



Chapter 18: Socio-Economics

Array EIA Report
2024

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18. SOCIO-ECONOMICS

18.1. INTRODUCTION

1. This chapter of the Array Environmental Impact Assessment (EIA) Report presents the assessment of the likely significant effects (LSE¹) (as per the EIA Regulations) on socio-economics as a result of the Ossian Array which is the subject of this application (hereafter referred to as “the Array”). Specifically, this chapter considers the potential socio-economic impacts of the Array during the construction, operation and maintenance, and decommissioning phases. The socio-economic effects associated with the Proposed offshore export cable corridor(s) and the Proposed onshore transmission infrastructure (comprising the Proposed onshore export cable corridor(s) and Proposed onshore converter station(s)) will be assessed as part of separate EIA Scoping Report(s) and associated EIA Report(s). The socio-economic effects of Ossian as a whole are considered in the Cumulative Effects Assessment (CEA).

18.2. PURPOSE OF THE CHAPTER

2. The Array EIA Report provides the Scottish Ministers, statutory and non-statutory stakeholders with adequate information to determine the LSE¹ of the Array on the receiving environment, which is based primarily onshore. This is further outlined in volume 1, chapter 1.
3. The purpose of this socio-economics Array EIA Report chapter is to:
 - present the existing environmental baseline established from desk-based surveys;
 - identify any assumptions and limitations encountered in compiling the environmental information;
 - present the environmental impacts on socio-economics arising from the Array and reach a conclusion on the LSE¹ on socio-economics, based on the information gathered and the analysis and assessments undertaken; and
 - highlight any necessary monitoring and/or mitigation measures which are recommended to prevent, minimise, reduce or offset the likely significant adverse environmental effects of the Array on socio-economics

18.3. STUDY AREA

18.3.1. APPROACH

4. While a significant proportion of the activity associated with the Array is expected to take place offshore, the relevant study areas for the socio-economic assessment are located onshore.
5. The socio-economics study areas for the assessment of effects on employment and economy have been defined in line with the guidance on identification of ‘local areas’ for offshore developments published by Marine Scotland (Marine Scotland, 2022). This guidance identified six principles for identifying local study areas for offshore development:
 - Principle 1 (Dual Geographies): The local area for the supply chain and investment impacts should be separate from the local area(s) for wider socio-economic impacts.
 - Principle 2 (Appropriate Impacts): The appropriate impacts to be considered for assessments should be identified before defining the local areas.
 - Principle 3 (Epicentres): The local areas should include all the epicentres of the appropriate impacts.
 - Principle 4 (Accountability): The local areas used in the assessment should comprise of pre-existing economic or political geographies (community councils, local authorities, development agencies) to enhance accountability.

- Principle 5 (Understandable): The local areas should be defined in such a way that they are understandable to the communities they describe.
- Principle 6 (Connected Geography): The local area for the supply chain and investment impacts should consist of connected (including coastal) pre-existing economic or political geographies.

18.3.2. STUDY AREAS FOR SOCIO-ECONOMIC IMPACT ASSESSMENT

6. The main local epicentres of impact (Principle 3: Epicentres of Impact) are expected to be the ports used during the construction and operation and maintenance phases of the Array. These ports may also be used during the decommissioning phase, however, the nature of port facilities required for the decommissioning phase of the Array is unknown at the time of writing.
7. At this stage the specific ports are not known, and therefore the following socio-economic study areas have been considered:
 - “the Construction Port”, which consists of the local authority area(s) relevant for each potential construction port(s) (construction phase only);
 - “the Operation and Maintenance Port”, which consists of the local authority area(s) relevant for each operation and maintenance port(s) (operation and maintenance phase only);
 - Scotland; and
 - the United Kingdom (UK).
8. While ports are not known, a list of potential ports for the construction and operational and maintenance phases have been considered to identify the maximum design scenario (Table 18.1 and Table 18.2). This was based on an independent assessment of port capabilities (Crown Estate Scotland, 2020). In each case the relevant local study areas were defined based on where the majority of local employees are likely to live. This has been determined based on local authority areas (Principle 4: Accountability; Principle 5: Understandable) that the ports are based in or which are in the immediate vicinity (Principle 6: Connected Geography). The defined local study areas for each potential port are summarised in Table 18.1 and Table 18.2 for potential construction ports and operation and maintenance ports, respectively.
9. The long lists of local study areas for the Construction Port and the Operation and Maintenance Port have been used to identify the locations that might be expected to be most sensitive to change and so would represent the maximum design scenario for the economic and social impact assessments.

Table 18.1: Potential Construction Ports and Local Study Areas

Ports	Local Study Area (Local Authority Areas Included)
Glensanda	Highland
Arnish	Highland
Nigg	Highland
Scrabster	Highland
Kishorn	Highland
Cromarty Firth/ Invergordon	Highland
Peterhead	Aberdeenshire
Ardersier	Highland, Moray
Methil	Fife
Aberdeen	Aberdeen City, Aberdeenshire
Grangemouth	Falkirk, Stirling, Clackmannanshire, West Lothian
Montrose	Angus, Dundee City, Aberdeenshire
Dundee	Dundee City, Fife, Angus
Leith	City of Edinburgh, Midlothian, West Lothian, East Lothian

Ports	Local Study Area (Local Authority Areas Included)
Rosyth	Fife, Stirling, Clackmannanshire, Falkirk, Perth and Kinross, City of Edinburgh, West Lothian

Table 18.2: Potential Operation and Maintenance Ports and Local Study Areas

Ports	Local Study Area (Local Authority Areas Included)
Buckie	Moray
Kinlochbervie	Highland
Lochinver	Highland
Cromarty Firth/Invergordon	Highland
Wick	Highland
Kyle of Lochalsh	Highland
Uig	Highland
Ullapool	Highland
Glensanda	Highland
Arnish	Highland
Nigg	Highland
Scrabster	Highland
Kishorn	Highland
Fraserburgh	Aberdeenshire
Peterhead	Aberdeenshire
Ardersier	Highland, Moray
Macduff	Aberdeenshire, Moray
Methil	Fife
Aberdeen	Aberdeen City, Aberdeenshire
Grangemouth	Falkirk, Stirling, Clackmannanshire, West Lothian
Montrose	Angus, Dundee City, Aberdeenshire
Dundee	Dundee City, Fife, Angus
Leith	City of Edinburgh, Midlothian, West Lothian, East Lothian
Rosyth	Fife, Stirling, Clackmannanshire, Falkirk, Perth and Kinross, City of Edinburgh, West Lothian

10. Although some ports from the Highland local authority area listed in Table 18.1 and Table 18.2 are located on the west coast of Scotland, these have been listed for completeness; the construction and operation and maintenance ports most likely to be used by the Applicant will be on the east coast of Scotland, and there is no intention for construction or operation and maintenance vessels to travel round the north of Scotland in order to traverse between the Array and the construction/operation and maintenance port(s).

18.4. POLICY AND LEGISLATIVE CONTEXT

11. Volume 1, chapter 2 of the Array EIA Report presents the policy and legislation of relevance to renewable energy infrastructure. Government guidance and advice relevant to socio-economics includes guidance on defining local areas (Marine Scotland, 2022) and general advice on assessing the socio-economic impact of offshore developments (Marine Analytical Unit, 2022). Table 18.3 presents a summary of the policy provisions relevant to socio-economics, with other relevant policy provisions set out in Table 18.4.

Table 18.3: Summary of Policy Relevant to Socio-Economics

Summary of Relevant Policy	How and Where Considered in the Array EIA Report
UK Offshore Wind Sector Deal (UK Government, 2020)	
The UK Offshore Wind Sector Deal highlights the number of jobs that could be created as part of the transition to Net Zero. Some estimates suggest that the UK could have 40 GW of generating capacity by 2030, and that could create up to 27,000 jobs in the UK. To meet this ambition will require addressing strategic issues, such as lack of grid capacity, and co-ordination across the sector, including developers, governments and the education sector. The UK Government has also highlighted the role that offshore wind can play in the transition to a net zero economy by 2050 (UK Government, 2021). Based on existing technology, electrification remains the main route to reach carbon neutrality. To make this change possible, the supply of electricity will need to increase significantly to match demand and the Government aims to decarbonise the power sector by 2035. This also has the potential to create many new green jobs, as part of the UK Government's Build Back Greener agenda.	Employment impacts are considered in section 18.11.
National Performance Framework (Scottish Government, 2018)	
The National Performance Framework sets out the Scottish Government's ambitions across economic, social and environmental factors. This includes increasing wellbeing and creating sustainable and inclusive growth.	Social impacts are considered in section 18.11
National Planning Framework (NPF) 4 (Scottish Government, 2023)	
The Scottish Government's National Planning Framework (NPF) 4 outlines the Scottish Government's approach to planning and development in support of achieving Net Zero in Scotland by 2045, including how people's lives can be improved through sustainable, liveable, and productive places. Policy 11c highlights that 'Development proposals will only be supported where they maximise net economic impact, including local and community socio-economic benefits such as employment, associated business and supply chain opportunities.	Economic impacts are considered in section 18.11.
National Strategy for Economic Transformation (Scottish Government, 2022a)	
The Scottish Government's vision is to create a wellbeing economy where society thrives across economic, social and environmental dimensions, and which delivers prosperity for all Scotland's people and places. Of particular importance is the ambition to be greener, with a just transition to net zero, a nature-positive economy and a rebuilding of natural capital. The strategy notes that Scotland has substantial energy potential and that it has developed a growing green industrial base. This provides a strong foundation for securing new market opportunities arising from the transition to net zero. Renewable energy also has a role to play in supporting productive businesses and regions across Scotland.	Employment impacts are considered in section 18.11. The development of a green industrial base is considered in section 18.12.2.
Offshore Wind Policy Statement (Scottish Government, 2020)	
The Scottish Government's Offshore Wind Policy Statement (OWPS) highlights the potentially substantial economic impacts associated with offshore wind, particularly floating foundations. When the OWPS was published in October 2020, the ScotWind leasing round was expected to lead to an additional 11 GW of offshore wind capacity by 2030, generating substantial economic impacts in Scotland's offshore wind supply chain. The ScotWind leasing round is now expected to lead to an additional 27.6 GW of offshore wind capacity (Crown Estate Scotland, 2023), with particular economic opportunities related to floating offshore wind.	Economic impacts, including those associated with floating foundations, are considered in section 18.11.

Table 18.4: Summary of Guidance Relevant to Socio-economics

Summary of Relevant Guidance	How and Where Considered in the Array EIA Report
Guidance on defining local areas for socio-economics (Marine Scotland, 2022)	
This guidance outlines the principles for defining the 'local area' on land that may be affected by large marine developments like offshore wind farms. This guidance is aimed at supporting the creation of economic impact assessments for such developments.	Discussed in section 18.3.1.
General advice for offshore Socio-Economic Impact Assessment (Marine Analytical Unit, 2022)	
Provides advice on assessing socio-economic impacts for offshore development, including the social impacts that should be considered and how they should be assessed as well as how economic impacts should be assessed. This includes taking account of factors such as deadweight, leakage, displacement and economic multipliers. Advice is also given on how social impacts should be assessed provided ports are known.	Economic and social impacts are considered in section 18.11. More detail on how the economic impacts have been calculated is provided in volume 3, appendix 18.1.

with how these have been considered in the development of this socio-economics chapter. Further detail is presented within volume 1, chapter 5.

18.5. CONSULTATION

12. Stakeholder consultation to inform this socio-economics chapter focused on the economic development agencies and local authorities in the areas that are most likely to have local epicentres of impact, e.g. construction ports, operation and maintenance ports. These are likely to be on the east coast of Scotland.
13. Consideration was given to the Marine Analytical Unit's (MAU) general advice on assessing the socio-economic impact of offshore developments (Marine Analytical Unit, 2022), specifically the advice to consult with stakeholders in relevant communities to identify the economic and social impacts. Given that neither the construction port nor the operation and maintenance port are yet known, and that there are a number of potential ports that could be selected, it was not possible to identify specific relevant communities that could be consulted at this stage. However, this assessment does consider both potential economic and potential social impacts in the areas around the construction port and the operation and maintenance port (albeit that the locations are not yet known) and the stakeholder engagement included economic development and local authority organisations covering the most likely locations on the east coast of Scotland.
14. The organisations included in the socio-economic stakeholder consultation were:
 - Aberdeen City Council (Economic Development);
 - Aberdeenshire Council (Economic Development);
 - Angus Council (Economic Development);
 - Dundee City Council (Economic Development);
 - Energy Transition Zone Ltd;
 - Forth Ports (Port of Dundee);
 - Highland Council (Economic Development);
 - Highlands and Islands Enterprise;
 - Scottish Enterprise; and
 - University of the Highlands and Islands.
15. A letter was written to each stakeholder, summarising the proposed approach to assessing socio-economic impacts, including the economic and social impacts to be considered. Comments were sought on the approach, the impacts to be included and any comments on the socio-economic impacts particularly relevant to the geographic areas that stakeholder organisations are responsible. Responses received have been noted in Table 18.5.
16. Table 18.5 presents a summary of the key issues raised during consultation activities undertaken to date specific to socio-economics for the Array and in the Ossian Array Scoping Opinion (MD-LOT, 2023) along

Table 18.5: Summary of Issues Raised During Consultation and Scoping Opinion Representations Relevant to Socio-Economics

Date	Consultee and Type of Consultation	Issue(s) Raised	Response to Issue Raised and/or Where Considered in this Chapter
Relevant Consultation to Date			
January 2024	Dundee City Council – Virtual meeting	<p>Dundee City Council welcomed the economic opportunities that could arise for the City of Dundee, and indicated that the Council would do what it could do to assist the Applicant in maximising the economic impacts for the City.</p> <p>The Council recognised that the scale of the local benefits would depend to a large extent on decisions yet to be made on the construction port(s) and the operation and maintenance port(s). If the Port of Dundee is selected, this would be welcomed by the Council.</p> <p>The potential for any negative effects was discussed, and it was noted that any activities taking place in the Port of Dundee was unlikely to impact on tourism, since there is a clear physical separation of even the waterside tourism assets in Dundee from the Port facilities that would be used for construction or operation and maintenance.</p>	<p>The comments from Dundee City Council have been taken into account in the assessment. It has not been possible to assess the economic and social impacts on the City of Dundee because the construction port(s) and the operation and maintenance port(s) have not yet been selected. However, the economic impact assessment (see section 18.11) includes consideration of the potential impacts in the areas surrounding the construction port(s) and the operation and maintenance port(s) and so this provides an indication of the scale of economic benefits that might be expected for the City of Dundee should the Port of Dundee be selected.</p>
January 2024	Scottish Enterprise – Written response on stakeholder letter	<p>Scottish Enterprise provided advice on the considerations that it would take into account when considering impact on the Scottish economy, whilst recognising that the Applicant has a wide range of potential stakeholders. The considerations are summarised below:</p> <ul style="list-style-type: none"> • Metrics: quantitative measures could include gross jobs created, gross GVA and tax take. • Ranges and scenarios: consider the range of benefits by considering commitment and ambitions levels. • Displacement: competition and displacement should be considered. • Multipliers: direct, indirect and induced effects should be considered. • Spatial impacts: anticipate that it may be easier to estimate impacts at the UK and Scottish levels, and more challenging at the local level where Scottish suppliers, construction and operation bases have yet to be determined. • Clarity for assumptions and limitations: it may be useful to make clear what assumptions have been made to inform calculations. • Timing and impact period: it may be helpful to understand the scale of impacts associated with different aspects (construction, operation and maintenance, decommissioning phases) to understand how impacts build up over time. • Supporting research: the Scottish Government, via ClimateXchange, has commissioned work regarding future monitoring and evaluation of supply chain content and associated economic impacts for Scotland's offshore wind farms. 	<p>The economic impact assessment (see section 18.11) takes account of these considerations as follows:</p> <ul style="list-style-type: none"> • Metrics: gross jobs created and gross GVA have been used as measures but the tax take has not been considered since this will depend on future government decisions on the tax system. • Ranges and scenarios: volume 3, appendix 18.1 includes the economic impact of both commitment and ambitions scenarios. • Displacement: the treatment of displacement is discussed in the volume 3, appendix 18.1. • Multipliers: direct, indirect and induced effects have been considered. More details of the approach are set out in volume 3, appendix 18.1. • Spatial impacts: the assessment includes the study areas of the UK and Scotland, as well as areas surrounding the construction port(s) and the operation and maintenance port(s), whilst recognising that the ports are not yet known. • Clarity for assumptions and limitations: the methods used and assumptions are set out in volume 3, appendix 18.1. • Timing and impact period: the assessment includes the construction, operation and maintenance and decommissioning phases of the Array. • Supporting research: the research had not yet been published when this assessment was undertaken.
Scoping Opinion			
June 2023	MD-LOT (based on MAU advice in MAU Scoping Representation (May 2023))	<p>Potential impacts on local communities should be assessed.</p> <p>Magnitude and significance methodology applied at the national level may not capture local social impacts.</p> <p>The approach to assessing employment impacts should include the types of jobs that are expected to be created.</p> <p>Expect detailed methodology describing how the economic impacts have been assessed.</p> <p>Would like to see engagement with communities around main ports, with engagement by professional researchers</p>	<p>Potential economic impacts on the areas around the construction and operation and maintenance ports have been assessed in section 18.11. However, the ports are not yet known and so it was not possible to relate this to specific local communities at this stage.</p> <p>Local social effects are assessed including how differences in port characteristics can affect social impacts (section 18.11).</p> <p>Considered as part of the economic impact assessment (section 18.11).</p> <p>A detailed description has been provided as part of volume 3, appendix 18.1.</p> <p>Local ports were not known at the time of the assessment so no engagement with communities was possible.</p>
June 2023	Scottish Fishermen's Federation Scoping Representation (April 2023)	Expect to see details of what jobs will be created. Would like to understand the potential effect on fishing jobs	Employment created by the Array and effects on commercial fishing are considered in section 18.11.
June 2023	UK Chamber of Shipping Scoping Representation (April 2023)	The economic effects associated with vessel displacement should be considered, e.g. longer journey times	Economic effects associated with vessel displacement are considered in section 18.11, based on the shipping and navigation chapter. (volume 2, chapter 13).

