

# MachairWind Offshore Windfarm

## Socio-Economics Technical Report



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## Glossary of Acronyms

Term	Definition
ECC	Export Cable Corridor
EIA	Environmental Impact Assessment
EU	European Union
GB	Great Britain
GVA	Gross Value Added
km	Kilometres
ONS	Office for National Statistics
SCDS	Supply Chain Development Statement
TTWA	Travel to Work Area
UK	United Kingdom
WDA	Windfarm Development Area
WTG	Wind Turbine Generator
UK	United Kingdom



## Glossary of Terms

Term	Definition
Breeding season	Furness (2015) defines breeding season as the period from modal return to the colony through to modal departure from the colony at the end of breeding, for birds at UK colonies.
Cable protection	Protective measure to minimise the effects of scour and hazards along the offshore cables (e.g. to prevent cable exposure or snagging of vessel anchors or fishing gear), as well as for protecting these cables at infrastructure crossing points.
Development Area	Application boundary for consenting purposes which, for the Project, consists of a Windfarm Development Area, Offshore Export Cable Corridor, and Offshore Transmission Development Area. Separate consent and marine licence applications will be submitted for each Development Area where applicable.
Environmental Impact Assessment (EIA)	The process of evaluating the likely significant environmental effects of a proposed development over and above the existing circumstances (or 'baseline').
Fleet	A physical group of vessels sharing similar characteristics (e.g., nationality).
Gross Value Added (GVA)	Measure of the value of goods and services produced in an area, industry, or sector of an economy.
International Council for the Exploration of the Seas (ICES) statistical rectangles	The International Council for the Exploration of the Seas (ICES) standardise the division of sea areas to enable statistical analysis of data. Each ICES statistical rectangle is 30 min latitude by 1 degree longitude in size (approximately 30 x 30 nautical miles). A number of rectangles are amalgamated to create ICES statistical areas.
Inter-array cables (IACs)	Armoured cable containing electrical and fibre optic cores which link the wind turbine generators to each other and to the offshore substation platform(s).
Landfall	The area from Mean Low Water Springs to a transition bay(s), where the offshore export cable(s) come ashore.
MachairWind Offshore Windfarm	An offshore windfarm capable of exporting around 2 GW of renewable energy to the National Electricity Transmission System. MachairWind Offshore Windfarm comprises three Development Areas: <ul style="list-style-type: none"> <li>• The WDA – located on the west coast of Scotland to the northwest of Islay and west of Colonsay;</li> <li>• The Offshore Export Cable Corridor – a preliminary boundary extending from the WDA to mean high water springs at a landfall location near Girvan, South Ayrshire; and</li> <li>• The Onshore Transmission Development Area – a preliminary boundary which extends landward from mean low water springs and includes the land required for the landfall of the offshore export cables and their route up to but not including the proposed high voltage direct current switching station which will be developed and constructed by Transmission Owner, ScottishPower Transmission.</li> </ul> Separate consent and licence applications will be submitted for each Development Area.
National Electricity Transmission System	The high-voltage electricity power transmission network serving Great Britain which receives electricity from generators (such as offshore windfarms) and transmits that electricity to anywhere on the National Electricity Transmission System to satisfy demand.
Offshore export cable	Armoured cable containing electrical cores between the offshore substation platform(s) and landfall. Offshore export cables will include bundled fibre optic cables. The offshore export cables are subject to Marine Licence applications under the Marine (Scotland) Act 2010. The portion of the offshore export cable(s) located within the WDA is assessed as part of this MachairWind WDA EIA and a marine licence application to construct, alter or improve this portion has been submitted alongside the WDA application. A separate marine licence



Term	Definition
	application will be submitted for the portion of the offshore export cable(s) from the WDA boundary to mean high water Mean High Water Springs.
Offshore export cable corridor	The preliminary boundary extending from the WDA to mean high water springs near Girvan, South Ayrshire and within which the offshore export cable(s) will be located. A separate marine licence application will be submitted for the offshore export cable(s) located within the Offshore ECC.
Offshore Substation Platform (OSP)	An offshore platform with a fixed foundation located within the WDA which houses electrical equipment such as transformers, switchgear, protection and control systems, and enables the windfarm's renewable electricity to be collected via inter-array cables and exported to the National Electricity Transmission System via offshore export cables.
Offshore Substation Platform (OSP) link cables	Electrical cables which link OSPs (if more than one OSP is required). These cables will include fibre optic cores or bundled fibre optic cables. OSP link cables will be wholly located within the WDA.
Onshore Transmission Development Area (OnTDA)	The preliminary boundary which extends landward from mean low water springs and includes the land required for the landfall of the offshore export cables and their route up to but not including the proposed high voltage direct current switching station which will be developed and constructed by Transmission Owner, ScottishPower Transmission. This Transmission Owner is responsible for consenting the high voltage direct current switching station. Onward connections to the National Electricity Transmission System will be consented by National Grid Electricity Transmission and ScottishPower Transmission. Where relevant, these are considered as part of cumulative effects assessment in the EIA.
Scour protection	Protective measures to avoid sediment being eroded away from the base of the wind turbine generator foundations as a result of the flow of water.
The Applicant	The legal entity submitting consent applications for the MachairWind Offshore Windfarm, namely Machairwind Limited.
The Project	MachairWind Offshore Windfarm including all its Development Areas and associated infrastructure.
Windfarm Development Area (WDA)	The application boundary within the OAA where consent will be sought for the proposed WDA infrastructure. The WDA infrastructure is subject to Section 36 consent and marine licence applications (generation and transmission) which are being applied for separately from the Offshore ECC infrastructure and OnTDA infrastructure.
WDA infrastructure	The offshore generation and transmission infrastructure located within the WDA including but not limited to: WTGs, WTG fixed foundations (and associated scour protection), OSP(s), OSP fixed foundations (and associated scour protection), IACs, OSP link and offshore export cable(s) and their associated external cable protection (insofar as these are located within the WDA) and fibre optic cables.
Wind Turbine Generator (WTG)	A wind turbine generator which converts wind energy into electrical energy. Each wind turbine generator is a complex system composed of a high number of components. Typically, the main components include the rotor assembly (composed of three blades and a hub); the nacelle (containing a generator, shaft and gearbox, power electronic converter and transformer); and the tower (containing lifting equipment and the switchgear).



## 1 INTRODUCTION

### 1.1 PURPOSE OF THE REPORT

1. This technical report is intended to support the **Chapter 18 Socio-economics** as part of the Environmental Impact Assessment (EIA) of MachairWind Offshore Windfarm's Windfarm Development Area (WDA).
2. It sets out the intended Study Areas for the assessment of the WDA, as well as providing a detailed baseline and economic impact methodology, as well as providing an assessment of local and national baseline and economic impacts. This will provide the information needed to assess the level of significance.
3. This report should be read in conjunction with **Appendix 16 Socio-Economic Action Plan**, which sets out the actions that the Developer is taking to increase local social and economic benefits arising from the Project.

## 2 METHODOLOGY

### 2.1 STUDY AREAS

4. While a significant proportion of the activity associated with the Project is expected to take place offshore, the relevant Study Areas for the offshore socio-economic assessment are located onshore.
5. The offshore socio-economics Study Areas for the assessment of effects on employment and economy are defined in line with the guidance on identification of 'local areas' for offshore developments published by the Scottish Government (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 offshore socio-economics economic impacts, including tourism and recreation;
  - 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 (e.g. Highlands & Islands Enterprise area of operation)) 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; and
  - 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.



## 2.2 BASELINE METHODOLOGY

6. The methodology for establishing the baseline involved a broad desktop study of data sources as well as supplementation with broader information sources, such as reports, and community consultations that were undertaken as part of a previous assessment of MachairWind’s potential impact in various port communities (BiGGAR Economics, 2024).
7. The baseline assessment was focused on both Scotland and the United Kingdom (UK), and the smaller port-based Study Areas. It focused on key statistics such as general population demographics, age group distribution, overall economic activity levels and employment within high level industries.
8. The data sources considered are provided in **Table 2.1**.

