

18 SOCIO-ECONOMICS, TOURISM AND RECREATION

18.1 Introduction

As noted in Chapter 1, in addition to contributing up to 6% of the installed capacity towards the 40% renewable energy target for 2020¹ (based on a site Maximum Export Capacity of 100 MW) the Torr Head Tidal Energy Array Project will also contribute towards achieving wider energy sustainability and economic benefits including:

- > Increased security of energy supply;
- > Reduced dependency on imported fuels and reduced exposure to fluctuating fuel prices;
- > Increased energy infrastructure; and
- > Generation of economic opportunities across Northern Ireland and in the local community within energy and marine related industries.

This chapter therefore focuses specifically on assessing the impacts of the Project on local, regional and national socio-economic conditions, including impacts on GDP and employment, and tourism and recreation. The assessment has been undertaken by DKM Economic Consultants, with inputs from other team members.

Table 18-1 details the supporting studies which relates to the socio-economic, tourism and recreation impact assessment. Copies of these supporting studies are provided on the accompanying CD.

Table 18-1 Supporting studies

Details of study	Locations of supporting studies CD
Tidal Ventures Ltd – Socio-Economic Supporting Technical Report (DKM, 2014)	D:\Supporting studies\Socio-economic study
Navigational Risk Assessment (NRA) (Anatec, 2014)	D:\Supporting studies\Shipping and navigation

18.1.1 Assessment area

Although this Environmental Statement (ES) covers the offshore Project only, socio-economic impacts will be experienced both onshore and offshore (tourism and sea angling). Therefore with regard to assessing potential socio-economic impacts of the Project, the area of assessment covers the following geographical areas:

- > Local - for the purposes of this assessment the local study area has been defined as the Moyle Local Government District (LGD) – this is the most north-easterly LGD in Northern Ireland (see Figure 18-1)²;
- > Regional – this area is defined as the North of Northern Ireland NUTS III region³ (see Figure 18-2); and
- > National - Northern Ireland.

The focus in the analysis is on the local and national levels, given the geographic extent of the North of Northern Ireland NUTS III region.

¹ The 40% target is estimated to be between 1500 – 1800 MW depending on the mix of renewable energy generation contributing towards the target and related capacity factors of different technologies (DETI, 2012).

² Northern Ireland is currently divided into 26 Local Government Districts or LGDs (namely Antrim, Ards, Armagh, Ballymena, Ballymoney, Banbridge, Belfast, Carrickfergus, Castlereagh, Coleraine, Cookstown, Craigavon, Derry, Down, Dungannon and South Tyrone, Fermanagh, Larne, Limavady, Lisburn, Magherafelt, Moyle, Newry and Mourne, Newtownabbey, North Down, Omagh, and Strabane). This is due to be rationalised to 11 LGDs as of 1st April 2015, but for consistency with historic data, this assessment is based on the existing structure.

³ The NUTS (Nomenclature of Territorial Units for Statistics) classification system is a hierarchical system for dividing up the EU's territory in order to produce regional statistics for the Community. http://epp.eurostat.ec.europa.eu/portal/page/portal/nuts_nomenclature/introduction

Figure 18-1 Local Government Districts of Northern Ireland (Source: Northern Ireland Statistics & Research Agency (NISRA) Geography Fact Sheet, December 2013)

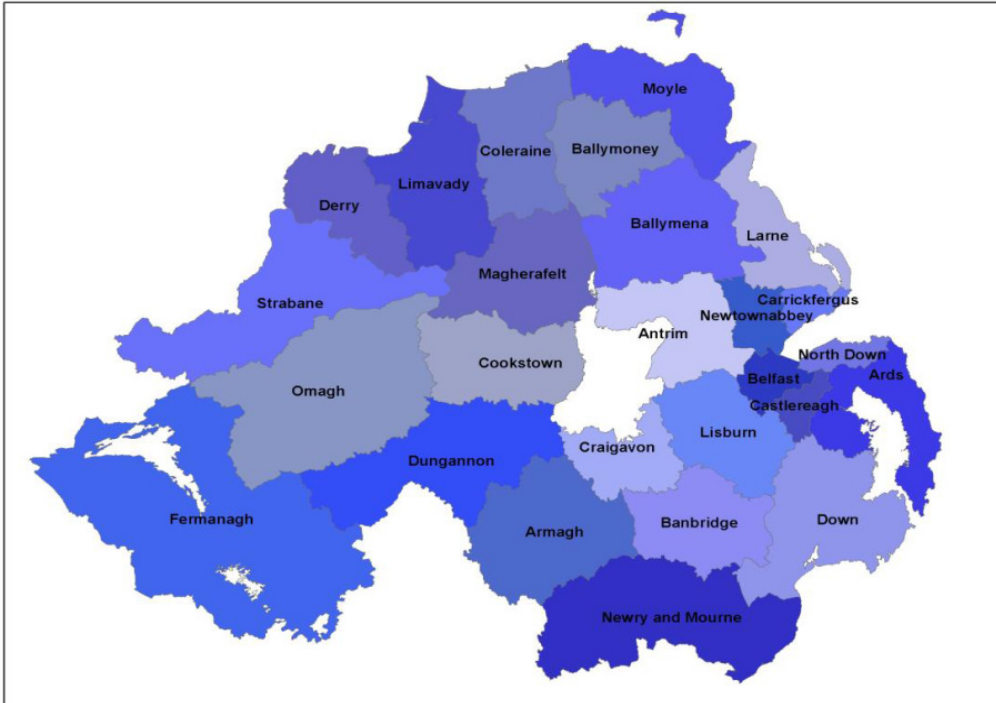
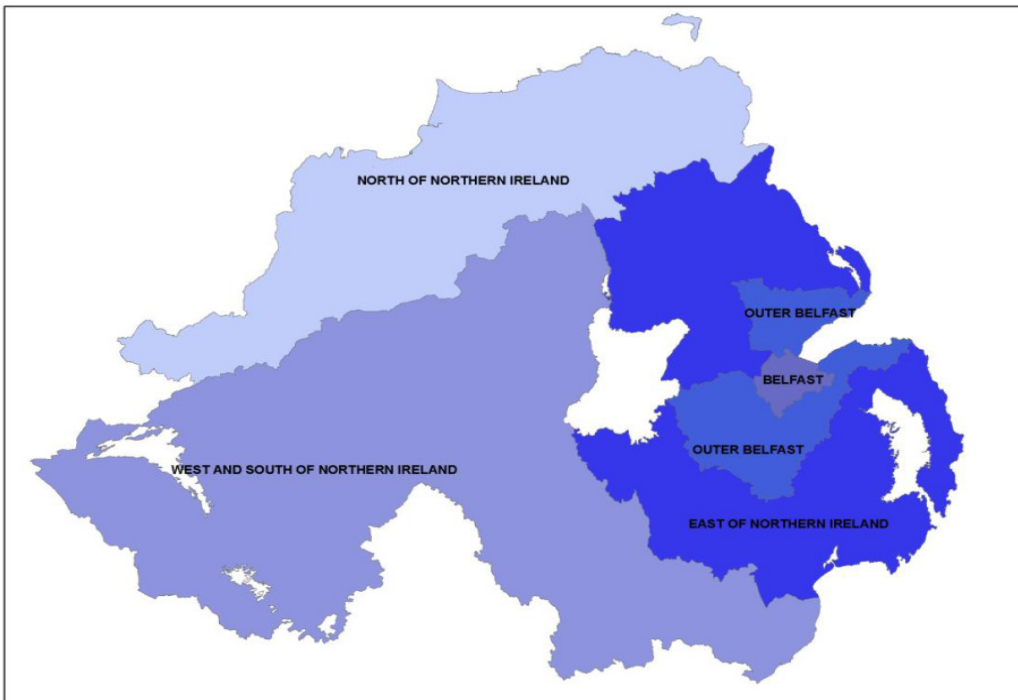