18.6. METHODOLOGY TO INFORM BASELINE

18.6.1. DESKTOP STUDY

17. Information on socio-economic baseline conditions within the socio-economic study areas was collected through a detailed desktop review of existing studies and datasets which are summarised in Table 18.6.
18. The methodology for establishing the baseline involved a broad desktop study. This study was aimed at evaluating and assessing the key datasets and statistics relevant to the socio-economic assessment and supply chain capabilities in the UK and Scotland. It focused on various key statistics, including general population demographics, age group distribution, overall employment levels, and specific employment figures within industries linked to the offshore sector.

Table 18.6: Summary of Key Desktop Reports

Title	Source	Extent	Year
Business Register and Employment Survey	(ONS, 2023a)	2021	2023
Annual Population Survey	(ONS, 2023b)	2022	2023
Mid-Year Population Estimates	(ONS, 2022a)	2021	2022
Principal Population Projections 2020-based	(ONS, 2022b)	2020-2045	2022
2020-based Principal Population Projections	(National Records of Scotland, 2021)	2020-2045	2021
The Economic Impact of Scotland's Renewable Energy Sector	(Fraser of Allander, 2023)	2021	2023

18.6.2. SITE-SPECIFIC SURVEYS

19. No site-specific surveys have been undertaken to inform the socio-economics EIA chapter. This is because socio-economic impacts are determined by the level of expenditure, receptors would be assessed based on available socio-economic data and construction and operation and maintenance ports are not known.

18.7. BASELINE ENVIRONMENT

18.7.1. OVERVIEW OF BASELINE ENVIRONMENT

20. The following sections provide a summary of the socio-economic baseline environment.

Population

21. In 2021, Scotland had a population of almost 5.5 million (Table 18.7), 8.2% of the UK population of 67.0 million. The share of the working age population (aged 16 to 64 years old) was higher in Scotland at 63.8%, compared to the UK (62.9%). Compared to the UK, Scotland has a lower proportion of younger people (aged 0 to 15 years old) as a share of the population and a higher proportion of older people (aged 65+ years old).

Table 18.7: Population by Age Group, 2021 (ONS, 2023)

Population	Scotland	UK
Aged 0-15	16.6%	18.4%
Age 16-64	63.8%	62.9%
Aged 65+	19.6%	18.7%
Total	5,479,900	67,026,300

Labour market and employment

22. In 2021, there were 2.6 million jobs in the Scottish economy (Table 18.8), representing around 8.1% of employment in the UK economy (32.2 million jobs).
23. During the development stage, which includes project management, project design and environmental impact assessments, there will be opportunities for the professional, scientific and technical activities sector, which employs 167,000 people in Scotland (5.9% of UK employment in this sector).
24. Employment in electricity, gas, steam and air conditioning supply sectors in Scotland (18,500 people) is 13.1% of UK's employment in the sector, reflecting a proportionately larger renewable energy sector in Scotland. This may also indicate that the Scottish professional services sector has experience in supporting the renewable energy sector.
25. Sectors relevant to the construction phase of the Array include manufacturing, which has total employment in Scotland of 179,000 people (7.4% of UK employment in the sector) and construction, which has total employment in Scotland of 158,000 people (9.8% of UK employment in the sector). Scotland's high share employment in mining and quarrying sectors, which employ 23,500 people (50% of UK employment in the sector), reflects strengths in offshore oil and gas, which are relevant for the development and construction phases. Scottish employment in transportation and storage of 107,000 people (6.6% of UK employment in the sector), will also be relevant since the Array will require port infrastructure during the construction, operation and maintenance and decommissioning phases.

Table 18.8: Number of People in Employment in Selected Industries, 2021 (ONS, 2023a)

Economic Sectors	Scotland	UK	Scotland as % of UK
Manufacturing	179,000	2,415,169	7.4%
Professional, scientific and technical activities	167,000	2,830,611	5.9%
Construction	158,000	1,607,641	9.8%
Transportation and storage	107,000	1,616,090	6.6%
Mining and quarrying (including oil and gas)	23,500	46,983	50.0%
Electricity, gas, steam and air conditioning supply	18,500	137,500	13.5%
Total Employment	2,617,000	32,172,341	8.1%

Annual economic output

26. The Array will contribute to the Scottish and UK economies during all phases, and its contribution will be measured in Gross Value Added (GVA), which is a measure of the economic output of an economy, where non-staff costs are subtracted from turnover. In 2021, the total economic output of the Scottish and UK economies (ONS, 2023c) was:

- Scotland: £149.9 billion; and
- UK: £2,040 billion.

Renewable energy sector

27. Analysis by the Fraser of Allander Institute (Fraser of Allander, 2023) considered the economic impact of Scotland’s renewable energy sector. It estimated that in 2021, the sector directly employed 13,600 full-time equivalent employees. When spending in the supply chain (indirect effects) and spending by staff (induced effects) are included it was estimated that the sector supported employment of 42,000 and an impact of £4.7 billion GVA.
28. Of this, it was estimated that offshore wind supported approximately 15,000 employees, though it should be noted that there is considerable uncertainty related to these estimates and the industry is changing rapidly as the offshore wind sector grows.

Potential port locations baseline

29. Table 18.9 presents baseline data for the local study areas for the long list of potential construction ports identified on the east coast of Scotland. The table shows that lowest populations of the local study areas are for the six ports located in the Highlands¹. The local study area for Rosyth has the largest population due to its proximity to the local authority areas of Fife, Stirling, Clackmannanshire, Falkirk, Perth and Kinross, the City of Edinburgh, and West Lothian. In terms of the local labour market, the local study area for Peterhead has the smallest workforce of the local study areas identified, whilst the local study area for Rosyth has the largest workforce.

Table 18.9: Potential Construction Port Local Study Areas Baseline Data (ONS, 2023a)

Ports	Population	Workforce (Total Employment)	Construction Sector Workforce
Glensanda	238,100	115,025	8,000
Arnish	238,100	115,025	8,000
Nigg	238,100	115,025	8,000
Scrabster	238,100	115,025	8,000
Kishorn	238,100	115,025	8,000
Cromarty Firth/ Invergordon	238,100	115,025	8,000
Peterhead	262,700	102,200	7,500
Ardersier	334,500	152,535	10,375
Methil	374,700	135,665	7,500
Aberdeen	490,100	260,020	13,000
Grangemouth	491,300	203,315	13,450
Montrose	526,500	216,220	13,125
Dundee	638,500	249,685	13,125
Leith	916,400	498,300	20,625
Rosyth	1,546,300	758,735	34,450

30. Table 18.10 presents baseline data for the local study areas for the long list of operation and maintenance ports identified on the east coast of Scotland. The table shows the local study area for Buckie has the smallest population and the smallest workforce of the local study areas for the 25 potential operation and maintenance ports identified. The local study area for Rosyth has the largest population and workforce.

Table 18.10: Potential Operation and Maintenance Port Local Study Areas Baseline Data (ONS, 2023a)

Ports	Population	Workforce (Total Employment)	Construction Sector Workforce
Buckie	96,400	37,510	2,375
Kinlochbervie	238,100	115,025	8,000
Lochinver	238,100	115,025	8,000
Cromarty Firth/Invergordon	238,100	115,025	8,000
Wick	238,100	115,025	8,000
Kyle of Lochalsh	238,100	115,025	8,000
Uig	238,100	115,025	8,000
Ullapool	238,100	115,025	8,000
Glensanda	238,100	115,025	8,000
Arnish	238,100	115,025	8,000
Nigg	238,100	115,025	8,000
Scrabster	238,100	115,025	8,000
Kishorn	238,100	115,025	8,000
Fraserburgh	262,700	102,200	7,500
Peterhead	262,700	102,200	7,500
Ardersier	334,500	152,535	10,375
Macduff	359,100	139,710	9,875
Methil	374,700	135,665	7,500
Aberdeen	490,100	260,020	13,000
Grangemouth	491,300	203,315	13,450
Montrose	526,500	216,220	13,125
Dundee	638,500	249,685	13,125
Leith	916,400	498,300	20,625
Rosyth	1,546,300	758,735	34,450

18.7.2. FUTURE BASELINE SCENARIO

31. The EIA Regulations require that a “a description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort, on the basis of the availability of environmental information and scientific knowledge” is included within the Array EIA Report.

¹ It should be noted that some ports from the Highland local authority area listed in Table 18.9 and Table 18.10 are located on the west coast of Scotland, but the construction and operation and maintenance ports most likely to be used by the Applicant will be on the east coast of Scotland, and

there is no intention for construction or operation and maintenance vessels to travel round the north of Scotland in order to traverse between the Array and the construction/operation and maintenance port(s).

- 32. If the Array does not come forward, an assessment of the 'without development' future baseline conditions has also been carried out and is described within this section.
- 33. From 2021 to 2043 (the latest years available), Scotland's population is projected to increase by 1.2% (National Records of Scotland, 2021). In contrast, the wider UK population is anticipated to grow by 7.6% (ONS, 2022b).
- 34. A critical aspect of these demographic changes is the shift in the working-age population, defined as individuals aged 16 to 64 years old. During this period, Scotland is projected to witness a decrease in its working-age population, with an expected decline of over 96,200 individuals, representing a -2.8% change (National Records of Scotland, 2021). This contrasts with the overall UK trend (ONS, 2022b), where the working-age population is forecasted to rise by almost 1,310,900, an increase of approximately 3.1%.
- 35. The anticipated reduction in Scotland's working-age population presents a challenge to its economic and labour market stability. Without effective measures to attract and retain a skilled workforce, Scotland may face workforce shortage. The growth of sectors that provide high quality jobs will therefore be an important driver of Scotland's population trends and economic performance.

Table 18.11: Population Projections (National Records of Scotland, 2021) (ONS, 2022b)

	Scotland		UK	
	2021	2043	2021	2043
Population	5,438,100	5,503,019	67,026,300	70,968,244
Aged 0-15	16.9%	13.4%	18.4%	15.9%
Age 16-64	64.2%	61.7%	62.9%	60.3%
Aged 65+	18.9%	24.8%	18.7%	23.9%

18.7.3. DATA LIMITATIONS AND ASSUMPTIONS

- 36. One limitation of this assessment is the reliance on population data from 2021 and projections from 2018, which are the latest available. These figures are not expected to be adjusted until the end of 2024.
- 37. Additionally, the lack of specific information on the locations of the ports limited the details that could be included about local socio-economic study areas. In the absence of specific information on the ports, the Array alone assessment does consider the potential economic and social impacts in the vicinity of the ports that are selected. The CEA also considers the potential economic and social impacts, however, as construction and operation and maintenance ports of other projects/plans are not currently known, the long list of ports detailed in Table 18.9 and Table 18.10 could not be used. This is further discussed in paragraph 190. In addition, due to the lack of specific information on ports which may be used in the decommissioning phase for the Array alone at present, and the uncertainty of the future baseline for decommissioning, for the social impacts a high-level assessment of decommissioning has been undertaken. Similarly, for the cumulative effects assessment, it was not possible to determine significance of effects for the decommissioning phase for social impacts. It should be noted that sections 18.11 and 18.12 do present an assessment of significance of effects for economic impacts during the decommissioning phase where appropriate.

18.8. KEY PARAMETERS FOR ASSESSMENT

18.8.1. MAXIMUM DESIGN SCENARIO

- 38. The maximum design scenarios identified in Table 18.12 are those expected to have the potential to result in the greatest adverse effect on an identified receptor or receptor group. Many of the economic effects assessed in the socio-economic EIA chapter are expected to be beneficial. Therefore, this chapter assesses the Project Design Envelope (PDE) Option (volume 1, chapter 3) that could generate the lowest beneficial impacts.
- 39. These scenarios have been selected from the details provided in volume 1, chapter 3 of the Array EIA Report. Effects of greater adverse significance or, where appropriate, lesser beneficial significance are not predicted to arise should any other development scenario, based on details within the Project Description (volume 1, chapter 3) (e.g. different infrastructure layout), to that assessed here, be taken forward in the final design scheme.
- 40. The Applicant's SCDS (Ossian OWFL, 2023), provides estimates of expenditure in Scotland, rUK, the EU and elsewhere across two scenarios (commitment and ambition) associated with four categories of expenditure: development, manufacturing and fabrication, installation, and operation and maintenance (the first six years).
- 41. The SCDS was submitted in July 2021 and updated in April 2023 (Ossian OWFL, 2023), based on the initial 2,610 MW capacity. As discussed in more detail in volume 3, appendix 18.1, this was used as the basis of estimating expected expenditure in each of the socio-economic study areas for each of the PDE Options. The PDE Option with the lowest beneficial economic impacts was assessed as the maximum design scenario for the economic impacts, and this was identified as PDE Option 4 under the commitment scenario.

Table 18.12: Maximum Design Scenario Considered for Each Potential Impact as Part of the Assessment of LSE¹ on Socio-Economics

Potential Impact	Phase ²			Maximum Design Scenario	Justification
	C	O	D		
Employment and GVA impacts associated with the construction, operation and maintenance and decommissioning of the Array	✓	✓	✓	<p>Construction and Operation and Maintenance Phases</p> <p>The employment and GVA impacts for the construction phase and the operation and maintenance phase has been estimated based on supply chain scenarios set out in the Supply Chain Development Strategy (SCDS), updated in April 2023 (Ossian Offshore Wind Farm Limited (Ossian OWFL), 2023). The SCDS includes both a commitment scenario and an ambition scenario for supply chain expenditure in Scotland, the rest of the UK (rUK) and the European Union (EU). The commitment scenario has been the basis for the socio-economic assessment, since this represents lower Scottish and UK supply chain content than the ambition scenario, and therefore lower beneficial employment and GVA impacts.</p> <p>The capacity of the Array modelled has been based on PDE Option 4: 130 turbines with floating foundations, and a capacity of up to 3.6 GW. The construction and operation and maintenance phase spending have been based on the SCDS, with adjustments necessary to account for the capacity of PDE Option 4.</p> <p>Decommissioning Phase</p> <p>The scale and duration of decommissioning activity is uncertain. The exact approach to decommissioning is not yet confirmed as industry practice at the time is not currently known. The Maximum Design Scenario (MDS) assumes all structures above seabed level and dynamic cables within the water column will be removed and that a decommissioning support facility will be located in Scotland.</p> <p>For the decommissioning phase, it is not yet known the extent to which employment and GVA impacts will be generated for each socio-economic study area, since it will depend on procurement practices and the structure of the economies of the study areas at the time. It is standard practice in economic assessment to discount future benefits so that they are given less weight than benefits that occur sooner. Using the typical discount rate of 3.5% per annum as recommended by HM Treasury (HM Treasury, 2022), a benefit occurring in 40 years time will be valued at less than a quarter of a benefit of the same scale occurring now. Decommissioning phase employment and GVA impacts are therefore considered to be considerably less valued than the construction and operation and maintenance phase employment and GVA impacts.</p>	<p>Expected to lead to changes in employment and economic activity in each socio-economic study area.</p> <p>The commitment scenario is expected to lead to smaller beneficial changes in employment and economic activity in each study area than the ambition scenario.</p>
Demographic changes and demand for housing and other services	✓	✓	✓	<p>The scenarios for demographic changes and demand for housing and other services will be related to the employment and GVA impact under PDE Option 1, since the main driver will be labour market demand associated with the employment opportunities created. The assessment has been based on the employment impacts in volume 3, appendix 18.1. It was estimated that construction port(s) contracts could support 1,110 years of employment at the construction port(s) and a peak direct employment of 240 jobs. It was estimated that operation and maintenance port(s) could support employment of 70 jobs at the operation and maintenance port.</p>	<p>May lead to an increase in local populations in order to meet demand for labour related to economic opportunities. Employment impacts arising from PDE Option 1 have been used as the basis for the social impact assessment as this is associated with the highest port-related employment impacts.</p>
Changes to visitor behaviour	✓	✓	✓	<p>The location of the construction and operation and maintenance ports are yet not determined and so it is not possible to consider any potential effects of onshore socio-economic activity on visitor behaviour.</p> <p>The assessment considers whether changes to visitor behaviour could arise from changes to shipping and marine navigation (e.g. cruise ships). The assessment has been based on the findings from the shipping and navigation assessment (volume 2, chapter 13), taking account of designed in measures.</p>	<p>May lead to changes in visitor behaviour, though this is likely to be mitigated by designed in measures.</p>
Changes to commercial fisheries	✓	✓	✓	<p>The assessment of socio-economic effects arising from any changes to commercial fisheries has been based on the findings of the commercial fisheries assessment (volume 2, chapter 12).</p>	<p>May lead to reduced activity associated with commercial fisheries.</p>
Changes to shipping and marine recreation	✓	✓	✓	<p>The assessment of socio-economic effects arising from any changes to shipping and marine navigation has been based on the findings of the shipping and navigation assessment (volume 2, chapter 13), taking account of designed in measures.</p>	<p>May lead to changes in behaviour in these sectors, though this is likely to be mitigated by designed in measures.</p>

² C = Construction, O = Operation and maintenance, D = Decommissioning

42. Under the maximum design scenario for economic impacts, the construction cost for the Array would be £ [redacted] (Table 18.13), of which the largest expenditure would be manufacturing and fabrication (£6.3 billion). The annual operation and maintenance spend would be £ [redacted].

