Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects

Environmental Statement

Volume 3

Appendix 27.1 - Socio-Economics Construction Costs and Sourcing Assumptions Note

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Title**:** **Sheringham Shoal and Dudgeon Offshore Wind Farm Extensions Projects Environmental Statement** **Appendix 27.1 Socio-Economics Construction Costs and Sourcing Assumptions Note**		
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Table of Contents

Table of Tables

Table of Plates

Glossary of Acronyms

BRES	Business Register and Employment Survey
CAPEX	Capital Expenditure
CfD	Contracts for Difference
DCO	Development Consent Order
DEP	Dudgeon Extension Project
DEVEX	Development Expenditure
FTE	Full-Time Equivalent
GVA	Gross Value Added
LEP	Local Enterprise Partnership
MW	Megawatt
O&M	Operation and Maintenance
ONS	Office for National Statistics
OPEX	Operational Expenditure
OWIC	Offshore Wind Industry Council
SEP	Sheringham Extension Project
UK	United Kingdom

Glossary of Terms

Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Project(s) (NSIP).
Direct Employment and Gross Value Added	Employment and Gross Value Added which is associated with the first round of capital expenditure i.e. the direct spend with prime contractors in each impact area.
Dudgeon Offshore Wind Farm Extension site	The Dudgeon Offshore Wind Farm Extension offshore lease area.
Dudgeon Offshore Wind Farm Extension Project (DEP)	The Dudgeon Offshore Wind Farm Extension site as well as all onshore and offshore infrastructure.
DCO boundary	The area subject to the application for development consent, including all permanent and temporary works for SEP and DEP.
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 Directive 2011/92/EU of 13 December 2011 (as amended in 2014 by Directive 2014/52/EU).
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.
Evidence Plan Process (EPP)	A voluntary consultation process with specialist stakeholders to agree the approach, and information to support, the EIA and HRA for certain topics.
Ex-ante research	Ex-ante research is conducted prior to the implementation of a project.
Ex-post research	Ex-post research is conducted after the implementation of a project.
Full-Time Equivalent Jobs (FTE Jobs)	The total number of jobs after converting jobs with less than full-time hours and jobs with more than full-time hours into full-time hour jobs. Full-time hours are assumed to be 37.5 hours per week (e.g. a job with 20 hours per week would be 0.5 Full-Time Equivalent jobs).
Gross Value Added (GVA)	The measure of the value of goods and services produced in an area, industry or sector of an economy. At the level of a firm, it is broadly equivalent to employment costs plus a measure of profit.

Indirect Employment and Gross Value Added	Employment and Gross Value Added which is associated with the suppliers of companies that supply goods and services as part of the supply chain of SEP and DEP.
Landfall	The point at the coastline at which the offshore export cables are brought onshore and connected to the onshore export cables.
Local Enterprise Partnership (LEP)	Voluntary partnerships between local authorities and businesses set up in 2011 by the Department for Business, Innovation and Skills to help determine local economic priorities and lead economic growth and job creation within the local area.
Location Quotient (LQ)	The proportion of employment in a sector/industry in the East Anglia study area divided by that of the UK.
Mitigation	A term used interchangeably with Commitment(s) by Rampion 2. Mitigation measures (Commitments) are embedded within the assessment at the relevant point in the EIA (e.g. at Scoping or PEIR).
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.
PEIR boundary	The area subject to survey and preliminary impact assessment to inform the PEIR.
Sheringham Shoal Offshore Wind Farm Extension site	Sheringham Shoal Offshore Wind Farm Extension lease area.
Sheringham Shoal Offshore Wind Farm Extension Project (SEP)	The Sheringham Shoal Offshore Wind Farm Extension site as well as all onshore and offshore infrastructure.
Study area	Area where potential impacts from the project could occur, as defined for each individual EIA topic.
The Applicant	Equinor New Energy Limited.