Figure 18-2 NUTS III Regions Northern Ireland (Source: Northern Ireland Statistics & Research Agency (NISRA) Geography Fact Sheet, December 2013)



18.2 Legislation and policy

There is no specific legislation or statutory guidelines for the assessment of economic impacts. However, the approach adopted for this assessment follows UK Government guidelines and is based on recognised best practice for the production of such assessments. The following planning, policy and strategy documents are relevant with respect to renewable energy, in particular tidal energy, and set the context for the importance of the proposed Project. They also highlight the economic and employment opportunities that can potentially flow from such projects.

18.2.1 Planning Policy Statement 4: Planning and Economic Development

Planning Policy Statements (PSSs) contain policies on land use and planning matters and apply to the whole of Northern Ireland. PPS 4: Planning and Economic Development sets out the Department of Environment Northern Ireland (DoENI) Planning Department revised planning policies for economic development uses and indicates how growth associated with such uses can be accommodated and promoted in development plans. With regard to renewables PPG 4 includes the following statement:

“The key aim of this PPS is to facilitate the economic development needs of the Region in ways consistent with protection of the environment and the principles of sustainable development. Safeguarding of environment, and the fostering of a ‘clean, green image’, can provide economic advantages and employment in itself in terms of the promotion of, for example, tourism, recreation, agri-food and quality of life attractions. Greater use of renewable energy sources will also contribute to protection of the environment and sustainability”

18.2.2 Regional Development Strategy for Northern Ireland 2035

The Regional Development Strategy (RDS) sets out a framework for the spatial development of Northern Ireland to 2035. The RDS includes a number of references to the development of renewable energy, most notably:

“Responsibility for the preparation of local development plans and development schemes will transfer to local councils; these must ‘take account’ of the RDS. A strategic system of marine planning for all NI waters - i.e. ‘inshore’ [out to 12 nautical miles (nm)] and ‘offshore’ [beyond 12 nm] will be established through a combination of the Marine and Coastal Access Act 2009, and a Northern Ireland (NI) Marine Bill (when enacted). This will balance the environmental, social and economic needs of the marine environment and will include provision for marine plans. The RDS is relevant to marine planning and its strategic guidance will be taken into account in marine plans which are to be prepared by DOENI.”

The RDS sets out Regional Guidance (RG) which applies to everywhere in the region and is presented under the three sustainable development themes of Economy, Society and Environment (DRD, 2010) and Spatial Framework Guidance (SFG) which is additional to the region-wide guidance and is tailored to each of the five elements of the Spatial Framework.

Guidance included in RG5: Deliver a sustainable and secure energy supply states that ‘Northern Ireland needs a robust and sustainable energy infrastructure. This should deliver reliable and secure sources of energy to communities and businesses across the Region. New generation or distribution infrastructure must be carefully planned and assessed to avoid adverse environmental effects, particularly on or near protected sites. At the plan or project level, this will require a Strategic Environmental Assessment (SEA) or Environmental Impact Assessment (EIA) and potentially a Habitats Regulation Assessment (HRA) to identify likely effects and appropriate mitigation. Decision makers will have to balance impacts against the benefits from a secure renewable energy stream, and the potential for cleaner air and energy for industry and transportation’.

RG5 also identifies the following actions in relation to renewable energy:

- > Increase the contribution that renewable energy can make to the overall energy mix. There will need to be a significant increase in all types of renewable electricity installations and renewable heat installations, including a wide range of renewable resources for electricity generation both onshore and offshore to meet the Region’s needs;
- > Strengthen the grid. With an increasing number of renewable electricity installations as well as increasing numbers of renewable heat installations we will need to strengthen the grid. It will be necessary to integrate heat and electricity infrastructure (e.g. district heating networks and new electricity grid) alongside new road infrastructure development at the planning stage. If electric transport becomes more widespread, there will

need to be a reliable recharging network. It also means increasing electricity interconnection capacity to strengthen the linkages between transmission and distribution networks;

- > Work with neighbours. This will ensure a secure energy supply from competitive regional electricity and gas markets in the EU's Internal Market; and
- > Develop "Smart Grid" Initiatives. This will improve the responsiveness of the electricity grid to facilitate new forms of renewable generation, to improve reliability, productivity, and energy efficiency and empower customers to make a more informed choice in relation to their energy usage.

RG5 also notes that development of Northern Ireland's renewable energy sources is vital to increase its energy security, help combat climate change and to achieve the renewable energy targets set out in the Strategic Energy Framework (SEF) for 40% electricity consumption from renewable sources and 10% renewable heat target by 2020. This will involve development of a mix of renewable energy sources including tidal stream energy.

RG9: Reduce our carbon footprint and facilitate mitigation and adaptation to climate change whilst improving air quality highlights Northern Ireland's reliance on fossil fuels and reinforces the importance of energy efficiency along with decarbonisation of the power sector in achieving emissions reduction targets.

Renewable energy is also acknowledged in SFG13: Sustain rural communities living in smaller settlements and the open countryside with regard to providing employment opportunities for rural communities.

"Facilitate the development of rural industries, businesses and enterprises in appropriate locations. Farming plays a major part in sustaining rural community networks, as employers, consumers and producers. Forestry and fishing also contribute to communities, in employment and commercial terms, as well as in terms of recreation opportunities. Other industries such as tourism and renewable energy can provide further jobs and opportunities in rural areas as long they are integrated appropriately within the settlement or rural landscape."

18.2.3 Northern Ireland Economic Strategy 2012

The Northern Ireland Economic Strategy 2012 further reinforces the importance of renewables and the need to achieve 20% of electricity consumption from renewable sources and 4% renewable heat by 2015. It also identified a number of challenges that remain in particular that Northern Ireland has also low levels of electricity generated from renewable sources, with gas, coal and oil accounting for 90% of power generation. This leaves the region vulnerable to fluctuations in both supply and pricing, and it also presents important environmental considerations."

Northern Ireland Innovation Strategy 2014-2025

The Northern Ireland Innovation Strategy lists a number of case studies which are relevant to this Project including:

- > The Energy Skills Training Network;
- > University of Ulster; and
- > The Employer Support Programme – InnovateUs.