Table 18.13: Maximum Design Scenario for Economic Impacts (PDE Option 4, commitment): Scotland, rUK and Total Array Spending (£m)

130 Wind Turbines	Scotland	rUK	Total
Development	[redacted]	[redacted]	[redacted]
Manufacturing and fabrication	[redacted]	[redacted]	[redacted]
Installation	[redacted]	[redacted]	[redacted]
Construction	[redacted]	[redacted]	[redacted]
Annual operation and maintenance	[redacted]	[redacted]	[redacted]

43. For the social impacts the main driver of the magnitude of impacts will be population and demographic changes arising from labour market demand associated with the employment opportunities created. PDE Option 1 was assessed as the maximum design scenario for the social impact assessment as this is associated with the highest port-related employment impacts.

18.8.2. IMPACTS SCOPED OUT OF THE ASSESSMENT

44. On the basis of the baseline environment and the Project Description outlined in volume 1, chapter 3 of the Array EIA Report, no impacts have been scoped out of the assessment.

18.9. METHODOLOGY FOR ASSESSMENT OF EFFECTS

18.9.1. OVERVIEW

Economic impact assessment

45. The socio-economic assessment of effects has followed the methodology set out in volume 1, chapter 6 of the Array EIA Report. Specific to the socio-economic effects related to the offshore elements, the following guidance documents have also been considered:

- General Advice for Offshore Socio-economic Impact Assessments, (Marine Analytical Unit, 2022);
- Defining 'local area' for assessing impact of offshore renewables and other marine developments: guidance principles (Marine Scotland, 2022);
- UK Offshore Wind Sector Deal (UK Government, 2020); and
- The Green Book: Appraisal and Evaluation in Central Government (HM Treasury, 2022).

46. The economic impacts considered for each socio-economic study area and are reported in terms of:

- GVA: this is a measure of economic output, the economic value added by an organisation, industry or region and is typically estimated by subtracting the non-staff operational costs from the turnover of an organisation.
- Years of Employment: this is a measure of employment which is equivalent to one person being employed for a year and is typically used when considering short-term employment impacts, such as those associated with the construction employment.
- Employment (Jobs): a measure of employment which considers the headcount employment in an organisation or industry.

47. The focus of the economic impact assessment has been on the direct and indirect (supply chain) effects, in line with the UK Offshore Wind Sector Deal (UK Government, 2020). In addition to this, the assessment also considers the effects of staff spending and the economic impact that this subsequent increase in demand stimulates (the induced effect).

48. Deadweight (what would have happened without the Array), leakage (economic impacts occurring outside of study areas considered) and displacement (economic activity that is being displaced by the Array) have been taken into account and are discussed in volume 3, appendix 18.1.

49. The Array will include the construction and installation of floating foundations and wind turbines, the Offshore Substation Platforms (OSPs), and the construction and installation of inter-array and interconnector cabling. The analysis for the Array covers three phases:

- construction (including development, manufacturing and fabrication, and installation);
- operation and maintenance; and
- decommissioning.

50. The impacts during the construction phase have been based on the planned expenditure associated with this phase, as discussed in volume 3, appendix 18.1. In addition to the total impact over the period, the assessment also considers the timings of impacts during this phase to understand the peaks and troughs of this activity.

51. The impacts during the operation and maintenance phase for the Array have been based on projected operation and maintenance expenditure, as discussed in volume 3, appendix 18.1.

52. The impacts during the decommissioning phase for the Array have been based on industry estimates, as discussed in the volume 3, appendix 18.1. These impacts are expected to be less than for the construction phase.

Social impact assessment

53. As well as generating economic impacts in each of the socio-economic study areas considered, the Array may have social impacts on the communities where economic activity takes place. The magnitude of these social impacts is expected to result from the level of economic impact associated with the Array.

54. Therefore, the social impact assessment aims to outline the primary pathways through which the development of offshore wind projects, such as the Array, could lead to social impacts. It focuses on the following key areas:

- demographic changes;
- housing demand and availability;
- impacts on other local services; and
- socio-cultural alterations.

55. As the construction and operation and maintenance port(s) are not yet known, the social impact assessment has been based on the population and workforce of the local areas surrounding a long list of potential construction and operation and maintenance port(s).

56. The social impact assessment has focused on how communities could be affected by economic changes, and how different characteristics (such as the size of the settlement, its economic characteristics and social dynamics) will inform the types of social impacts that are experienced as well as their sensitivity to change. This is expected to vary depending on the different phases considered, e.g. a temporary increase in workers during the construction phase will have different effects compared to a long term increase in employment in a given area.

18.9.2. CRITERIA FOR ASSESSMENT OF EFFECTS

57. When determining the significance of effects, a two-stage process is used which involves defining the magnitude of the potential impacts and the sensitivity of the receptors. This section describes the criteria

applied in this chapter to assign values to the magnitude of potential impacts and the sensitivity of the receptors. The terms used to define magnitude and sensitivity are based on those which are described in further detail in volume 1, chapter 6 of the Array EIA Report.

58. The socio-economics impacts have been considered over distinct study areas to capture the spatial extent of any impact. The magnitude and significance of any impact are then considered in relation to the baseline conditions within those socio-economic study areas.

Magnitude of economic impacts

59. Between 2000 and 2019, the average level of Gross Domestic Product (GDP) per capita growth in the UK was 1% per annum (International Monetary Fund, 2022). Similarly, between 2000 and 2019 the number of jobs increased by 1% per annum (ONS, 2023d). The magnitude of any change in an economy should be considered within this context and in relation to changes in the levels of economic activity.

60. In addition to the change in the overall impact in the GVA or employment of an area, consideration can also be made for the sectors of the economy which are considered to contribute to the potential for the local area to secure contracts. For example, in the context of offshore wind, the construction, manufacturing and professional services sectors present in an area are likely to contribute towards it securing contracts, since the presence of potential suppliers is likely to increase the value of contracts secured in the study area.

61. The definitions of the magnitude of economic impacts are provided in Table 18.14.

Table 18.14: Definition of Terms Relating to the Magnitude of an Economic Impact

Magnitude of Impact	Definition
High	An effect would be considered to have a high magnitude if it was equivalent to all of the typical economic growth per capita. Specifically, for each study area or a sector in a study area: <ul style="list-style-type: none"> Peak annual GVA impact is greater than, or equal to, 1% of the economy or sector; or Peak employment supported is greater than, or equal to, 1% of the total number of jobs in that area or sector.
Medium	An effect would be considered to have a medium magnitude if it was equivalent to half of the typical economic growth per capita. Specifically, for each study area: <ul style="list-style-type: none"> Peak annual GVA impact is greater than, or equal to, 0.5% of the economy or sector; or Peak employment supported is greater than, or equal to, 0.5% of the total number of jobs in that area or sector.
Low	An effect would be considered to have a low magnitude if it was equivalent to a quarter of the typical economic growth per capita. Specifically, for each study area: <ul style="list-style-type: none"> Peak annual GVA impact is greater than, or equal to, 0.25% of the economy or sector; or Peak employment supported is greater than, or equal to, 0.25% of the total number of jobs in that area or sector.
Negligible	An effect would be considered to have a negligible magnitude if it was equivalent to less than a quarter of the typical economic growth per capita. Therefore, for each study area: <ul style="list-style-type: none"> Peak annual GVA impact is less than 0.25% of the economy or sector; or Peak employment supported is less than 0.25% of the total number of jobs in that area or sector.

Magnitude of social impacts

62. The magnitude of impacts on the social or community assets will be dependent on the scale of the economic and demographic changes that occur in each of the socio-economic study areas and how these affect demand for services, such as housing, education and health. The definitions of the magnitude of social impacts are provided in Table 18.15, consistent with the magnitude of change definitions for the economic impacts.

Table 18.15: Definition of Terms Relating to the Magnitude of a Social Impact

Magnitude of Impact	Definition
High	An effect would be considered to have a high magnitude if there was a population change greater than 1% of the current population in a study area.
Medium	An effect would be considered to have a medium magnitude if there was a population change between 0.5% and 1% of the current population in a study area.
Low	An effect would be considered to have a low magnitude if there was a population change between 0.25% and 0.5% of the current population in a study area.
Negligible	An effect would be considered to have a negligible magnitude if there was a population change less than 0.25% of the current population in a study area.

Sensitivity of receptors – economic impacts

63. The sensitivity of an economy is linked to how it absorbs change. To consider the sensitivity of an economy, or a sector within that economy, it is necessary to consider both the resilience and agility of the economy. There are several factors that contribute to an assessment of resilience and agility; these include:

- the scale of the economy;
- the diversity of sectors in the economy;
- the level of economic activity;
- the level of skills and education; and
- the level of economic potential from utilising capital (natural, human, social, economic).

64. The criteria for defining sensitivity for economic receptors in this chapter are outlined in Table 18.16.

Table 18.16: Definition of Terms Relating to the Sensitivity of Economic Receptors

Value (Sensitivity of the Receptor)	Description
High	A highly (major) sensitive economy will not be able to absorb changes without fundamentally altering its present character or value. Factors that would contribute to an economy being considered of high sensitivity include: <ul style="list-style-type: none"> - the economy is particularly reliant on a 1 single sector; - the number of jobs in the economy has been declining over multiple years; and - the share of people with no qualifications is significantly above the average for the wider economy.
Medium	An economy with medium sensitivity has a moderate capacity to absorb changes without fundamentally altering its present character or value, however it would be less resilient than the wider economy. Factors that would contribute to an economy being considered of medium sensitivity include: <ul style="list-style-type: none"> - the economy is particularly reliant on a small number of sectors; - the number of jobs in the economy has grown less than the wider economy; and - the share of people with no qualifications is above the average for the wider economy.
Low	A low (minor) sensitive economy is tolerant of changes without fundamentally altering its present character or value. Factors that would contribute to an economy being considered of low sensitivity include: <ul style="list-style-type: none"> - most sectors of the economy are well represented; - the number of jobs in the economy has grown in line with the wider economy; and - the level of educational attainment is in line with the wider economy.
Negligible	An economy with negligible sensitivity is very agile and will be able to accommodate changes without affecting its character or overall value. Factors that would contribute to an economy having negligible sensitivity include: <ul style="list-style-type: none"> - the economy is well balanced between sectors; - the number of jobs in the economy has grown at a quicker rate than the wider UK economy; and - the share of people with no qualifications is below average for the wider economy.

Sensitivity of the tourism economy

65. Considering the significance of effect on the tourism economy in a particular study area requires an assessment of the sensitivity of the tourism sector in the study area. For example, a tourism sector will be sensitive if there are only a few drivers of tourism or if there is a particular reliance on a particular type of visitor.
66. As the construction and operation and maintenance ports are not known, it is not possible to assesses how sensitive their local tourism economies are to change. However, to some extent, sensitivity of tourism economies can be considered generically by taking account of how port operators manage their facilities to avoid conflict between customer types (including customers from the offshore wind sector and from the tourism sector).

Sensitivity of community and social assets

67. The sensitivity of community and social assets will depend on their relative capacity to adapt to change and meet increased demand without affecting existing services, e.g. whether there is additional capacity in the housing market, schools, etc.
68. As the construction and operation and maintenance ports are not yet known, it is not possible at this stage to assess sensitivity at the community level. However, a long list of potential ports has been identified as have associated local study areas. By assessing the magnitude of the most beneficial and most adverse scenarios for the local study areas with the lowest and the highest populations, the range of possible assessments that could be made on the significance of the local social impacts can be identified. This means that a qualitative assessment can be made of the circumstances in which the sensitivity of a local study area could result in an impact considered to be significant.

Assessment of significance

69. The magnitude of the impact and the sensitivity of the receptor are combined when determining the significance of the effect upon socio-economics. The particular method employed for this assessment is presented in Table 18.17.
70. Where a range is suggested for the significance of effect, for example, minor to moderate, it is possible that this may span the significance threshold. The technical specialist’s professional judgement has been applied to determine which outcome defines the most likely effect, which takes in to account the sensitivity of the receptor and the magnitude of impact. Where professional judgement has been applied to quantify final significance from a range, the assessment sets out the factors that result in the final assessment of significance. These factors may include the likelihood that an effect will occur, data certainty and relevant information about the wider environmental context.
71. For the purposes of this assessment:
 - a level of residual effect of moderate or more will be considered a ‘significant’ effect in terms of the EIA Regulations; and
 - a level of residual effect of minor or less will be considered ‘not significant’ in terms of the EIA Regulations.
72. Effects of moderate significance or above are therefore considered important in the decision-making process, whilst effects of minor significance or less warrant little, if any, weight in the decision-making process.

Table 18.17: Matrix Used for the Assessment of the Significance of the Effect

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

18.10. MEASURES ADOPTED AS PART OF THE ARRAY

73. As part of the Array design process, a number of designed in measures have been proposed to increase the potential for beneficial impacts and mitigate adverse impacts on socio-economics (see Table 18.18). They are considered inherently part of the design of the Array and, as there is a commitment to implementing these measures, these have been considered in the assessment presented in section 18.11 (i.e. the determination of magnitude and therefore significance assumes implementation of these measures). These designed in measures are considered standard industry practice for this type of development.

Table 18.18: Designed In Measures Adopted as Part of the Array

Designed In Measures Adopted as Part of the Array	Justification
Establishment of an online portal where potential suppliers can register interest, boosting the supply chain (implemented).	Measures to increase the capacity of the Scottish supply chain will support more companies to secure wind contracts and increase economic impact.
Signed memorandum of understanding with Scottish suppliers.	Engagement with Scottish and UK suppliers of offshore wind services will ensure that the appropriate capacity is in place.

Designed In Measures Adopted as Part of the Array	Justification
Engaging with international companies to invest in Scottish manufacturing capacity.	Higher manufacturing potential in Scotland will result in higher Scottish content and more economic activity.
Establishing a £30 million Supply Chain Fund, which will enable local companies to invest in new facilities and equipment, and have confidence to invest.	Increased capacity will enable Scottish firms to secure more contracts and increase the Scottish economic impact.
Establish a £3 million Education, Research and Community Benefit Fund, which will promote offshore wind careers for young people, develop an apprenticeship programme and benefit local communities.	Will increase the capacity of the Scottish workforce, increasing the potential Scottish economic impact.

74. Although the construction and operation and maintenance ports are not known at this time, once selected the Applicant will engage with local communities and relevant stakeholders to identify and address potential challenges and work to increase benefits to the local community area.

18.11. ASSESSMENT OF SIGNIFICANCE

75. Table 18.12 summarises the potential impacts arising from the construction, operation and maintenance and decommissioning phases of the Array, as well as the maximum design scenario against which each impact has been assessed. An assessment of the likely significance of the effects of the Array on the socio-economic receptors caused by each identified impact is given below.

EMPLOYMENT AND GROSS VALUE ADDED (GVA) IMPACTS ASSOCIATED WITH THE CONSTRUCTION, OPERATION AND MAINTENANCE AND DECOMMISSIONING OF THE ARRAY

76. This section considers the employment and GVA impacts associated with the construction, operation and maintenance and decommissioning of the Array, and is divided into the following subsections:

- economic impact in Scotland and the UK;
- economic impact at construction port;
- economic impact at operation and maintenance port; and
- contribution to the UK energy sector.

Economic impact in Scotland and the UK

77. More detail on the expenditure and economic impact assumptions and methodology is available in volume 3, appendix 18.1.

Construction phase

Magnitude of impact

78. The first step in assessing the economic impact of the Array was to estimate the total expenditure broken down by category and considering the share secured in each socio-economic study area. This was based on BIGGAR Economics analysis of the SCDS, developments related to the Array and modelling of the typical costs associated with a floating offshore wind (BVG Associates, 2024). As this is the most adverse scenario, this has been based on the Option (PDE Option 4) with the lowest economic impacts (more detail is presented in volume 3, appendix 18.1).

