Partners in UK offshore wind

MONA OFFSHORE WIND PROJECT

Environmental Statement

Volume 8, Annex 3.1: Socio-economics technical impact report

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Prepared by:

RPS

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Mona Offshore Wind Ltd.

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Glossary

Term	Meaning
CAPEX	Capital expenditure
DECEX	Decommissioning expenditure
DEVEX	Development (and project management) expenditure
Epicentres of impact	Locations from where impacts 'radiate'.
Gross Value Added	Gross Value Added is the measure of the value of goods and services produced by a business, area, industry, or sector of an economy.
OPEX	Operational expenditure
Outline Employment and Skills Plan	A plan identifying opportunities for the employment and skills development of local people in relation to the Mona Offshore Wind Project.
Tier 1 contractor	Tier 1 contractors are those that have a direct contract with the ultimate developer. These companies are hired by the developer and are responsible for most aspects of the project from start to finish. This includes coordinating subcontractors, scheduling inspections, obtaining permits, managing budgets and timelines, and ensuring all safety protocols are adhered to.

Acronyms

Acronym	Description
FTE	Full time equivalent
GVA	Gross Value Added
ONS	Office for National Statistics
ORE	Offshore Renewable Energy
UK	United Kingdom

Units

Unit	Description
£ bn	billion
GW	Gigawatt
MW	Megawatt
£ m	million
%	Percentage

1 Socio-economics technical impact report

1.1 Introduction

1.1.1.1 This technical report provides supplementary information regarding methodology and outputs which inform the assessment of **economic** and **social** impacts within Volume 4, Chapter 3: Socio-economics of the Environmental Statement.

1.1.1.2 Specifically, this technical impact report considers the potential impact of expenditure associated with the Mona Offshore Wind Project on employment and Gross Value Added (GVA), and the related potential workforce impacts on housing, accommodation, and population.

1.1.1.3 The Mona Offshore Wind Project is a proposed offshore wind farm located in the east Irish Sea within Welsh waters. The project presents an opportunity to further develop the offshore wind industry in the United Kingdom (UK) and to support growth in employment and economic output.

1.1.1.4 This report considers the potential **economic** and **social** impacts of the Mona Offshore Wind Project as follows:

- **PART 1 – Economic impacts**: covering the employment and Gross Value Added (GVA) impacts associated with the Mona Offshore Wind Project
- **PART 2 – Social impacts**: covering the impacts of the workforce associated with the Mona Offshore Wind Project on housing, accommodation, and population.

1.1.1.5 The approach to separating potential economic and social impacts is consistent with the best available and non-binding industry guidance, Glasson *et al.* (2020) Guidance on assessing the socio-economic impacts of offshore wind farms, and Marine Scotland (2022) guidance Defining 'Local Area' for assessing impact of offshore renewables and other marine developments.

1.1.1.6 Potential **tourism** impacts are considered fully within Volume 4, Chapter 3: Socio-economics of the Environmental Statement, and are not considered within this report[1].

1.1.1.7 Potential **socio-economic impacts on the Isle of Man associated with lifeline ferry services** are considered fully within Volume 4, Chapter 3: Socio-economics of the Environmental Statement, and are not considered in this report[2].

1.1.1.8 This technical impact report considers the potential economic and social impact of the Mona Offshore Wind Project seaward of Mean High Water Springs (MHWS) and onshore receptors (landward of Mean Low Water Springs (MLWS)) during the construction, operations and maintenance and decommissioning phases.

1.1.1.9 With respect to consideration of potential offshore and onshore impacts, the approach of this assessment is focused on the 'source' of a potential impact, rather than the

[1] The effect-receptor pathways between the Mona Offshore Wind Project and tourism conditions include visual amenity, temporary overnight accommodation, and recreation – there is limited effect-receptor linkages between project expenditure and this receptor. Where linkages do exist – specifically by way of temporary overnight accommodation impacts – this relationship is explored fully within Volume 4, Chapter 3: Socio-economics of the Environmental Statement.

[2] The effect-receptor pathways between the Mona Offshore Wind Project and socio-economic conditions on the Isle of Man include lifeline ferry services and visual amenity – there is limited effect-receptor pathway between project expenditure and this receptor.

ultimate location where the impact occurs. This is consistent with the broader approach to separating onshore and offshore effects:

- Offshore: if physical infrastructure and civil works are located offshore, any resulting impacts are categorised as offshore
- Onshore: if physical infrastructure and civil works are located onshore, any resulting impacts are categorised as onshore.

PART 1 – Economic Impacts

1.2 Economic study area(s)

1.2.1 National economic study area(s) – offshore and onshore

1.2.1.1 Given the range of requirements associated with the delivery of the Mona Offshore Wind Project, it is likely that project expenditure will deliver impacts of varying magnitude in different locations.

1.2.1.2 National economic study areas are defined to reflect the wider reach of employment and GVA impacts that may materialise through the supply chain and demand for labour. As such, two national economic study areas have been identified:

- **UK**: understanding the UK content of potential economic impacts associated with offshore wind farm developments is an important aspect of considering a project's potential benefits. It is recognised, therefore, that assessing the potential impacts of the Mona Offshore Wind Project at the UK level will assist the Planning Inspectorate in its examination of the project application
- **Wales**: the proximity of the site to the Welsh coast makes it possible that ports within Wales may be selected to support delivery of some elements of the Mona Offshore Wind Project. Assessing potential impacts at the Wales level will assist the Planning Inspectorate in understanding the Mona Offshore Wind Project's potential economic benefits on a devolved nation, the waters of which the Mona Offshore Wind Project will be located within. Wales can be defined as both a nation and a region of the UK. For the purposes of this assessment, Wales is defined as a nation.