Horizon 2020

At a wider EU level, Horizon 2020 refers to Secure, Clean and Efficient Energy as follows:

"The Energy Challenge is structured around seven specific objectives and research areas:

- > Reducing energy consumption and carbon footprint;
- > Low-cost, low-carbon electricity supply;
- > Alternative fuels and mobile energy sources;
- > A single, smart European electricity grid;
- > New knowledge and technologies;
- > Robust decision making and public engagement; and
- > Market uptake of energy and ICT innovation".

A budget of €5,931 million has been allocated to non-nuclear energy research for the period 2014-2020. Out of this figure, more than €200 million is earmarked to support European Institute of Innovation and Technology activities, subject to a mid-term review. The main priorities set up under this scheme include:

Energy efficiency

Energy efficiency is a no-regret option for Europe, addressed by both short-term and long-term EU policies. The EU is aiming to progressively decrease primary energy consumption by 2020 and 2030. Research and demonstration activities within this area will focus on buildings, industry, heating and cooling, SMEs and energy-related products and services, integration of ICT and cooperation with the telecom sector.

Low carbon technologies

It is important to develop and bring to market affordable, cost-effective and resource-efficient technology solutions to decarbonise the energy system in a sustainable way, secure energy supply and complete the energy internal market. Research activities within this area will cover photovoltaics, concentrated solar power, wind energy, ocean energy, hydro power, geothermal energy, renewable heating and cooling, energy storage, biofuels and alternative fuels, carbon capture and storage.

18.2.4 Northern Ireland Renewable Industry Group (NIRIG)

The Northern Ireland Renewable Industry Group (NIRIG), which was launched in January 2011, is a collaboration between RenewableUK and the Irish Wind Energy Association. The aim of the NIRIG is to represent the views of the renewable energy in Northern Ireland, providing a conduit for knowledge exchange, policy development and support and consensus on best practice between all stakeholders in renewable energy (RenewableUK, 2015).

NIRIG currently has more than 30 member companies comprising onshore large and small scale wind developers; offshore and marine renewables developers; manufacturers; environmental; legal and planning consultants; training providers; and consultation companies ((RenewableUK, 2015).

18.2.5 Antrim Coast and Glens Area of Outstanding Natural Beauty (AONB) Management Plan 2008-2018

Although this ES focuses on the offshore Project, in terms of local recreation and tourism in particular along the coast, it is important to note that the onshore Project area is located within the Antrim Coast and Glens AONB. The management plan for this AONB highlights the importance of the coastal areas from a natural beauty and tourism perspective, making several references to the Moyle coastline, Rathlin Island and Torr Head.

The vision for the AONB in 2028 as set out in the management plan is “a place where a diversified rural economy is supported by a sustainable farming sector, varied business activity and low impact tourism based on its landscape, tranquillity and culture. Vibrant communities have access to jobs, services and housing, working together to conserve and enjoy the AONB’s unique features.”

18.3 Scoping and consultation

Since the commencement of the Project, consultation on issues of socio-economic relevance has been ongoing. Table 18-2 summarises the most relevant consultation activities carried out relevant to socio-economics.

Table 18-2 Consultation activities undertaken in relation to socio-economics

Date	Stakeholder	Consultation	Topic / specific issue
12/12/2012	Moyle District Council	Meeting	Supply chain opportunities.
23/01/2013			Community Benefit.
28/02/2013			Requested that fishing interest groups and local community be kept informed of project proposals

Date	Stakeholder	Consultation	Topic / specific issue
24/01/2014 15/03/2013	Antrim Borough Council	Meeting	Engagement with fishermen will be important Discussed grid infrastructure requirements and grid connection application process Community benefits
20/03/2014	Green Party	Meeting	Highlighted importance of community benefits Options to participate at all party renewables group meetings
20/06/2014	Department of Agriculture and Rural Development (DARD)	Telephone enquiry	Query regarding the publication date of the next Northern Ireland Rural Development Programme. Current Programme dealt with period 2007 – 2013
20/06/2014	Moyle District Council	Telephone enquiry	Query regarding the publication date of the next Economic and Tourism Strategy and Action Plan for Moyle. The current publication deals with the period 2008 – 2013
09/07/2014	Agri-Food and Biosciences Institute (AFBI)	Telephone enquiry	Query regarding use of area for recreation angling
09/07/2014	John Morton, Ballycastle Harbour Authority	Telephone enquiry	Query regarding use of area for recreation angling
01/07/2014	Emma McGill, Moyle District Council	Telephone enquiry	Query regarding use of area for recreation angling
11/12/2012 25/09/2014	Aquaholics Dive Centre and Sea Safaris	Telephone enquiry	Displacement of activities in the area Query regarding possible impact of Project on diving business in the area
24/09/2014	Predator Charters Ltd.	Telephone enquiry	Query regarding possible impact of Project on sightseeing boat tours in the area
11/11/2012	Rathlin Island Ferry Service	Meeting	Rathlin community to be kept informed of project proposals
10/12/2012	Red Bay Boats (local boat hire)	Meeting	Welcome the development and don't have any major concerns Would pass relevant information on to local yacht clubs
11/12/2012	Moyle District Council	Meeting	Enquired as to whether there would be any supply chain opportunities and what community benefits there would be Also interested to know what harbour facilities would be required
12/12/2012	Rathlin Development and Community Association	Meeting	Suggest that the Project could compile a portfolio of services and facilities at Rathlin Asked for regular updates on the Project Asked for more information on opportunities for, and impacts on, local people. Also expressed concern about the visual element of landfall

Date	Stakeholder	Consultation	Topic / specific issue
20/01/2015	DoENI Marine Division, Council for Nature Conservation and Countryside (CNCC), Royal Society for the Protection of Birds (RSPB), Northern Ireland Environment Agency (NIEA) - Natural Heritage, Department for Agriculture and Rural Development (DARD), Agri-Foods and Biosciences Institute (AFBI), Northern Ireland Marine Task Force, Ulster Wildlife Trust	ES Gate Review Meeting	<p>DETI queried use of Scottish data as basis for ES but agreed best available information given this is first commercial scale project in Northern Ireland. Suggested including more information on supply chains with reference to North Antrim Marine Energy Group and community / tourist benefits of permanent information boards etc. Also consider R&D and academic opportunities in relation to environmental monitoring etc.</p> <p>All comments received have been included in the stakeholder spreadsheet which included as a supporting document on the enclosed CD. This spreadsheet records where changes to the ES have been made in response to comments received and what those changes are. Where changes have not been made, reasons for this are also provided</p>

Relevant comments from the DoENI Marine Division and Department of Enterprise, Trade and Investment (DETI) in the EIA Scoping Opinion (DoENI and DETI, 2014) are summarised in Table 18-3, together with responses to the comments and reference to the relevant ES sections where specific comments have been addressed.