79. For the Array it was estimated that the total spend would be £ [redacted] of which £ [redacted] (43%) would be secured in Scotland and £ [redacted] (52%) would be secured in the UK (Table 18.19).

Table 18.19: Scotland, UK and Total Array Construction Spending by Category

Category	Scotland	UK	Total
Wind Turbine	[redacted]	[redacted]	[redacted]
Floating Foundation Manufacturing	[redacted]	[redacted]	[redacted]
Offshore Cable Installation	[redacted]	[redacted]	[redacted]
Cables Supply	-	[redacted]	[redacted]
OSP	[redacted]	[redacted]	[redacted]
Development and Consenting Services	[redacted]	[redacted]	[redacted]
Floating Mooring Systems	[redacted]	[redacted]	[redacted]
Floating Foundations Installation	[redacted]	[redacted]	[redacted]
Operation and Maintenance Base	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]
Total (%)	43%	52%	

80. To estimate the economic impact associated with expenditure in each category, each contract was divided into smaller categories, which were then assigned to one or more sectors of the economy. Turnover per employee and turnover/GVA ratios for the relevant sectors (ONS, 2023e) were then applied to the expenditure in order to estimate the direct impact.

81. On this basis, it was estimated that the direct economic impact could be £1.3 billion GVA and 19,960 years of employment in Scotland, and £1.6 million GVA and 24,040 years of employment in the UK. The largest opportunities relate to the manufacture of floating wind turbine installations, which account for over half of the economic impact in Scotland (Table 18.20).

82. Based on the economic modelling undertaken, the direct employment supported by the Array in Scotland is expected to attract average wages of £36,800, which is 4% higher than the Scottish median annual wage of £35,500 (ONS, 2023g). A significant proportion of these are associated with the manufacture of floating foundations, which are expected to attract wages of around £37,200. Manufacturing is a sector that is also characterised by high levels of full-time work.

Table 18.20: Array Construction Direct Economic Impact, Scotland and the UK

Category	Scotland		UK	
	GVA	Years of Employment	GVA	Years of Employment
Wind Turbine	£288 m	4,360	£457 m	6,870
Floating Foundation Manufacturing	£736 m	10,610	£736 m	10,610
Offshore Cable Installation	£12 m	150	£17 m	200
Cables Supply	-	-	£27 m	360
OSP	£74 m	1,290	£86 m	1,450
Development and Consenting Services	£116 m	1,820	£149 m	2,320
Floating Mooring Systems	£32 m	490	£65 m	970
Floating Foundations Installation	£78 m	1,220	£78 m	1,220
Operation and Maintenance Base	£2 m	30	£2 m	30
Total	£1,340 m	19,960	£1,617 m	24,040

- 83. As well as the direct economic impact associated with the expenditure, spending in the supply chain (indirect) and spending by staff (induced) will also support wider economic impacts. These were estimated using GVA and employment multipliers (Scottish Government, 2022b) (ONS, 2023f) that capture linkages between sectors of the economy.
- 84. Applying GVA and employment multipliers it was estimated that the Array's total economic impact could be £2.3 billion GVA and 33,500 years of employment in Scotland (peaking at 6,340 jobs), and £4.2 billion GVA and 60,310 years of employment in the UK (peaking at 11,210 jobs). This is shown in Table 18.21 and Table 18.22.

Table 18.21: Array Construction Total GVA impact, Scotland and the UK

Category	Scotland	UK
Direct GVA	£1,340 m	£1,617 m
Indirect GVA	£506 m	£1,295 m
Induced GVA	£418 m	£1,293 m
Total GVA	£2,264 m	£4,205 m
Peak GVA	£428 m	£780 m

Table 18.22: Array Construction Total Employment impact, Scotland and the UK

Category	Scotland	UK
Direct Years of Employment	19,960	24,040
Indirect Years of Employment	8,080	17,800
Induced Years of Employment	5,460	18,470
Total Years of Employment	33,500	60,310
Peak Employment	6,340	11,210

- 85. Given that the level of in employment in Scotland's construction sector is equal to 158,000 jobs (Table 18.8), the peak employment would account for 4.0% of total construction sector employment. On this basis, the magnitude of impacts in Scotland has been assessed as high.
- 86. In the UK the level of employment supported in the construction sector is equal to 1.6 million jobs (Table 18.8). Therefore, peak employment is expected to account for 0.7% of total construction sector employment. On this basis, the magnitude of impacts in the UK has been assessed as medium.

Sensitivity of receptor

- 87. The sensitivity of an economy is based on its responsiveness to change, its relative diversity (more diverse economies are less sensitive) and growth trajectory (for example is the number of jobs increasing or decreasing). The criteria are set out in Table 18.16.
- 88. Given the size and diversity of the Scottish economy, which employs 2.6 million people, it has been assessed as low sensitivity, since the number of jobs in the economy means that it is tolerant of changes without fundamentally altering its present character.
- 89. Similarly, the UK economy, which employs 32.2 million people, has also been assessed as negligible sensitivity, since the number of jobs is substantially greater than in the Scottish economy and so it is even more tolerant of changes.

Significance of the effect

- 90. Overall, the magnitude of the impact in Scotland is deemed to be high and the sensitivity of the economy is considered to be low. Given that the share of employment substantially exceeds the threshold for assessing high impact (greater than 1%) the effect has been assessed as **moderate** beneficial significance, which is significant in EIA terms.
- 91. Overall, the magnitude of the impact in the UK is deemed to be medium and the sensitivity of the economy is considered to be negligible. Given the magnitude is in the middle of the range for assessing magnitude (0.5-1.0%) the effect has been assessed as **minor** beneficial significance, which is not significant in EIA terms.

Secondary mitigation and residual effect

- 92. The Applicant has committed to enhancement of beneficial effects as per section 18.10. No secondary mitigation is required.

Operation and maintenance phase

Magnitude of impact

- 93. For the Array it was estimated that the annual spend could be £ [redacted] of which £ [redacted] (29%) could be secured in Scotland and £ [redacted] (89%) could be secured in the UK (Table 18.23).

Table 18.23: Scotland, UK and Total Array Operation and Maintenance Spending by Category

Category	Scotland	UK	Total
Operational Training	[redacted]	[redacted]	[redacted]
Operational Onshore Logistics	[redacted]	[redacted]	[redacted]
Operational Offshore Logistics	[redacted]	[redacted]	[redacted]
Health and Safety Inspections	[redacted]	[redacted]	[redacted]
Seabed Lease	[redacted]	[redacted]	[redacted]
Transmission Network Use of System (TNUoS) Charges	-	[redacted]	[redacted]
Operational Insurance	-	[redacted]	[redacted]
Operations Centre and Support Staff	[redacted]	[redacted]	[redacted]
Wind Turbine Maintenance and Service	[redacted]	[redacted]	[redacted]
Balance of Plant Maintenance and Service	[redacted]	[redacted]	[redacted]
Maintenance Vessels	[redacted]	[redacted]	[redacted]
Maintenance Port	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]
Total (%)	29%	91%	100%

- 94. Applying turnover per employee and turnover/GVA ratios for the relevant sectors it was estimated that the Array's direct annual economic impact could be £26 million GVA and 310 years of employment in Scotland, and £58 million GVA and 530 years of employment in the UK (Table 18.24).

Table 18.24: Array Operation and Maintenance Direct Economic Impact, Scotland and the UK

Category	Scotland		UK	
	GVA	Years of Employment	GVA	Years of Employment
Operational Training	£2 m	40	£2 m	40
Operational Onshore Logistics	£1 m	10	£1 m	10
Operational Offshore Logistics	£2 m	20	£3 m	30
Health and Safety Inspections	<£1 m	<10	<£1 m	<10
Seabed Lease	£10 m	100	£10 m	100
TNUoS Charges	-	-	£22 m	110
Operational Insurance	-	-	£4 m	10
Operations Centre and Support Staff	£3 m	30	£3 m	40
Wind Turbine Maintenance and Service	£3 m	40	£5 m	60
Balance of Plant Maintenance and Service	£4 m	60	£6 m	100
Maintenance Vessels	£1 m	10	£1 m	20
Maintenance Port	<£1 m	<10	<£1 m	<10
Total	£26 m	310	£58 m	530

95. Applying GVA and employment multipliers it was therefore estimated that the Array's annual economic impact could be £43 million GVA and 490 jobs in Scotland, and £179 million GVA and 1,480 jobs in the UK. This is shown in Table 18.25 and Table 18.26.

Table 18.25: Array Operation and Maintenance Total GVA impact, Scotland and the UK

Category	Scotland	UK
Direct GVA	£26 m	£58 m
Indirect GVA	£10 m	£80 m
Induced GVA	£7 m	£41 m
Total GVA	£43 m	£179 m

Table 18.26: Array Operation and Maintenance Total Employment impact, Scotland and the UK

Category	Scotland	UK
Direct Jobs	310	530
Indirect Jobs	130	750
Induced Jobs	50	210
Total Jobs	490	1,480

96. The annual operation and maintenance impact is expected to account for 0.3% of the Scottish construction sector's total employment and has the magnitude of impacts has therefore been assessed as low.

97. Similarly, the impact on the UK economy is expected to account for less than 0.1% of the construction sector's total employment and therefore the magnitude of impacts on the UK economy has been assessed as negligible.

Sensitivity of the receptor

98. As for the construction phase, the sensitivity of the Scottish economy, which employs 2.6 million people, has been assessed as low, and the sensitivity of the UK economy, which employs 32.2 million people, has been assessed as negligible.

Significance of the effect

99. Overall, the magnitude of the impact in Scotland is deemed to be low and the sensitivity of the economy is considered to be low. Given the impact is at the lower end of the scale for assessing magnitude (0.25% to 0.5%) the effect has been assessed as **negligible** beneficial significance, which is not significant in EIA terms.

100. Overall, the magnitude of the impact in the UK is deemed to be negligible and the sensitivity of the economy is considered to be negligible. The effect will, therefore, be of **negligible** beneficial significance, which is not significant in EIA terms.

Decommissioning phase

Magnitude of impact

101. Decommissioning would be expected to take place after the operation and maintenance lifespan, and so there is considerable uncertainty about the level of expenditure and the share that could be secured in Scotland and the UK.

102. The potential expenditure associated with decommissioning and the share that could be secured in Scotland and the UK was not part of the SCDS process. It was assumed that there would be an expenditure of around [REDACTED] per MW associated with decommissioning, based on the BVG Associates Guide to Floating Wind Farm (BVG Associates, 2024). This suggests that total spending associated with Ossian would be [REDACTED]. An adjustment was then made to account for the share of spend on the Array only. On this basis, the cost of decommissioning the Array would be [REDACTED].

103. Analysis by BVG Associates (BVG Associates, 2021) indicates that the lowest share of decommissioning expenditure that could be secured in Scotland and the UK would be 30%, though there is substantial scope to increase this share as the sector develops.

104. Therefore, it was estimated that the total decommissioning spend could be [REDACTED] of which [REDACTED] could be secured in Scotland and in the UK (Table 18.27).

Table 18.27: Scotland, UK and Total Array Decommissioning Spending by Category

Category	Scotland	UK	Total
Floating substructure – wind turbine decommissioning	[REDACTED]	[REDACTED]	[REDACTED]
Mooring and anchoring decommissioning	[REDACTED]	[REDACTED]	[REDACTED]
Total Impact	[REDACTED]	[REDACTED]	[REDACTED]
Total (%)	30%	30%	-

105. Applying turnover per employee and turnover/GVA ratios for the relevant sectors it was estimated that the Array's direct economic impact could be £16 million GVA and 190 years of employment in Scotland and the UK (Table 18.28).

Table 18.28: Array Decommissioning Direct Economic Impact, Scotland and the UK

Category	Scotland		UK	
	GVA	Years of Employment	GVA	Years of Employment
Floating substructure – wind turbine decommissioning	£2 m	30	£2 m	30
Mooring and anchoring decommissioning	£14 m	160	£14 m	160
Total	£16 m	190	£16 m	190

106. Applying GVA and employment multipliers it was therefore estimated that the economic impact of decommissioning the Array could be £30 million GVA and 330 years of employment in Scotland, and £40 million GVA and 510 years of employment in the UK (Table 18.29; Table 18.30).

Table 18.29: Array Decommissioning Total GVA impact, Scotland and the UK

Category	Scotland	UK
Direct GVA	£16 m	£16 m
Indirect GVA	£7 m	£14 m
Induced GVA	£5 m	£12 m
Total GVA	£30 m	£40 m

Table 18.30: Array Decommissioning Total Employment impact, Scotland and the UK

Category	Scotland	UK
Direct Years of Employment	190	190
Indirect Years of Employment	90	180
Induced Years of Employment	60	140
Total Years of Employment	330	510

107. This is therefore expected that decommissioning will account for around less than 0.2% of employment in the Scottish construction sector and therefore the magnitude of impact has been assessed as negligible.

108. Decommissioning is expected to account for less than 0.1% of UK construction sector employment and therefore the impact on the UK economy has been assessed as negligible.

Sensitivity of receptor

109. As for the construction phase, the sensitivity of the Scottish economy, which employs 2.6 million people, has been assessed as low, and the sensitivity of the UK economy, which employs 32.2 million people, has been assessed as negligible.

Significance of the effect

110. Overall, the magnitude of the impact in Scotland is deemed to be negligible and the sensitivity of the economy is considered to be low. Given the size of the Scottish economy, the effect has been assessed as **negligible** beneficial significance, which is not significant in EIA terms.

111. Overall, the magnitude of the impact in the UK is deemed to be negligible and the sensitivity of the economy is considered to be negligible. The effect will, therefore, be of **negligible** beneficial significance, which is not significant in EIA terms.

Economic impact at construction port(s)

112. The economic impact at the construction port has been assessed based on expenditure in the relevant categories (e.g. marshalling harbour) and the share that could be secured at the construction port. Sectoral assumptions have then been used to assess the employment impact supported. More detail on the expenditure and economic impact assumptions and methodology is available in volume 3, appendix 18.1.

Construction phase

Magnitude of impact

113. Some of the economic impacts associated with the construction of the Array are expected to be geographically concentrated around the main construction port.

114. It was estimated that the construction port could secure contracts worth ██████████, with the largest contract relating to the marshalling harbour activities ██████████. This is approximately 2% of the total spend associated with the Array.

115. It is estimated that this could support 1,110 years of employment at the construction port(s) and a peak direct employment of 240 jobs for four years (compared to peak employment in Scotland of 6,340) (Table 18.31).

Table 18.31: Array Construction Port Economic Impact

Category	Total Investment	Port Spend	Years of Employment	Peak Employment
Wind Turbine Assembly	██████	██████	70	10
Marshalling Harbour	██████	██████	930	210
Offshore Logistics	██████	██████	60	10
Anchor Installation	██████	██████	50	10
Total	██████	██████	1,110	240

116. Considering that the construction port local study area with the smallest construction workforce employs 7,500 people and the largest employs 34,450 (Table 18.8), peak employment of 240 would represent between 3.2% and 0.7% of total construction employment in the local study areas. On this basis, the magnitude of economic impact in the local study area for construction port(s) has been assessed as medium to high (depending on the port(s) selected).

Sensitivity of receptor

117. The sensitivity of the construction port local study areas, which employ between 100,000 to 758,700 people, has been assessed as low to medium (depending on the port(s) selected).

Significance of the effect

- 118. The most adverse scenario for economic impact at construction port(s) (the lowest economic benefits) would be where the magnitude of the impact in the local study areas is be deemed to be medium and the sensitivity of the local economy is considered to be low, giving an effect assessed as **minor** beneficial significance, which is not significant in EIA terms. This would be the case if the construction port(s) selected were Rosyth, where the economic impacts could easily be absorbed given the large workforce available within the associated local study area.
- 119. The most beneficial scenario for economic impact at construction port(s) (the highest economic benefits) would be where the magnitude of the impact in the local study areas is be deemed to be high and the sensitivity of the local economy is considered to be medium, giving an effect assessed as **moderate to major** beneficial significance, which is significant in EIA terms. This would be the case if the construction port(s) selected were either Peterhead or one Highland ports, where the economic impacts would represent a substantial change to the economy of the local study area.

Secondary mitigation and residual effect

- 120. The Applicant has committed to enhancement of beneficial effects as per section 18.10. No secondary mitigation is required.

Economic impact at operation and maintenance port(s)

- 121. The economic impact at the operation and maintenance port has been assessed based on expenditure in the relevant categories (e.g. marshalling harbour) and the share that could be secured at the operation and maintenance port. Sectoral assumptions have then been used to assess the employment impact supported. More detail on the expenditure and economic impact assumptions and methodology is available in volume 3, appendix 18.1.

Operation and maintenance phase

Magnitude of impact

- 122. Some of the economic impacts associated with the operation and maintenance of the Array are expected to be geographically concentrated around the operation and maintenance port.
- 123. It was estimated that this port could secure contracts worth [REDACTED] with the largest contract relating to the operations centre and support staff [REDACTED]. This is equivalent to around 10% of total operational spend. It was estimated that could support employment of 70 jobs at the operation and maintenance port (compared to 490 jobs in Scotland) (Table 18.32).
- 124. Considering that the operation and maintenance port local study area with the smallest construction sector workforce employs 2,375 people and the largest employs 34,450 (Table 18.8), 70 jobs would represent between 2.9% and 0.2% of total construction employment in the local study areas. On this basis, the magnitude of economic impact in the local study area for operation and maintenance port(s) has been assessed as negligible to high (depending on the port(s) selected).