1.2.1.3 The economic study areas for the socio-economics assessment are shown below in Figure 1.1.

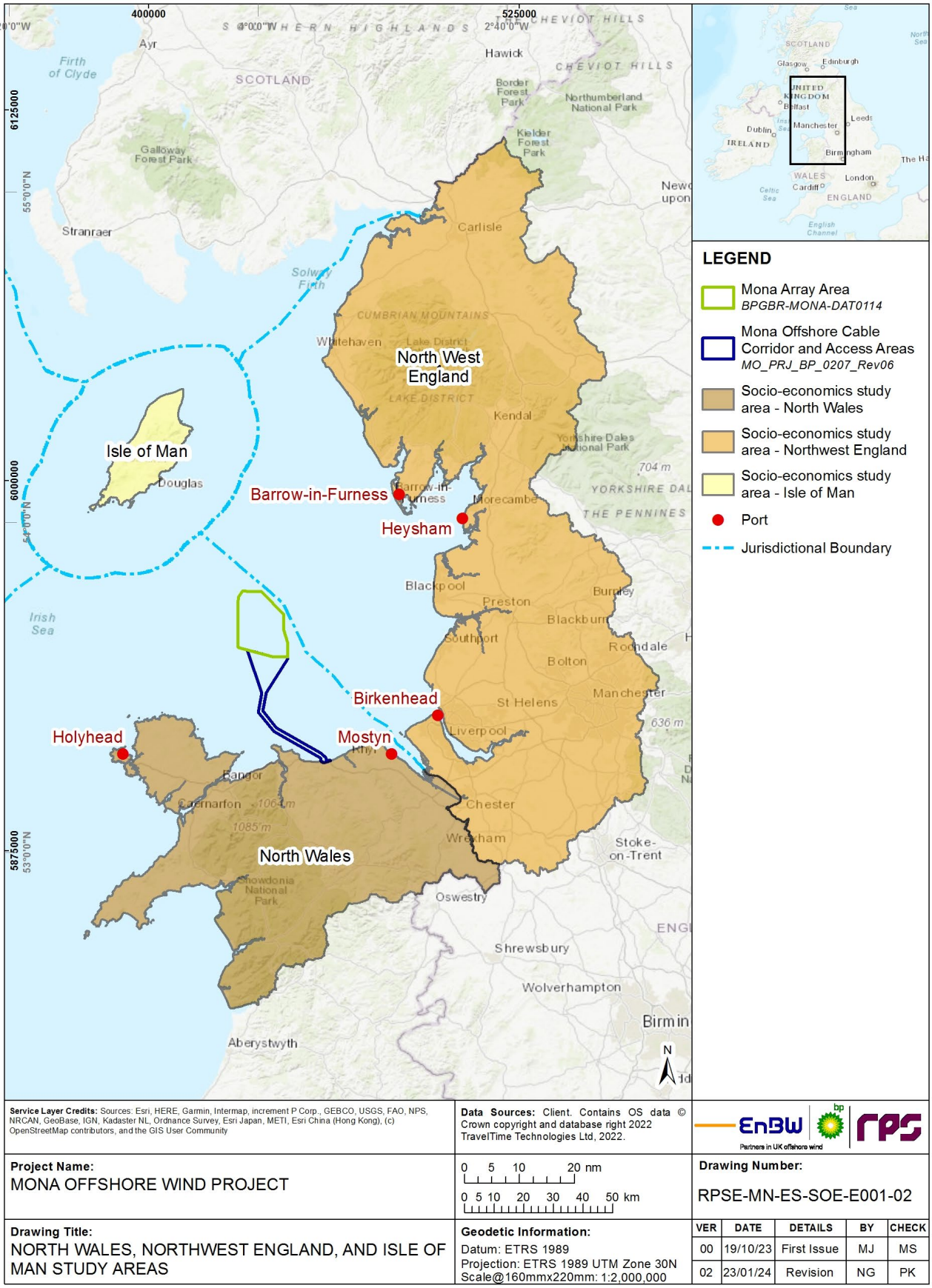

Figure 1.1 North Wales, Northwest England, and Isle of Man study areas

Note: Isle of Man is displayed in Figure 1.1 to show the extent of the study areas assessed within Volume 4, Chapter 3: Socio-economics of the Environmental Statement. There is limited effect-receptor pathway between project expenditure and socio-economic conditions on the Isle of Man, therefore the Isle of Man is not considered within this report.

1.2.2 Sub-national economic study area(s) – offshore assessment

1.2.2.1 To ensure the assessment of potential socio-economic impacts is proportionate, the offshore assessment considers sub-national study areas which concentrate on locations England and Wales in proximity to the Irish Sea. Therefore, locations in North Wales and Northwest England are considered as part of this assessment[3].

1.2.2.2 The various components which contribute to the delivery of the Mona Offshore Wind Project will have different 'epicentres of impact' – locations from where the potential impacts 'radiate'. Industry best practice guidance 'Defining 'Local Area' for assessing impact of offshore renewables and other marine developments' (Marine Scotland 2022) sets out that economic impacts can be geographically linked to a range of epicentres, including construction and operations and maintenance ports involved in the delivery of offshore infrastructure.

1.2.2.3 In this assessment the sub-national economic study areas are linked to the selection of potential construction, operations and maintenance, and decommissioning ports within North Wales and Northwest England that have the capability to support the associated supply of inputs, products and services for the Mona Offshore Wind Project. These ports, and their socio-economic catchment areas, are potential epicentres of impact on economic receptors. Due to the infrastructure requirements of large components (e.g. laydown and storage areas), it is likely that multiple fabrication and marshalling ports will be utilised during project delivery. This is likely to include ports outside North Wales and Northwest England given the port capabilities set out within Appendix A. The assessment also considers a situation where no Tier 1 port contracts are secured within North Wales or Northwest England.

1.2.2.4 The following approach has been followed to define potential sub-national study areas:

- **Step 1:** identification of port facilities that are potential options for construction, operations and maintenance, or decommissioning bases
- **Step 2:** assessment of economic study area(s) associated with potential port facilities.

1.2.2.5 The approach to considering these steps is set out in more detail in Appendix A.

1.2.2.6 The following sub-national economic study areas have been defined for the purposes of assessing potential offshore impacts:

- **North Wales** sub-national offshore economic study area[4] (hereafter referred to as 'North Wales')
- **Northwest England** sub-national offshore economic study area[5] (hereafter referred to as 'Northwest England').

1.2.3 Sub-national economic study area(s) – onshore assessment

1.2.3.1 The permanent onshore infrastructure for the Mona Offshore Wind Project includes the landfall, the onshore export cables, the onshore substation (at Bodelwyddan) and

[3] The selection process associated with the identification of ports, inputs, and services will not conclude until the post-consent phase for the Mona Offshore Wind Project, which is typical for offshore wind farms. It is likely that fabrication and marshalling ports elsewhere in the UK and internationally will be utilised for the delivery of components.

[4] Does not meet the statistical definition of a UK region.

[5] Does meet the statistical definition of a UK region.

the 400kV Grid Connection Cables that will connect the Mona Offshore Wind Project to the National Grid. This location is considered as the 'epicentre of impact' for the onshore assessment.

1.2.3.2 The following economic study area has been defined for the purposes of assessing potential onshore impacts:

- **North Wales** sub-national onshore economic study area[6] (hereafter referred to as 'North Wales').