Table 18-3 Scoping comments relevant to socio-economics

Name of organisation	Key concerns	Response	ES Section with which the specific issue is addressed
Agri-Food and Biosciences Institute (AFBI)	Advised on the extent of recreation angling in the area off Torr Head and the type of fish in the area. Also advised of the possibility for recreation anglers to find alternative sites.	All such information is included.	Sections 1.8.3, 1.9.3 and 1.10.3 Impact assessment.
Ballycastle Harbour Authority	Advised on the extent of recreation angling in the area off Torr Head and the type of fish in the area. Also advised of the possibility for recreation anglers to find alternative sites.	All such information is included.	Sections 1.8.3, 1.9.3 and 1.10.3 Impact assessment.
Moyle District Council	Advised on the extent of recreation angling in the area off Torr Head and the type of fish in the area.	All such information is included.	Sections 1.8.3, 1.9.3 and 1.10.3 Impact assessment.

18.4 Baseline description

The socio-economic, tourism and recreation baseline is described below.

18.4.1 Data sources

The baseline was developed mainly from publicly available sources and consultations with individuals in relevant public sector bodies and businesses. The main sources of the data used to inform the socio-economic baseline are:

- > Census 2011;
- > Northern Ireland Statistics & Research Agency (NISRA) Geography Fact Sheets and population estimates;

- > Online Moyle District Council Business Directory⁴ and InvestNI 2014 report Northern Ireland Marine Energy Capability Directory for the local and national baseline respectively;
- > Department of Finance & Personnel labour market data; and
- > Office of National Statistics (ONS) regional GVA data.

The main sources of data used to inform the tourism and recreation baseline are:

- > Consultations with individuals in Moyle LGD, Ballycastle Harbour, and local businesses;
- > Online Moyle District Council Business Directory;
- > Agri-Food & Biosciences Institute (AFBI);
- > Discovernorthernireland.com; and
- > Antrim Coast and Glens AONB Management Plan.

18.4.2 Population, age & gender

Population

Moyle LGD area is approximately 494 km² in size with a population of approximately 17,050 per the 2011 Census of Population, giving a population density of 34.5 per km². This was the smallest population of any LGD in Northern Ireland in 2011, and of any principal authority in the UK. The main population centres in the area of assessment are (see Figure 18.3 below.):

- > Ballycastle population 5,480 (2008 estimate);
- > Cushendall population 1,363 (2008 estimate); and
- > Cushendun population 138 (2001 census).

The population of the Moyle LGD increased from 15,933 in 2001 to 17,050 in 2011, a 7% increase. Over the same period the population of the North of Northern Ireland (NoNI) increased by 5% to 288,597, while that of Northern Ireland increased by 7.5% to 1,810,863.

According to the most recent estimates from the NISRA (NISRA, 2014) the population for the whole of Northern Ireland was estimated at 1.83 million in mid-2013, up 1% on the Census figure. NISRA intercensal estimates do not present values for NoNI, but by reference to the national increase, it is estimated that the population of NoNI in mid-2013 was 291,600.

The population of Moyle was estimated at 17,129 in mid-2012; estimates for mid-2013 are on the new council district level, but by reference to the national increase it is estimated that the population of Moyle LGD in mid-2013 was 17,200.

Moyle's population density of 34.5 persons per square kilometre is up from 33.2 in 2001, but it is still sparse in comparison to NoNI which has a density of 89.7 per km² and to NI as a whole which has a density of 133.5 per km².

⁴ <http://www.moyle-council.org/moyledirectory/>

Figure 18-3 Main Population Centres of Moyle LGD (source - Google Maps)



Age & gender

Males accounted for 50.2% of Moyle's population in 2011, while females accounted for 49.8%. The gender split in both the NoNI and NI as a whole was 49.3% males and 50.7% females. So there is a slight weighting in favour of males in the District, which is not unusual for primarily rural areas.

Table 18-4 presents the breakdown of the population of Moyle, NoNI and Northern Ireland by age, per Census 2011. A higher proportion of Moyle residents fall into the older age bands than in NoNI and NI as a whole. In NoNI and at national level, there is a higher percentage of people in all the age bands up to 49 years, while the opposite is the case in the older bands.

Table 18-4 Population percentage breakdown by age band (%) (source - Census 2011)

	0 - 9 years	10 - 19 years	20 - 29 years	30 - 39 years	40 - 49 years	50 - 59 years	60 - 69 years	70 +
Moyle	12	13	12	12	14	13	11	12
NoNI	13	15	14	13	15	12	10	9
NI	13	14	14	13	15	12	10	10

Totals do not sum to 100 due to rounding.

Labour market

Economic activity data are displayed in Table 18.5. According to the Census 2011, there were 12,375 residents in the Moyle area aged between 16 and 74 years. Some 63.3% or 7,837 of these were classified as economically active (i.e. working or seeking work), slightly higher than the rate for NoNI (62%) but somewhat lower than that for NI as a whole (66.2%).

Some 7,022 (89.6%) of the economically active population in Moyle were working, as follows:

- > 46.4% were in full-time employment (31 hours or more per week);
- > 21.6% were in part-time employment (less than 31 hours per week);
- > 21.6% were classed as self-employed; while
- > 10.4% were unemployed.

Moyle's unemployment rate of 10.4% compares favourably with 12% in NoNI, but it is 1.8 percentage points higher than the national rate of 8.6% (Census definition of unemployment).

Table 18-5 Economic activity at district, regional and national level (source - Census 2011)

	Moyle	NoNI	NI
All usual residents aged 16 to 74	12,375	209,839	1,313,420
Economically active	7,837	130,109	869,767
Employee - part-time	21.6%	23.8%	23.4%
Employee - full-time	46.4%	49.5%	54.5%
Self-employed	21.6%	14.7%	13.5%
Unemployed	10.4%	12.0%	8.6%
Employed incl. self-employed	7,022	114,496	794,967
Economically inactive	4,538	79,730	443,653

Table 18-6 presents the breakdown of Moyle's employment by sector in 2011. The most important sector is Human Health & Social Work, which accounts for 14.9% of all employed residents. The next largest is Retail & Wholesale Trade, which accounted for 14% of those employed, followed by Construction at 12.5% and Education at 11.3%. Note these data represent the sectors in which residents work, without indication of where their employment is actually situated.

The breakdown of Moyle's residents by occupation (as opposed to sector) is detailed in Table 18-7. The highest proportion (21.7%) works in the Skilled Trade Occupations. This is significantly higher than NoNI's figure of 15.4% and the national figure of 14% for the same occupation. Professional Occupations are the second largest, accounting for 15.8%, in line with NoNI's figure of 16% but slightly lower than the national average of 17.2%.

Caring, Leisure & Other Service Occupations account for 11.3%, higher than NoNI's figure of 9.6% and the national average of 9.3% (perhaps reflective of the prominence of the Human Health & Social Work sector). Administrative & Secretarial Occupations account for 10.1%, lower than the 12.7% recorded in NoNI and the 14.1% at national level.