Table 18.32: Array Operation and Maintenance Port Economic impact

Category	Total Investment	Port Spend	Employment
Operational Offshore Logistics	[REDACTED]	[REDACTED]	20
Operations Centre and Support Staff	[REDACTED]	[REDACTED]	30
Wind Turbine Maintenance and Service	[REDACTED]	[REDACTED]	10
Balance of Plant Maintenance and Service	[REDACTED]	[REDACTED]	10
Maintenance Port	[REDACTED]	[REDACTED]	<10
Total	[REDACTED]	[REDACTED]	70

Sensitivity of receptor

- 125. The sensitivity of the operation and maintenance port local study areas, which employ between 37,500 to 758,700 people, has been assessed as negligible (whichever port(s) are selected).

Significance of the effect

- 126. The most adverse scenario for economic impact at operation and maintenance port(s) (the lowest economic benefits) would be where the magnitude of the impact in the local study areas is be deemed to be negligible and the sensitivity of the local economy is considered to be negligible, giving an effect assessed as **negligible** beneficial significance, which is not significant in EIA terms.
- 127. The most beneficial scenario for economic impact at operation and maintenance port(s) (the highest economic benefits) would be where the magnitude of the impact in the local study areas is be deemed to be high and the sensitivity of the local economy is considered to be negligible, giving an effect assessed as **minor** beneficial significance, which is not significant in EIA terms.

Contribution to UK Energy Sector

Operation and maintenance phase

Magnitude of impact

- 128. The primary contribution that the Array is expected to make is providing additional energy capacity in the UK, supplying renewable electricity to energy consumers as the economy transitions to a net zero economy.
- 129. It is anticipated that the Array will have a capacity of up to 3.6 GW, with a load factor of 50%. On this basis, it would be expected to generate 15.8 TWh of electricity annually.
- 130. Given that the UK's annual electricity consumption in 2022 was 320.7 TWh (ONS, 2023h), this represents 4.9% of annual electricity consumption. The magnitude of impact has been assessed as high based on the criteria set out in Table 18.14.

Sensitivity of receptor

- 131. The UK electricity sector is very large, with diverse sources of energy production including onshore and offshore wind, solar, nuclear, fossil fuels, interconnectors and hydropower. However, it is currently undergoing substantial change in order to transition to a net zero economy by 2050 and decarbonise the electricity sector by 2035.

132. A rapidly changing sector, like the UK's energy sector which requires new sources of electricity and grid infrastructure, is more sensitive to change. Therefore, the sensitivity of the UK electricity sector has been assessed as medium.

Significance of the effect

133. Overall, the magnitude of the impact is deemed to be high and the sensitivity of the receptor is considered to be medium. Given the size of the overall contribution to the UK's energy sector the effect has therefore, been assessed as **major** beneficial significance, which is significant in EIA terms.

Secondary mitigation and residual effect

134. The Applicant has committed to enhancement of beneficial effects as per section 18.10. No secondary mitigation is required.

DEMOGRAPHIC CHANGES AND DEMAND FOR HOUSING AND OTHER SERVICES

135. This section considers potential demographic changes and demand for housing and other services associated with the construction, operation and maintenance and decommissioning phases of the Array, and is divided into the following subsections:

- population;
- housing demand and availability;
- other local services; and
- socio-cultural.

Population

136. The Array has the potential to affect the labour market of the area around epicentres of impact, such as the construction and operation and maintenance port(s), with wider effects on the local population, which may in turn affect local services and socio-cultural dynamics.

137. Population growth, including short-term workers, depends on the number of employees needed, and the length of contracts. It will also depend on the local economy's capacity to provide additional services, as more local workers with expertise will reduce reliance on transient workers and short-term changes in population. There are distinct differences between ports in urban and rural areas (as highlighted in Table 18.9 and Table 18.10), and as a result the impact on demographic structures will depend on the port(s) selected.

138. During the construction phase a peak workforce of 240 people (Table 18.31) will be required to fulfil contracts at the construction port(s). Industry data suggests that these are expected to be primarily men aged 30 to 44, though the industry is making efforts to diversify this demographic and increase female representation to 33% by 2030 (Offshore Wind Industry Council, 2023). This may attract individuals and families, affecting the demographic composition near the port(s). During the operation and maintenance phase, a workforce of 70 is expected at the operation and maintenance port(s) (Table 18.32).

139. In Scotland's rural areas, it would be expected that the opportunity for high-level local jobs could encourage individuals that had left the area for economic opportunities elsewhere to return. This could increase the number of working-age residents in rural areas and benefit long-term demographics.

140. The factors that determine the demographic impact are outlined in Figure 18.1.

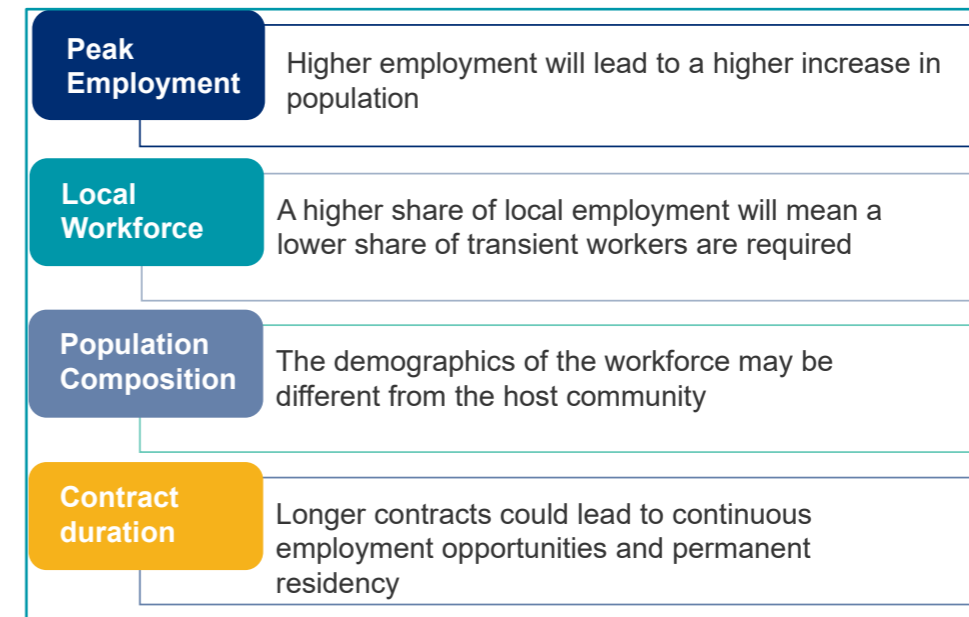


Figure 18.1: Factors Affecting Magnitude of Change to Community Populations

141. The sensitivity of the area around the port(s) will depend on the size of the existing population and its demographics. A larger population (e.g. a port located close to a large population) as well as a population that has a larger share of people who are working age will be less sensitive to population change.

142. Figure 18.2 provides details on the factors that influence how a community might respond to changes in demographics and other population impacts.

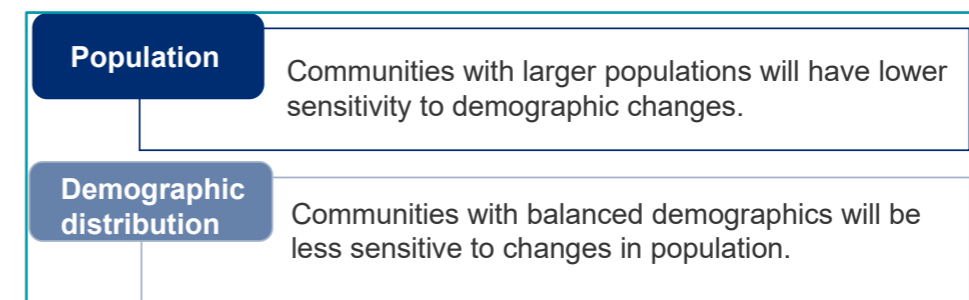


Figure 18.2: Factors Affecting Sensitivity of Community Populations

Housing demand and availability

143. The main driver of accommodation demand is expected to be the increased population required to meet the requirements of the construction port. During the peak of construction, the Array is expected to require 240 employees at the construction port, increasing demand for short-term accommodation, such as hotels, bed and breakfasts, and caravan parks.

144. The heightened demand for temporary housing is expected to benefit local accommodation providers. Increased trade and occupancy rates can provide a vital lifeline for these businesses, helping them remain operational year-round and offering sustained employment opportunities in rural areas.

145. However, if the local accommodation sector is nearing or at total capacity and cannot expand rapidly to accommodate the influx, this could adversely impact tourism. Visitors may face difficulties securing accommodation, particularly during peak seasons, potentially leading to a downturn in tourism-related activities.

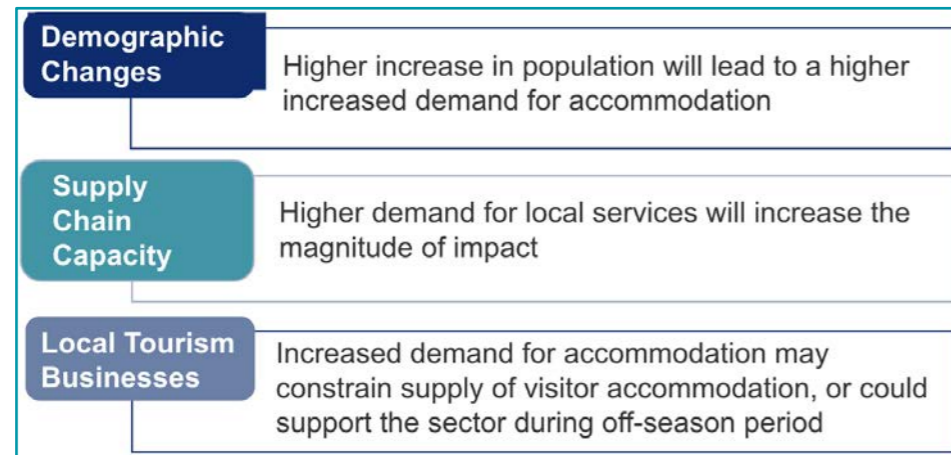


Figure 18.3: Factors Affecting Magnitude of Change to Housing Demand and Availability

146. The Applicant has the opportunity to alleviate potential effects on the accommodation sector by collaborating with partners to establish solutions for accommodation.
147. The impact of housing on communities depends on how well the housing supply can adjust to changes in demand over short and long periods of time. The sensitivity of local areas to these impacts is influenced by factors such as the size of the nearby population, the availability of accommodation options like hotels and adaptable living spaces, the ability of the housing sector to meet increased demand and affordability of accommodation.
148. Research undertaken for the Scottish Government suggests that coastal communities face a number of housing constraints, particularly in terms of high-quality options (Scottish Government and Diffley Partnership, 2022).
149. The importance of overnight tourism, where visitors use temporary accommodation, also affects how vulnerable an area is to these changes.

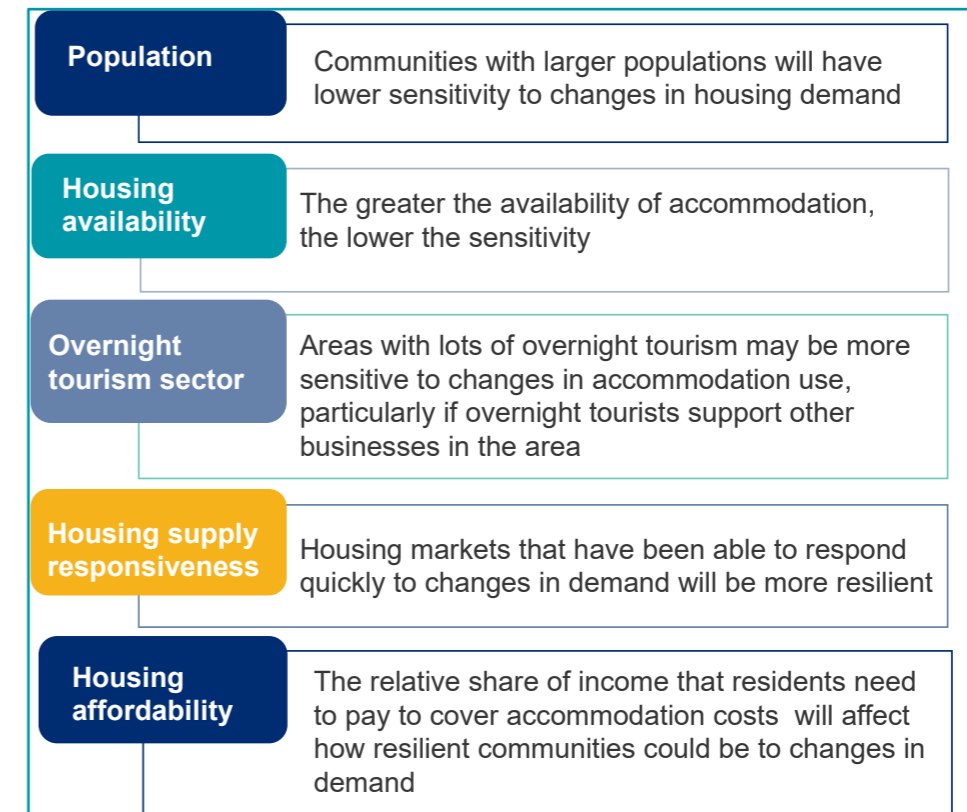


Figure 18.4: Factors Affecting Sensitivity of Community Populations

Other local services

150. The anticipated population increase around the construction port(s) is likely to increase demand for healthcare, educational, and private services. These include:
- educational services;
 - healthcare services;
 - social support;
 - police and fire services;
 - other local authority services; and
 - recreation and transport.
151. The main influences on demand for healthcare services are expected to be a temporary population increase and the health of that population. Specifically, individuals involved in port activities are generally working-age adults in good health, which means they will likely have limited demand for public health services such as General Practitioners (GPs), hospitals, and social care. In contrast, the general population has a higher proportion of older individuals who are more likely to need healthcare services.
152. The demand for schools and educational services depends on the number of children in the under-18 population, especially if transient workers bring their children. This is more likely if employment opportunities are seen as long term, while short term employment opportunities are unlikely to result in a large increase in educational demand is not expected.
153. A larger population is likely to be a rise in demand for personal services such as cafes, restaurants, and supermarkets. This is expected to boost the commercial vitality of towns and villages, leading to benefits

for local businesses and the economy. It may also contribute to increased use of public transport and more traffic on local road networks.

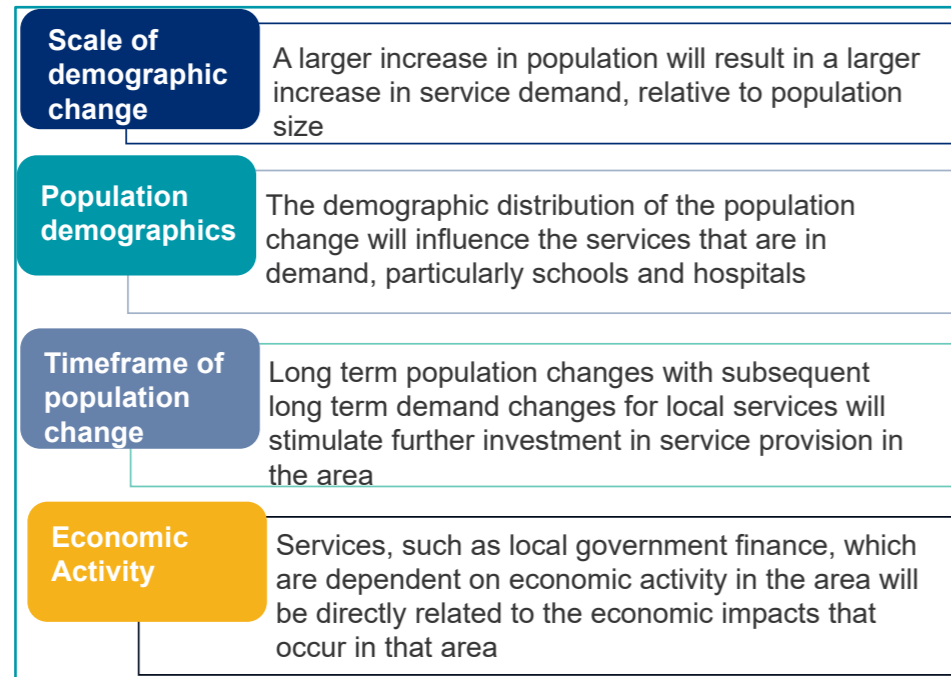


Figure 18.5: Factors Affecting Magnitude of Change to Local Services

154. The sensitivity of the above services will primarily be determined by the level of capacity within each of these services, and how quickly they are able to respond to changing demand (e.g. hire more staff).