27.1 SOCIO-ECONOMICS CONSTRUCTION COSTS AND SOURCING ASSUMPTIONS NOTE

27.1.1 Introduction

1. It is Equinor's intention, on behalf of the partners in Sheringham Shoal Offshore Wind Farm and Dudgeon Offshore Wind Farm, to seek a single development consent order (DCO) for both Dudgeon Offshore Wind Farm Extension Project (DEP) and Sheringham Shoal Offshore Wind Farm Extension Project (SEP) wind farms. The socio-economic assessment therefore needs to assess the two wind farms both individually and in aggregate. This reflects the possibility that one or the other of the projects are developed (but not both), as well as both projects proceeding either concurrently or sequentially.
2. DEP has an expected capacity up to 448MW, with between 17 and 30 wind turbines. On the other hand, SEP has an expected capacity up to 338MW, with between 13 and 23 wind turbines. This implies a turbine capacity of between 15MW and 26MW.
3. The assessment of economic impacts of SEP and DEP relies on information regarding the following:
   - **Costs**: how much different elements of the two-wind farm will cost to construct and operate, as well as the efficiencies from constructing two rather than one offshore wind farm; and
   - **Sourcing**: what proportion of the supply will be sourced from each of the impact areas for the construction and operational phases.
4. This note sets out the methodology for estimating each of these elements.

27.1.1 Costs and Cost Reductions

5. Construction and operation and maintenance (O&M) expenditure incurred by SEP and DEP is the key driver of economic impacts generated by the development. At this stage detailed cost estimates are not likely to be available. Cost estimates are considered commercially sensitive. Thus, the approach we take to these types of assessments is to estimate the development and operating costs on the basis of the most robust and up to date publicly available industry data.
6. A key source information on development and O&M costs is The Crown Estate's Guide to an Offshore Wind Farm (The Crown Estate, 2019), which provides a reasonably comprehensive breakdown in cost estimates by type of expenditure up to 2025. The Guide also includes more detailed information on operations, maintenance, service activities, decommissioning, floating wind and emerging technologies in data, digital and robotics and autonomous systems. The report takes account of bid prices seen in recent UK Government Contract for Difference (CfD) auctions to ensure that the cost estimates reflect the most recent evidence on price changes in the industry.

7. A number of studies have also considered the evidence for recent and future cost reduction potential. This evidence includes The Crown Estate's *Wind Cost Reduction Pathways Study* (The Crown Estate, 2012) and the Offshore Renewable Energy Catapult's *Cost Reduction Monitoring Framework* (Offshore Renewable Energy Catapult, 2016) in order to approximate the change over the period.

8. Below, we use the evidence from The Crown Estate's latest guide to provide cost estimates for each phase of proposed SEP and proposed DEP on a per MW basis.

27.1.2 Construction Costs

9. Construction cost estimates are drawn from The Crown Estate's Guide to an Offshore Wind Farm (2019) and are shown in **Table 1-1** below. The total estimated cost per MW is £2.37 million.

10. The Crown Estate's report is based on an export cable 60km in length (59km of which are assumed to be offshore, and 1km onshore). The offshore export cable corridors for SEP and DEP are expected to be up to 55km and 40km in length from offshore substation to landfall, respectively. The onshore export cable is estimated to be 60km in length, bringing the total export cable lengths for SEP and DEP to 115km and 100km, respectively. To account for the longer export cables, we have adjusted construction costs for balance of plant and installation and commissioning depending on a pro-rata basis based on export cable length. The updated construction cost estimates (£/ MW) for SEP and DEP are set out in **Table 1-1**. Please note that all development (i.e. DEVEX), construction (i.e. CAPEX) and operational (OPEX) costs are presented in 2019-pricing.

Table 1-1: Estimated Costs for the Construction Phase

	The Crown Estate (£/ MW)	DEP (£/ MW)	SEP (£/ MW)
Development and project management	£120,000	£120,000	£120,000
Wind turbine (incl. nacelle, rotor and tower)	£1,000,000	£1,000,000	£1,000,000
Balance of plant (incl. cables, foundations, substations and operations base)	£600,000	£719,000	£687,000
Installation and commissioning	£650,000	£917,000	£864,000
Total	£2,370,000	£2,756,000	£2,670,000

Source: Calculations by Hatch, based on The Crown Estate (2019).