1.3 Methodology

1.3.1 Overview

1.3.1.1 The methodology adopted for estimating potential economic impacts as part of this assessment is set out in Figure 1.2 Technical impact assessment methodology.

1.3.1.2 There is no formal guidance or standard approach for assessing the potential economic impacts of an offshore wind farm. However, this methodology reflects industry best practice for delivering a robust estimate of economic impacts, as summarised by the best available and non-binding industry guidance document Glasson *et al.* (2020).

1.3.1.3 This methodology also utilises the following industry guidance documentation to underpin headline assumptions:

- Crown Estate and Offshore Renewable Energy (ORE) Catapult (2019) Guide to an offshore wind farm
- BVG Associates (2023) Guide to an offshore wind farm: online interactive tool.

[6] Includes the six local authorities which de facto constitute 'North Wales'

Scenarios	• Establish appropriate scenarios based on consideration of potential procurement scenarios.
Total project expenditure	• Estimate of total DEVEX, CAPEX, OPEX, and DECEX established via best available industry guidance (Crown Estate, 2019)
Expenditure by supply chain category	• Estimate of DEVEX, CAPEX, OPEX, and DECEX by supply chain category established via best available industry guidance (Crown Estate, 2019)
UK content	• Estimate of UK level expenditure by supply chain category, established via best available industry guidance (BVGA, 2023).
Direct impacts	• Supply chain category expenditure combined with publicly available ONS data to estimate UK direct employment and GVA impacts.
Indirect impacts	• Supply chain category expenditure combined with publicly available ONS UK input-output tables to estimate UK indirect employment and GVA impacts.
Induced impacts	• Direct and indirect employment estimates by supply chain category combined with publicly available ONS wages data to estimate UK induced employment and GVA impacts.
Sub-UK impacts	• **Direct**: 'business as usual' sector conditions by location • **Indirect**: supply chain environment • **Induced**: flow of wages within the local economy

Figure 1.2 Technical impact assessment methodology

1.3.2 Assessment scenarios

1.3.2.1 A scenario represents a potential future outcome based on a set of assumptions. A range of scenarios are developed by changing the assumptions. Socio-economics looks at different scenarios to identify potential impacts and outcomes associated with various assumptions that may come about relating to economic and social factors.

Most likely – 'current capability' scenario

1.3.2.2 This assessment considers a 'current capability' scenario to represent the 'most likely' potential economic and social impacts.

1.3.2.3 The current capability scenario is based on a set of assumptions derived from evidence of impacts associated with existing conditions and capabilities in the offshore wind sector, and typical expenditure levels.

1.3.2.4 The current capability scenario assumes that where the capability already exists within the sector to deliver a certain supply chain category (as set out in Appendix B), the associated impacts are captured within national and sub-national content figures, where relevant.

1.3.2.5 The current capability scenario has been quantitatively assessed to represent the 'most likely' economic and social impacts associated with the Mona Offshore Wind Project under current sector conditions.

1.3.2.6 This approach is consistent with Glasson et al. (2020), which recommends specifying the 'more likely' scenario in order to avoid wide ranges of economic impact estimates which can 'make life very difficult for decision makers and host authorities'.

Minimum – 'low' scenario

1.3.2.7 Within Volume 4, Chapter 3: Socio-economics of the Environmental Statement the assessment considers a 'low' scenario to represent the 'worst case' potential economic impacts. The low scenario considers a situation where no contracts are secured with a Tier 1 supplier (a direct supplier of a product or service) within North Wales and North West England for the delivery of development, fabrication, or marshalling activities.

1.3.2.8 The low scenario has been qualitatively assessed to represent the 'minimum' – or 'worst case' – economic impact associated with the Mona Offshore Wind Project.

1.3.2.9 As it would result in no change to receiving environment, the low scenario is not assessed for social impacts.

Maximum scenario

1.3.2.10 A 'maximum' scenario would cover a situation where greater sector investment would lead to an increase in national and sub-national content.

1.3.2.11 There is no information available at this stage to provide a basis for the assumptions that would be required to define a 'maximum' scenario.

1.3.2.12 Assessing a maximum scenario would provide a set of impact estimates above the current capability scenario. There is a risk that assessing a 'maximum' scenario could overstate potentially beneficial economic impacts.

1.3.2.13 In the case of socio-economics, the maximum scenario can therefore be considered an unhelpful scenario upon which to base an EIA. For this reason, the maximum scenario has not been assessed within Volume 4, Chapter 3: Socio-economics of the Environmental Statement.

1.3.3 Total project expenditure

1.3.3.1 No project specific expenditure information for the Mona Offshore Wind Project is available due to the early stage of the project development cycle.

1.3.3.2 The Crown Estate and ORE Catapult (2019) Guide to an offshore wind farm establishes project expenditure estimates based on typical costs associated with offshore wind farm components. This guidance has been utilised to provide expenditure estimates for the socio-economic assessment of consented projects e.g. Awel-y-Môr Offshore Wind Farm.

1.3.3.3 The Crown Estate and ORE Catapult component-based expenditure figures are provided on the basis of a 1 GW capacity project, using 10 MW wind turbine generators. To ensure the assessment is project-specific, the Crown Estate and ORE Catapult expenditure estimates have been adapted according to the project description (refer to Volume 1, Chapter 3: Project description of the Environmental Statement).

1.3.3.4 To focus the assessment, the option delivering the highest expenditure estimates has been taken forward to represent the 'maximum' economic impacts associated with the Mona Offshore Wind Project.

1.3.3.5 Expenditure by component estimates have been inflated to 2023 prices using Office for National Statistics (ONS, 2023) data on inflation rates of input and output producer price inflation and are aggregated by project phase to establish the project expenditure estimates set out in Table 1.1.

1.3.4 Expenditure by supply chain category

1.3.4.1 The Crown Estate and ORE Catapult (2019) guidance sets out very detailed indicative costs by component of a typical offshore wind farm. The supply chain framework upon which these indicative costs are based is set out in Appendix B.

1.3.4.2 The next step is to establish a detailed estimate of project expenditure by component based on the key stages of:

- Development and project management
- Construction
- Operations and maintenance
- Decommissioning.

1.3.4.3 These stages involve inputs from a wide variety of industries throughout the supply chain. Different industries are subject to varying assumptions in relation to how expenditure translates into the number of jobs supported and the level of GVA output (i.e. the value of goods and services) that flows back into the economy. Therefore, the more detailed the breakdown of expenditure by component, the more reliable the estimate of impacts is likely to be.