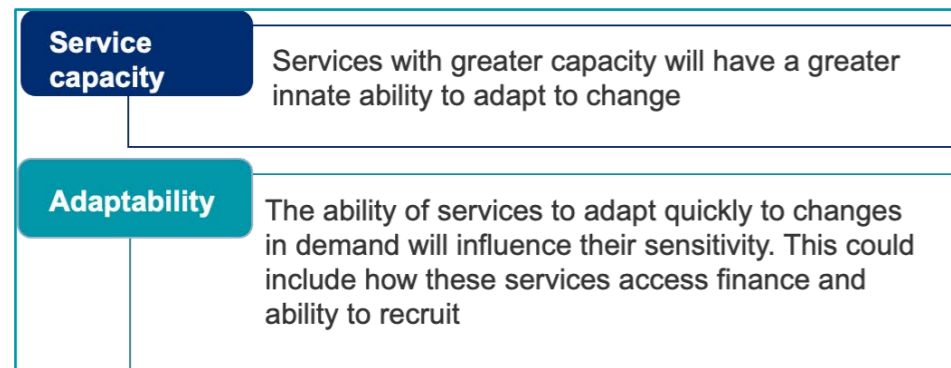


Figure 18.6: Factors Affecting Sensitivity of Local Services

Socio-cultural

155. The increased activity around the construction port(s) and operation and maintenance port(s), and related impacts such as an increased population, may have effects on how local communities perceive their area.

To investigate this further, a survey conducted by the Scottish Government considered socio-economic and cultural impacts (Scottish Government and Diffley Partnership, 2022).

156. This survey found that the majority of residents (63%) observed no change in their quality of life, while a notable 25% reported improvements, which is significantly higher than the 4% who felt the impacts were adverse (Figure 18.7).

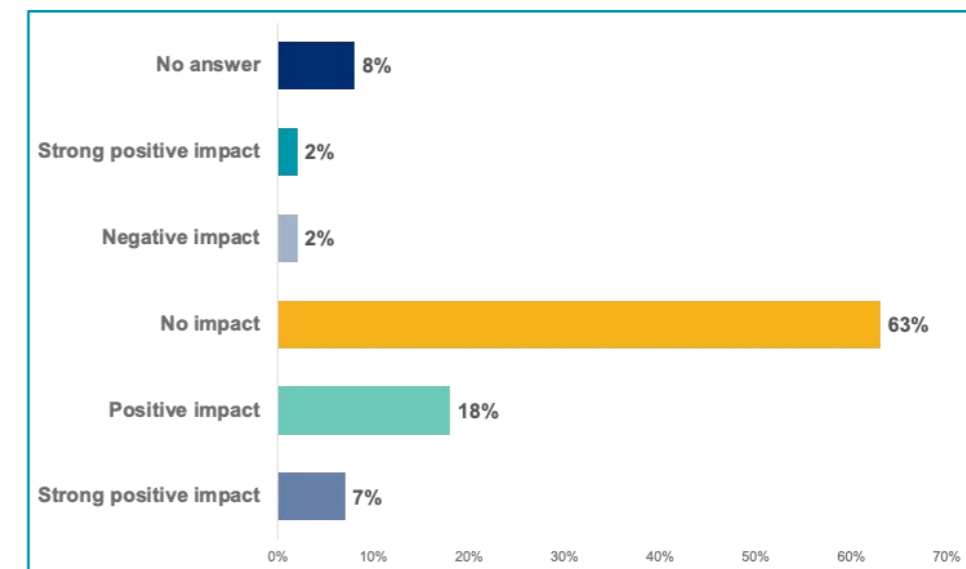


Figure 18.7: Community Perceptions of Offshore Wind Impacts on Quality of Life (Scottish Government and Diffley Partnership, 2022)

157. In terms of community relations, 59% reported no impact, whereas 16% experienced beneficial impacts, compared to 7% who experienced adverse impacts. Furthermore, perceptions of the community character remained largely unaffected for most, with a beneficial impact noted by 21% of respondents, against 9% who perceived an adverse impact (Scottish Government and Diffley Partnership, 2022).

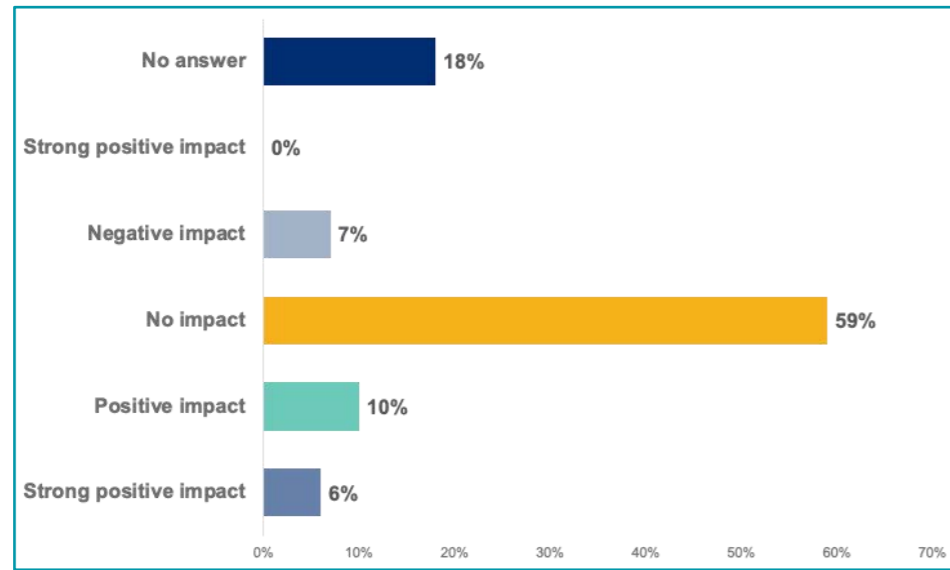


Figure 18.8: Community Perceptions of Offshore Wind Impacts on Community Relations (Scottish Government and Diffley Partnership, 2022)

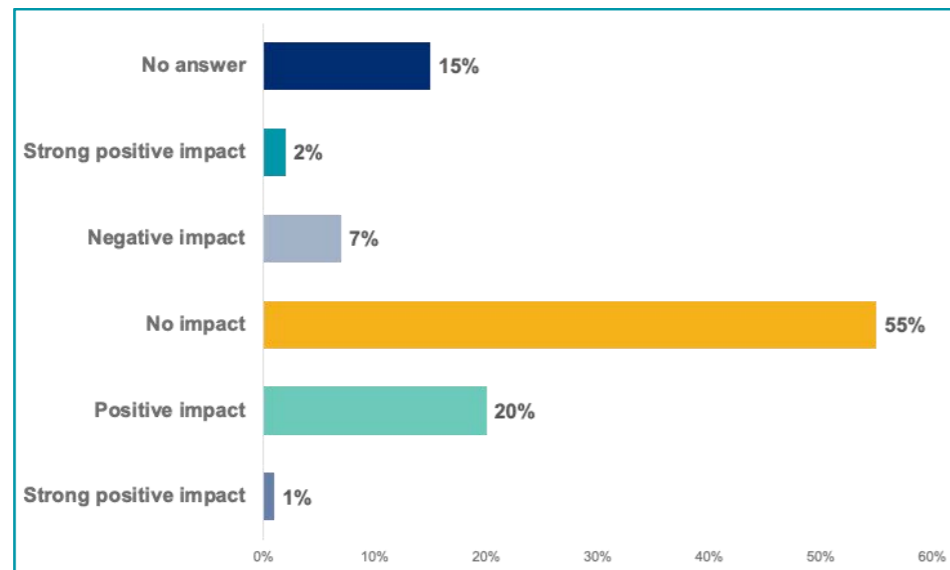


Figure 18.9: Community Perceptions of Offshore Wind Impacts on Community Character (Scottish Government and Diffley Partnership, 2022)

158. The temporary population increase associated with the construction phase has the potential to affect communities. The evidence suggests that adverse effects are likely to be limited (Scottish Government and Diffley Partnership, 2022).

Population change and social impacts

159. Population change is considered the primary driver of social impacts (including demographics, housing demand and availability, local services, and socio-cultural factors). Therefore, the magnitude of these social impacts will be linked to the expected increase in population.

- 160. The extent to which the economic impacts lead to noticeable population changes will be related to the proportion of employment taken up by those already resident in the local study areas and the proportion taken up by those moving to the local study areas.
- 161. The greatest change would be in the circumstances where all of the employment was taken by new residents and where a substantial proportion of these residents also moved with family members.

Social impacts at construction port(s)

- 162. During the construction phase a peak workforce of 240 people (Table 18.31) will be required to fulfil contracts at the construction port(s). Based on an assumption of a change in population of two for every job, to allow for some employees moving with family members, that would imply a temporary increase in population of up to 480 during peak construction.
- 163. The method adopted for assessing the magnitude of social impacts included that an effect would be considered to have a negligible magnitude if there was a population change less than 0.25% of the current population in a study area (Table 18.15). On this basis, it is possible to estimate the threshold below which a given population change would be considered to be negligible.
- 164. A population change of 480 (the estimated maximum temporary population change during peak construction) would be considered to be negligible in a local study area where the existing population was less than 192,000 (since 480 is 0.25% of 192,000).
- 165. Whilst the construction port(s) is not known, a long list of potential construction ports have been identified and local study areas defined. Of the potential construction ports, the local study areas of those located in Highland have the lowest populations, at 238,100 (Table 18.9). On that basis, the magnitude of change would be assessed as negligible, whichever construction port(s) were selected.
- 166. Given the methodology for assessing significance (summarised in the matrix shown in Table 18.17), if the magnitude of change is assessed as negligible, then depending on the sensitivity of the local study area to change, the social impacts at construction port(s) would be assessed as **negligible to low** significance, which is not significant in EIA terms.

Social impacts at operation and maintenance port(s)

- 167. During operation and maintenance, a workforce of 70 is expected at the operation and maintenance port(s) (Table 18.32). Based on an assumption of a change in population of two for every job, to allow for some employees moving with family members, that would imply an increase in population of up to 140 during operation and maintenance.
- 168. Using the same approach as for construction ports, a population change of 140 (the estimated maximum population change during operation and maintenance) would be considered to be negligible in a local study area where the existing population was less than 56,000 (since 140 is 0.25% of 56,000).
- 169. A long list of potential operation and maintenance ports have been identified and local study areas defined. Of the potential operation and maintenance ports, the local study area associated with Buckie has the lowest population, at 96,400 (Table 18.10). On that basis, the magnitude of change would be assessed as negligible, whichever operation and maintenance port(s) were selected.
- 170. Given the methodology for assessing significance (summarised in the matrix shown in Table 18.17), if the magnitude of change is assessed as negligible, then depending on the sensitivity of the local study area to change, the social impacts at operation and maintenance port(s) would be assessed as **negligible to low** adverse significance, which is not significant in EIA terms.

Social impacts at decommissioning phase

- 171. As with the construction phase, economic impacts during the decommissioning phase are expected to be short-term in duration. While ports used in decommissioning are not known at this time, given the much

smaller economic impacts associated with decommissioning it is unlikely that there will be substantial changes to population and so no significant social impacts are expected during the decommissioning phase.

CHANGES TO VISITOR BEHAVIOUR

172. When assessing the impact of the proposed development on visitor behaviour, two key aspects must be considered. The first is the potential for visual impacts from tourism assets. During Scoping, seascape, landscape and visual effects were scoped out of the Array EIA (MD-LOT, 2023), since no LSE¹ were expected. This would apply to tourism assets located onshore.
173. The second is the possibility that increased construction and operational activity in ports could disrupt tourism activities in the immediate vicinity of ports (for example, cruise tourism). Where cruise and other tourism activity is important to ports, it is anticipated that port authorities will actively manage these activities to minimise friction.
174. On this basis, significant socio-economic effects on visitor behaviour are not anticipated.

CHANGES TO COMMERCIAL FISHERIES

175. The commercial fisheries chapter (volume 2, chapter 12) has considered the potential effects on commercial fishing across the construction, operation and maintenance and decommissioning phases. Such effects could have socio-economic consequences if the Array reduces the value of fish caught by commercial fisheries, with potential downstream impacts, for example on fish processors.
176. The commercial fisheries chapter considered effects such as temporary and long term loss of access to fishing grounds, displacement or disruption of fish and shellfish resources, increased steaming time, interference with fishing vessels and gear snagging. This was assessed for a range of fishing receptors, including pelagic, demersal seine and demersal otter trawlers (including haddock, demersal species and *Nephrops*, a type of lobster), scallop dredging and potting vessels targeting brown crab and lobster.
177. No significant effects were identified during the construction, operation and maintenance, and decommissioning phases.
178. As a result, no socio-economic consequences arise that required assessment.

CHANGES TO SHIPPING AND MARINE RECREATION

179. The shipping and navigation chapter (volume 2, chapter 13) has considered the potential effects on shipping and navigation across the construction, operation and maintenance and decommissioning phases. The Array could increase transit times, resulting in increased costs for the industry, which could have wider socio-economic consequences if increased costs were passed on to consumers in Scotland or exporters.
180. The shipping and navigation chapter considered a number of potential impacts such as increased risk of collision, displacement from adverse weather routeing, reduced access to local ports and harbours, loss of station, reduction of underkeel clearance, anchor interaction with subsea cables or mooring lines and reduction in search and rescue capability.
181. No significant effects were identified, including from vessel displacement, with the busiest routes (which have up to six vessels per week) experiencing less than 0.1 nm of displacement as a result of the Array. As a result, no socio-economic consequences arise that required assessment.

18.12. CUMULATIVE EFFECTS ASSESSMENT

182. The CEA assesses the impact associated with the Array together with other relevant plans, projects and activities. Cumulative effects are defined as the combined effect of the Array in combination with the effects

from a number of different projects, on the same receptor or resource. Further details on CEA methodology are provided in volume 1, chapter 6.

183. The projects and plans selected as relevant to the CEA presented within this chapter are based upon the results of a screening exercise (see volume 3, appendix 6). Volume 3, appendix 6.4 further provides information regarding how information pertaining to other plans and projects is gained and applied to the assessment. Each project or plan has been considered on a case-by-case basis for screening in or out of this chapter's assessment based upon data confidence, impact-receptor pathways and the spatial/temporal scales involved.
184. In undertaking the CEA for the Array, it should be noted that other projects and plans under consideration will have differing potential for proceeding to an operational stage and hence a differing potential to ultimately contribute to a cumulative impact alongside the Array. Therefore, a tiered approach has been adopted which provides a framework for placing relative weight upon the potential for each project/plan to be included in the CEA to ultimately be realised, based upon the project/plan's current stage of maturity and certainty in the projects' parameters. The tiered approach which will be utilised within the Array CEA employs the following tiers:
- tier 1 assessment - Array with Proposed offshore export cable corridor(s) and Proposed onshore transmission infrastructure and all plans/projects which became operational since baseline characterisation, those under construction, and those with consent and submitted but not yet determined;
 - tier 2 assessment - All plans/projects assessed under Tier 1, plus those projects with a Scoping Report; and
 - tier 3 assessment - All plans/projects assessed under Tier 2, which are reasonably foreseeable, plus those projects likely to come forward where an Agreement for Lease (AfL) has been granted.
185. The specific projects scoped into the CEA for socio-economics are outlined in Table 18.33.
186. The range of potential cumulative impacts that are identified and included in Table 18.34, is a subset of those considered for the Array alone CEA assessment. This is because some of the potential impacts identified and assessed for the Array alone, are localised and temporary in nature. It is considered therefore, that these potential impacts have limited or no potential to interact with similar changes associated with other plans or projects. These have therefore not been taken forward for detailed assessment.
187. Similarly, some of the potential impacts considered within the Array alone assessment are specific to a particular phase of development (e.g. construction, operation and maintenance or decommissioning). Where the potential for cumulative effects with other plans or projects only have potential to occur where there is spatial or temporal overlap with the Array during certain phases of development, impacts associated with a certain phase may be omitted from further consideration where no plans or projects have been identified that have the potential for cumulative effects during this period.
188. The CEA for socio-economics has been based on assessment of whether the planned projects are likely to overlap with the supply chain requirements of the Array. On this basis, the assessment has focused on other offshore wind projects, predominantly those related to the ScotWind leasing round. Therefore, the following have been scoped out:
- offshore wind projects happening outside of the UK;
 - tidal, wave and other energy related projects: these are not part of the offshore wind sector;
 - cables and pipelines, which form part of the existing baseline;
 - dredging and aggregates; aquaculture; oil and gas; cables and pipelines; military; coastal: these are not part of the offshore wind sector; and
 - ports and port pontoon expansions: these are included as part of the topic baseline and hence not considered part of the cumulative impact assessment.
189. It should be noted that the information displayed within Table 18.33 differs from other chapters. Instead of naming each individual project or plan considered within the CEA for socio-economics, Table 18.33 shows projects and/or plans grouped by status (i.e. application, consented, under construction, operational) under

each tier using the criteria set out in paragraph 184. This approach has been selected for the socio-economics chapter CEA as the total number of other projects and/or plans is of more relevance and importance to socio-economics CEA than the specifics of an individual cumulative project.

