target delivery of up to 30 GW by 2030, which will supply over one-third of UK electricity (DBEIS, 2019)

- 1.3.1.5 The proposed Hornsea Four project would make a significant contribution both to the achievement of UK decarbonisation targets and to global commitments to mitigating climate change. By generating low carbon, renewable electricity in the UK, the proposed Hornsea Four project will also help to reduce the UK's reliance on imported energy and improve the UK's energy security. Further details are provided in [Chapter 2: Policy and Policy Context](#).

## 1.4 Background to Hornsea Four Project

### 1.4.1 Ørsted A/S

- 1.4.1.1 The Applicant (Ørsted Hornsea Four Ltd) and Ørsted Power (UK) Ltd are owned by Ørsted A/S. Ørsted Wind Power A/S specialises in procuring, producing, distributing and trading energy and related products in Northern Europe. Ørsted Wind Power A/S is the world leader in the development, construction and operation of offshore wind farms, with more than 25 years' experience and a strong track record delivering successful projects, with approximately 3,849 MW of operational offshore wind farms worldwide, and a further 3,582 MW under construction in the lead up to 2020.

### 1.4.2 Former Hornsea Zone

- 1.4.2.1 The former Hornsea Zone was one of nine offshore wind generation zones around the UK coast identified by The Crown Estate (TCE) during its third round of offshore wind licensing. As part of a competitive tender, SMart Wind Ltd., a then 50/50 joint venture between International Mainstream Renewable Power (Offshore) Ltd and Siemens Project Ventures GmbH, was awarded the rights to the development of the former Hornsea Zone by entering into a Zone Development Agreement (ZDA) with TCE in 2009.
- 1.4.2.2 Ørsted Wind Power A/S acquired the development rights to Hornsea Project One in February 2015 and, in August 2015, Ørsted Wind Power A/S acquired SMart Wind Ltd and the then Hornsea Zone, together with the development rights for Hornsea Project Two, Hornsea Project Three and Hornsea Four.
- 1.4.2.3 Subsequently in March 2016, the Hornsea ZDA was terminated and project specific agreements (Agreements for Lease (AfLs)) were agreed with TCE for Hornsea Project One, Hornsea Project Two, Hornsea Project Three and Hornsea Four. The Hornsea Zone has therefore been dissolved and is referred to throughout this PEIR as the former Hornsea Zone.
- 1.4.2.4 The first project to be proposed within the former Hornsea Zone was Hornsea Project One. Hornsea Project One included up to three offshore wind farms with a maximum generating capacity of 1,200 MW and the associated connections to shore. The SoS granted



development consent for Hornsea Project One on 10 December 2014, which has now 174 fully constructed and operational wind turbines.

- 1.4.2.5 The second project to be proposed within the former Hornsea Zone was Hornsea Project Two. Hornsea Project Two comprises up to two offshore wind farms with a maximum generating capacity of 1,800 MW. The SoS granted development consent for Hornsea Project Two on 16 August 2016.
- 1.4.2.6 The third project to be proposed within the former Hornsea Zone was Hornsea Project Three which submitted an application for Development Consent in May 2018. The Hornsea Project Three examination concluded in April 2019. If consented, Hornsea Project Three will comprise an offshore wind farm with up to 30 wind turbines.
- 1.4.2.7 The Hornsea Four array area is shown in relation to the existing Hornsea projects on [Figure 1.2](#). Hornsea Four will be the fourth project to be developed in the former Hornsea Zone and will have similarities to the existing Hornsea projects both in terms of the nature of the project and general geographic location. As a result, the PEIR has where appropriate considered the results of EIAs for the existing Hornsea projects learning from these experiences. The PEIR will also consider matters that have been raised during consultation on the existing Hornsea projects that are applicable to the Hornsea Four EIA.

### **1.4.3 Hornsea Four – Project Infrastructure Summary**

- 1.4.3.1 Hornsea Four will include both offshore and onshore infrastructure. The Hornsea Four array area includes a maximum of 180 wind turbine generators located approximately 65 km offshore due east of Flamborough Head at their closest point (adjacent to Hornsea Project Two on its eastern project boundary). The offshore array area also includes all infrastructure required to operate and maintain the wind farm and to transmit the power generated by the turbines to the Creyke Beck National Grid substation, located near Cottingham, Humberside. Such infrastructure will include a further maximum of 10 other offshore structures and associated cables.
- 1.4.3.2 The offshore wind farm will be connected to the landfall (and joint transition bays) via up to six offshore export cables/circuits installed within the offshore export cable corridor (ECC). A full list and description of all offshore and onshore infrastructure is given in [Chapter 4: Project Description, Section 4.6](#).
- 1.4.3.3 The Hornsea Four PEIR boundary includes up to six export cables/circuits buried in trenches connecting to an onshore substation along an approximately 40 km route from landfall to National Grid Substation. Hornsea Four may use High Voltage Alternating Current (HVAC) or High Voltage Direct Current (HVDC) transmission systems, or a combination of both technologies in separate electrical systems, to deliver the electricity produced offshore to the substation. Details on the number of circuits for each transmission system is provided in [Chapter 4: Project Description, Section 4.1.1](#).