1.3.5 UK content

1.3.5.1 The next step is to establish an estimate of UK content.

1.3.5.2 'UK content' is a measure of the proportion of materials, labour, and services sourced domestically in the development, construction, operations and maintenance, and decommissioning of offshore wind farms. Quantifying the UK content of offshore wind

investment is an important measure in assessing the impact of the offshore wind sector on the national economy.

1.3.5.3 Measurement of the UK content in offshore wind investment relies on detailed supply chain analysis. This involves tracking the origin of components, assessing the location of fabrication facilities, and analysing the utilisation of local labour and services. Accurate measurement requires a comprehensive data collection system, collaboration between industry stakeholders, and transparent reporting standards. Developers agreed that from 2015 all UK offshore wind farms would report their UK content data for aggregation by RenewableUK (BVG Associates, 2023).

1.3.5.4 The BVG Associates (2023) guide to an offshore wind farm online interactive tool provides an estimate of UK content by project expenditure category, which is set out in Table 1.2.

1.3.5.5 The BVG Associates UK content estimates for each expenditure category have been applied to supply chain categories to estimate UK expenditure.

1.3.6 UK impacts

1.3.6.1 Best practice principles involve assessing the direct, indirect, and induced economic impacts of an offshore wind farm in terms of employment and GVA.

1.3.6.2 **Direct** economic impacts are directly attributable to a development. For example, the direct employment impacts are the jobs supported by activities associated with delivering each phase of a project.

1.3.6.3 **Indirect** economic impacts are secondary impacts that occur as a result of the interactions between a development and other parts of the economy. For example, the project will require fabrication of components and subcomponents, and supply of equipment and transportation, all of which increases sector demand leading to economic impacts throughout the supply chain.

1.3.6.4 **Induced** economic impacts result from changes in household spending patterns as a consequence of direct and indirect economic impacts. For example, the employment opportunities supported by the project (including those throughout the supply chain) result in workers having income to spend, leading to further economic impacts in other parts of the economy.

Employment

Direct

1.3.6.5 UK expenditure estimates have been combined with turnover per full time equivalent (FTE) data to provide an estimate of direct employment[7] for each supply chain category at the UK level.

Indirect

1.3.6.6 UK supply chain expenditure data from the ONS United Kingdom Input-Output Analytical Tables (ONS, 2023a) has been combined with turnover per FTE data to

[7] All impact estimates are workplace-based.

provide an estimate of indirect employment for each supply chain category at the UK level.

Induced

1.3.6.7 Induced employment impacts supported by both direct and indirect wage impacts have been combined with detailed household expenditure to estimate overall induced employment impacts.

GVA

Direct

1.3.6.8 Direct employment estimates have been combined with GVA per FTE data to provide an estimate of direct GVA for each supply chain category at the UK level.

Indirect

1.3.6.9 UK level indirect GVA impacts have been estimated on the basis of GVA coefficients within the ONS United Kingdom Input-Output Analytical Tables (ONS, 2023a).

Induced

1.3.6.10 Induced employment estimates have been combined with GVA per worker data to provide an estimate of induced GVA impacts.

Sub-UK impacts

Direct

1.3.6.11 The current capability scenario (see section 1.3.2) has been estimated based on the potential level of expenditure in each sub-UK socio economic study area under 'business as usual' circumstances.

1.3.6.12 The BVG Associates (2023) Guide to an offshore wind farm online interactive tool provides an indicative list of companies and suppliers with proven capabilities of operating within the UK offshore wind supply chain. This list correlates with the supply chain framework set out in Appendix B.

1.3.6.13 This list has been analysed to identify the supply chain capabilities of each sub-UK economic study area – Wales, Northwest England, and North Wales.

Indirect

1.3.6.14 It is assumed that competitive UK contracting would distribute indirect impacts according to existing sectoral profiling. Therefore, UK indirect employment and GVA impacts have been distributed within sub-UK study areas according to their existing shares of UK activity.

Induced

1.3.6.15 Induced impacts supported by both direct and indirect wage impacts have been combined with detailed household expenditure to estimate overall induced impacts in each sub-UK economic study area.

1.4 Results

1.4.1 Total project expenditure

1.4.1.1 Expenditure by supply chain category estimates have been inflated to 2023 prices and aggregated to development expenditure (DEVEX), construction expenditure (CAPEX), operations expenditure (OPEX), and decommissioning expenditure (DECEX) to establish the project expenditure estimates set out in Table 1.1:

Table 1.1: Total project expenditure estimates, 2023 prices.

Source: HJA analysis following Crown Estate and ORE Catapult (2019) guidance.

Phase	Expenditure category	Expenditure estimate
Development and project management	DEVEX	£0.2 bn
Construction	CAPEX	£4.6 bn
Operations and maintenance	OPEX	£5.1 bn
Decommissioning	DECEX	£0.5 bn
Total	**TOTEX**	**£10.3 bn**

1.4.2 UK, national, and sub-national content

1.4.2.1 As per 1.3.5.4, the BVG Associates (2023) guide to an offshore wind farm online interactive tool provides an estimate of UK content by project expenditure category. These estimates are presented in Table 1.2, along with the content estimates for each economic study area. Given that UK and local/sub-national/national content can only be accurately measured post-contracting, these figures should be treated as estimates only, and are based on assumptions which draw on previously delivered offshore windfarms in the UK.

Table 1.2: Content estimates, 2023 prices

Source: HJA analysis, partly adapted from BVGA (2023)

Note: Figures may not sum due to rounding

Expenditure category	North Wales	Northwest England	Wales	UK
DEVEX	4%	7%	4%	72%
CAPEX	3%	5%	4%	25%
OPEX	56%	56%	56%	77%
DECEX	14%	14%	18%	29%
TOTEX	**29%**	**30%**	**30%**	**52%**

1.4.3 Offshore impacts

1.4.3.1 As per 1.1.1.9, if physical infrastructure and civil works are located offshore, any resulting impacts are categorised as offshore.

Construction

1.4.3.2 Construction phase economic impacts reflect both DEVEX and CAPEX project expenditure categories, and are summarised in Table 1.3. The inclusion of expenditure

associated with project development and management captures the impacts on employment and GVA during the earliest stages of the Mona Offshore Wind Project.

Table 1.3: Construction phase economic impacts – offshore

	North Wales	Northwest England	Wales	UK
Employment (FTE years)				
Direct	180	440	400	4,500
Indirect	35	300	120	2,700
Induced	75	150	120	1,400
Total	**280**	**890**	**640**	**8,600**
GVA				
Direct	£30 m	£60 m	£50 m	£330 m
Indirect	£3 m	£20 m	£10 m	£220 m
Induced	£4 m	£9 m	£7 m	£80 m
Total	**£40 m**	**£85 m**	**£65 m**	**£620 m**

Operations and maintenance

1.4.3.3 Operations and maintenance phase economic impacts reflect the OPEX project expenditure category and are summarised in Table 1.4.