190. In addition, whilst the social impact assessment for the Array alone considered a long list of potential construction and operation and maintenance ports to assess impacts (see paragraph 55), this approach has not been used for the assessment of cumulative effects as port locations to be used by other projects/plans are not currently known, therefore, it is not currently possible to determine if they would use the same or different ports.

Table 18.33: List of Other Projects and Plans Considered within the CEA for Socio-Economics

Status [i.e. Application, Consented, Under Construction, Operational]	Distance from Array (km)	Description of Project/Plan	Dates of Construction (If Applicable)	Dates of Operation (If Applicable)	Overlap with the Array [e.g. Project Construction Phase Overlaps with Array Construction Phase]
Tier 1					
Proposed offshore export cable corridor(s)	0.00	Proposed offshore transmission for Ossian	2030 to 2037	2038 to 2072	The construction and operational phases of the Proposed offshore export cable corridor(s) overlap with the construction and operation and maintenance phases of the Array.
Proposed onshore transmission infrastructure	342.97	Proposed onshore transmission infrastructure for Ossian	2030 to 2037	2038 to 2072	The construction and operational phases of the Proposed onshore transmission infrastructure overlap with the construction and operation and maintenance phases of the Array.
Under construction	N/A	up to 7.5 GW	2024 to 2027	2025 onwards	The operation and maintenance phases of these projects are likely to overlap with the operation and maintenance phase of the Array. The other projects include Dogger Bank A, B and C; Dudgeon Extension Project; East Anglia One North, Two and Three; Erebus; and Sheringham Shoal Extension Offshore Wind Farms.
Consented	N/A	up to 7.1 GW	2025 to 2030	2027 onwards	The operation and maintenance phase of these projects (Awel y Mor, Hornsea Three, Hornsea Four and Inch Cape Offshore Wind Farms) is likely to overlap with construction and operation and maintenance phases of the Array
Planning	N/A	up to 12.4 GW	2025 to 2032	2026 onwards	The construction and operation and maintenance phases of two of the projects in planning (Berwick Bank Offshore Wind Farm and West of Orkney Offshore Wind Farm) is likely to overlap with construction and operation and maintenance phases of the Array. For the others in planning (Culzean Pilot; Five Estuaries; Green Volt; Mona; and Rampion 2 Offshore Wind Farms), construction is likely to occur before that of the Array, although they are likely to be in operation and maintenance phase when the Array moves to operation and maintenance.
Tier 2 Projects/Plans					
Scoping	N/A	up to 21 GW (9.3 GW floating)	2025 to 2033	2029 onwards	The construction and operation and maintenance phases of these projects may overlap with construction and operation and maintenance phases of the Array. This includes the following fixed offshore wind farms: Caledonia; Dogger Bank D, South, South East and South West; Eastern Regions Zone; Morecambe; Morven; Morgan; North Falls and Spiorad na Mara. It also includes the following floating offshore wind farms: Broadshore Hub; Buchan; Cenos; Marram; Muir Mhòr; Salamander; Stromar and Caledonia (part floating).
Tier 3 Projects/Plans					
Pre-planning	N/A	up to 16.2 GW (11.7 GW floating)	Unknown	Unknown	The construction and operation and maintenance phases of these projects may overlap with construction and operation and maintenance phases of the Array. This includes the following fixed offshore wind farms: Bowdun; and Machairwind and the following floating offshore wind farms: Arven; Aspen; Ayre; Beech; Bellrock; Campion; Cedar; Flora; Havbredey; Innovation and Targeted Oil and Gas (INTOG) sites 8 and 13; Malin Sea; Stoura; and Talisk.

18.12.1. MAXIMUM DESIGN SCENARIO

191. The MDS identified in Table 18.34 have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. The cumulative effects presented and assessed in this section have been selected from the details provided in volume 1, chapter 3 as well as the information available on other projects and plans (see volume 3, appendix 6.4), to inform a 'maximum design scenario'. Effects of greater adverse significance are not predicted to arise should any other development scenario, based on details within the volume 1, chapter 3 (e.g. different wind turbine layout), to that assessed here, be taken forward in the final design scheme.

Table 18.34: Maximum Design Scenario Considered for Each Impact as part of the Assessment of Likely Significant Cumulative Effects on Socio-economics

Potential Cumulative Effect	Phase ³			Tier	Maximum Design Scenario
	C	O	D		
Employment and GVA impacts associated with the construction, operation and maintenance and decommissioning of the Array	✓	✓	✓	Tier 1, 2 and 3	The economic impacts include the overall economic impact of the Array, the onshore works and offshore cable. This is based on PDE Option 4, and the supply chain spending outlined in the SCDS (as for the Array only). In addition to the economic impacts generated by the expenditure associated with the Array, it may have cumulative effects associated with its interaction with other projects, such as increasing the critical mass of the offshore wind sector, attracting manufacturers etc., and increasing competition for limited resources, which may delay construction of other projects and/or increase capacity and efficiency in the sector.
Demographic changes and demand for housing and other services	✓	✓	✓	Tier 1, 2 and 3	Construction and Decommissioning Temporary changes to demographics and increased demand for services in the area around the construction port are likely to be made more permanent in conjunction with other projects on the east coast of Scotland. This is based on PDE Option 1, and the supply chain spending outlined in the SCDS (as for the Array only). Operation and Maintenance Changes to demographics and increased demand for services in the area around the operation and maintenance port may increase as ports specialise in offshore wind farm maintenance, attracting other similar developments. This is based on PDE Option 1, and the supply chain spending outlined in the SCDS (as for the Array only).
Changes to visitor behaviour	✓	✓	✓	Tier 1, 2 and 3	The assessment considers whether changes to visitor behaviour could arise from changes to shipping and marine navigation (e.g. cruise ships). The assessment has been based on the findings from the shipping and navigation assessment (volume 2, chapter 13), taking account of designed in measures.
Changes to commercial fisheries	✓	✓	✓	Tier 1, 2 and 3	The assessment of socio-economic effects arising from any changes to commercial fisheries has been based on the findings of the commercial fisheries assessment (volume 2, chapter 12).
Changes to shipping and marine recreation	✓	✓	✓	Tier 1, 2 and 3	The assessment of socio-economic effects arising from any changes to shipping and marine navigation has been based on the findings of the shipping and navigation assessment (volume 2, chapter 13), taking account of designed in measures.

³ C = Construction, O = Operation and maintenance, D = Decommissioning

18.12.2. CUMULATIVE EFFECTS ASSESSMENT

192. An assessment of the likely significance of the cumulative effects of the Array upon socio-economic receptors arising from each identified impact is given below.

EMPLOYMENT AND GVA IMPACTS ASSOCIATED WITH THE CONSTRUCTION, OPERATION AND MAINTENANCE AND DECOMMISSIONING OF THE ARRAY

193. This section considers the cumulative employment and GVA impacts associated with the construction, operation and maintenance and decommissioning of the Array, and is divided into the following subsections:

- economic impacts of Ossian in Scotland and the UK;
- increased offshore wind supply chain in Scotland and the rest of the UK; and
- increased competition for resources.

Economic Impacts of Ossian in Scotland and the UK

Tier 1

194. The Array forms part of Ossian (which also includes the Proposed offshore export cable corridor(s) and Proposed onshore transmission), and the impact of Ossian is considered here. Further details of the economic impact of Ossian are discussed in the Technical Appendix (volume 3, appendix 18.1).

Construction phase

Magnitude of impact

195. Based on the SCDS and BiGGAR Economics modelling (which has been adjusted for recent developments in grid connection detail, refer to section 3.3 of volume 3, appendix 18.1 for further details), it is expected that the total cost of the Ossian project will be £10.2 billion. Of this, £3.6 billion in contracts are expected to be secured in Scotland, supporting £2.4 billion GVA and 35,920 years of employment. This represents over 4% of employment in the construction sector and therefore the magnitude of this impact has therefore been assessed as high.
196. The UK as a whole is expected to secure contracts worth £4.6 billion, supporting £4.8 billion GVA and 67,980 years of employment. This represents 0.8% of employment in the UK construction sector and therefore the magnitude of this impact has been assessed as medium.
197. The construction port impacts are associated with the Array, and therefore there are not expected to be greater impacts associated with the Ossian project as a whole.

Table 18.35: Economic Impact of Ossian Construction

	Scotland	UK
Turnover	£3,570 m	£4,573 m
Total GVA	£2,433 m	£4,772 m
Total Years of Employment	35,920	67,980
Peak Employment	6,570	12,230

Sensitivity of receptor

198. As for the Array economic impacts, the sensitivity of the Scottish economy has been assessed as low and the sensitivity of the UK economy has been assessed as negligible sensitivity.

Significance of effect

199. Overall, the magnitude of the impact in Scotland is deemed to be high and the sensitivity of the economy is considered to be low. Given that the share of employment substantially exceeds the threshold for assessing high impact (greater than 1%) the effect has been assessed as **moderate** beneficial significance, which is significant in EIA terms.
200. Overall, the magnitude of the impact in the UK is deemed to be medium and the sensitivity of the economy is considered to be negligible. Given the magnitude is in the upper part of the range for assessing magnitude (0.5-1.0%) the effect has been assessed as **minor** beneficial significance, which is not significant in EIA terms.

Secondary mitigation and residual effect

201. The Applicant has committed to enhancement of beneficial effects as per section 18.10. No secondary mitigation is required.

Operation and maintenance phase

Magnitude of impact

202. Based on the SCDS and BiGGAR Economics modelling, it is expected that the annual operation and maintenance cost of the Ossian project will be ██████████. Of this additional expenditure, ██████████ in contracts are expected to be secured in Scotland, supporting £44 million GVA and 500 years of employment. This represents 0.3% of employment in the Scottish construction sector and therefore the magnitude of this impact has therefore been assessed as low.
203. The UK as a whole is expected to secure contracts worth ██████████ supporting £183 million GVA and 1,510 years of employment. This represents less than 0.1% of employment in the UK construction sector, and therefore the magnitude of this impact has been assessed as negligible.

Table 18.36: Economic Impact of Ossian Operation and Maintenance

	Scotland	UK
Turnover	£68 m	£207 m
Total GVA	£44 m	£183 m
Total Years of Employment	500	1,510

Sensitivity of receptor

204. As for the Array economic impacts, the sensitivity of the Scottish economy has been assessed as low and the sensitivity of the UK economy has been assessed as negligible sensitivity.

Significance of effect

- 205. Overall, the magnitude of the impact in Scotland is deemed to be low and the sensitivity of the economy is considered to be low. Given the impact is at the lower end of the scale for assessing magnitude (0.25-0.5%) the effect has been assessed as **negligible** beneficial significance, which is not significant in EIA terms.
- 206. Overall, the magnitude of the impact in the UK is deemed to be negligible and the sensitivity of the economy is considered to be negligible. The effect will, therefore, be of **negligible** beneficial significance, which is not significant in EIA terms.

Decommissioning phase

Magnitude of impact

- 207. The total decommissioning cost is estimated to be ██████████. Of this expenditure, ██████████ in contracts are expected to be secured in Scotland, supporting £90 million GVA and 1,040 years of employment. This is equivalent to 0.2% of employment and the magnitude of this impact has therefore been assessed as low.
- 208. The UK as a whole is expected to secure contracts worth ██████████ supporting £130 million GVA and 1,580 years of employment. This is equivalent to less than 0.1% of employment in the UK construction sector and therefore the magnitude has been assessed as negligible.

Table 18.37: Economic Impact of Ossian Decommissioning

	Scotland	UK
Turnover	£162 m	£162 m
Total GVA	£90 m	£130 m
Total Years of Employment	1,040	1,580

Sensitivity of receptor

- 209. As for the Array economic impacts, the sensitivity of the Scottish economy has been assessed as low and the sensitivity of the UK economy has been assessed as negligible sensitivity.

Significance of effect

- 210. Overall, the magnitude of the impact in Scotland is deemed to be negligible and the sensitivity of the economy is considered to be low. As the magnitude is at the higher end of the range (less than 0.25%) the effect has been assessed **minor** beneficial significance, which is not significant in EIA terms.
- 211. Overall, the magnitude of the impact in the UK is deemed to be negligible and the sensitivity of the economy is considered to be negligible. The effect will, therefore, be of **negligible** beneficial significance, which is not significant in EIA terms.

Increased Offshore Wind Supply Chain in Scotland and the Rest of the UK

Tiers 1 to 3

- 212. There are a number of offshore wind developments that are being developed in Scotland, particularly on the east coast of Scotland, including a number of developments as part of the ScotWind leasing round.

Construction phase

Magnitude of impact

- 213. As discussed in section 18.4, offshore wind has substantial potential to generate economic impacts in Scotland and the UK. In part this is by attracting international manufacturers, e.g. blade and cable manufacturers, drawn by the critical mass of offshore wind development.
- 214. The Array is expected to account for over 10% of the ScotWind leasing round by capacity, and a substantial proportion of floating capacity. It is also expected to be one of the earlier ScotWind projects that are developed. As such, it has the potential to attract manufacturers and increase the Scottish and UK supply chain in Scotland, increasing the economic impact associated with offshore wind.
- 215. The most adverse scenario has been considered based on already committed investments, though further investments are likely as the supply chain develops. These projects require certainty that projects will be developed and orders will be forthcoming, which is why early stage projects such as the Array are important in securing the investment.
- 216. This includes a factory proposed by Sumitomo, a Japanese multinational, to manufacture subsea cables in the Highlands which is expected to directly employ over 150 people, and a factory proposed by XLCC to manufacture subsea cables in Ayrshire, which is expected to employ 900 people. These factories would employ the equivalent of 0.6% of manufacturing employment in Scotland and less than 0.1% of manufacturing employment in the UK.
- 217. On this basis the magnitude of impact in Scotland has been assessed as medium and magnitude of impact in the UK has been assessed as negligible. More local impacts are likely to have a higher magnitude of impact. However, this cannot be assessed since the local area that will be relevant for each of the projects are not known.

Sensitivity of receptor

- 218. As for the Array economic impacts, the sensitivity of the Scottish economy has been assessed as low and the sensitivity of the UK economy has been assessed as negligible sensitivity.

Significance of effect

- 219. Overall, the magnitude of the impact in Scotland is deemed to be medium and the sensitivity of the economy is considered to be low. Given that that magnitude is at the lower end of the range (0.5-1.0%) the effect has been assessed as **minor** beneficial significance, which is not significant in EIA terms.
- 220. Overall, the magnitude of the impact in the UK is deemed to be negligible and the sensitivity of the economy is considered to be negligible. The effect will, therefore, be of **negligible** beneficial significance, which is not significant in EIA terms.

Operation and maintenance phase

Magnitude of impact

- 221. The large number of offshore wind farms may lead to economies of scale, with operation and maintenance hubs at certain ports.
- 222. As the operation and maintenance port is not known it is not possible to assess the magnitude of potential impacts.

Significance of effect

- 223. It is not possible to determine the magnitude of the beneficial impact and therefore it is not possible to assess the significance of the effect.

Decommissioning phase

Magnitude of impact

- 224. The large number of offshore wind farms may lead to specialisation related to decommissioning and increased economic impacts at certain ports.
- 225. As the decommissioning port is not known it is not possible to assess the magnitude of potential impacts.

Significance of effect

- 226. It is not possible to determine the magnitude of the beneficial impact and therefore it is not possible to assess the significance of the effect.

Increased Competition for Resources

Tiers 1 to 3

Construction phase

Magnitude of impact

- 227. Due to the size of planned offshore wind farms, including ScotWind, there may be competition for resources, including port and manufacturing capacity as well as skilled labour.
- 228. Without co-ordination between developers and suppliers, competitive pressure on resources may lead to delays to less developed projects and a slower build out of offshore wind capacity. However, it is also likely to lead to increased investment in the sector in order to meet the demand for services. For example, it may lead to new port capacity and manufacturing facilities, or increased efficiency in the sector.
- 229. Under the most adverse scenario, it is anticipated that there will be a slower build out of offshore wind, though the total activity is expected to be the same. It is also anticipated that the demand for ports and other services will lead to increased investment and government response to increase supply, which will lead to a faster build out.

- 230. Therefore, the magnitude of impact has been assessed as negligible for the Scottish and UK economies. To assess local impacts would require knowledge of the construction port(s), which is not known at this stage and therefore the magnitude cannot be assessed at a local scale.

Sensitivity of receptor

- 231. As for the Array economic impacts, the sensitivity of the Scottish economy has been assessed as low and the sensitivity of the UK economy has been assessed as negligible sensitivity.

Significance of effect

- 232. Overall, the magnitude of the impact in Scotland is deemed to be negligible and the sensitivity of the economy is considered to be low. The effect will, therefore, be of **negligible** adverse significance, which is significant in EIA terms.
- 233. Overall, the magnitude of the impact in the UK is deemed to be negligible and the sensitivity of the economy is considered to be negligible. The effect will, therefore, be of **negligible** adverse significance, which is not significant in EIA terms.

Operation and maintenance phase

Magnitude of impact

- 234. The large number of offshore wind farms may also lead to competition for resources, such as access to ports. As with the construction sector this is expected to result in increased investment and efficiency, and improved co-ordination across the sector.
- 235. Therefore, there is not expected to be a reduction in the build out of offshore wind farms and the magnitude of impact has been assessed as negligible for the Scottish and UK economies. To assess local impacts would require knowledge of the operation and maintenance port(s), which is not known at this stage and therefore the magnitude cannot be assessed at a local scale.