Note: figures may not sum due to rounding; the individual component figures provided within the guide do not sum to category totals and, as such, component proportions have been applied to category totals to ensure consistency

11. With an estimated capacity of up to 448MW and an offshore substation located 55km from landfall, the construction cost for DEP is estimated at £1.23 billion. On the other hand, based on an estimated capacity of up to 338MW and an offshore substation located 40km from landfall, the construction cost for SEP is estimated at £903 million. Together, the two offshore wind farms have an estimated maximum capacity of 786MW and an overall construction cost of £2.14 billion (2019-pricing).

27.1.2.1 Construction Cost Savings

12. It is Equinor's intention to submit one DCO application for the construction of SEP and DEP. As part of the DCO submission three scenarios are being considered, including:
    - The construction of DEP or build SEP in isolation;
    - The construction of SEP and DEP concurrently – reflecting the maximum peak effects; and
    - Construction of one project followed by the other with a gap of up to two years (sequential) – reflecting the maximum duration of effects.

13. Under the concurrent construction scenario, economies of scale may be achieved (especially during the installation and commissioning phase), leading to cost savings in the overall construction cost for SEP and DEP. **Table 1-2** below sets out an overview of the possible cost savings that could be achieved as a result of concurrent construction. At this stage, these cost savings should be considered as indicative.

Table 1-2: Estimated Cost Savings as a Result of Concurrent Construction

	% Cost Savings	DEP (£/ MW)	SEP (£/ MW)
Development and project management	5%	£114,000	£114,000
Wind turbine	0%	£1,000,000	£1,000,000
Balance of plant	5%	£683,000	£652,000
Installation and commissioning	15%	£779,000	£734,000
Total	6.5%	£2,577,000	£2,500,000

Source: Calculations by Hatch, based on discussions with Equinor (2020).

Note: figures may not sum due to rounding.

14. Based on the savings outlined, it is estimated that concurrent construction will bring down the overall cost per MW by between 6 and 7%, bringing the overall construction cost for SEP and DEP combined down to around £2.00 billion.

27.1.3 Operation & Maintenance Costs

15. During the operations phase, costs are split into two elements:
    - Direct employment costs (i.e. those employed directly by the wind farm); and
    - Supply chain expenditure.

16. Past experience suggests that annual operations costs of offshore wind farms range between 1.5% and 3% of total construction costs. For the purposes of this assessment, the lower end of the range has been used. We have used a 1.25% value to the estimate the supply chain and then included employment costs in addition as employment costs are based on localised data. The supply chain amounts to around £15.4 million per annum for DEP and £11.2 million per annum for SEP, totalling around £26.7 million per annum across both offshore wind farms.

17. To estimate the direct jobs, we have drawn on previous experience from the offshore wind industry and current operations employment at Dudgeon and Sheringham Shoal offshore wind farms. This provides an estimate of 67 offsite and onsite full-time equivalent (FTE) posts across both wind farms if both projects operational at the same time. Given the similarities in scale between SEP and DEP and the existing operational wind farms, the demand for direct O&M employment is estimated to be the same per Project. However, if only one project is operational it is anticipated that this would require around 53 direct O&M jobs posts. Thus, showing cost savings if both projects are developed.

18. Salary estimates are then based on earnings data from the Office of National Statistics (ONS) and consultation with developers on the likely employment costs associated with these types of direct jobs. We have excluded non-salary employment related costs as these are assumed to be included in the other O&M costs presented below. The estimated average gross annual employment costs for each post is £55,000, giving a total annual employment cost of around £3.70 million across both wind farms if both projects are operational or £2.91 million if one project is operational. The total O&M cost as a percentage of construction costs is conservatively estimated to range from between 1.4% to 1.6%.

19. The estimates for other operations and maintenance costs (supply chain expenditure) is therefore estimated to be around £30.4 million each year for both SEP and DEP or £14.2 million for SEP and £18.3 million for DEP. Note that the costs savings in employment mean that SEP and DEP functioning as individual projects in isolation do not equal SEP & DEP when developed concurrently.