Table 18-6 Moyle LGD employment by sector, 2011 (source - Census 2011)

	Numbers	%
A Agriculture, forestry & fishing	457	6.5
B Mining & quarrying	17	0.2
C Manufacturing	491	7.0
D Electricity, gas, steam & air conditioning supply	26	0.4

	Numbers	%
E Water supply; sewerage, waste management & remediation activities	54	0.8
F Construction	876	12.5
G Wholesale & retail trade; repair of motor vehicles & motor cycles	986	14.0
H Transport & storage	313	4.5
I Accommodation & food service activities	454	6.5
J Information & communication	112	1.6
K Financial & insurance activities	144	2.1
L Real estate activities	79	1.1
M Professional, scientific & technical activities	250	3.6
N Administrative & support service activities	219	3.1
O Public administration & defence; compulsory social security	381	5.4
P Education	791	11.3
Q Human health & social work activities	1,048	14.9
R,S Arts, entertainment & recreation; other service activities	319	4.5
T Activities of households as employers; undifferentiated goods - & services - producing activities of households for own use	1	0.0
U Activities of extraterritorial organisations & bodies	3	0.0
Total	7,021	100.0

Table 18-7 Breakdown of employed Moyle residents aged 16 – 74 by occupation (source - Census 2011)

	Moyle %	NoNI %	NI %
Managers, directors & senior officials	7.8	7.5	8.0
Professional occupations	15.8	16.0	17.2
Associate professional & technical occupations	7.2	7.8	8.6
Administrative & secretarial occupations	10.1	12.7	14.1
Skilled trades occupations	21.7	15.4	14.0
Caring, leisure & other service occupations	11.3	9.6	9.3
Sales & customer service occupations	6.8	11.2	10.0
Process, plant & machine operatives	7.6	8.5	8.0
Elementary occupations	11.6	11.2	10.8
Total	100.0	100.0	100.0

18.4.3 Gross Value Added (GVA)

Provisional data for 2012 indicate that the Gross Value Added (GVA)⁵ for Northern Ireland was £29.41 billion (ONS, 2013). Growth in 2013 and 2014 is forecast at 1.4% and 2.4% respectively (EY, 2014), to bring NI GVA in 2014 to £30.54 billion.

At NUTS III level, provisional 2012 GVA for NoNI was £3.59 billion (ONS, 2013). This was the lowest GVA figure of all the NUTS III regions in Northern Ireland and it was also the only region to record a decrease (-0.3%) in GVA between 2011 and 2012 (in current prices). Uplifting to 2014 using the same growth rates as for NI, gives NoNI GVA in 2014 of £3.73 billion.

Official GVA data is not available at LGD level. However, on the basis that the population of Moyle LGD is 5.9% of the population of the NoNI region, it can be estimated that the local GVA in 2014 would be in the region of £220 million (£3.73 billion x 5.9%).

The GVA statistics indicate the impact of the recession on the NI economy, with national GVA only returning to 2008 levels (at current prices) in 2012. As NoNI is the least populated of the NUTS III regions, it is not surprising that its GVA is also the lowest. However, on a per capita basis, NoNI still ranks the lowest. The figure for 2012 of £12,382 is 23.2% lower than the NI average of £16,127. As is often the case, GVA per capita in the capital region (i.e. Belfast) is significantly higher than the other regions, reflecting among other things commuting from the regions to better-paid employment in the capital.

The impact of the recession is even more apparent on a per capita basis, with national GVA yet to return to its 2008 level, even in nominal terms, everywhere except in Belfast. Once again, it is not unusual for a capital region to recover more quickly from recessions than more peripheral regions.

We can also use this data to estimate labour force productivity, i.e. GVA per person employed. The Department of Finance & Personnel's (DFPNI) Monthly Labour Market Report indicates that employment in April 2014 totalled 821,000 (DETI, 2014). By reference to the estimate of 2014 GVA above, this implies an average GVA per person employed in NI of £37,200 (£30.54 billion ÷ 821,000).

The most up-to-date data on GVA by sector is from 2011. As per Table 18.8 below, by far the largest contributor to GVA in NoNI is Public Administration, Education & Health, which accounted for 33.6% of the total. This was followed by Distribution, Transport & Accommodation (20.1%) and Production (13.7%). Construction, which might be expected to benefit from the current Project, generated 7.4% of regional GVA. The breakdown of GVA by sector in NoNI generally mirrors the sectoral breakdown at national level.

Table 18-8 GVA by sector NoNI and NI (£ million, current prices) (Source: ONS – Regional Gross Value Added (Income Approach), December 2013)

	NoNI		NI	
	2011	% of Total	2011	% of Total
A: Agriculture, forestry and fishing	78	2.2%	380	1.3%
BCDE: Production	492	13.7%	4,396	15.1%
of which C: Manufacturing	432	12.0%	3,777	13.0%
F: Construction	265	7.4%	2,004	6.9%
GHI: Distribution; transport; accommodation & food	726	20.1%	5,909	20.3%
J: Information and communication	79	2.2%	905	3.1%
K: Financial and insurance activities	138	3.8%	1,445	5.0%
L: Real estate activities	334	9.3%	2,570	8.8%
MN: Business service activities	162	4.5%	1,993	6.9%

⁵ GVA is equivalent to Gross Domestic Product or GDP, and effectively comprises payroll plus profits across all firms and other employers. In practice, GVA of bodies such as Government departments and agencies is taken to equal payroll.

	NoNI		NI	
	2011	% of Total	2011	% of Total
OPQ: Public administration; education; health	1,212	33.6%	8,506	29.3%
RST: Other services and household activities	116	3.2%	951	3.3%
Total GVA	3,603	100.0%	29,063	100.0%

This can be used to estimate sectoral GVA per worker, at NI level, in 2011, which can then be uplifted to 2014, using a cumulative growth rate of 1.8% in NI GVA per worker (see Table 18.9). The implication is that GVA per worker in manufacturing is £49,900⁶, and in construction is £31,400⁷. Given these, the overall average of £37,200 appears reasonable for the purposes of this study⁸.

Table 18-9 Estimate of sectoral GVA per person employed, NI 2014 (source: ONS and NISRA)

	Persons employed* ('000s)	GVA 2011 (£ million)	GVA per worker (£)	
			2011	2014
A: Agriculture, forestry & fishing	17,822	380	21,322	21,708
BCDE: Production	88,344	4,396	49,760	50,660
of which C: Manufacturing	77,072	3,777	49,006	49,893
F: Construction	65,059	2,004	30,803	31,360
GHI: Distribution; transport; accommodation & food	214,093	5,909	27,600	28,100
J: Information & communication	20,267	905	44,654	45,462
K: Financial & insurance activities	25,993	1,445	55,592	56,598
L: Real estate activities	7,504	2,570	342,484	348,681
MN: Business service activities	68,724	1,993	29,000	29,525
OPQ: Public administration; education; health	250,986	8,506	33,890	34,504
RST: Other services & household activities	36,185	951	26,282	26,757
Total	795,263	29,063	36,545	37,206

*Includes self-employed.