- 1.4.3.4 Onshore infrastructure will comprise of a cable relay station, which will be required only under the HVAC scenario, the onshore cable (consisting of the HVAC or HVDC export cables), and the 400 kV HVAC substation interconnecting cables running from the landfall to an onshore project substation (either HVAC or HVDC) and extension to the Creyke Beck National Grid substation ([Chapter 4: Project Description](#)).
- 1.4.3.5 [Figure 1.2](#) identifies the Hornsea Four array area and onshore PEIR boundary for the purposes of the EIA of Hornsea Four at PEIR, and their relative location to the Hornsea Zone. More details of the onshore and offshore infrastructure and component parts of the project are provided in [Chapter 4: Project Description, Section 4.6](#).

# Hornsea 4

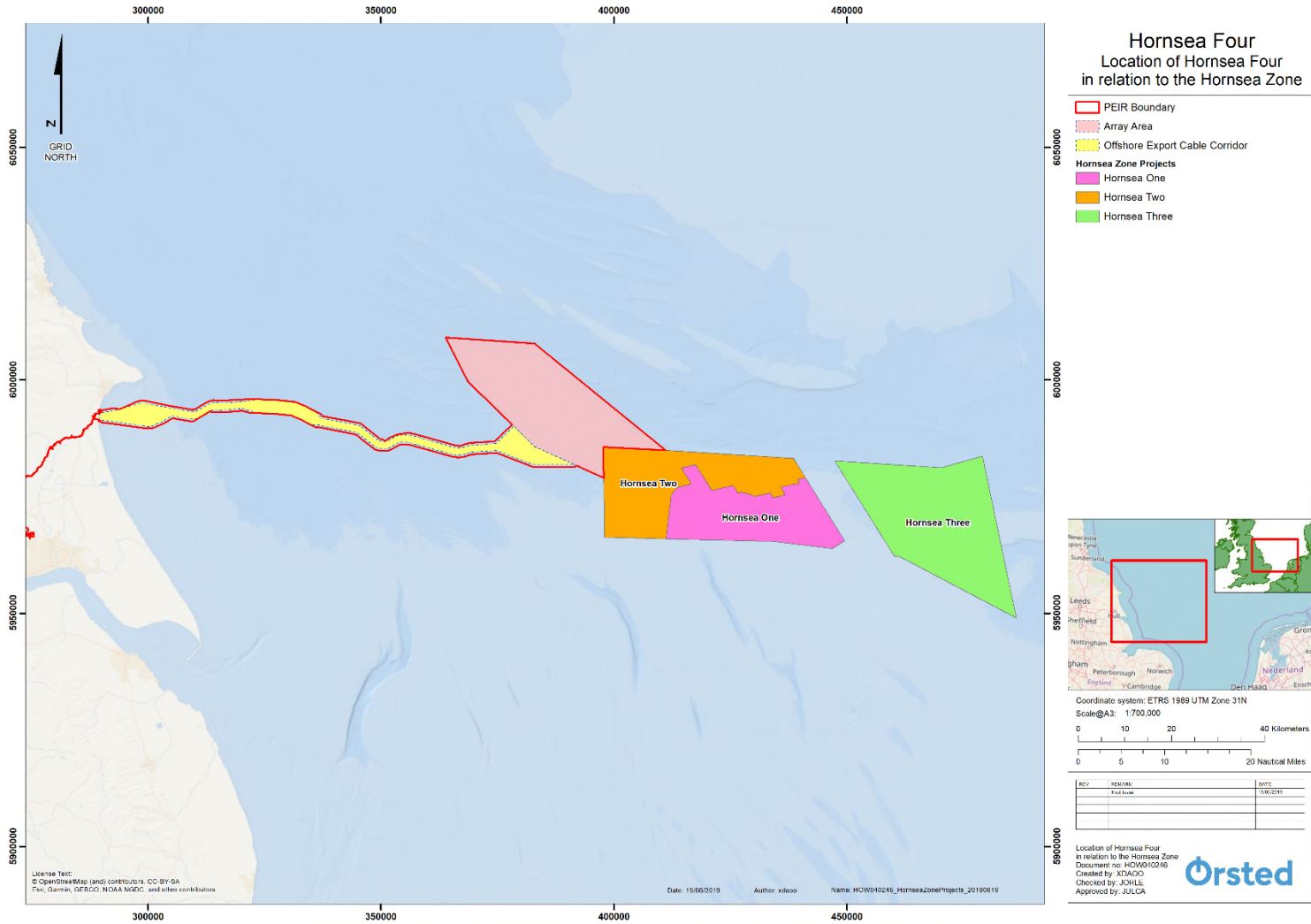


Figure 1.2 Location of the Hornsea Four PEIR boundary and Hornsea Four Array Area in relation to the Hornsea Zone.

## 1.5 The Hornsea Four Team

- 1.5.1.1 The Applicant has been supported on the EIA process *inter alia* by an experienced team of specialist EIA and environmental professionals from Royal HaskoningDHV (RHDHV) and GoBe Consultants Ltd, who are accredited by the Institute of Environmental Management and Assessment (IEMA) under their EIA Quality Mark Scheme
- 1.5.1.2 Further specialist support is also provided by a range of selected sub-consultants responsible for specialist topics, please see respective PEIR Receptor chapters.
- 1.5.1.3 Additionally, Pinsent Masons LLP has been instructed to provide legal advice throughout the Hornsea Four DCO application process.

## 1.6 EIA Process

- 1.6.1.1 The overall objective of the EIA process is to identify any likely significant effects and for any adverse effects to be avoided or minimised where possible, as well as identifying opportunities for beneficial impacts.
- 1.6.1.2 EIA is required under the terms of European Union (EU) Directive 2011/92/EU (as amended by Directive 2014/52/EU) on the assessment of the effects of certain public and private projects on the environment ('the EIA Directive'). The EIA Directive is transposed into English law for Nationally Significant Infrastructure Projects (NSIPs) by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations').
- 1.6.1.3 The primary purpose of the EIA is to support the Development Consent Order (DCO) application for Hornsea Four under the Planning Act 2008 (the 2008 Act). As part of the pre-application process for the DCO application, the Applicant has prepared this PEIR, which presents an initial review of the potential issues associated with the construction, operation and maintenance, and eventual decommissioning of Hornsea Four.