20. The supply chain cost has been split proportionately across the categories within The Crown Estates 2019 *Guide to an Offshore Wind Farm* to provide an estimate of costs for individual elements of the supply chain expenditure as follows:

Table 1-3: Estimated Annual Supply Chain Cost for the Operations phase, £/ MW

	DEP (£/ MW)	SEP (£/ MW)	SEP & DEP (£/MW)
Operations*	£1,900	£1,800	£1,900
Maintenance & Service	£32,600	£31,600	£32,100
Total	£34,500	£33,400	£34,000

Source: Calculation by Hatch, based on The Crown Estate (2019).

*Note: this excludes labour costs which are calculated separately. There are slight difference in cost per MW due to the differences in cost per MW assumed in the DEVEX and CAPEX values for SEP and DEP.

27.1.3.1 Geographical Sourcing and Expenditure Retention

21. Building on the estimate of costs for each element of the SEP and DEP wind farms, the next step is to estimate the retention of expenditure within the East Anglia study area. The retention of expenditure is the proportion of the first-round project expenditure that is likely to be spent with suppliers located in the study area and hence support jobs and gross value added (GVA) in the supply chain within the area.

22. The analysis which informs the sourcing assumptions draws on the following sources of evidence:

- The Applicant's track record in the delivery of offshore wind farms. Evidence of achieved UK sourcing by the Applicant on the completed Sheringham Shoal and Dudgeon offshore wind farms, informed the development of the scenarios. The sourcing achieved in the past has been viewed as a minimum potential share which can potentially be captured by UK supply chains. The values have been supplemented by the following other sources of industry evidence and supply chain analysis to inform the final scenarios.
- Ex-post Assessments. The amount of UK and local supply chain sourcing which occurred during construction of existing wind farms provides useful context for the development of sourcing assumptions. UK content analysis by RenewableUK (2017) is the most up to date study available which informed the development of scenarios.
- An assessment of local and national supply chain strengths. The level and type of capacity that exists in the local and national business base and the presence of companies already trading in or with capability to diversify into the offshore wind sector are important considerations. The following sources have been used to identify the construction and operational activities which could feasibly be carried out by companies in the UK and local economic development study areas:
    - The Business Register Employment Survey (BRES) – this dataset provides a detailed sectoral breakdown of national and local employment. Concentrations of employment and sector strengths were identified using a location quotient analysis; and
    - Local supply chain intelligence – drawn from local sector studies and various locally produced policy and strategy documents and Hatch's wider knowledge and experience of the New Anglia Local Enterprise Partnership and the East of England Energy Group.

27.1.3.2 Local and National Supply Chain Strengths

23. Offshore wind and other energy developments in the UK present a significant opportunity for the local and national economy. Over the past two decades the supply chain has seen significant growth both across the UK and in the East of England.

24. Baseline analysis suggests that offshore wind is still a key priority locally and nationally and is becoming an increasingly important component of the local and national economy.

25. The UK is a market leader in offshore wind having the highest operational capacity globally. The *Industrial Strategy* (HM Government, 2017) has set Clean Growth at the heart of its four grand challenges. Since then, the offshore wind sector has also issued a Sector Deal (HM Government, 2018) together with the government, with the aim of helping the industry raise productivity and competitiveness of UK-based companies to ensure the UK continues to play a leading role as the global market grows in the decades to 2050.

26. As well as being a key priority within New Anglia, the energy sector is a focal point of the development of the local policy strategy. The LEP's economic strategy has clean growth including the energy sector at its centre, with the aspiration to be one of the world's leading hubs for offshore wind. It recognises the importance of innovation, supply chain development and skills provision in achieving this ambition.

27.1.3.3 Ex-Post Assessments

27. The scale of offshore wind development in the UK over the last two decades means there are now a number of examples of built out wind farms. Although information on the precise contracting arrangements for individual developments can be commercially sensitive, there are a number of summary studies that draw together evidence from developments to estimate average levels of UK sourcing. Two useful examples of this are:

- The UK content of operating offshore wind farms (BVG Associates, 2015); and
- Offshore Wind Industry Investment in the UK (RenewableUK, 2017).