*Table 2.1 Summary of Key Data Sources Used*

Data Sources	Summary
Mid-year Population Estimates Scotland 2023 (National Records of Scotland, 2024)	Population estimates in Scotland, broken down by age and small areas
Mid-year Population Estimates UK 2023 (ONS, 2024)	Population estimates in the UK, broken down by age
Principal Population Projections 2022-based (ONS, 2023)	Population projections in the UK and each nation, broken down by age
Business Register and Employment Survey 2023 (ONS, 2024)	Provides a breakdown of employment by sector, by nation, small area and travel to work area (TTWA/s)
Regional Gross Value Added (GVA) by industry: All International Territorial Level regions (ONS, 2025)	Provides the level of GVA in the UK and each region/nation

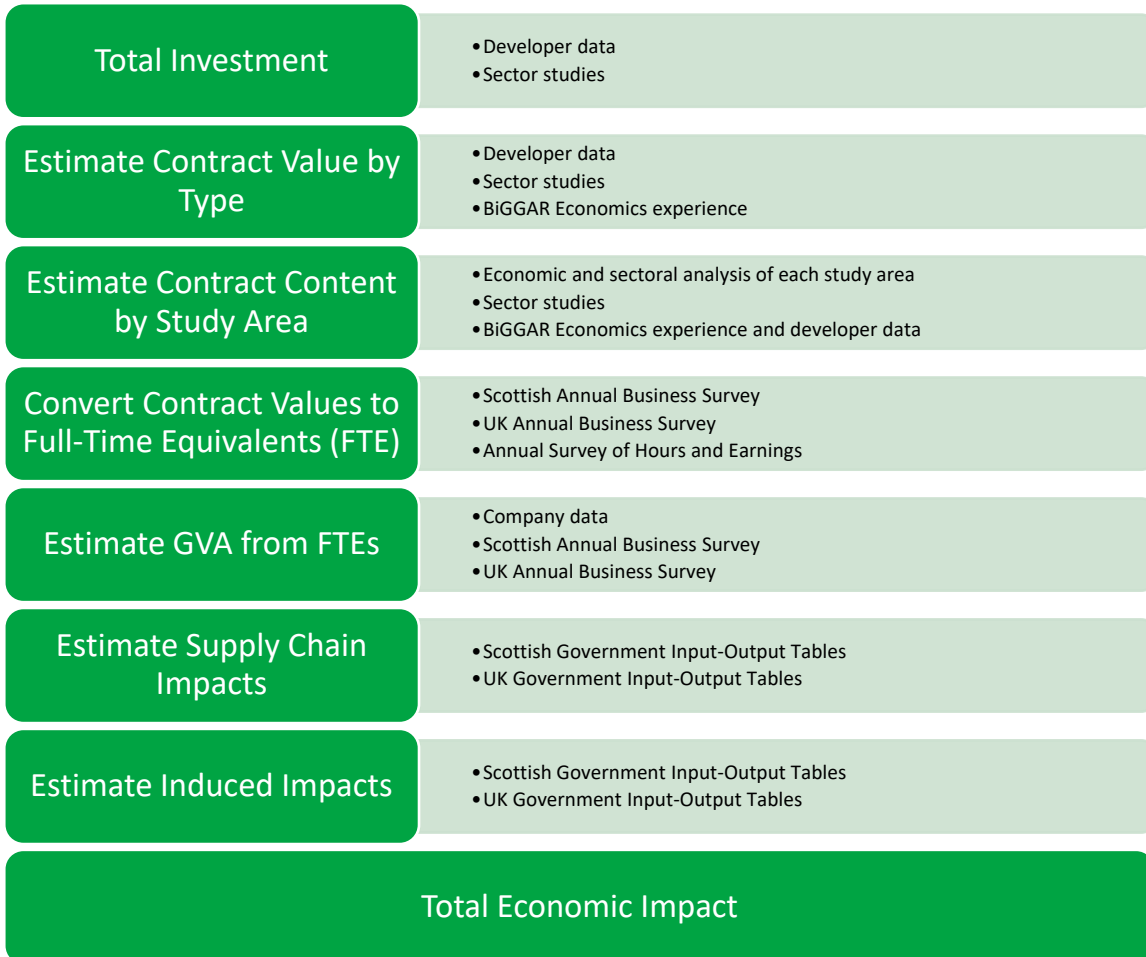
## 2.3 ECONOMIC IMPACT METHODOLOGY

9. This section outlines the methodology for assessing economic impacts
10. The estimation of the economic benefits is based on a purpose-built tool developed by BiGGAR Economics, which has been used in several EIAs that have been approved by consenting authorities (e.g. Green Volt Offshore Wind Farm). The analysis is based on an Input-Output methodology built upon the following steps, as set out in **Plate 2.1**.
  - Estimation of the total investment (development and construction, operation and maintenance (O&M) and decommissioning);
  - Estimation of contract value by type (that is, how the investment is expected to be split across several types of contracts for different types of goods and services);
  - Estimation of contract content by Study Area (that is, the proportion of each contract type that could be secured within the local, Scottish or UK economies);
  - Conversion of contract values into the direct employment supported (based on the turnover per employee in the relevant sectors for the suppliers of each different type of goods and services);
  - Estimation of direct GVA based on direct employment supported;
  - Estimation of supply chain (indirect) impacts on GVA and employment;
  - Estimation of induced impacts on GVA and employment.



11. The level of decommissioning spending is not available at this stage but the analysis includes the decommissioning phase, based on industry expectations of the scale of spending required and on the assumption that the contract types will be similar to the construction phase.

Plate 2.1 Economic Impact Methodology and Data Sources



### 2.3.1 Data Sources

12. The assessment requires information from a number of sources, including:
- Commercial data from the Applicant, including the Supply Chain Development Statement (SCDS) (Machairwind Limited, 2023);
  - UK Annual Business Survey for data on GVA, turnover and employment across the UK (ONS, 2024);
  - Scottish Government Input-Output GVA and employment multipliers for Type 1 impacts (supply chain spending) and Type 2 impacts (supply chain spending and staff spending) (Scottish Government, 2024).
  - UK Input-Output GVA and employment multipliers for Type 1 and Type 2 impacts (ONS, 2024).
13. These data sources are complemented by BiGGAR Economics experience working with developers in the offshore wind sector and by the use of sectoral reports, such as BVG Associates' Guide to an Offshore Wind Farm (BVG Associates, 2021).



### 2.3.2 Supply Chain Development Statement

14. The Applicant's SCDS (Machairwind Limited, 2023) provides estimates of the share of expenditure in Scotland, the UK, the European Union (EU) and elsewhere associated with four categories of expenditure:
  - Development (such as studies, surveys, analysis and resources required to obtain planning consent);
  - Manufacturing and fabrication (including wind turbine generators, blades and towers, foundations, inter-array and export cables, onshore and offshore substation fabrication);
  - Installation (turbine and foundation installation, onshore substation construction and installation and export cable route works);
  - O&M (during the first six years of O&M).
15. The SCSD presents two sets of expenditure figures:
  - Expenditure Commitments: a scenario reflecting the Applicant's cost assumptions at the time Project delivery, including Scottish expenditure assumptions that account for known challenges and opportunities within the Scottish supply chain; and
  - Expenditure Ambitions: a scenario that presents an ambitious view of possible Scottish supply chain expenditure by the Project, subject to future investment in new facilities and infrastructure by industry and government.
16. For the purposes of the EIA, the commitment scenario has been used to inform the economic impact assessment as it presents a realistic case of supply chain by the Project, notwithstanding changes to market conditions and the Project's characteristics arising since the SCDS was last updated in 2023. As the SCDS presents cost assumptions for the entirety of the Project, further assumptions have been applied to determine the share of expenditure associated with the WDA.
17. In the SCDS, it was expected that the total expenditure on onshore and offshore infrastructure during the development and construction phase of the MachairWind Offshore Windfarm would be £6.0 billion, with an additional £406 million of costs during the first six years of O&M.
18. The SCDS identified £1.8 billion of development and construction phase spending and £304 million of O&M spending that would be retained in the Scottish economy. For the rest of the UK, £1.3 billion of development and construction phase spending and £61 million of O&M spending was identified that would be retained in the rest of the UK economy (**Table 2.2**).

*Table 2.2 Supply Chain Development Statement Commitment Scenario, £m*

	Scotland	Rest of UK	EU	Rest of World	Total
Development	234	59	-	-	293
Manufacturing and fabrication	578	1125	1,938	-	3,640
Installation	1,004	152	903	-	2,059
<b>Sub-total (Development and Construction)</b>	<b>1,816</b>	<b>1,335</b>	<b>2,840</b>	-	<b>5,991</b>
O&M (6 years)	304	61	41	-	406

19. Each of these categories was then split into sub-categories based on BiGGAR Economics' own offshore wind economic model, which incorporates a detailed breakdown of cost categories based on industry data, including BVG Associates Guide to an Offshore Wind Farm (BVG Associates, 2021).



20. The Technical Report takes account of the economic impact associated with MachairWind Offshore WDA, MachairWind Offshore Export Cable Corridor (ECC) and MachairWind Onshore Transmission Development Area (OnTDA).

### 2.3.3 Input-Output Modelling

21. Economic impacts are expressed in terms of:

- GVA: a measure of economic activity expressed as the difference between an organisation's turnover and its non-staff operational expenditure;
- Years of employment: a measure of short-term employment used in the context of jobs associated with development and construction activity. As an example, a job lasting for 18 months is equivalent to 1.5 years of employment.
- Jobs: a measure of employment used to reflect long-term employment such as during the O&M phase.