18.4.4 Commuting patterns

Relevant also are workers' commuting patterns. These data are not yet available for the 2011 census, but Table 18-10 presents the proportions per the 2001 Census.

As one might expect of a mainly rural district, Moyle residents exhibit a significantly higher proportion of persons working from home (usually agriculture), lower proportions involved in short commutes (less than 10 km), but higher proportions involved in longer commutes (more than 10 km). Excluding the no fixed place/offshore/outside UK category, approximately one third of Moyle residents commuted more than 20 km to work in 2001, compared to 19% in NoNI and 15% in NI as a whole.

⁶ As per Table 18-9, 2011 manufacturing GVA = £3.777 billion, while numbers employed are 77,072, giving £49,006 per worker in 2011; uplifted by 1.8% gives an estimate of £49,893 per worker in 2014.

⁷ As per Table 18-9, 2011 construction GVA = £2.004 billion, while numbers employed are 65,059, giving £30,802 per worker in 2011; uplifted by 1.8% gives an estimate of £31,357 per worker in 2014.

⁸ This also appears reasonable compared with the estimates in the July 2010 report *Economic Study for Ocean Energy Development in Ireland A report to Sustainable Energy Authority Ireland and Invest Northern Ireland*, page 67 (http://www.seai.ie/Renewables/Ocean_Energy/Economic_Study_for_Ocean_Energy_in_Ireland.pdf).

Table 18-10 Distance travelled to work (Source - NISRA 2001 Census)

	Moyle LGD	NoNI	NI
Works mainly at or from home	15.6%	9.6%	8.8%
< 5 km	25.8%	42.6%	38.0%
5 km <10 km	6.2%	12.0%	16.1%
10 km <20 km	12.7%	11.2%	16.5%
20 km <40 km	17.5%	9.3%	9.9%
40km <60 km	5.5%	3.1%	2.5%
60 km+	6.5%	4.9%	2.1%
No fixed place of work, offshore or outside UK	10.2%	7.2%	6.1%
Total	100%	100%	100%

Source: <http://www.nisra.gov.uk/Census/2001%20Census%20Results/Migration%20Tables/MTLocalGovernmentDistricts.html>

18.4.5 Supply chain

National supply chain

NI has a strong marine-related engineering tradition, and is well-positioned to benefit from the opportunities generated by this Project. InvestNI indicates the following:

“25% of the world's full-scale marine energy devices have been developed, tested or manufactured in Northern Ireland” (InvestNI, 2014).

Notable in particular is the SeaGen project in Strangford Lough, the world's first large scale commercial tidal stream generator⁹. A detailed profile of the NI supply chain has been compiled by InvestNI in its 2014 report Northern Ireland Marine Energy Capability Directory (InvestNI, 2014), the findings of which are summarised in Table 18-11. There are clearly a considerable number of firms, academic bodies and other organisations active in the sector in NI, and capable of supplying the current Project. Particularly notable is the depth of expertise in Engineering and in Manufacturing & Components, as well as the number of bodies involved in Research. Among these are some of the leading firms and employers in NI.

Table 18-11 Northern Ireland marine energy supply chain (source - InvestNI (2014) Northern Ireland Marine Energy Capability Directory)

Sector	Commercial	Academic/ Public Sector /non-profit-making	Total
Technology development	6	1	7
Applied research, innovation and testing	1	12	13
Consultancy	13	2	15
Engineering	50	1	51
Manufacturing & components	43	0	43
Vessels	8	1	9
Surveying	5	3	8

⁹ <http://en.wikipedia.org/wiki/SeaGen>

Sector	Commercial	Academic/ Public Sector /non-profit-making	Total
Deployment	2	0	2
Ports, port operations & land based support	24	5	29
Total*	152	25	177

*NB some firms appear in more than one category.

The Project, along with the neighbouring Fair Head Tidal Project, represents a major opportunity for these firms and organisations to expand their activities and capabilities in the marine renewables sector. Noteworthy also is the fact that the industry representative body, the Northern Ireland Renewables Industry Group (NIRIG), has formed a dedicated specialist technical marine energy sub-group.

Local supply chain

The online Moyle District Council Business Directory provides information on some 672 businesses in the district council area. This information enables an analysis of businesses in the area by sector. Businesses in the Construction, Manufacturing, and Hospitality sectors were focussed on due to the relevance of those sectors to this study.

Construction

The construction sector was broken down into two separate segments, namely:

- > Building services; and
- > Construction and related manufacturing firms.

The results of the analysis of these two segments are presented in the following two tables. There are a total of 15 local businesses in the building services segment. Seven of these (47%) are either electricians or electrical contractors.

Table 18-12 Building services in Moyle (source - Moyle District Council Business Directory)

Activity	Number of firms
Electrical Contractor	2
Electricians & Electrical Contractors	5
Site Services, Digger Operators	1
Quarry Plant Manufacturers	1
Site Investigations	1
Kitchen Units, Bathrooms & Stoves	1
Joinery - Architectural, industrial	1
Boiler Cleaning Servicing	1
Insulation Installers	1
Construction - Building Services	1
Total	15

Of the 23 businesses classed as “Construction and Related Manufacturing Companies” in Moyle, 14 (61%) are involved in Building Construction. There is one involved in the manufacture of concrete and one involved in the manufacture of concrete products.

Table 18-13 Construction and related manufacturing firms in Moyle (source: Moyle District Council Business Directory)

Activity	Number of firms
Building Construction	14
Architecture	1
Wrought Ironwork	1
Concrete Products	1
Manufacturing and building construction	1
Windmills & Windpower Eqpt.	1
Agricultural Contractors and Building Contractors	1
Property Development	1
Manufacturers of Concrete	1
Gas Servicing and Installation	1
Total	23

Manufacturing

The Manufacturing sector is broken down into three different segments in the Directory:

- > Food and Drink Manufacturing and Processing;
- > Textiles and Clothing Manufacturing; and
- > General Manufacturing and Engineering.

The General Manufacturing and Engineering segment was focussed on for the purposes of this analysis. Results are presented in Table 18.14.

Table 18-14 Construction and related manufacturing firms in Moyle (source: Moyle District Council Business Directory)

Activity	Number of firms
Joinery Manufacturers	1
Manufacture of Boats & Smallcraft	1
Welder	1
Boat Manufacturing	1
Other	6
Total	10

Hospitality

There are a total of 244 businesses in the Hospitality sector according to the Moyle District Council Business Directory. Of these:

- > 70 (29%) are classed as Self Catering Accommodation;
- > 69 (28%) are B&Bs;
- > 31 (13%) are Public Houses;
- > 24 (10%) are Cafés/Restaurants/Takeaways;

- > 17 (7%) are Campsites or Caravan Parks;
- > 11 (5%) are Guesthouses;
- > 11 (5%) are Visitor Attractions;
- > 6 (2%) are Youth Hostels; and
- > 5 (2%) are Hotels.

The number and range of these businesses highlight the importance of tourism to the district.