28. BVG's analysis of ten wind farms built between 2009 and 2013 in the UK provides the following range at the development (DEVEX), construction (CAPEX), and operational (OPEX) phases:

Table 1-4: UK Supply Chain Content in Offshore Wind Farm Developments

	Lower	Upper	Weighted Average
DEVEX	16%	90%	57%
CAPEX	12%	32%	18%
OPEX	64%	82%	73%
Total	30%	57%	43%

Source: BVG Associates (2015)

29. The RenewableUK (2017) report provides a range for UK content from eight more recent offshore wind farms in the UK for each of the categories listed above.

Table 1-5: UK Supply Chain Content in Offshore Wind Farm Developments

	Lower	Upper	Weighted Average
DEVEX	27%	92%	73%
CAPEX	22%	38%	29%
OPEX	52%	89%	75%
Total	44%	53%	48%

Source: RenewableUK (2017).

30. The change between the two reports shows an increase in total UK content of around 5% as well as lower variability between the upper and lower bounds. This is helpful in providing more confidence in the estimates used for sourcing assumptions.

31. The BVG Associates (2015) report also provides a breakdown of CAPEX by category of expenditure:

Table 1-6: UK Supply Chain Content in CAPEX, 2015

	UK Content
Project development	67%
Installation and Commissioning	33%
Balance of Plant	18%
Turbines	3%

Source: BVG Associates (2015).

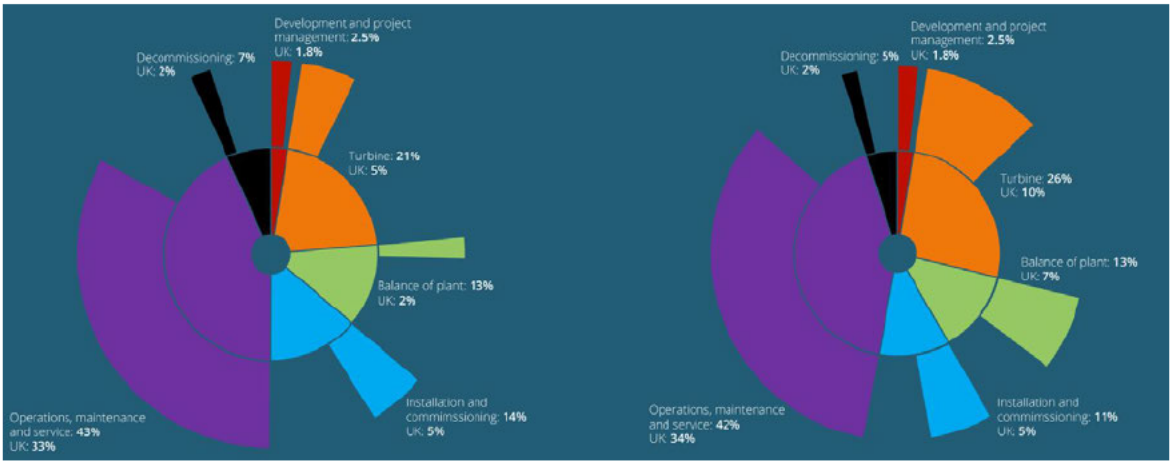
Please note: UK content of has been calculated by dividing the proportion of CAPEX by the contribution to UK content from the BVG Associates report.

32. The Crown Estate's research (2019) builds on the research undertaken by BVG (2015) and provides an update to UK content sourcing throughout a project lifecycle (including development, construction, operations and decommissioning). The research suggests that for recent wind farms, the overall UK content is a little under half (or 48%) of undiscounted lifetime spend. The key contributions typically include:

- Operations, maintenance and service where much of the activity is close to the wind farm site;
- Installation and commissioning where the UK has several leading marine contractors and equipment suppliers; and
- Turbine-related expenditure, where most blades and some towers are supplied from the UK.

33. The Offshore Wind Sector Deal (HM Government, 2018) commits the sector to increasing UK content to 60% by 2030, including increases in the capital expenditure phase. This is represented in **Plate 27-1-1** below, and is further reinforced in a recent publication by the Offshore Wind Industry Council (OWIC) entitled *Collaborating for Growth – Playbook* (OWIC, 2020).