22. The assessment of GVA and employment impacts includes:

- Direct economic impacts: economic impacts associated with the activity of primary contractors involved in development and construction, O&M and decommissioning. This was captured using the ratio of turnover to GVA and employment in relevant sectors, e.g. the level of employment supported by a given expenditure (ONS, 2024);
- Indirect economic impacts: economic impacts associated with the spending taking place across the supply chain of those businesses involved in development and construction, O&M and decommissioning. This was captured using indirect (Type 1) economic multipliers (Scottish Government, 2024) (ONS, 2024).
- Induced economic impacts: economic impact associated with staff spending in the wider economy from businesses, involved in development and construction, O&M and decommissioning. This was captured using induced (Type 2 minus Type 1) economic multipliers (Scottish Government, 2024) (ONS, 2024).

### 2.3.4 Worked Example

23. This section provides a worked example of how the direct, indirect and induced GVA impacts have been calculated.

24. Expenditure was first broken down by contract type in each Study Area and the relevant economic sector was identified for each contract type. To determine the direct GVA impact the relevant turnover to GVA ratios from the ONS Annual Business Survey (ONS, 2024) were applied, as follows:

Plate 2.2 Direct GVA Impact – Worked Example

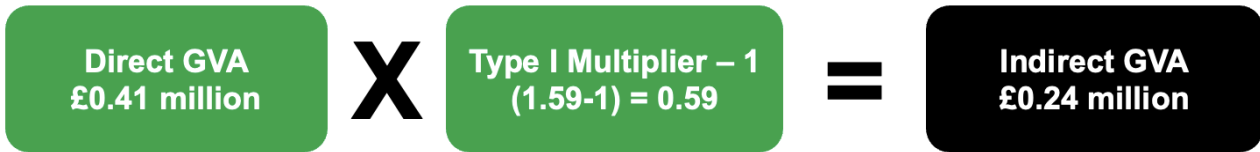


$$\text{Expenditure } \text{£1m} \times \text{GVA-Turnover Ratio } 41\% = \text{Direct GVA } \text{£0.41 million}$$

25. Alongside the direct impact generated by the project, there will be an impact on the supply chain of those businesses being awarded project related contracts. To estimate indirect impacts, Type 1 multipliers were sourced from the Scottish and UK Input-Output Tables (Scottish Government, 2024) (ONS, 2024), and applied as follows:



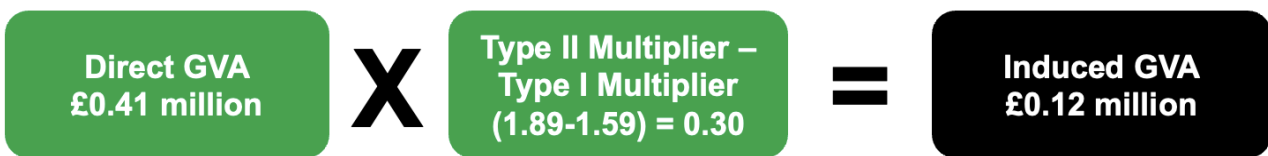
Plate 2.3 Indirect GVA Impact – Worked Example



$$\text{Direct GVA } \pounds 0.41 \text{ million} \times \text{Type I Multiplier} - 1 \text{ (} 1.59 - 1 \text{) } = 0.59 = \text{Indirect GVA } \pounds 0.24 \text{ million}$$

26. The analysis also reports on induced impacts, which are the result of those employed to carry out project related work spending their salaries and wages across the economy. To include induced impacts, it was necessary to apply Type 2 Scottish and UK multipliers (Scottish Government, 2024) (ONS, 2024), which include both indirect and induced effects, as follows:

Plate 2.4 Induced GVA Impact – Worked Example



$$\text{Direct GVA } \pounds 0.41 \text{ million} \times \text{Type II Multiplier} - \text{Type I Multiplier (} 1.89 - 1.59 \text{) } = 0.30 = \text{Induced GVA } \pounds 0.12 \text{ million}$$

27. The direct, indirect and induced impacts are then added to give the total impact.

Plate 2.5 Total GVA Impact – Worked Example



$$\text{Direct GVA } \pounds 0.41 \text{ million} + \text{Indirect GVA } \pounds 0.24 \text{ million} + \text{Induced GVA } \pounds 0.12 \text{ million} = \text{Total GVA } \pounds 0.77 \text{ million}$$

28. In accordance with the scoping response from the Marine Analytical Unit (Marine Analytical Unit, 2022), the assessment also considers:

- Deadweight: any economic activity that would take place anyway, even if the MachairWind Offshore Windfarm did not proceed. The MachairWind Offshore Windfarm requires substantial capital investment, and it has been assumed that if it did not proceed this capital investment would not take place.
- Leakage: when expenditure takes place in an economy, not all of that expenditure is retained within that economy. Some of the spending may benefit other economies. This is known as leakage. Leakage has been accounted for in the analysis by making assumptions on the proportion of each category of expenditure (for each contract type) that directly benefits the economy in each Study Area;
- Displacement: economic activity that would not happen as a consequence of the MachairWind Offshore Windfarm, for example, because the MachairWind Offshore Windfarm uses resources that would otherwise be used by another project. The cumulative effects assessment considers the impacts associated with other offshore wind developments, including whether Scottish and UK activity would be displaced; and
- Substitution: activity that would have occurred without government intervention. The Applicant has a number of global investment opportunities. Any investment attracted by government intervention is not expected to substitute any other investment in the UK economy and so it was not necessary to adjust the analysis for substitution.

### 2.3.5 Local Area Impact Methodology

29. In addition to modelling the economic impacts at the Scottish and UK level for the MachairWind Offshore Windfarm WDA and MachairWind Offshore Windfarm, the economic impacts that are likely



to occur at the local level were modelled based on the activities of the three different port types: marshalling and assembly port, marine operation base and O&M port. The selected ports are indicative and may be subject to change.

- 30. The SCDS development and construction spend at the Scottish level was disaggregated into the marshalling and assembly port activities and the marine operation base port activities. The operational costs in Scotland were directly applied to the operations and maintenance port activities.
- 31. Multiplying the expected spend of the development, construction and O&M by each of the port type spend proportions, as well as following the input-output methodology presented earlier on in this section, the economic impacts were calculated for each of the potential local areas. Based on assessment of the local area’s capacity to absorb change and provide the necessary workforce, an assumption was made about the share of transient workers that would be needed to undertake this activity, and this was also calculated.

### 3 BASELINE ASSESSMENT

#### 3.1 STUDY AREAS

- 32. The main geographic focus of the economic impact assessment, based on the SCDS, are:
  - Scotland; and
  - The UK
- 33. The main local epicentres of impact are expected to be the ports used during the construction and O&M of the WDA. A short-list of potential ports has been selected by the Developer for three different types of port impact. The ports considered are shown in **Table 3.1**.
- 34. The three port types are:
  - Marshalling and assembly port - this will be a relatively large port with enough lay-down space to facilitate the storage, movement and partial assembly of large pieces of equipment. Impacts will be short-term in nature and concentrated during the construction phase;
  - Marine operations base - this will be a smaller port located within 90 minutes of the windfarm which will mainly be used as a base for workers going to the windfarm for assembly and construction related activities with limited storage for key equipment. Impacts will be short-term in nature and concentrated during the construction phase; and
  - O&M port - this will be a port from which day to day operations, including monitoring and maintenance, can be carried out. Impacts will be long-term in nature and happen during the operations and maintenance phase.
- 35. The ports short-listed by the Developer as well as the local areas that are being considered are shown in **Table 3.1**. TTWAs have been identified based on national classifications or built up from other areas, such as local authorities or electoral wards.

*Table 3.1 Potential Port Locations*

	Description	Study Area
<b>Marshalling and Assembly</b>		
Hunterston	Kilmarnock and Irvine TTWA	An area covering Hunterston, as well as the nearby settlements of Fairlie and the southern half of Largs
Kishorn	Wester Ross, Strathpeffer and Lochalsh	A large area covering western Highland



	Description	Study Area
Stornoway/Arnish	Western Isles TTWA	Stornoway and the surrounding areas.
<b>Marine Operations Base</b>		
Bendoran (Mull)	Mull, Iona, Coll and Tiree datazones (04 and 05)	South Mull and Iona
Oban	Oban TTWA	Oban and the surrounding area
Port Ellen (Islay)	Whisky Isles datazones (02, 03, 04 and 05) covering Islay	The Isle of Islay
<b>Operations and Maintenance Port</b>		
Campbeltown and Machrihanish	Campbeltown TTWA	The southern part of the Kintyre peninsula
Hunterston	Kilmarnock and Irvine TTWA	An area covering Hunterston, as well as the nearby settlements of Fairlie and the southern half of Largs
King George V	Renfrewshire and Glasgow City	An area comprising western Glasgow, Renfrew and part of Paisley

### 3.2 SCOTLAND AND THE UK

#### 3.2.1 Population

36. In 2023, the population of Scotland was almost 5.5 million, equivalent to 8.0% of the UK's population of 68.3 million. While the share of the working age population is higher in Scotland (63.4%) than in the UK (62.8%), the share of those aged 65 and over was higher at 20.3%, compared to 18.9%.