18.4.6 Tourism and recreation baseline

Tourism and related sectors are economically important in the Moyle LGD. The 2011 Census indicates 6.5% of the local workforce is engaged in Accommodation & Food Service Activities, while a further 4.5% is engaged in Arts, Entertainment & Recreation; Other Service Activities, giving a total of approximately 10% of the workforce involved in areas directly or indirectly related to tourism. There would also be spillovers into retail and other sectors. In a similar vein, the online Moyle District Council Business Directory indicates that of the 672 local businesses listed, some 244 are in the Hospitality sector.

That said, with regard to tourism infrastructure, the Antrim Coast and Glens AONB Management Plan 2008-2018 observes “Although tourism is active in the area, tourist stay is short with many passing through the area to the Giant’s Causeway on the Causeway Coastal Route and failing to stop to appreciate its many attractions. Tourism infrastructure is poor, with accommodation, services, facilities and transport not sufficiently well developed for future potential growth. Access to the countryside is also very limited for walking, off-road cycling and horse riding.”

Tourism activities range from general sightseeing to attending local festivals showcasing local culture (such as music), to more active outdoor pursuits, which can be divided into land-based (cycling and walking) and marine (sea angling, diving and sight-seeing by boat). Our focus in this chapter is on the marine tourism element.

Sea angling

Recreational sea angling encompasses fishing from both the shore and boat using line rod, line and hook. The focus here is on angling by boat, given the nature of the Project.

Sea angling is an economically important activity in NI. According to the Agri-Food Biosciences Institute (AFBI) Report Recreational Sea Angling (RSA) in Northern Ireland (AFBI, 2011): “*in Northern Ireland it was estimated that in 2005, whilst game angling was the most popular form of angling, there were over 5,000 RSA with 2,923 anglers fishing from the sea and 2,138 fishing from shore. It was estimated that the spending of local sea anglers on expenses such as food, boat hire, travel costs etc. was £1,459 per angler per year giving an estimated total expenditure of £7.4 million by local anglers. The report also estimated that in 2005 Northern Ireland hosted 450 visiting anglers for the sole reason of engaging in sea/shore angling*”.

Torr Head and the surrounding seas are a popular sea angling area. For instance, DiscoverNorthernIreland.com indicates that “*The Causeway Coast of Country Antrim, running from Portrush down through the famous Glens, offers some excellent sea angling and holds some record catches. Species include Wrasse, Cod, Whiting, Plaice, Flatfish, Turbot, Mackerel, Haddock, Dogfish, Coalfish, Pollack, Flounder and Conger Eels. Some of the best marks include Torr Head (a dangerous, exposed mark that should never be fished alone yet offers the possibility of some outstanding fishing) and rocks around Glenarm.*”

AFBI (2011) likewise notes that:

“*Ireland’s waters are extremely diverse, offering a wide range of fishing opportunities and in addition to species such as Pollack, mackerel and wrasse they contain a large number of elasmobranchs species (sharks, skates and rays)*”

Personal consultations with contacts in Moyle LDC indicate that:

“*Torr Head is a very popular point with anglers from all parts for recreational fishing and is highly regarded as one of the top three points for fishing for Tope, Ling and bigger sea fish several private fishing enterprises take excursions to the area on a weekly basis.*”

Table 18-15 sets out the species that are caught in the surrounding waters. Portrush Harbour lies approximately 40 km west of Torr Head while Layd Church is approximately 16 km south of Torr Head, just north of Cushendall. All other points lie in between. This points to an angling area extending over 55 km along the coast.

Table 18-15 Surrounding points for sea angling and species caught (source – AFBI, 2011)

Area	Catch
Portrush Harbour	Small codling, coalfish
Blue Pool, Portrush	Coalfish, pollock, wrasse
Skerries Rocks	Big pollack, ballan wrasse, codling
Dunseverick	Ballan wrasse, mackerel, large pollock, big coalfish, conger eels
White Park Bay	Flounder, turbot
Ballintoy	Plaice, dabs, turbot, ballan wrasse, mackerel, pollack coalfish, cod
Ballycastle	Pollack, ballan wrasse, flounder, bass, small turbot, dabs, plaice, dogfish, whiting, codling, sea trout, coalfish
Torr Head	Tope, pollack, coalfish, ballan wrasse, mackerel
Layd Church	Cod, conger eel, dogfish, wrasse

Other marine recreation activities

As well as sea angling, there are a number of businesses in the Moyle area involved in recreation activities such as sight-seeing boat trips, diving and surfing. Viewing the coastline from a boat on the sea is a popular activity while the marine life and numerous submerged wrecks result in the area being popular for divers. Results from the Maritime Traffic Survey carried out as part of the Navigational Risk Assessment and discussed in Chapter 16: Shipping and Navigation indicates that during the summer months the majority of vessels crossing the AfL area are recreational (no recreational vessels were recorded during the winter months).

18.5 Impact assessment and mitigation

18.5.1 Overview

Following establishment of the baseline conditions to the Project area, and an understanding of the Project activities, it is possible to assess the potential impacts from the Project. The range of impacts that has been considered is based on the impacts identified during EIA scoping and any further impacts that have been highlighted as the EIA has progressed. Table 18-16 lists all of the direct and indirect impacts to be covered as part of the assessment of socio-economic, recreation and tourism impacts and identifies the relevant phases under which each impact will be assessed. Table 18-16 also identifies where potential interactions between impacts and inter-relationships between receptors and EIA topics are likely to occur. Cumulative and in-combination impacts are discussed in Section 18.11.

Table 18-16 Impacts covered in impact assessment

Potential impact (impact title only)	Relevant phase of Project			Interactions / inter-relationships
	C/I	O/M	D	
Impact on GVA and employment through the supply chain	✓	✓	✓	N/A
Tourism & recreation	✓	✓	✓	Chapter 13. Commercial fisheries Chapter 17: Seascape, landscape and visual assessment (SLVIA)
C/I = construction / installation, O/M = operations and maintenance and D = decommissioning				

Each impact identified above is then described and assessed for each relevant phase of the Project as set out below (construction and installation, operation and maintenance and decommissioning).

18.5.2 Assessment criteria

The EIA process and methodology are described in detail in Chapter 8. However, each assessment section is required to develop its own criteria for the 'sensitivity and value of receptor' and 'magnitude of impact' aspects since the definition of these will vary between different topics. The sensitivity and value of the receptor and magnitude of impact criteria for socio-economics and for tourism & recreation are presented in Tables 18-17 and 18-18.

The sensitivity of receptor and magnitude of impact are then combined to determine the consequences of the impact. The definitions for impact consequence are presented in Chapter 8, Table 8-1. The significance of the impact is then considered by reference to the relevant criteria in the EIA Regulations. Definitions for impact significance are presented in Chapter 8, Table 8-2. It should be noted that with regard to socio economic impacts, the likelihood of the predicted impacts occurring will be based on the final chosen turbine technology, contractors etc.