Plate 27-1-1: UK Content for Recent Projects (Left) and Aspiration for 2030 (Right)



Source: The Crown Estate (2019).

34. Similar to the BVG Study (2015), The Crown Estate's (2019) research provides a breakdown of current UK content estimates by phase and sub-phase (for CAPEX spend).

Table 1-7: UK Supply Chain Content in CAPEX, 2019

	UK Content
DEVEX	71%
CAPEX	25%
- Turbines (incl. rotor, nacelle, tower and other)	24%
- Balance of plant	16%
- Installation and commissioning	36%
OPEX	77%

Source: The Crown Estate (2019)

Note: UK Content has been calculated by dividing the proportion of CAPEX by the contribution to UK content.

29.1.3.3.1 Local Sourcing

35. There is considerably less evidence on sourcing for local areas. This is in part because it is much more difficult to record. The variability in local supply chain strengths also means averages from different locations are less useful in providing a robust basis for sourcing assumptions for economic impact modelling.

29.1.3.3.2 Sourcing Assumptions

36. Both the construction and operation phases of SEP and DEP are split into scenarios depending on the proposed port location for each phase:
    - **UK-based port scenario** - the port is located within the UK but outside the East Anglia area; and
    - **Local port scenario** - the port is located within the East Anglia area.

29.1.3.3.3 Construction Phase

37. The evidence above has been drawn together to develop the proposed sourcing assumptions. These use The Crown Estate's (2019) figures as a base, with adjustments to the individual components depending on the scenario.

38. The UK-based port construction scenario illustrates the likely scale of impact where ports in the study areas are not used extensively during construction. As a result of all major construction port functions being located outside of the local study area, the scope to capture supply chain expenditure is very limited due to the limited presence in non-related parts of the offshore wind construction supply chain.

39. The local port scenario illustrates the scope for greater local sourcing that extensive port use during construction could have. This reflects the tendency for some activities to be intrinsically linked to port location. Conclusions about the likely supply chain opportunities which would arise if local ports in East Anglia were used have been informed by an assessment of the capability which exists in the impact areas and a review of port capability from the latest BVG Associates (2015) study of east coast ports. The specific capabilities which exist locally would result in opportunities associated with the following activities being captured:
    - Port related activities – particularly storage, transportation, stevedoring associated with the need to use local ports for storage and laydown of turbine towers.
    - Charter and operation of non-specialist vessels (e.g. for crew transfer) – This is reflected in an increased level of local sourcing for vessel related categories. Although the categories here relate to very specialist vessels (e.g. cable laying, foundation installation) which are unlikely to be sourced locally, the sourcing assumptions reflect the likely demand for a range of less specialist vessels to support these activities which could be sourced locally.

40. The summary table below compares the assumed proportion of retained expenditure for SEP and DEP based on UK content from the 2019 OREC and 2017 Renewable UK study.

41. This is equivalent to the retention of between £19.2 million and £171.0 million of first round construction related expenditure in the East Anglia economy (2019-pricing).

Table 1-8: Construction Phase Sourcing Assumptions

	East Anglia	Rest of UK
UK-based port scenario	1%	27%
Local port scenario	8%	20%
The Crown Estate (2019)	28%	

Source: Hatch calculations, based on The Crown Estate (2019).

42. The following table sets out in more detail the total level of DEVEX and CAPEX captured within East Anglia and the rest of the UK under each scenario identified above. More detail on DEVEX and CAPEX within the different study areas for each proposed wind farm is shown at the end of this paper (see **Section 27.1.4**). Please note that the estimates presented below remain unchanged, irrespective of the construction scenario being considered.