Table 3.2 Population 2023

	Scotland	UK
0-15	16.3%	18.3%
16-64	63.4%	62.8%
65+	20.3%	18.9%
<b>Total</b>	<b>5,490,100</b>	<b>68,265,200</b>

#### 3.2.2 Population Projections

37. Based on population projections from 2022, Scotland's population is expected to increase by 5.1% by 2043, while the population of the UK is expected to increase by 10.7%. The share of the population aged 16-64 is expected to fall from 63.4% to 61.1% (representing a total increase of 45,000, given the overall increase in population), while the UK's population is expected to fall to 62.2% (representing an increase of 4.1 million).

38. Over this period, the share of the population aged 0-15 is expected to decrease from 16.3% to 14.1% (lower than the UK at 15.2%), while the population aged 65+ is expected to increase from 20.3% to 24.8% (higher than the UK at 22.6%).



Table 3.3 Population Projections (2022-based)

	Scotland		UK	
	2023	2043	2023	2043
0-15	16.3%	14.1%	18.3%	15.2%
16-64	63.4%	61.1%	62.8%	62.2%
65+	20.3%	24.8%	18.9%	22.6%
<b>Total</b>	<b>5,490,100</b>	<b>5,770,150</b>	<b>68,265,200</b>	<b>75,585,250</b>

### 3.2.3 Labour Market and Employment

39. In 2023, there were 2.7 million people in employment in Scotland, which was equivalent to 8.2% of total employment in Great Britain (GB) (ONS, 2024).
40. During the development phase, which includes project management, project design and EIA, there will be opportunities in the professional services sector, which employs 190,000 people in Scotland (equivalent to 6.3% of GB employment in the sector).
41. Employment in electricity, gas, steam and air conditioning supply sectors in Scotland (20,000 people) is 16.9% of GB’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.
42. Sectors relevant to the construction phase include construction (136,000 jobs or 8.6% of GB employment in the sector), transportation and storage (119,000 jobs or 7.5% of GB employment in the sector) and mining and quarrying (25,000 jobs or 54.3% of GB employment, reflecting Scotland’s strength in oil and gas).

Table 3.4 Employment in Selected Industries, 2023

	Scotland	Great Britain*	Scotland as a % of GB
Professional, scientific and technical activities	190,000	2,993,000	6.3%
Manufacturing	178,000	2,374,000	7.5%
Construction	136,000	1,573,000	8.6%
Transportation and storage	119,000	1,595,000	7.5%
Mining and quarrying (including oil and gas)	25,000	46,000	54.3%
Electricity, gas, steam and air conditioning	20,000	118,000	16.9%
<b>Total Employment</b>	<b>2,657,000</b>	<b>32,259,000</b>	<b>8.2%</b>

\*Great Britain does not include Northern Ireland.

### 3.2.4 Annual Economic Output

43. The WDA will contribute to the Scottish and UK economies during all phases, and its contribution will be measured in GVA. In 2023, the total economic output of the Scottish and UK economies was:
  - £168.2 billion GVA in Scotland; and
  - £2,273 billion GVA in the UK.



### 3.3 LOCAL AREAS

44. This section presents a socio-economic baseline of the areas surrounding a range of ports that are being considered by the Developer. These are indicative, subject to change and build on consultations with the local communities. The baseline has been produced based on official statistics, as well as consultations undertaken as part of a previous assessment of the economic impact of the Project (BiGGAR Economics, 2024).

#### 3.3.1 Hunterston

45. Hunterston is a town in East Ayrshire and in 2022, it and the surrounding area had a population of 10,107, an increase of 18.8% since 2012. In comparison to the Scottish average a high proportion of the population are aged over 65 (33.4%, compared to 20.3%), which may reflect challenges in retaining younger populations and the area's attractiveness to retirees. It had a population aged 16-64 of 5,420 (53.6% of the population).

46. Given its proximity to large population centres, such as Glasgow, as well as an economic activity rate (67.7%) that is substantially lower than the national average (77.0%), it is anticipated that port will have access to a large pool of labour. It may play a role in reducing the unemployment rate of 4.2%, which is higher than the national average (3.2%). The largest sector of employment is human health and social work activities (20.7%, compared to 15.6% nationally), which may reflect the generally older population. This is followed by wholesale and retail trade (15.8%, 13.2% nationally) and accommodation and food services (9.1%, 8.6% nationally), suggesting the relative importance of tourism.

47. In the past, the local economy has focused on energy, with a nuclear power station providing employment (the plant is now being decommissioned, which continues to support employment) and the Port being used for coal imports for Longannet Power Station, which ceased in 2016, resulting in the closure of the Port and loss of 120 jobs.

48. More recently, the Hunterston PARC Development Framework has considered ways in which the Port could stimulate further economic growth under three areas: Port, Industry and Marine, which includes renewable energy and aquaculture. The site has been designated as an energy hub in National Planning Framework 4 (NPF4), citing its deep-water harbour, connection to the grid and potential to support marine technologies and hydrogen.

#### 3.3.2 Kishorn

49. Kishorn Port is located in north-west Highland and has a history dating to the 1970s when thousands of workers were involved in the fabrication of oil rigs. Following closure in the 1980s, the Port was reopened in 2008, and has since provided services for offshore renewable energy, oil and gas decommissioning and aquaculture.

50. The population in the electoral ward that includes Kishorn is 11,834, and has remained fairly stable, though it is far from significant population centres. Like other areas of Highland, the share of the population aged 65+ is much higher than the Scottish average (28.1%, compared to 20.3%). There are 6,930 people aged 16-64 (58.5% of the population).

51. The main sectors of employment include accommodation and food services (28.4%, compared to 8.6% nationally), reflecting the importance of tourism, and fishing and aquaculture (7.2%, compared to 0.4% nationally). Consultations with local representatives indicate that the population near the Port has very limited unemployment, with the workforce employed at local fish farms and the Port. The local community is keen to attract a more settled, long-term population associated with the Port.



52. Like many rural areas in Highland, there is a lack of affordable housing with demand for second homes, and from retirees and those relocating to the area pushing up house prices, and limited supply of land for housing. Nevertheless, if there are secure jobs for local people the community feels that it has the capacity to provide extra housing, including at the existing on-site facilities at Kishorn Port.

### 3.3.3 Stornoway/Arnish

53. Arnish Port on the Isle of Lewis in the Western Isles is located 4 km from Stornoway, the island's main town. It was built out in the 1970s as an extension of Stornoway Port and its fabrication yard (now owned by Navantia, formerly Harland and Wolff) was initially used by the oil and gas sector.
54. The area around Arnish Port had a population of 9,204 in 2022, a 3.7% decline since 2012, and around a quarter of the population are aged 65+ (25.2%, 20.3% nationally). It had a population aged 16-64 of 5,500 (59.8% of the population).
55. Significant sectors of employment include human health and social work (19.4% of employment, compared to 15.6% nationally), public administration and defence (10.8%, 6.2% nationally) and accommodation and food services (10.8%, 8.6% nationally). A substantial proportion of the local population (up to 12%) also work in the oil and gas sector, which is not reflected in local employment statistics.
56. From the consultation undertaken it was clear that there is a desire for employment opportunities to be long term and support sustainable population growth. In addition, there are concerns around housing, where demand (including from people returning to the Western Isles) exceeds supply, leading to what has been described as a housing crisis. There has been discussion of creating a permanent village near Arnish (on land owned by Stornoway Port) to provide housing for workers at the Port.

### 3.3.4 Bendoran

57. Bendoran is a small boatyard in the southwest of the Isle of Mull, which is run by South West Mull and Iona Development, a local community company. It is currently used as a watersports centre and community space, with 2 acres of shoreside. Given the distance of Bendoran from the northwest of the island, where the largest settlement, Tobermory, is located, rather than consider the whole of Mull as being within reasonable commuting distance, the local area selected covers South Mull and Iona.
58. The area has a population of 1,282, of which 726 are aged 16-64, which is equivalent to 56.6% of the population (63.4% nationally), with a higher share of the population aged 65+ (31.1%, compared to 20.3% nationally).
59. The area is a popular visitor destination and has a high share of employment in accommodation and food services (23.0%, compared to 8.6% nationally), which is typically associated with tourism. Fishing and aquaculture are also important (18.4% of employment) with several salmon fish farms, as is crofting and agriculture, though these are not represented in employment statistics.
60. As with many island economies, Mull and Iona's economies are heavily dependent on seasonal tourism, and this contributes to difficulties in the housing market, where there is a scarce supply of affordable housing and demand from visitors, including second homes. There are also constraints associated with a lack of housing land, in part due to crofting restrictions.