Table 1.4: Operations and maintenance phase economic impacts (per annum) – offshore

	North Wales	Northwest England	Wales	UK
Employment (FTE years)				
Direct	160	160	160	160
Indirect	2	25	7	220
Induced	30	35	30	70
Total	**190**	**220**	**200**	**450**
GVA				
Direct	£20 m	£20 m	£20 m	£20 m
Indirect	£0.2 m	£2.1 m	£0.6 m	£20 m
Induced	£1.7 m	£1.9 m	£1.7 m	£3.9 m
Total	**£25 m**	**£25 m**	**£25 m**	**£45 m**

Decommissioning

1.4.3.4 Decommissioning phase economic impacts reflect the DECEX project expenditure category and are summarised in Table 1.5.

Table 1.5: Decommissioning phase economic impacts – offshore

	North Wales	Northwest England	Wales	UK
Employment (FTE years)				
Direct	85	85	220	550
Indirect	10	120	45	1,000
Induced	45	65	70	300
Total	**140**	**270**	**330**	**1,900**
GVA				
Direct	£20 m	£20 m	£30 m	£50 m
Indirect	£1 m	£7 m	£3 m	£70 m
Induced	£2 m	£4 m	£4 m	£15 m
Total	**£25 m**	**£30 m**	**£35 m**	**£140 m**

1.4.4 Onshore impacts

1.4.4.1 As per 1.1.1.9, if physical infrastructure and civil works are located offshore, any resulting impacts are categorised as offshore. This section considers impacts arising from onshore infrastructure – onshore substation and cabling.

Construction

1.4.4.2 Construction phase economic impacts reflect both DEVEX and CAPEX project expenditure categories and are summarised in Table 1.6.

Table 1.6: Construction phase economic impacts – onshore

	North Wales	Wales	UK
Employment (FTE years)			
Direct	60	60	420
Indirect	2	9	230
Induced	10	10	130
Total	**70**	**80**	**780**
GVA			
Direct	£5 m	£5 m	£30 m
Indirect	£ m	£1 m	£15 m
Induced	£1 m	£1 m	£8 m
Total	**£6 m**	**£6 m**	**£55 m**

Operations and maintenance

1.4.4.3 Operations and maintenance phase economic impacts reflect the OPEX project expenditure category and are summarised in Table 1.7.

Table 1.7: Operations and maintenance phase economic impacts – onshore

	North Wales	Wales	UK
Employment (FTE years)			
Direct	20	20	90
Indirect	1	4	110
Induced	2	3	35
Total	**20**	**25**	**230**
GVA			
Direct	£1.1 m	£1.1 m	£10 m
Indirect	£0.1 m	£0.3 m	£9.3 m
Induced	£0.1 m	£0.2 m	£2.0 m
Total	**£1.3 m**	**£1.5 m**	**£20 m**

Decommissioning

1.4.4.4 Decommissioning phase economic impacts reflect the DECEX project expenditure category. No supply chain category within the framework (Appendix B) can be categorised as onshore expenditure given the associated descriptions within the guidance. Given the exclusion of onshore decommissioning activities from the guidance, onshore decommissioning phase impacts are not assessed.

PART 2 – Social Impacts

1.5 Social study area(s)

1.5.1 Introduction

1.5.1.1 Social impacts can be understood as how certain activities and actions affect surrounding people and communities.

1.5.1.2 The most likely cause of social impacts are related to the implications of economic impacts, i.e. the movement of labour. Therefore, the theoretical underpinnings of the economic study areas – with a focus on epicentres of impact by way of potential port(s) and onshore infrastructure locations – are also applicable in defining suitable social study areas.

1.5.1.3 Social impacts are not assessed at a national level, therefore Wales and UK study areas not considered within the assessment.

1.5.2 Social study area(s) – offshore assessment

1.5.2.1 Having identified potential port facilities in Part 1, the same list has been utilised in determining appropriate offshore social study area(s). The extent of the offshore economic study areas has been determined on the basis of labour catchment areas using a 60 minute drive time catchment as a proxy.

1.5.2.2 Therefore, the same 60-minute drive catchments for the same long list of port facilities results in the same best fit social study areas, as follows:

- North Wales
- Northwest England.

1.5.3 Social study area(s) – onshore assessment

1.5.3.1 In line with the definition of offshore social study areas, having identified potential onshore substation locations in Part 1, the same locations has been utilised in determining appropriate onshore social study area(s). The extent of the onshore economic study area was determined on the basis of labour catchment areas using a 60 minute drive time catchment as a proxy.

1.5.3.2 Therefore, the same 60-minute drive catchments for the same potential onshore substation locations results in the same best fit social study area, as follows:

- North Wales.

1.6 Methodology

1.6.1 Construction phase – offshore

1.6.1.1 Potential primary construction port facilities could support the following activities:

- Wind turbine staging and installation
- Foundation staging and installation
- Offshore substation staging and installation
- Inter-array cable staging and installation
- Export cable staging and installation.

1.6.1.2 During the construction phase the roles associated with these activities are anticipated to be based largely offshore, with workers accommodated within vessels. However, these workers have the potential to give rise to demand for temporary accommodation at the start and end of typical shift periods at sea within the catchments of the relevant transfer port(s) before or after spending time at their home location. Some roles e.g. assembly or management, will be based onshore, and have the potential to give rise to further demand for temporary accommodation, and possibly short-term rented accommodation.

1.6.1.3 Potential workforce impacts associated with the Mona Offshore Wind Project have been estimated based on assumptions relating to the following variables:

- Maximum activities within a single social study area
- Maximum vessel numbers
- Vessel crew size
- Share of non-local workers
- Shift arrangements
- Shifts per annum
- Nights of accommodation required per shift.

1.6.1.4 The assumptions underlying each variable are set out below.

Maximum activities within a single social study area

1.6.1.5 In line with the assessment of economic impacts, the assessment of social impacts adopts a current capability impact scenario. This assumes that no single port can deliver all activities associated with the construction phase of the Mona Offshore Wind Project. Port capacity and capabilities determine the facilities at which the installation of individual components can take place. The capabilities of the ports within the offshore social study areas are set out within Appendix A, Table A.1.

1.6.1.6 The current capability scenario assumes the maximum activity that could occur within a single social study area is the marshalling of the inter-array cables and export cable.