Sensitivity of receptor

- 236. As for the Array economic impacts, the sensitivity of the Scottish economy has been assessed as low and the sensitivity of the UK economy has been assessed as negligible sensitivity.

Significance of effect

- 237. Overall, the magnitude of the impact in Scotland is deemed to be negligible and the sensitivity of the economy is considered to be low. The effect will, therefore, be of **negligible** adverse significance, which is not significant in EIA terms.
- 238. Overall, the magnitude of the impact in the UK is deemed to be negligible and the sensitivity of the economy is considered to be negligible. The effect will, therefore, be of **negligible** adverse significance, which is not significant in EIA terms.

Decommissioning phase

Magnitude of impact

239. The large number of offshore wind farms may also lead to competition for resources. As with the construction sector this is expected to result in increased investment and efficiency, and improved co-ordination across the sector. Therefore, the magnitude of impact has been assessed as negligible in Scotland and the UK.

Sensitivity of receptor

240. As for the Array economic impacts, the sensitivity of the Scottish economy has been assessed as low and the sensitivity of the UK economy has been assessed as negligible.

Significance of effect

241. Overall, the magnitude of the impact in Scotland is deemed to be negligible and the sensitivity of the economy is considered to be low. The effect will, therefore, be of **negligible** adverse significance, which is not significant in EIA terms.

242. Overall, the magnitude of the impact in the UK is deemed to be negligible and the sensitivity of the economy is considered to be negligible. The effect will, therefore, be of **negligible** adverse significance, which is not significant in EIA terms.

DEMOGRAPHIC CHANGES AND DEMAND FOR HOUSING AND OTHER SERVICES

243. There are a number of offshore wind developments that are being developed in Scotland, particularly on the east coast of Scotland, including a number of developments as part of the ScotWind leasing round.

Tiers 1 to 3

Construction phase

Magnitude of impact

244. While impacts associated with the construction phase are generally expected to be relatively short-term, the pipeline of projects associated with ScotWind and other developments means that they are likely to be experienced as a longer-term impact.

245. As discussed, the Array is likely to result in short-term demand for housing and other services over its construction phase. However, if this is followed by other projects of a similar nature, skilled workers and their families are likely to remain in the area over a longer period of time. This is expected to result in a stable increase in population and sustained demand for services such as education, and more integration with the community.

246. The magnitude of this impact is likely to be determined by the individual characteristics of any area, such as its long-term growth trajectory and population dynamics. As the construction ports to be used by the projects considered within the CEA are not known, it is not possible to assess the magnitude of any change.

Significance of effect

247. As the construction ports to be used by the projects considered within the CEA are not known, it is not possible to assess the sensitivity and significance.

Operation and maintenance phase

Magnitude of impact

248. Operation and maintenance impacts are expected to generate long-term jobs at operations and maintenance ports. In conjunction with other east coast offshore wind farms this may result in increased co-ordination and the development of operations and maintenance hubs, which will result in increased demographic and other impacts.

249. As the operation and maintenance ports to be used by the projects considered within the CEA are not known, it is not possible to assess the magnitude of any change.

Significance of effect

250. As the operation and maintenance ports to be used by the projects considered within the CEA are not known, it is not possible to assess the sensitivity and significance.

Decommissioning phase

Significance of the effect

251. Though the magnitude and sensitivity will depend on the port chosen, these impacts are unlikely to be significant.

CHANGES TO VISITOR BEHAVIOUR

252. No significant socio-economic effects on visitor behaviour are anticipated associated with the Array. Significant cumulative socio-economic impacts on visitor behaviour are also not anticipated.

CHANGES TO COMMERCIAL FISHERIES

Tiers 1 to 3

253. The commercial fisheries chapter has considered potential cumulative effects on commercial fishing across the construction, operation and maintenance and decommissioning phases. Such effects could have socio-economic consequences if the Array reduces the value of fish caught by commercial fisheries, with potential downstream impacts, for example on fish processors.

254. Prior to mitigation, offshore wind projects deemed to be in Tiers 1 to 3 are expected to have moderate adverse cumulative effects on:

- temporary loss or restricted access to fishing grounds during construction, operation and maintenance, and decommissioning;
- long term loss or restricted access to fishing grounds during construction, operation and maintenance, and decommissioning; and
- displacement of fishing activities into other areas during construction, operation and maintenance, and decommissioning.

255. The assessment also notes that the Array is likely to make a minimal contribution to the loss of fishing grounds. The Applicant proposes at a regional scale to monitor fishing activity with the region to identify any changing effort. In addition, the Applicant is committed to explore opportunities for coexistence with the Array, subject to final design and layout.

256. Following mitigation, the residual effects were assessed as minor and not significant. As a result, no socio-economic consequences arise that required assessment.

CHANGES TO SHIPPING AND MARINE RECREATION

Tiers 1 to 3

257. The shipping and navigation chapter has considered potential cumulative effects on shipping and navigation across the development, operation and maintenance and decommissioning phases. No significant effects were identified. As a result, no socio-economic consequences arise that required assessment.

18.13. PROPOSED MONITORING

258. This section outlines the proposed monitoring proposed for socio-economic impacts. Proposed monitoring measures are outlined in Table 18.38 below.

Table 18.38: Proposed Monitoring and the Method of Implementation for Socio-Economics

Potential Environmental Effect	Monitoring Commitment	Means of Implementation
Expenditure Impacts	Monitor expenditure throughout the supply chain to evaluate its impacts and determine whether the commitments outlined in the SCDS are being met. This will also help identify necessary actions to ensure the maximization of spending commitments as per the SCDS.	Secured through the terms in the Option for Lease Agreement with Crown Estate Scotland

18.14. TRANSBOUNDARY EFFECTS

259. The assessment has considered the economic impact in Scotland and the UK, as well as the potential economic impacts associated with the construction, operation and maintenance and decommissioning phases. However, a significant proportion of expenditure is also expected to take place in the EU and elsewhere in the world, which will generate beneficial economic impacts.

Construction phase

260. In addition to expenditure of ██████ in Scotland and ██████ in rUK, there is expected to be expenditure of ██████ in the EU and ██████ elsewhere in the world. This largest category of expenditure is expected to be wind turbine engines, which are typically manufactured in the EU. This will generate economic activity and support employment in the EU and elsewhere.

261. While there are likely to be beneficial transboundary socio-economic effects associated with the Array, given the scale of the EU and global economies, it is therefore considered likely that, at most, there will be a negligible beneficial transboundary effect.

Table 18.39: Array Construction Expenditure

Phase	Scotland	rUK	EU	Elsewhere	Total
Construction	██████	██████	██████	██████	██████

Operation and maintenance phase

262. In addition to an annual expenditure of ██████ in Scotland and ██████ in rUK, there is expected to be an expenditure of ██████ in the EU and ██████ elsewhere in the world. This is expected to lead to beneficial socio-economic effects, generating economic activity and supporting employment in the EU and elsewhere. Given the scale of the EU and global economies, it is considered likely that there will be a negligible beneficial effect.

Table 18.40: Array Operation and Maintenance Expenditure

Phase	Scotland	rUK	EU	Elsewhere	Total
Operation and maintenance	██████	██████	██████	██████	██████

Decommissioning phase

263. In addition to decommissioning expenditure of ██████ in Scotland and the UK, there is expected to be an expenditure of ██████ in the EU elsewhere in the world. This is expected to lead to beneficial socio-economic effects, generating economic activity and supporting employment in the EU and elsewhere. Given the scale of the EU and global economies, it is considered likely that there will be a negligible beneficial effect.

Table 18.41: Array Decommissioning Expenditure

Phase	Scotland/UK	EU/Elsewhere	Total
Decommissioning	██████	██████	██████

18.15. INTER-RELATED EFFECTS (AND ECOSYSTEM ASSESSMENT)

264. For socio-economics, the following potential impacts have been considered within the inter-related effects assessment:

- employment and GVA impacts associated with the construction, operation and maintenance and decommissioning of the Array; and
- demographic changes and demand for housing and other services.

265. Table 18.42 lists the inter-related effects (Array lifetime effects) that are predicted to arise during the construction, operation and maintenance, and decommissioning phases of the Array and also the inter-related effects (receptor-led effects) that are predicted to arise for socio-economic receptors.

Table 18.42: Summary of Likely Significant Potential Inter-Related Effects for Socio-economics from Individual Effects Occurring across the Construction, Operation and Maintenance and Decommissioning Phases of the Array (Array Lifetime Effects) and from Multiple Effects Interacting Across all Phases (Receptor-led Effects)

Description of Impact	Phase ⁴ Likely Significant Inter-Related Effects		
	C	O	D
Array Lifetime Effects			
Employment and GVA impacts associated with the construction, operation and maintenance and decommissioning of the Array	✓	✓	✓
Demographic changes and demand for housing and other services	✓	✓	✓
Receptor-led Effects			

18.16. SUMMARY OF IMPACTS, MITIGATION, LIKELY SIGNIFICANT EFFECTS AND MONITORING

266. Table 18.43 presents a summary of the potential impacts, designed in measures and the conclusion of LSE¹ in EIA terms in respect to socio-economics. The impacts assessed include:

⁴ C = Construction, O = Operation and maintenance, D = Decommissioning

- employment and GVA impact associated with construction, operation and maintenance and decommissioning, including:
 - economic impact in the Scotland and the UK;
 - economic impact at Construction Port(s)
 - economic impact at Operation and Maintenance Port(s); and
 - contribution the UK energy sector.
 - demographic changes and demand for housing and other services, including:
 - population;
 - housing demand and availability;
 - other local services; and
 - socio-cultural impacts.
 - changes to visitor behaviour;
 - changes to commercial fisheries; and
 - changes to shipping and marine recreation.
267. Overall, it is concluded that there will be the following LSE¹ arising from the Array during the construction, operation and maintenance or decommissioning phases:
- a temporary, beneficial and moderate significant effect on the Scottish economy, during the construction phase of the Array and
 - a beneficial and moderate significant effect on the UK energy system due to the increased supply of renewable electricity from the Array.
268. Table 18.44 presents a summary of the potential impacts, designed in measures and the conclusion of LSE¹ on socio-economics in EIA terms. The cumulative effects assessed include:
- employment and GVA impact associated with construction, operation and maintenance and decommissioning of the Array, including:
 - economic impacts of Ossian in Scotland and the UK;
 - increased offshore wind supply chain in Scotland and the rest of the UK; and
 - increased competition for resources.
 - demographic changes and demand for housing and other services, including:
 - population;
 - housing demand and availability;
 - other local services; and
 - socio-cultural impacts.
 - changes to visitor behaviour;
 - changes to commercial fisheries; and
 - changes to shipping and marine recreation.
269. Overall, it is concluded that there will be the following likely significant cumulative effects from the Array alongside other projects/plans:
- a temporary, beneficial and moderate significant effect on the Scottish economy, during the construction phase.
270. No likely significant transboundary effects have been identified in regard to effects of the Array.

Table 18.43: Summary of Likely Significant Environmental Effects, Secondary Mitigation and Monitoring

Description of Impact	Phase	Magnitude of Impact	Sensitivity of Receptor	Significance of Effect	Additional Measures	Significance of Residual Effect	Proposed Monitoring
Employment and GVA impacts associated with the construction, operation and maintenance and decommissioning of the Array							
Economic impact (in Scotland)	Construction	High	Low	Moderate, Significant (beneficial)	N/A	Moderate, Significant (beneficial)	Monitor expenditure in Scotland
	Operation and maintenance	Low	Low	Negligible, Not significant (beneficial)	N/A	Negligible, Not significant (beneficial)	N/A
	Decommissioning	Negligible	Low	Negligible, Not significant (beneficial)	N/A	Negligible, Not significant (beneficial)	N/A
Economic impact (in the UK)	Construction	Medium	Negligible	Minor, Not significant (beneficial)	N/A	Minor, Not significant (beneficial)	N/A
	Operation and maintenance	Negligible	Negligible	Negligible, Not significant (beneficial)	N/A	Negligible, Not significant (beneficial)	N/A
	Decommissioning	Negligible	Negligible	Negligible, Not significant (beneficial)	N/A	Negligible, Not significant (beneficial)	N/A
Economic impact at construction port	Construction (assuming construction port(s) with lowest economic benefit)	Medium	Low	Minor, Not significant (beneficial)	N/A	Minor, Not significant (beneficial)	N/A
	Construction (assuming construction port(s) with highest economic benefit)	High	Medium	Moderate to major, Significant (beneficial)	N/A	Moderate to major, Significant (beneficial)	Monitor expenditure in Scotland
Economic impact at operation and maintenance port	Operation and maintenance (assuming operation and maintenance port(s) with lowest economic benefit)	Negligible	Negligible	Negligible, Not significant (beneficial)	N/A	Negligible, Not significant (beneficial)	N/A
	Operation and maintenance (assuming operation and maintenance port(s) with highest economic benefit)	High	Negligible	Minor, Not significant (beneficial)	N/A	Minor, Not significant (beneficial)	N/A
Contribution to UK energy sector	Operation and maintenance	High	Medium	Major, Significant (beneficial)	N/A	Major, Significant (beneficial)	Monitor expenditure in UK
Demographic changes and demand for housing and other services							
Population and Social Impacts (including Housing demand and availability, Other local services, Socio-cultural)	Construction	Negligible-Low	N/A	Negligible-Low, Not significant	N/A	Negligible-Low, Not significant (Adverse)	N/A
	Operation and maintenance	Negligible-Low	N/A	Negligible-Low, Not significant	N/A	Negligible-Low, Not significant (Adverse)	N/A
	Decommissioning	Negligible- Low	N/A	Negligible-Low, Not significant	N/A	Negligible-Low, Not significant (Adverse)	N/A

Table 18.44: Summary of Likely Significant Cumulative Environment Effects, Mitigation and Monitoring

Description of Impact	Phase	Cumulative Effects Assessment Tier	Magnitude of Impact	Sensitivity of Receptor	Significance of Effect	Additional Measures	Significance of Residual Effect	Proposed Monitoring
Employment and GVA impacts associated with the construction, operation and maintenance and decommissioning of the Array								
Economic impact of Ossian (in Scotland)	Construction	Tier 1	High	Low	Moderate, Significant (beneficial)	N/A	Moderate, Significant (beneficial)	Monitor expenditure in Scotland
	Operation and maintenance	Tier 1	Low	Low	Negligible, Not significant (beneficial)	N/A	Negligible, Not significant (beneficial)	N/A
	Decommissioning	Tier 1	Low	Low	Minor, Not significant (beneficial)	N/A	Minor, Not significant (beneficial)	N/A
Economic impact of Ossian (in the UK)	Construction	Tier 1	Low	Negligible	Minor, Not significant (beneficial)	N/A	Minor, Not significant (beneficial)	N/A
	Operation and maintenance	Tier 1	Negligible	Negligible	Negligible, Not significant (beneficial)	N/A	Negligible, Not significant (beneficial)	N/A
	Decommissioning	Tier 1	Negligible	Negligible	Negligible, Not significant (beneficial)	N/A	Negligible, Not significant (beneficial)	N/A
Increased offshore wind supply chain in Scotland	Construction	Tier 1, 2 and 3	Medium	Low	Minor, Not significant (beneficial)	N/A	Minor, Not significant (beneficial)	N/A
	Operation and maintenance	Tier 1, 2 and 3	N/A	N/A	N/A	N/A	N/A	N/A
	Decommissioning	Tier 1, 2 and 3	N/A	N/A	N/A	N/A	N/A	N/A
Increased offshore wind supply chain in the UK	Construction	Tier 1, 2 and 3	Negligible	Negligible	Negligible, Not significant (beneficial)	N/A	Negligible, Not significant (beneficial)	N/A
	Operation and maintenance	Tier 1, 2 and 3	N/A	N/A	N/A	N/A	N/A	N/A
	Decommissioning	Tier 1, 2 and 3	N/A	N/A	N/A	N/A	N/A	N/A
Increased competition for resources	Construction	Tier 1, 2 and 3	Negligible	Negligible	Negligible, Not significant (adverse)	N/A	Negligible, Not significant (adverse)	N/A
	Operation and maintenance	Tier 1, 2 and 3	Negligible	Negligible	Negligible, Not significant (adverse)	N/A	Negligible, Not significant (adverse)	N/A
	Decommissioning	Tier 1, 2 and 3	Negligible	Negligible	Negligible, Not significant (adverse)	N/A	Negligible, Not significant (adverse)	N/A
Demographic changes and demand for housing and other services								
Population and Social Impacts (including Housing demand and availability, Other local services, Socio-cultural)	Construction	Tier 1, 2 and 3	N/A	N/A	N/A	N/A	N/A	N/A
	Operation and maintenance	Tier 1, 2 and 3	N/A	N/A	N/A	N/A	N/A	N/A
	Decommissioning	Tier 1, 2 and 3	N/A	N/A	N/A	N/A	N/A	N/A

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