### 3.3.5 Port Ellen

61. Port Ellen is the second largest town on the island of Islay. Its harbour hosts the CalMac ferry terminal, as well as a marina for smaller boats. Islay had a population of 3,183 in 2022, which has grown by 13.8% since 2012, and 27.8% of the population are aged over 65 (20.3% nationally). A further 1,865 people are aged 16-64 (58.2%).
62. The most significant industry on Islay is the whisky industry, with 9.4% of the workforce employed in the manufacture of beverages, including the distilleries of Laphroaig, Lagavulin and Ardbeg and the recently reopened Port Ellen Distillery. Whisky, as well as the natural beauty of the island, also drives the tourism sector, with 17.3% employed in the accommodation and food services sector. Fishing and aquaculture is another notable sector, which employs 8.0% of the workforce.
63. Consultations with the local population indicated a perceived over reliance on the whisky industry and an open to opportunities that could help diversify the economy. However, locals expressed concern over the availability of labour with perceptions of the local population of the economy being fully employed, and potential competition for labour from high-paying distilleries.
64. Housing is seen as a major concern with limited availability and very high prices, driven in part by demand from tourists. Efforts are ongoing to address this, with some homes recently being built, and there is potential for temporary housing solutions. There are also concerns about the poor state of public services, including broadband, roads, public transport and health care and port/ferry congestion.

### 3.3.6 Oban

65. The busy Port of Oban is located on the west coast of Argyll and Bute and acts as the main CalMac ferry terminal and one of the main logistics hubs for the Inner and Outer Hebrides, as well supporting a fishing fleet, cruise ships and leisure tourism. Infrastructure, including roads, is seen as a constraint on increased growth.
66. Oban, and the surrounding area, has a population of 8,051, and a broadly similar demographic to the Scottish average with 5,048 working age adults (62.7%, compared to 63.4% nationally). Consultations with the local community suggest that the labour market is relatively constrained.
67. The largest sectors of employment are accommodation and food services (20.6%), which is much higher than the Scottish average (8.6%) and reflects the importance of the local tourism sector. The transport and storage sector is also relatively important, accounting for 7.0% of employment (4.5% nationally).
68. While there have been recent developments built/proposed in the local area, housing is seen as a challenge, with many local people concerned with the condition of rental properties and access to housing.

### 3.3.7 Campbeltown and Machrihanish

69. Campbeltown and Machrihanish are located on the Kintyre Peninsula in Argyll and Bute. The Port is located in Campbeltown, where it hosts a CalMac ferry terminal, a marina and quayside berths. It handles cargo such as timber as well as supporting fishing and has previously acted as a transport hub for a wind turbine tower manufacturer.
70. The area around Campbeltown and Machrihanish had a population of 5,953 in 2022 and has declined by 8.3% since 2012. A lack of employment opportunities in the area has led to difficulties in attracting and retaining workers. In addition, the population aged 16-64 is lower (57.2%, or 3,449 people) than elsewhere in Scotland (63.4%), with a higher relative share aged 65+ (26.9%, 20.3% nationally).



71. In part due to the presence of the Port, transportation and storage is a major sector of employment (10.0%) compared to Scotland (4.5%). In addition, wholesale and retail trade (20.0%) and accommodation and food (10.0%) are important sectors, traditionally associated with tourism, though jobs are often seasonal and low-paid. Economic drivers include whisky, the Port and tourism (particularly related to golf).
72. Housing is seen as a concern in the local area, with low quality accommodation that is in need of refurbishment and a lack of housing supply, though there is scope to develop nearby land for housing. Other developments, such as the University of the Highlands and Islands' Argyll Brewster Centre, may provide skills needed for the offshore wind industry.

### 3.3.8 King George V

73. The King George V Dock was built in 1931 as a centre of shipbuilding and cargo, with deep water access. It continues to handle cargo, including grains, chemical and industrial equipment and has acted as a hub for onshore wind, importing and transporting 1,200 wind turbines. It has undergone recent modernisation and has good transport links.
74. The Dock is located on the border between Glasgow City and Renfrewshire, and the surrounding area had a population of 87,435 in 2022 (having increased by 5.2% since 2012), with a higher than average working age population (67.2%, compared to 63.4%). It is also located close to significant population centres, such as Glasgow and Paisley.
75. The economy is well-diversified, with nearby clusters of manufacturing excellence, substantial retail and leisure at nearby Braehead, and employment across health, public administration and administrative and support services. The economic activity is 70.4%, which is much lower than the Scottish average (77.0%), suggesting that there is labour market capacity.
76. Due to the proximity of large population centres, it is not anticipated that housing will represent a significant problem for the local area.

## 4 ECONOMIC IMPACT IN SCOTLAND AND THE UK

77. This section considers the economic impact associated with the WDA and the project as a whole (the Project).

### 4.1 WINDFARM DEVELOPMENT AREA

78. Applying the methodology set out in **Section 2.3**, this section sets out the economic impacts associated with MachairWind WDA. This includes the development and construction phase, the O&M phase and the decommissioning phase.

#### 4.1.1 WDA Development and Construction

79. It is anticipated that the total expenditure associated with the development and construction of MachairWind WDA will be £4,857 million (excluding the OfTDA and OnTDA). Assumptions were made about the share of each contract type that could be secured in Scotland and the UK, and this was used to inform the economic impact assessment.
80. It is anticipated that the largest economic opportunities for Scotland and the UK will relate to turbine assembly and installation, although the majority of turbine components are likely to be imported.



81. On this basis, it was assumed that for MachairWind Offshore Windfarm WDA development and construction expenditure of £1,327 million would be secured in Scotland and £2,491 in the UK (including Scotland) (**Table 4.1**).

*Table 4.1 MachairWind WDA Development and Construction Spending, £m*

	Scotland	UK (including Scotland)	Total
Expenditure	1,327	2,491	4,857

82. As set out in **Section 2.3**, the economic impact of this expenditure was then estimated by applying ratios of turnover/GVA and turnover per employee for the relevant sectors, and the indirect (supplier) spending and induced (staff spending) impacts were then estimated by applying economic multipliers.

83. On this basis, it was estimated that the total economic impact of MachairWind WDA would be £803 million GVA and 10,200 years of employment in Scotland and £2,435 million GVA and 34,390 years of employment in the UK (including Scotland) (**Table 4.2** and **Table 4.3**).

*Table 4.2 MachairWind WDA Development and Construction GVA Impact, £m*

	Scotland	UK (including Scotland)
Direct	460	911
Indirect	204	837
<b>Total (Direct + Indirect)</b>	<b>665</b>	<b>1,748</b>
Induced	138	687
<b>Total</b>	<b>803</b>	<b>2,435</b>

*Table 4.3 MachairWind WDA Development and Construction Employment Impact, years of employment (peak)*

	Scotland	UK (including Scotland)
Direct	5,890	12,370
Indirect	2,780	12,480
<b>Total (Direct + Indirect)</b>	<b>8,670</b>	<b>24,850</b>
Induced	1,530	9,530
<b>Total (peak)</b>	<b>10,200 (3,390)</b>	<b>34,390 (10,340)</b>

#### 4.1.2 WDA Operation and Maintenance

84. As with the development and construction spending, the SCDS contained details of the anticipated expenditure on O&M (over six years), including the shares expected to be secured in Scotland and the UK. By dividing the SCDS figures by six it was estimated that the average annual O&M expenditure for MachairWind Offshore Wind WDA is expected to be £66 million.

85. This was broken down into smaller categories of expenditure, and assumptions were made about the share of expenditure expected to be secured in Scotland and the UK. The largest opportunities in Scotland are expected to be in turbine maintenance and service, maintaining balance of plant and providing operational insurance.



86. On this basis, it is anticipated that £50 million of annual O&M expenditure would be secured in Scotland and £59 million in the UK (including Scotland) (**Table 4.4**).

*Table 4.4 MachairWind WDA Annual O&M Spending, £m*

	Scotland	UK (including Scotland)	Total
Expenditure	50	59	66

87. Applying appropriate economic ratios and multipliers (as set out in **Section 2.3**), it was estimated that the annual economic impact from O&M would be £29 million GVA and 390 jobs in Scotland and £55 million GVA and 740 jobs in the UK (including Scotland) (**Table 4.5** and **Table 4.6**).

*Table 4.5 MachairWind WDA Annual O&M GVA Impact, £m*

	Scotland	UK (including Scotland)
Direct	17	20
Indirect	7	18
<b>Total (Direct + Indirect)</b>	<b>24</b>	<b>39</b>
Induced	5	16
<b>Total</b>	<b>29</b>	<b>55</b>

*Table 4.6 MachairWind WDA O&M Employment Impact (Jobs)*

	Scotland	UK (including Scotland)
Direct	225	260
Indirect	105	270
<b>Total (Direct + Indirect)</b>	<b>330</b>	<b>530</b>
Induced	60	200
<b>Total</b>	<b>390</b>	<b>740</b>

#### 4.1.3 WDA Decommissioning

88. While the level of decommissioning spend was not provided as part of the SCDS, industry studies (BVG Associates, 2021) suggest that the cost of decommissioning a WDA the size of MachairWind could be around £310 million.