1.6.1.7 Under the current capability impact scenario it is assumed that procurement and contracting decisions are taken in line with the current competitiveness of the UK offshore wind sector. Employment related to fabrication is assumed to draw on the standing workforces of existing enterprises. This will not have any impact on the demand for housing, accommodation, and local services above current baseline activity.

1.6.1.8 No permanent (i.e. long term), relocation of workers is anticipated during the offshore construction phase based on the mobile nature of large parts of the offshore workforce.

Maximum vessel numbers, vessel crew size, shift arrangements, and accommodation requirements

1.6.1.9 The maximum vessel numbers associated with delivery of the inter array cables and export cable have been taken from the project design envelope and inform the maximum design scenario set out in volume 4, chapter 3: Socio-economics of the ES.

1.6.1.10 Typical vessel crew sizes have been estimated on the basis of industry guidance and advice from project engineers.

1.6.1.11 Based on standard industry practice, it is assumed that vessel crews will work according to four week on/off shift patterns. On this basis, it is assumed each construction vessel will support 13 shifts per annum.

1.6.1.12 It is assumed that roles associated with these activities will be based offshore, with workers accommodated within vessels.

1.6.1.13 It is assumed each crew member will require a maximum of two nights of overnight accommodation per shift. This consists of one night before and one night after a shift period. It is assumed crew members will stay at their permanent residence elsewhere for the remainder of their 'off shift' period.

1.6.1.14 It is assumed that a minimum of one third of workers would not require local overnight accommodation, on the basis these workers are permanently based close enough to the relevant port(s) as to remove the need for overnight accommodation.

1.6.2 Operations and maintenance phase – offshore

1.6.2.1 Potential operations and maintenance port facilities are expected to support the following activities:

- Wind turbine operations and maintenance
- Foundation operations and maintenance
- Offshore substation operations and maintenance
- Inter-array cable staging and installation
- Export cable staging and installation.

1.6.2.2 It is assumed that a small operational base will be located at the selected operations and maintenance port, whilst operational headquarters may be located elsewhere in the UK, as this activity is not geographically dependant on port selection.

1.6.2.3 The Mona Offshore Wind Project is likely to directly create new roles within operation and maintenance activities. It is assumed that indirect and induced employment impacts will draw on the existing resident workforce in each area. Given these impacts are expected to take place in the wider economy, the contribution of these impacts to labour migration is expected to reflect typical migration patterns associated with economic growth. Indirect and induced employment impacts are therefore expected to have a negligible impact on population, housing, and accommodation.

1.6.2.4 Direct roles could be filled through a number of routes including:

- Local workers transitioning from the offshore Oil and Gas sector
- Local resident entrants to the sector resulting from training activities
- Non-local commuting to the selected locality
- Non-local worker relocation to the selected locality

Local workers transitioning from the offshore Oil and Gas sector

1.6.2.5 To estimate the number of workers transitioning from the Oil and Gas sector, the following steps have been undertaken:

1. Estimate the number of Oil and Gas industry jobs currently based in each social study area from OEUK (2022) research

2. Estimate the number of transitioning Oil and Gas workers in each social study area based on forecast job losses in related sectors from RGU (2023) research.

1.6.2.6 This adjustment has been applied to the estimated operational phase employment impacts.

Local resident entrants to the sector resulting from training activities

1.6.2.7 There is no established benchmark for assuming the contribution of local residents to the operations and maintenance workforce of an offshore energy scheme. This figure may vary between projects depending on several factors, including the project characteristics, location, local labour market conditions, developer approach, and government policy.

1.6.2.8 With a lead time of approximately four years before commencement of operations there is time to train a substantial part of the remaining workforce from the local labour market. The Applicant has committed to an Outline Employment and Skills Plan as part of the DCO application (Application Document Reference: J.24) which will set out an action plan to increase the level of new local entrants to the sector.

1.6.2.9 In the absence of an industry standard benchmark, in this assessment it is assumed that 50% of the remaining workforce will be sourced locally through new entrants to the sector resulting from training activities.

Non-local worker relocation to the selected locality

1.6.2.10 The proportion of the operations and maintenance workforce commuting from outside the project locality for their shifts can vary significantly depending on various factors, including the project characteristics, location, accessibility, housing market conditions, and developer approach.

1.6.2.11 In the absence of an industry standard benchmark, in this assessment it is assumed a maximum of 50% of the remaining workforce will be recruited from outside the relevant social study area, and will choose to permanently relocate to the locality. This assumption is conservative so that the number of relocations is not under-estimated. It is assumed that any migrating workers would also relocate their families. The assessment of population impact assumes an average household size of 2.4 persons (ONS, 2022).

Non-local commuting to the selected locality

1.6.2.12 The remaining 50% of non-local workers are assumed to travel from outside the relevant social study area for their shift. Workers in this category will either require overnight accommodation for one night before and after their shift, or their commute will be sufficiently short as to not require overnight accommodation. Overnight accommodation demand in this category is considered negligible relative to the scale of existing overnight stays in any of the social study areas and does not warrant further consideration.

1.6.3 Construction phase – onshore

1.6.3.1 Development associated with potential onshore infrastructure sites could support the following activities:

- Landfall
- Onshore export cable installation
- Onshore substation installation

- Onshore grid connection installation.

1.6.3.2 Roles associated with these activities are anticipated to be based onshore. These workers have the potential to give rise to demand for temporary accommodation during the period of their on-site activity. This could be a period of a few days, weeks, or months, depending on the component being installed.

1.6.3.3 Onshore construction activities are anticipated to draw on a more localised labour market. No permanent (i.e. long term), relocation of workers is anticipated during the onshore construction phase based on the mobile nature of large parts of the onshore workforce.

1.6.4 Operations and maintenance phase – onshore

1.6.4.1 Development associated with potential onshore infrastructure sites could support the following activities:

- Landfall
- Onshore export cable operations and maintenance
- Onshore substation operations and maintenance
- Onshore grid connection operations and maintenance.

1.6.4.2 Potential impacts associated with operations and maintenance of onshore infrastructure are estimated to be negligible and are not anticipated to be of material consideration (see Table 1.11).

1.7 Results

1.7.1 Offshore impacts

Construction

1.7.1.1 Based on the detailed methodology set out in section 1.6, the potential offshore social impacts during the construction phase of the Mona Offshore Wind Project under a current capability impact scenario are set out in Table 1.8.

Table 1.8: Construction phase social impacts – offshore

	North Wales	Northwest England
Maximum temporary overnight stays (nights per annum)	35,800	35,800

Operations and maintenance

1.7.1.2 Based on the detailed methodology set out in section 1.6, the potential offshore social impacts during the operations and maintenance phase of the Mona Offshore Wind Project are set out in Table 1.9.