- 1.6.1.4 The final ES will be informed by the Scoping Opinion, responses to the PEIR and additional contributions from consultees and will be prepared to satisfy the requirements of the consenting procedures of the Planning Act 2008 and to provide adequate environmental information for the purpose of the EIA Regulations. The ES will support Hornsea Four's application for a DCO. Consultation has been undertaken and/or is ongoing in parallel with the EIA, feeding in to the process. This includes both Section 42 (statutory consultee) and Section 47 (community) consultations. Notably an Evidence Plan process is being run with several key stakeholders to help co-ordinate responses and identify issues and solutions in advance of any application. See [Chapter 6: Consultation](#) for further details.
- 1.6.1.5 The EIA has been progressed using a proportionate approach to ensure the process and outputs are as efficient, focussed and effective as possible. This responds directly to known issues within the UK planning regime of overly long and complex documentation and

unfocussed assessments. The benefits of delivering proportionate EIA, as defined by IEMA (IEMA, 2017) are to:

- Drive collaborative action and understanding across the EIA community;
- Focus assessments so their findings are accessible to all stakeholders;
- Reduce uncertainty and risk within project consenting;
- Save time and costs for developers, consenting authorities and consultees; and
- Allow more time to be spent exploring the delivery of environmental improvements.

1.6.1.6 Further discussion on the proportional approach adopted, the tools and measures utilised, and the processes embedded in to the project are set out in [Chapter 5: EIA Methodology](#).

## 1.7 The PEIR Structure

1.7.1.1 The Hornsea Four PEIR comprises six volumes, summarised below:

- Volume 1: Introduction, Project Design and Policy Context;
- Volume 2: Offshore Environmental Assessment;
- Volume 3: Onshore Environmental Assessment;
- Volume 4: Introductory Annexes;
- Volume 5: Offshore Annexes; and
- Volume 6: Onshore Annexes.

## 1.8 References

Committee on Climate Change. 2018, Reducing UK Emissions, 2018 Progress Report to Parliament, Committee on Climate Change.

DBEIS, 2019. Offshore Wind Sector Deal, Policy Paper (Online), available at: <https://www.gov.uk/government/publications/offshore-wind-sector-deal/offshore-wind-sector-deal>. (Accessed 15 April 2019).

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