89. Based on conservative industry analysis of Scotland and the UK's ability to secure decommissioning contracts (BVG Associates, 2021), it was assumed that 30% of contracts would be secured in Scotland. It should be noted that decommissioning is expected to take place several decades after the time of writing and so it is possible that the capacity of the Scottish and UK economies to undertake decommissioning work may change in that period.

90. It is anticipated that the largest economic opportunities for Scotland will relate to cable decommissioning and foundation decommissioning. Further economic opportunities will be associated with turbine decommissioning and mooring and anchoring decommissioning.

91. On this basis, it was anticipated that £93 million of decommissioning expenditure could be secured in the UK, all of which is anticipated to be in Scotland (**Table 4.7**).



*Table 4.7 MachairWind WDA Decommissioning Spending, £m*

	Scotland	UK (including Scotland)	Total
Expenditure	93	93	310

92. Applying appropriate economic ratios and multipliers (as set out in **Section 2.3**), it was estimated that the total economic impact from decommissioning MachairWind Offshore Windfarm WDA would be £51 million GVA and 610 years of employment in Scotland, and £77 million GVA and 940 years of employment in the UK (including Scotland) (**Table 4.8** and **Table 4.9**).

*Table 4.8 MachairWind WDA Decommissioning GVA Impact, £m*

	Scotland	UK (including Scotland)
Direct	29	29
Indirect	13	26
<b>Total (Direct + Indirect)</b>	<b>42</b>	<b>55</b>
Induced	9	22
<b>Total</b>	<b>51</b>	<b>77</b>

*Table 4.9 MachairWind WDA Decommissioning Employment Impact, years of employment*

	Scotland	UK (including Scotland)
Direct	340	340
Indirect	170	330
<b>Total (Direct + Indirect)</b>	<b>510</b>	<b>670</b>
Induced	100	260
<b>Total</b>	<b>610</b>	<b>940</b>



## 4.2 PROJECT

93. This section sets out the economic impacts associated with the MachairWind Offshore Windfarm (including the WDA, OfTDA and OnTDA). This includes the development and construction phase, the O&M phase and the decommissioning phase.

### 4.2.1 Project Development and Construction

94. It is anticipated that the total expenditure associated with the development and construction of MachairWind Offshore Windfarm will be £6.0 billion, of which Scotland would secure £1.8 billion and the UK would secure £3.1 billion.

Table 4.10 MachairWind Offshore Windfarm Development and Construction Spending, £m

	Scotland	UK (including Scotland)	Total
Expenditure	1,788	3,123	5,991

95. For the MachairWind Offshore Windfarm, it was estimated that the economic impact in Scotland would be £1.1 billion GVA and 14,250 years of employment and that the impact in the UK (including Scotland) would be £3.1 billion GVA and 43,470 years of employment (**Table 4.11** and **Table 4.12**).

Table 4.11 MachairWind Offshore Windfarm Development and Construction GVA Impact, £m

	Scotland	UK (including Scotland)
Direct	632	1,145
Indirect	285	1,059
<b>Total (Direct + Indirect)</b>	<b>917</b>	<b>2,204</b>
Induced	188	860
<b>Total</b>	<b>1,105</b>	<b>3,064</b>

Table 4.12 MachairWind Offshore Windfarm Development and Construction Employment Impact, years of employment (peak)

	Scotland	UK (including Scotland)
Direct	8,210	15,500
Indirect	3,940	15,990
<b>Total (Direct + Indirect)</b>	<b>12,150</b>	<b>31,490</b>
Induced	2,100	11,970
<b>Total</b>	<b>14,250 (5,160)</b>	<b>43,470 (12,840)</b>

### 4.2.2 Project Operation and Maintenance

96. On the basis of the SCDS, it is anticipated that the annual O&M expenditure would be £68 million, of which £51 million could be secured in Scotland and £61 million could be secured in the UK.



Table 4.13 MachairWind Offshore Windfarm O&M Spending, £m

	Scotland	UK (including Scotland)	Total
Expenditure	51	61	68

97. For the MachairWind Offshore Windfarm, it was estimated that the annual economic impact in Scotland would be £30 million GVA and 400 jobs and that economic impact in the UK (including Scotland) would be £56 million GVA and 760 jobs (**Table 4.14** and **Table 4.15**).

Table 4.14 MachairWind Offshore Windfarm O&M GVA Impact, £m

	Scotland	UK (including Scotland)
Direct	18	21
Indirect	7	19
<b>Total (Direct + Indirect)</b>	<b>25</b>	<b>40</b>
Induced	5	16
<b>Total</b>	<b>30</b>	<b>56</b>

Table 4.15 MachairWind Offshore Windfarm O&M Employment Impact (Jobs)

	Scotland	UK (including Scotland)
Direct	240	270
Indirect	110	270
<b>Total (Direct + Indirect)</b>	<b>340</b>	<b>540</b>
Induced	60	200
<b>Total</b>	<b>400</b>	<b>760</b>

### 4.2.3 Project Decommissioning

98. Based on BiGGAR Economics analysis, it was estimated that the cost of decommissioning would be £650 million. Based on industry analysis (BVG Associates, 2021), it was assumed that Scotland and the UK could secure 30% of contracts, worth £195 million.

Table 4.16 MachairWind Offshore Windfarm Decommissioning Spending, £m

	Scotland	UK (including Scotland)	Total
Expenditure	195	195	650

99. Decommissioning contracts are expected to generate an economic impact of £105 million GVA and 1,260 years of employment and that the UK (including Scotland) could secure contracts worth £195 million, generating an economic impact of £159 million GVA and 1,930 years of employment (**Table 4.17** and **Table 4.18**).



Table 4.17 MachairWind Offshore Windfarm Decommissioning GVA Impact, £m

	Scotland	UK (including Scotland)
Direct	60	60
Indirect	27	54
<b>Total (Direct + Indirect)</b>	<b>87</b>	<b>114</b>
Induced	18	46
<b>Total</b>	<b>105</b>	<b>159</b>

Table 4.18 MachairWind Offshore Windfarm Decommissioning Employment Impact, years of employment

	Scotland	UK (including Scotland)
Direct	700	700
Indirect	350	680
<b>Total (Direct + Indirect)</b>	<b>1,050</b>	<b>1,380</b>
Induced	210	540
<b>Total</b>	<b>1,260</b>	<b>1,930</b>

## 5 ECONOMIC IMPACT IN LOCAL AREAS

100. As discussed in **Section 2.3**, there are three types of ports that will be used by MachairWind, including:
- A marshalling and assembly port, which will be used to store and assemble parts during the construction phase;
  - Marine operations base, which will be located close to the WDA and be used as a base for workers during the construction phase;
  - An O&M port, which will be used for day-to-day operations during the operation phase.
101. It is anticipated that around £143 million will be spent at ports during the development and construction phase. Of this it is anticipated that around £113 million (79%) will be spent at marshalling and assembly ports on contracts associated with warehousing, tower assembly and vehicle berthing. A further £30 million (21%) will be spent at the Marine Operation Base on contracts associated with tower assembly and construction activities.
102. During the operation phase, there will be 60 employees located at the O&M port, with associated supply chain expenditure, including the use of laydown and warehousing space, and the berthing of vessels.
103. For each type of port, three locations have been selected, and an assessment of the potential economic impact has been undertaken on the basis of the associated contracts and the capacity of the Study Area to provide the needed workforce. Where the volume of economic activity exceeds the local area's capacity, the number of transient workers required has been assessed. These ports are indicative and may be subject to change.
104. In line with **Section 2.3**, the economic impacts have then been estimated based on the activity in each sector, with calculations of direct, indirect and induced GVA and employment.



## 5.1 MARSHALLING AND ASSEMBLY PORT IMPACTS

### 5.1.1 Stornoway/Arnish

105. It is anticipated that the largest economic opportunities for the Stornoway/Arnish Local Area will relate to tower assembly, berthing of vessels and construction of the offshore substation.
106. On this basis, it was assumed that development and construction expenditure of £74 million would be secured in the Local Area and £39 million would be secured by the transient workforce required (**Table 5.1**).

*Table 5.1 MachairWind Offshore Windfarm Stornoway/Arnish Development and Construction Spending, £m*

	Stornoway/Arnish Local Area	Transient Workforce
Expenditure	74	39

107. As set out in **Section 2.3**, the economic impact of this expenditure was then estimated by applying ratios of turnover/GVA and turnover per employee for the relevant sectors, and the indirect (supplier) spending and induced (staff spending) impacts were then estimated by applying economic multipliers.
108. On this basis, it was estimated that the total economic impact of MachairWind Offshore Windfarm in the Stornoway/Arnish Local Area would be £41 million GVA and 696 years of employment, peaking at 232 jobs, with a further £13 million GVA and 288 years of direct employment associated with transient workforce, peaking at 96 jobs (**Table 5.2** and **Table 5.3**).