Table 1.9: Operations and maintenance phase social impacts – offshore

	North Wales	Northwest England
Non-local worker relocation to the selected locality	25	6
Estimated household population increase	65	15

1.7.2 Onshore impacts

Construction

1.7.2.1 Based on the detailed methodology set out in section 1.6, the potential onshore social impacts during the construction phase of the Mona Offshore Wind Project under a current capability impact scenario are set out in Table 1.10.

Table 1.10: Construction phase social impacts – onshore

	North Wales
Maximum temporary overnight stays (nights per annum)	5,000
Maximum medium term housing requirement (dwellings)	20

Operations and maintenance

1.7.2.2 Based on the detailed methodology set out in section 1.6, the potential offshore social impacts during the operations and maintenance phase of the Mona Offshore Wind Project are set out in Table 1.11.

Table 1.11: Operations and maintenance phase social impacts – onshore

	North Wales
Maximum direct jobs per annum (FTE years)	20
Non-local worker relocation to the selected locality	9
Estimated household population increase	22

1.8 Summary

1.8.1.1 This technical impact report has summarised the potential socio-economic impacts of the Mona Offshore Wind Project within the following categories:

- **Economic**: assessing the potential employment and GVA impacts associated with the Mona Offshore Wind Project and the associated impacts on local employment opportunities
- **Social**: assessing the potential impacts of the workforce associated with the Mona Offshore Wind Project on housing, accommodation and population (including local services)

1.8.1.2 The impacts assessed within this technical report are the basis for an assessment of significant socio-economic effects of the Mona Offshore Wind Project, which can be found in Volume 4, Chapter 3: Socio-economics of the Environmental Statement.

1.8.1.3 Potential tourism impacts are considered within Volume 4, Chapter 3: Socio-economics of the Environmental Statement.

1.8.1.4 Potential socio-economics impacts on the Isle of Man linked to lifeline ferry services are considered within Volume 4, Chapter 3: Socio-economics of the Environmental Statement.

1.9 References

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Appendix A: Economic impact study area definition

A.1.1.1.1 This appendix sets out the approach to defining economic study areas.

A.1. Step 1: identify potential port facilities

A.1.1.1.1 Assumptions adopted as part of this analysis are to inform the assessment alone and have been determined based on a consideration of ports within the defined study area that have the potential to service offshore developments within the Irish Sea. The final selection of ports, potential manufacturing and fabrication facilities, and delivery models required for the Mona Offshore Wind Project has not been determined at the point of application. It is, however, likely that more than one port will be used to support elements of the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project as part of a wider supply chain.

A.1.1.1.2 Final selection of ports, potential manufacturing and fabrication facilities, and delivery models will be subject to ongoing engineering and procurement considerations – the use of assumptions for the purposes of this assessment does not indicate any commercial preference or imply any decision.

A.1.1.1.3 The ports involved in the project lifetime of an offshore wind farm can vary depending on the size and location of the project. Typically, an offshore wind farm project will require multiple ports throughout its lifetime, broadly covering the following:

- Fabrication port (construction phase): as technology develops and the size of offshore wind farm components continues to increase, the need to manufacture components in close proximity to the waterside also grows due to the challenges of transporting large components by road or rail. Components such as blades, towers, foundations, cables, and offshore substations will therefore typically require fabrication at a port, within reasonable proximity of the waterside. Components are typically built at the fabrication port(s) and can subsequently be transferred directly to the offshore site, or to an intermediate marshalling port(s). Due to the infrastructure requirements of large components (e.g. laydown and storage areas), it is likely that multiple fabrication ports will be utilised during project delivery. The fabrication port(s) delivering any component can be based anywhere in the world
- Marshalling port (construction phase): this facility serves as a hub for the coordination of components, equipment, and workforce during the construction phase, including storage and distribution. The marshalling port(s) will also serve as the staging area for installation and support vessels. Due to the infrastructure requirements of large components, it is likely that multiple marshalling ports will be utilised during project delivery. Where marshalling ports are required, these will typically be located within reasonable proximity of the offshore site
- Operations and maintenance port: when an offshore wind farm has been commissioned, a port is selected as the primary hub for ongoing maintenance of components, along with other operational requirements. The operations and maintenance port will typically be located within close proximity of the offshore site.

A.1.1.1.4 There are a number of considerations when identifying ports that have the potential to support fabrication and/or marshalling activities during the construction phase. It is possible that some ports will be better suited to the fabrication and marshalling

requirements of certain components, whilst being unsuitable for other components. Considerations regarding port suitability include:

- Water depth: as the size of offshore wind farm components increases, so does the size of the associated transportation and installation vessels. A port should have adequate water depth to accommodate vessels and equipment
- Infrastructure: a port should have the necessary infrastructure and facilities, including laydown areas, cranes capable of lifting and moving equipment and components, storage areas (indoor and outdoor), workshops, and offices
- Transport links: a port should have suitable road and rail connectivity to allow for the efficient transfer of smaller components/subcomponents, equipment, workforce, and raw materials.
- Labour market: consideration can also be given to the availability of skilled labour within the labour market catchment of the port.

A.1.1.1.5 Given the many variables associated with port(s) selection during the construction phase, typical delivery models incorporate multiple ports which will each deliver the fabrication and/or marshalling needs of specific components, depending on requirements (e.g. foundations, offshore substations, inter array or export cables etc).

A.1.1.1.6 A long list of ports located in north Wales and northwest England, and their potential to support each of the various activities associated with delivery of the Mona Offshore Wind Project is set out in Table A.1.

A.1.1.1.7 Assumptions regarding port capabilities are based on non-statutory consultation responses from industry experts within the Offshore Energy Alliance region – the offshore energy industry cluster for the North Wales and North West England Region.

Table A. 1: Long list of capabilities of potential construction, operations and maintenance, and decommissioning port facilities in North Wales and Northwest England

Note: X = current capability to support delivery of component. Blank indicates not currently capable to support delivery of component.

	Holyhead	Mostyn	Birkenhead	Heysham	Barrow-in-Furness
Construction					
Wind turbine					
Fabrication					
Marshalling					
Foundations					
Fabrication					
Marshalling					
Offshore substations					
Fabrication					
Marshalling					
Export cables					
Fabrication					
Marshalling	X	X	X	X	X
Array cables					
Fabrication					
Marshalling	X	X	X	X	X
Operations and maintenance					
Operations base	X	X	X	X	X
Decommissioning					
Wind turbine					
Foundations					
Offshore substations					
Cables	X	X	X	X	X

A.1.1.1.8 Identified potential port facilities deemed to be suitable bases for components of the construction phase are also assumed to be suitable for the decommissioning phase, given the similarities between activities associated with both phases.