Table 1-9: Overall DEVEX and CAPEX for SEP and DEP captured within East Anglia and the rest of the UK by phase and sub-phase (£ million)

	UK-based port scenario		Local port scenario	
	East Anglia	Rest of UK	East Anglia	Rest of UK
DEVEX	£8.4	£58.5	£8.4	£58.5
CAPEX	£10.9	£517.5	£162.7	£365.7
- Turbines (incl. rotor, nacelle, tower)	£0.0	£185.7	£0.0	£185.7
- Balance of plant	£0.0	£87.3	£38.7	£48.6
- Installation and commissioning	£10.9	£244.5	£124.0	£131.4
Total	£19.2	£576.0	£171.0	£424.2

Source: Hatch calculations, based on The Crown Estate (2019).

29.1.3.3.4 Operation Phase

43. Based on the likely location that employees with different job types are geographically based it is assumed that 85% of offsite and onsite operations labour is sourced from within the area that the O&M port is located in and that this port is located in East Anglia.

44. For the first round O&M supply chain expenditure we use the benchmarks from The Crown Estate (2019) as a starting point. This assumes that on average 77% of overall OPEX (including employee costs) is retained in the UK. We have assumed that this is a reasonable level of UK sourcing for SEP and DEP and split the supply chain sourcing 26% and 48% between East Anglia and the rest of the UK.

45. On this basis £10.1 million in direct staff wages and first round supply chain expenditure would be retained in the East Anglia area annually (2019-pricing).

Table 1-10: Operations Phase Sourcing Assumptions

Sub-Phase	East Anglia	Rest of UK
Direct	85%	15%
Supply Chain	26%	48%
Total Operations Phase	**33%**	**44%**

Source: Hatch calculations, based on The Crown Estate (2019).

46. The following table sets out in more detail the total level of annual O&M expenditure (defined as direct annual employment and supply chain expenditure) within East Anglia and the rest of the UK. More detail on annual OPEX within the different study areas for each proposed wind farm is included at the end of this note.

Table 1-11: Overall annual OPEX for SEP and DEP captured within East Anglia and the rest of the UK by phase and sub-phase (£ million)

	East Anglia	Rest of UK
OPEX	£10.1	£13.4
- Direct employment	£3.1	£0.6
- Supply chain expenditure	£6.9	£12.8

Source: Hatch calculations, based on The Crown Estate (2019).

29.1.3.3.5 Total Sourcing

47. Assuming an estimated capacity of up to 786MW, and a 40-year lifespan for SEP and DEP, it is estimated that the overall share of the construction and lifetime operational expenditure (but excluding decommissioning) retained in East Anglia is between 13% and 17% depending on whether a local construction port is used, which is equivalent to £423.0 million and £574.8 million (2019-pricing).

Table 1-12: Overall Construction and Operations Sourcing Assumptions for SEP and DEP, %

	UK-based port scenario		Local port scenario	
	East Anglia	Rest of UK	East Anglia	Rest of UK
Construction (incl. DEVEX)	1%	27%	8%	20%
Operations & Maintenance	31%	44%	33%	44%
Total	**13%**	**33%**	**17%**	**29%**

Source: Hatch calculations, based on The Crown Estate (2019).

Table 1-13: Overall Construction and Operations Sourcing Assumptions for SEP and DEP, values (£ million)

	UK-based port scenario		Local port scenario	
	East Anglia	Rest of UK	East Anglia	Rest of UK
Construction (incl. DEVEX)	£19.2	£576.0	£171.0	£424.2
Operations & Maintenance	£403.7	£535.2	£403.7	£535.2
Total	**£423.0**	**£1,111.2**	**£574.8**	**£959.4**

Source: Hatch calculations, based on The Crown Estate (2019).

27.1.4 Detailed Project-Specific Expenditure

Table 1-14: Overall DEVEX and CAPEX for DEP captured within East Anglia and the rest of the UK by phase and sub-phase (£ million)

	UK-based port scenario		Local port scenario	
	East Anglia	Rest of UK	East Anglia	Rest of UK
DEVEX	£4.8	£33.3	£4.8	£33.3
CAPEX	£6.2	£299.7	£95.3	£210.6
- Turbines (incl. rotor, nacelle, tower)	£0.0	£105.8	£0.0	£105.8
- Balance of plant	£0.0	£50.7	£22.5	£28.2
- Installation and commissioning	£6.2	£143.1	£72.8	£76.5
Total	£11.0	£333.0	£100.1	£243.9

Source: Hatch calculations, based on The Crown Estate (2019).