*Table 5.2 MachairWind Offshore Windfarm Stornoway/Arnish Development and Construction GVA Impact, £m*

	Stornoway/Arnish Local Area
Direct	32
Indirect	6
<b>Total (Direct + Indirect)</b>	<b>38</b>
Induced	3
<b>Total</b>	<b>41</b>
Transient (direct staff costs)	13

*Table 5.3 MachairWind Offshore Windfarm Stornoway/Arnish Development and Construction Employment Impact, years of employment (peak)*

	Stornoway Local Area
Direct	543
Indirect	102
<b>Total (Direct + Indirect)</b>	<b>645</b>
Induced	51
<b>Total</b>	<b>696 (232)</b>
Transient Workforce	288 (96)



**5.1.2 Kishorn**

- 109. It is anticipated that the largest economic opportunities for the Kishorn Local Area will relate to tower assembly, berthing of vessels and construction of the offshore substation.
- 110. On this basis, it was assumed that development and construction expenditure of £59 million would be secured in Kishorn Local Area and £55 million would be secured by the transient workforce (**Table 5.4**).

*Table 5.4 MachairWind Offshore Windfarm Kishorn Development and Construction Spending, £m*

	Kishorn Local Area	Transient Workforce
Expenditure	59	55

- 111. As set out in **Section 2.3**, the economic impact of this expenditure was then estimated by applying ratios of turnover/GVA and turnover per employee for the relevant sectors, and the indirect (supplier) spending and induced (staff spending) impacts were then estimated by applying economic multipliers.
- 112. On this basis, it was estimated that the total economic impact of MachairWind Offshore Windfarm in the Kishorn Local Area would be £31 million GVA and 527 years of employment, peaking at 176 jobs, with a further £15 million GVA and 412 years of direct employment associated with the transient workforce, peaking at 137 jobs (**Table 5.5** and **Table 5.6**).

*Table 5.5 MachairWind Offshore Windfarm Kishorn Development and Construction GVA Impact, £m*

	Kishorn Local Area
Direct	25
Indirect	4
<b>Total (Direct + Indirect)</b>	<b>29</b>
Induced	2
<b>Total</b>	<b>31</b>
Transient (direct staff costs)	15

*Table 5.6 MachairWind Offshore Windfarm Kishorn Development and Construction Employment Impact, years of employment (peak)*

	Kishorn Local Area
Direct	419
Indirect	75
<b>Total (Direct + Indirect)</b>	<b>494</b>
Induced	33
<b>Total</b>	<b>527 (176)</b>
Transient Workforce	412 (137)



**5.1.3 Hunterston**

- 113. It is anticipated that the largest economic opportunities for the Hunterston Local Area will relate to tower assembly, berthing of vessels and construction of the offshore substation.
- 114. On this basis, it was assumed that development and construction expenditure of £101 million would be secured in the Local Area and £12 million will be secured by the transient workforce required (**Table 5.7**).

*Table 5.7 MachairWind Offshore Windfarm Hunterston Development and Construction Spending, £m*

	Hunterston Local Area	Transient Workforce
Expenditure	101	12

- 115. As set out in **Section 2.3**, the economic impact of this expenditure was then estimated by applying ratios of turnover/GVA and turnover per employee for the relevant sectors, and the indirect (supplier) spending and induced (staff spending) impacts were then estimated by applying economic multipliers.
- 116. On this basis, it was estimated that the total economic impact of MachairWind Offshore Windfarm in the Hunterston Local Area would be £62 million GVA and 1,051 years of employment, peaking at 350 jobs, with a further £4 million GVA and 88 years of direct employment associated with the transient workforce, peaking at 29 jobs (**Table 5.8** and **Table 5.9**).

*Table 5.8 MachairWind Offshore Windfarm Hunterston Development and Construction GVA Impact, £m*

	Hunterston Local Area
Direct	44
Indirect	11
<b>Total (Direct + Indirect)</b>	<b>55</b>
Induced	7
<b>Total</b>	<b>62</b>
Transient (direct staff costs)	4

*Table 5.9 MachairWind Offshore Windfarm Hunterston Development and Construction Employment Impact, years of employment (peak)*

	Hunterston Local Area
Direct	743
Indirect	200
<b>Total (Direct + Indirect)</b>	<b>944</b>
Induced	108
<b>Total</b>	<b>1,051 (350)</b>
Transient Workforce	88 (29)



## 5.2 MARINE OPERATIONS BASE IMPACTS

### 5.2.1 Bendoran

117. Part of the development and construction spending from the SCDS is expected to contribute towards the activities taking place in the marine operations base. It is anticipated that the largest economic opportunities for the Bendoran Local Area will relate to offshore assembly.
118. On this basis, it was assumed that development and construction expenditure of £10 million would be secured in the Bendoran Local Area and £20 million by the transient workforce (**Table 5.10**).

*Table 5.10 MachairWind Offshore Windfarm Bendoran Development and Construction Spending, £m*

	Bendoran Local Area	Transient Workforce
Expenditure	10	20

119. As set out in **Section 2.3**, the economic impact of this expenditure was then estimated by applying ratios of turnover/GVA and turnover per employee for the relevant sectors, and the indirect (supplier) spending and induced (staff spending) impacts were then estimated by applying economic multipliers.
120. On this basis, it was estimated that the total economic impact of MachairWind Offshore Windfarm in the Bendoran Local Area would be £4.7 million GVA and 78 years of employment, peaking at 26 jobs, with a further £6.1 million GVA and 137 jobs associated with the transient workforce, peaking at 46 jobs (**Table 5.11** and **Table 5.12**).

*Table 5.11 MachairWind Offshore Windfarm Bendoran Development and Construction GVA Impact, £m*

	Bendoran Local Area
Direct	4.2
Indirect	0.3
<b>Total (Direct + Indirect)</b>	<b>4.6</b>
Induced	0.1
<b>Total</b>	<b>4.7</b>
Transient Workforce (direct staff costs)	6.1

*Table 5.12 MachairWind Offshore Windfarm Bendoran Development and Construction Employment Impact, years of employment (peak)*

	Bendoran Local Area
Direct	70
Indirect	6
<b>Total (Direct + Indirect)</b>	<b>76</b>
Induced	2
<b>Total</b>	<b>78 (26)</b>
Transient Workforce	137 (46)



### 5.2.2 Port Ellen

121. It is anticipated that the largest economic opportunities for the Port Ellen Local Area will relate to offshore assembly.
122. On this basis, it was assumed that development and construction expenditure of £15 million would be secured in the Port Ellen Local Area and £15 million by the transient workforce (**Table 5.13**).

*Table 5.13 MachairWind Offshore Windfarm Port Ellen Development and Construction Spending, £m*

	Port Ellen Local Area	Transient Workforce
Expenditure	15	15

123. As set out in **Section 2.3**, the economic impact of this expenditure was then estimated by applying ratios of turnover/GVA and turnover per employee for the relevant sectors, and the indirect (supplier) spending and induced (staff spending) impacts were then estimated by applying economic multipliers.
124. On this basis, it was estimated that the total economic impact of MachairWind Offshore Windfarm in the Port Ellen Local Area would be £7.0 million GVA and 116 years of employment, peaking at 39 jobs, with a further £4.6 million GVA and 102 jobs associated with the transient workforce, peaking at 34 jobs (**Table 5.14** and **Table 5.15**).

*Table 5.14 MachairWind Offshore Windfarm Port Ellen Development and Construction GVA Impact, £m*

	Port Ellen Local Area
Direct	6.3
Indirect	0.5
<b>Total (Direct + Indirect)</b>	<b>6.8</b>
Induced	0.2
<b>Total</b>	<b>7.0</b>
Transient Workforce (direct staff costs)	4.6

*Table 5.15 MachairWind Offshore Windfarm Port Ellen Development and Construction Employment Impact, years of employment (peak)*

	Port Ellen Local Area
Direct	105
Indirect	9
<b>Total (Direct + Indirect)</b>	<b>113</b>
Induced	3
<b>Total</b>	<b>116 (39)</b>
Transient Workforce	102 (34)



**5.2.3 Oban**

- 125. It is anticipated that the largest economic opportunities for the Oban Local Area will relate to offshore assembly.
- 126. On this basis, it was assumed that development and construction expenditure of £17 million would be secured in the Oban Local Area and £13 million by the transient workforce (**Table 5.16**).