A.2. Step 2: assess economic study area(s) associated with potential port facilities

A.2.1.1.1 Labour catchment areas[8] associated with each longlisted port facility have been defined using a 60 minute drive time catchment as a proxy[9].

A.2.1.1.2 As per Glasson *et al.* (2020) and Marine Scotland (2022), adopting a methodology which defines sub-national economic study area(s) associated with offshore wind farm projects on the basis of local authority areas is necessary given that government data sources are structured to reflect conditions at local authority level. Below this level of governance, data becomes increasingly scarce and can be less reliable when dealing with survey based data, for example. It is also necessary to take account of wider policy and administrative designations in determining appropriate areas for consideration.

A.2.1.1.3 Therefore, 60 minute drive time catchments for each facility have been converted to the following best fit sub-national economic study areas:

- North Wales: together, the Holyhead and Mostyn ports' 60 minute drive time catchments cover (at least partially) the six local authorities which de facto constitute 'North Wales'. As per the Welsh Government's National Development Framework (Welsh Government, 2021), these local authorities constitute the 'North' strategic planning region. North Wales is therefore an appropriate definition for a sub-national economic study area. Since this assessment defines Wales as a nation, it is appropriate to define North Wales as a 'region' of Wales (although it should be noted that 'North Wales' does not meet the statistical definition of a UK region)
- Northwest England: together, the Barrow-in-Furness, Heysham, and Birkenhead ports' 60 minute drive time catchments cover (at least partially) 37 of 39 local authorities in the northwest region – the two exclusions being Allerdale and the City of Carlisle in north Cumbria. Levelling Up the United Kingdom (Department for Levelling Up, Housing and Communities, 2022) – the UK government's social and economic programme for government – utilises regional definitions for the purposes of identifying the next steps the Government will take to deliver its programme. Northwest England is therefore an appropriate definition for a sub-national economic study area (note: Northwest England does meet the statistical definition of a UK region).

[8] Labour catchment areas are commonly defined based on the locations from which people are typically drawn to an employment location such as a business, an employment centre (such as a port), or an entire town or city.

[9] As per non-statutory guidance in Glasson, J. et al. (2020).

Appendix B: Expenditure by component – supply chain framework

Table B. 2: Offshore wind farm supply chain categories (Crown Estate and ORE Catapult, 2019)

Level 1	Level 2	Level 3
(P) Development and project management	(P.1) Development and consenting services	(P1.1) Environmental impact assessments
	(P.2) Environmental surveys	Benthic environmental surveys
		(P.2.2) Fish and shellfish surveys
		(P.2.3) Ornithological environmental surveys
		(P.2.4) Marine mammal environmental surveys
		(P.2.5) Onshore environmental surveys
		(P.2.6) Human impact studies
	(P.3) Resource and metocean assessment	(P.3.1) Structure
		(P.3.2) Sensors
		(P.3.3) Maintenance
	(P.4) Geological and hydrographical surveys	(P.4.1) Geophysical surveys
		(P.4.2) Geotechnical surveys
		(P.4.3) Hydrographic surveys
	(P.5) Engineering and consultancy	(P.5) Engineering and consultancy
(T) Wind turbine	(T.1) Nacelle	(T.1.1) Bedplate
		(T.1.2) Main bearing
		(T.1.3) Main shaft

Level 1	Level 2	Level 3
		(T.1.4) Gearbox
		(T.1.5) Generator
		(T.1.6) Power take-off
		(T.1.7) Control system
		(T.1.8) Yaw system
		(T.1.9) Yaw bearing
		(T.1.10) Nacelle auxiliary systems
		(T.1.11) Nacelle cover
		(T.1.12) Small engineering components
		(T.1.13) Structural fasteners
		(T.1.14) Condition monitoring system
	(T.2) Rotor	(T.2.1) Blades
		(T.2.2) Hub casting
		(T.2.3) Blade bearings
		(T.2.4) Pitch system
		(T.2.5) Spinner
		(T.2.6) Rotor auxiliary systems
		(T.2.7) Fabricated steel components
	(T.3) Tower	(T.3.1) Steel
		(T.3.2) Tower internals
(B) Balance of plant	(B.1) Cables	(B.1.1) Export cable
		(B.1.2) Array cable

Level 1	Level 2	Level 3
		(B.1.3) Cable protection
	(B.2) Turbine foundation	(B.2.1) Monopile[10]
		(B.2.2) Jacket
		(B.2.3) Transition piece[11]
		(B.2.4) Corrosion protection
		(B.2.5) Scour protection
	(B.3) Offshore substation	(B.3.1) Electrical system
		(B.3.2) Facilities
		(B.3.3) Structure
	(B.4) Onshore substation	(B.4.1) Buildings, access and security
	(B.5) Operations base	
(I) Installation and commissioning	(I.1) Foundation installation	(I.1.1) Foundation installation vessel
	(I.2) Offshore substation installation	(I.2.1) Substation installation vessel
	(I.3) Onshore substation installation	
	(I.4) Onshore export cable installation	
	(I.5) Offshore cable installation[12]	(I.5.1) Cable-laying vessel
		(I.5.2) Cable burial

[10] Not included as an option within project design envelope – excluded from the assessment.

[11] Since monopile foundations option is excluded, transition piece is also excluded from the assessment.

[12] Offshore cable installation costs are not provided separately for export and array cables. These costs have therefore been split on the basis of the equivalent share of each in terms of balance of plant cost estimates.

Level 1	Level 2	Level 3
		(I.5.3) Cable pull-in
		(I.5.4) Electrical testing and termination
	(I.6) Turbine installation	(I.6.1) Turbine installation vessel
		(I.6.2) Commissioning
	(I.7) Construction port[13]	
	(I.8) Offshore logistics	(I.8.1) Sea-based support
		(I.8.2) Marine coordination
		(I.8.3) Weather forecasting and metocean data
(O) Operation, maintenance and service	(O.1) Operations	(O.1.1) Training
		(O.1.2) Onshore logistics
		(O.1.3) Offshore logistics
		(O.1.4) Health and safety inspections
	(O.2) Maintenance and service	(O.2.1) Turbine maintenance and service
		(O.2.2) Balance of plant maintenance and service
(D) Decommissioning	(D.1) Turbine decommissioning	
	(D.2) Foundation decommissioning	
	(D.3) Cable decommissioning	
	(D.4) Substation decommissioning	

[13] Construction port cost estimates are not provided, and have therefore been excluded from the assessment.