Table 1-15: Overall DEVEX and CAPEX for SEP captured within East Anglia and the rest of the UK by phase and sub-phase (£ million)

	UK-based port scenario		Local port scenario	
	East Anglia	Rest of UK	East Anglia	Rest of UK
DEVEX	£3.6	£25.2	£3.6	£25.2
CAPEX	£4.7	£217.8	£67.3	£155.2
- Turbines (incl. rotor, nacelle, tower)	£0.0	£79.9	£0.0	£79.9

	UK-based port scenario		Local port scenario	
	East Anglia	Rest of UK	East Anglia	Rest of UK
- Balance of plant	£0.0	£36.6	£16.1	£20.4
- Installation and commissioning	£4.7	£101.4	£51.2	£54.9
Total	£8.3	£243.0	£70.9	£180.3

Source: Hatch calculations, based on The Crown Estate (2019).

Table 1-16: Overall annual operation expenditure for SEP and DEP captured within East Anglia and rest of the UK (£ million)

	DEP		SEP		SEP and DEP	
	East Anglia	Rest of UK	East Anglia	Rest of UK	East Anglia	Rest of UK
OPEX	£6.5	£7.8	£5.4	£5.9	£10.1	£13.4
- Direct employment	£2.5	£0.4	£2.5	£0.4	£3.1	£0.6
- Supply chain expenditure	£4.0	£7.4	£2.9	£5.4	£6.9	£12.8

Source: Hatch calculations, based on The Crown Estate (2019).

Table 1-17: Overall lifecycle expenditure for DEP captured within East Anglia and the rest of the UK by phase and sub-phase (£ million)

	UK-based port scenario		Local port scenario	
	East Anglia	Rest of UK	East Anglia	Rest of UK
DEVEX	£4.8	£33.3	£4.8	£33.3
CAPEX	£6.2	£299.7	£95.3	£210.6
- Turbines (incl. rotor, nacelle, tower)	£0.0	£105.8	£0.0	£105.8
- Balance of plant	£0.0	£50.7	£22.5	£28.2
- Installation and commissioning	£6.2	£143.1	£72.8	£76.5
OPEX	£259.3	£313.8	£259.3	£313.8
Total	£270.7	£646.8	£359.4	£557.7

Source: Hatch calculations, based on The Crown Estate (2019).

Table 1-18: Overall lifecycle expenditure for SEP captured within East Anglia and the rest of the UK by phase and sub-phase (£ million)

	UK-based port scenario		Local port scenario	
	East Anglia	Rest of UK	East Anglia	Rest of UK
DEVEX	£3.6	£25.2	£3.6	£25.2
CAPEX	£4.7	£217.8	£67.3	£155.2
- Turbines (incl. rotor, nacelle, tower)	£0.0	£79.9	£0.0	£79.9
- Balance of plant	£0.0	£36.6	£16.1	£20.4
- Installation and commissioning	£4.7	£101.4	£51.2	£54.9
OPEX	£216.1	£234.0	£216.1	£234.0
Total	£224.4	£477.0	£287.0	£414.4

Source: Hatch calculations, based on The Crown Estate (2019).

Table 1-19: Overall lifecycle expenditure for SEP and DEP captured within East Anglia and the rest of the UK by phase and sub-phase (£ million)

	UK-based port scenario		Local port scenario	
	East Anglia	Rest of UK	East Anglia	Rest of UK
DEVEX	£8.4	£58.5	£8.4	£58.5
CAPEX	£10.9	£517.5	£162.7	£365.7
- Turbines (incl. rotor, nacelle, tower)	£0.0	£185.7	£0.0	£185.7
- Balance of plant	£0.0	£87.3	£38.7	£48.6
- Installation and commissioning	£10.9	£244.5	£124.0	£131.4
OPEX	£403.7	£535.2	£403.7	£535.2
Total	£423.0	£1,111.2	£574.8	£959.4

Source: Hatch calculations, based on The Crown Estate (2019).

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