*Table 5.16 MachairWind Offshore Windfarm Oban Development and Construction, £m*

	Oban Local Area	Transient Workforce
Expenditure	17	13

- 127. As set out in **Section 2.3**, the economic impact of this expenditure was then estimated by applying ratios of turnover/GVA and turnover per employee for the relevant sectors, and the indirect (supplier) spending and induced (staff spending) impacts were then estimated by applying economic multipliers.
- 128. On this basis, it was estimated that the total economic impact of MachairWind Offshore Windfarm in the Port Ellen Local Area would be £8.7 million GVA and 134 years of employment, peaking at 48 jobs, with a further £4.1 million GVA and 92 jobs associated with the transient workforce, peaking at 31 jobs (**Table 5.17** and **Table 5.18**).

*Table 5.17 MachairWind Offshore Windfarm Oban Development and Construction GVA Impact, £m*

	Oban Local Area
Direct	6.9
Indirect	1.1
<b>Total (Direct + Indirect)</b>	<b>8.0</b>
Induced	0.7
<b>Total</b>	<b>8.7</b>
Transient Workforce (direct staff costs)	4.1

*Table 5.18 MachairWind Offshore Windfarm Oban Development and Construction Employment Impact, years of employment (peak)*

	Oban Local Area
Direct	115
Indirect	19
<b>Total (Direct + Indirect)</b>	<b>134</b>
Induced	9
<b>Total</b>	<b>143 (48)</b>
Transient Workforce	92 (31)



**5.3 OPERATIONS AND MAINTENANCE PORT IMPACTS**

- 129. As with the development and construction spending, the SCDS contained details of the anticipated expenditure on O&M (over six years), and the Developer provided information on the employment at O&M ports.
- 130. On this basis, it was assumed that there would be 60 full time employees in O&M roles at the port, including the control room, office support and day-today maintenance. The economic impact of these roles was estimated based on the average staff costs, which suggests an economic impact of £2.7 million GVA.
- 131. Additional expenditure would take place in the local area, including on warehousing, laydown storage and berthing of vessels, though some of these contracts will be secured outside of the area. The direct economic impact would therefore include the impact of the 60 staff employed directly, as well as the impact associated with the supply chain.

**5.3.1 Hunterston**

- 132. It was estimated that in Hunterston, the total economic impact would be £3.4 million GVA, of which the largest impact would be associated with direct staff costs (**Table 5.19**), and 72 jobs, of which 60 would be directly employed at the Port (**Table 5.20**).

*Table 5.19 MachairWind Offshore Windfarm Hunterston Annual O&M GVA Impact, £m*

	Hunterston Local Area
Direct	3.0
Indirect	< 0.1
<b>Total (Direct + Indirect)</b>	<b>3.0</b>
Induced	0.4
<b>Total</b>	<b>3.4</b>

*Table 5.20 MachairWind Offshore Windfarm Hunterston Annual O&M Employment Impact (Jobs)*

	Hunterston Local Area
Direct	63
Indirect	1
<b>Total (Direct + Indirect)</b>	<b>64</b>
Induced	8
<b>Total</b>	<b>72</b>



### 5.3.2 Campbeltown and Machrihanish

133. It was estimated that in Campbeltown and Machrihanish, the total economic impact would be £2.9 million GVA, of which the largest impact would be associated with direct staff costs (**Table 5.21**), and 63 jobs, of which 60 would be directly employed at the Port (**Table 5.22**).

*Table 5.21 MachairWind Offshore Windfarm Campbeltown and Machrihanish Annual O&M GVA Impact, £m*

	Campbeltown and Machrihanish Local Area
Direct	2.8
Indirect	<0.1
<b>Total (Direct + Indirect)</b>	<b>2.8</b>
Induced	0.1
<b>Total</b>	<b>2.9</b>

*Table 5.22 MachairWind Offshore Windfarm Campbeltown and Machrihanish Annual O&M Employment Impact (Jobs)*

	Campbeltown and Machrihanish Local Area
Direct	62
Indirect	0
<b>Total (Direct + Indirect)</b>	<b>62</b>
Induced	1
<b>Total</b>	<b>63</b>

### 5.3.3 King George V

134. It was estimated that at King George V, the total economic impact would be £3.5 million GVA, of which the largest impact would be associated with direct staff costs (**Table 5.23**), and 73 jobs, of which 60 would be directly employed at the Port (**Table 5.24**).

*Table 5.23 MachairWind Offshore Windfarm King George V Annual O&M GVA Impact, £m*

	King George V Local Area
Direct	3.0
Indirect	0.1
<b>Total (Direct + Indirect)</b>	<b>3.1</b>
Induced	0.4
<b>Total</b>	<b>3.5</b>



Table 5.24 MachairWind Offshore Windfarm King George V Annual O&M Employment Impact (Jobs)

	King George V Local Area
Direct	64
Indirect	1
<b>Total (Direct + Indirect)</b>	<b>65</b>
Induced	8
<b>Total</b>	<b>73</b>

## 6 SUMMARY

### 6.1.1 MachairWind Summary

135. For MachairWind (i.e. the WDA as well as the OfTDA and OnTDA), the total investment during the construction phase would be £6.0 billion, of which £1.8 billion could be secured in Scotland and £3.1 billion could be secured in the UK. It was estimated that the Project could support:

- £1.1 billion GVA and 14,250 years of employment in Scotland (peaking at 5,160 jobs); and
- £3.1 billion GVA and 43,470 years of employment in the UK (peaking at 12,840 jobs).

136. During each year of the O&M phase, it was assumed that £68 million would be spent, of which Scotland could secure £51 million and the UK could secure £61 million. It was estimated that the Project could support:

- £30 million GVA and 500 jobs in Scotland; and
- £56 million GVA and 760 jobs in the UK.

137. It was estimated, based on BiGGAR Economics modelling, that during the decommissioning phase the total expenditure associated with the Project would be £650 million, of which Scotland and the UK could each secure £195 million. It was estimated that the Project could support:

- £105 million GVA and 1,260 years of employment in Scotland; and
- £159 million GVA and 1,930 years of employment in the UK.

### 6.1.2 WDA Summary

138. For the WDA, the total investment during the construction phase would be £4.9 billion, of which £1.3 billion could be secured in Scotland and £2.5 billion could be secured in the UK. It was estimated that the WDA could support:

- £803 million GVA and 10,200 years of employment in Scotland (peaking at 3,390 jobs); and
- £2.4 billion GVA and 34,390 years of employment in the UK (peaking at 10,340 jobs).

139. During each year of the O&M phase, it was assumed that £66 million would be spent, of which Scotland could secure £50 million and the UK could secure £59 million. It was estimated that the WDA could support:

- £29 million GVA and 390 jobs in Scotland; and
- £55 million GVA and 740 jobs in the UK.



140. It was estimated, based on BiGGAR Economics modelling, that during the decommissioning phase the total expenditure associated with the Project would be £310 million, of which Scotland and the UK could each secure £93 million. It was estimated that the WDA could support:
- £51 million GVA and 610 years of employment in Scotland; and
  - £77 million GVA and 940 years of employment in the UK.

### 6.1.3 Local Impact Summary

141. The Developer is considering a number of ports on the west coast that could be used to facilitate the construction and operation of MachairWind. The different port types include:
- A marshalling and assembly port, which will be used to store and assemble parts. The area around the port is likely to experience an increase in employment equivalent to 300-400 jobs over a 3 year period;
  - A marine operations base, which will be located close to the WDA and be used as a base for workers. The area around the port is likely to experience an increase in employment equivalent to around 70-80 jobs over a 3 year period; and
  - An O&M port, which will be used for day-to-day operations during the operation phase. The area around the port is likely to experience a long-term increase in employment of 60-70 jobs.
142. A baseline assessment of the different local areas suggests that many of these places (with some exceptions) are relatively far from significant population centres, with a lower share of working age adults in the population and economies that are often reliant on a small number of industries (e.g. whisky manufacturing, tourism, aquaculture). They often have limited capacity to accommodate an increased population.
143. The Developer is aware of potential issues and is taking steps to address them, as discussed in **Appendix 16 Socio-economic Action Plan**, which discusses strategies to increase local economic benefits.



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## REFERENCES

BVG Associates. (2021). Guide to an Offshore Wind Farm.

BVG Associates. (2021). UK and Scottish content baseline and roadmap.

BiGGAR Economics (2024), MachairWind Development, Economic and Social Scenarios: Opportunities and Impacts

Machairwind Limited. (2023). Supply Chain Development Statement Outlook.

National Records of Scotland. (2024). Mid-2023 Population Estimates Scotland.

ONS. (2023). Principal Population Projections 2022-based.

ONS. (2024). Annual Business Survey 2022.

ONS. (2024). Business Register and Employment Survey 2023.

ONS. (2024). Mid-year Population Estimated United Kingdom 2023.

ONS. (2024). Supply and Use Tables 2021.

ONS. (2025). Regional gross value added (balanced) by industry: all International Territorial Level (ITL) regions 2023.

Scottish Government. (2024). Scottish Input Output Tables 2021.