Table 18-17 Criteria for sensitivity of receptor

Sensitivity and value of receptor	Socio-economics	Tourism & recreation activities
Very high	Very low economic output and very limited supply of skilled labour	International status or high visitor nos.
High	Low economic output limited supply of skilled labour	National status or high visitor nos.
Medium	Average economic output, somewhat constrained supply of skilled labour	Regional status or medium visitor nos.
Low	High economic output and ready supply of skilled labour	Local status or few visitor nos.
Negligible	Very high economic output and very large supply of skilled labour	Local status or very few visitor nos.

Table 18-18 Criteria for magnitude of impact

Magnitude of impact	Socio-economics	Tourism & recreation activities
Severe	N/a	n/a
Major	Greater than local scale or which exceed recognised standards. >15% turnover/ employment change.	Major visual impact or physical interruption / severance. >15% turnover/ employment change.
Moderate	Noticeable and judged to be important at a local scale. 10-15% turnover/ employment change.	Moderate visual impact or physical interruption / severance. 10-15% turnover/ employment change.
Minor	Limited or very localised raised as local issues. 5-10% turnover/ employment change.	Minor visual impact or physical interruption / severance. 5-10% turnover/ employment change.
Negligible	Virtually no local scale or wider impact or effect. <5% turnover/ employment change.	Negligible visual impact or physical interruption / severance. <5% turnover/ employment change.
Positive	An enhancement in the availability or quality of a resource to the extent of potentially benefiting the wellbeing of the persons utilising that resource benefiting from it in some way. Increases in turnover, economic output and employment.	

18.5.3 Design envelope

In line with the design envelope approach, this assessment considers the maximum ‘worst case’ Project parameters. The identification of the worst case parameters for each receptor (i.e. Environmental Impact Assessment (EIA) topic) ensures that impacts of greater adverse significance would not arise should any other development scenario be taken forward in the final scheme design. With regard to the assessment of the socio-economic impacts the assessment considers the construction/installation, operations/maintenance and decommissioning phases of the Project, as follows:

- > Construction/installation - maximum Project parameter: Installation of 100 MW capacity tidal power electricity generation turbines and associated offshore infrastructure; GVA impact: £16.6 million, employment impact 446 work years (based on temporary employment e.g. for a couple of years) (DKM, 2014);
- > Operations/maintenance - maximum Project parameter: Long term operations and maintenance of 100 MW capacity tidal power electricity generation turbines and associated offshore infrastructure; GVA impact: £2.8 million per annum (£69 million cumulatively), employment impact 74 permanent Full Time Equivalent (FTE) jobs (based on permanent full time jobs); and
- > Decommissioning – maximum Project parameter: Decommissioning of 100 MW capacity tidal power electricity generation turbines and associated offshore infrastructure; GVA impact: £8.6 million, employment impact 230 work years (based on temporary employment e.g. for a couple of years).

As the Project is technology neutral, published economic and employment intensities per MW installed for similar projects in Scotland are used, adjusting for relative populations to account for leakage to other regions. More details of the GVA and employment calculations are presented in the remaining sub-sections of this chapter, and in the supporting technical report (DKM, 2014).

18.5.4 Data gaps and uncertainties

A number of data gaps and uncertainties apply to this assessment:

- > The Project is technology neutral, i.e. no decision has yet been made on the tidal turbine technology that will be used by the Project. As such, it is not possible to be specific with regard to the scale and location of impact. For instance, it cannot be determined at this juncture where the turbines, nacelles, etc. will be manufactured and hence the locational dimension of the related economic impact;
- > Similarly it is not yet known where the inter-array and export cables will be manufactured. This be determined once the configuration of the inter-array and export cables is known; and
- > It is not known whether, at the end of the operational phase, the installation will be decommissioned (as assumed here) or will in fact be repowered. Technological and regulatory uncertainties, among others, are relevant in this regard.

18.6 Impacts and mitigation during construction & installation

18.6.1 Impact 18.1 - GVA and employment through the supply chain

Employment

Scottish research¹⁰ indicates an employment impact of 20 jobs per MW installed, back through the supply chain (i.e. direct and indirect) and including the induced impact. On this basis the Torr Head Tidal Energy Array Project could be expected to generate some 2,000 work years in this phase. Split on the basis of cost, this would be -

	work years
Turbine manufacture	1,000
Installation/foundations	600

¹⁰ <http://www.cambridge-resource-economics.co.uk/MEG%20Supply%20Chain%20Survey%20Report.pdf>, as quoted in the Meygen ES report referred to earlier.

Export cables and infrastructure - offshore	320
Export cables and infrastructure - onshore	80
Total	2,000

For current purposes it is assumed, based on discussions with TVL and experience elsewhere, that the turbine manufacture employment is all indirect (i.e. bought in as opposed to delivered directly by TVL), the installation/foundations is 80% direct, and the export cables and infrastructure are 50% direct and 50% indirect.

In the analysis, local is defined as the area of assessment (see Figure 18-2), and consists of the Moyle LGD area. As the previous section demonstrated, almost 500 Moyle residents are employed in manufacturing, while almost 900 are employed in Construction and 300 are employed in Transport & Storage (2011 Census).

These are the sectors that might be expected to be mainly involved in the construction and installation of the Project, albeit local firms may not have the required specialisms to benefit. Also, traditionally there has been a high degree of outward commuting to work by Moyle residents, and a proportion of these would presumably be open to accepting employment closer to home. One might expect that the onshore installation of export cables and infrastructure would have the potential to employ a proportion of local people.

More broadly, NI has a long tradition of high end marine-related engineering, and significant offshore energy supply capability, as evidenced in the 2014 report Northern Ireland Marine Energy Capability Directory produced by InvestNI. InvestNI further indicate that “25% of the world's full-scale marine energy devices have been developed, tested or manufactured in Northern Ireland” (InvestNI, 2014). The Scottish research referred to above estimates that there would be “a 53% overall retention of capital expenditure ... for the Scottish supply chain”. While given relative size and experience with marine engineering, it is likely that the NI equivalent for the current Project would be somewhat lower, there is still a significant opportunity to establish a local Northern Ireland offshore renewable industry supply chain through synergies with similar projects. This is discussed in more detail as part of the assessment of cumulative impacts (Section 18.10.1).

In a simplistic manner, the population of NI is 34% of the population of Scotland (1.81 million vs. 5.3 million), so one might expect 34% of the above estimate to represent the proportion retained in the NI economy. With respect to induced impact, as Box 18-1 overleaf indicates, this should represent 23.5% of the combined direct and indirect impact, to give the following:

Table 18-19 NI work years generated in construction phase

	Direct	Indirect	Induced	Total
Turbine	0	181	42	223
Installation/foundations	87	22	25	134
Export cables and infrastructure - offshore	29	29	14	71
Export cables and infrastructure - onshore	7	7	3	18
Total	123	238	85	446

Thus approximately 450 work years could be expected to be generated in NI, during the construction phase of the Project¹¹.

¹¹ This implicitly assumes that a proportion of the turbine manufacture will be undertaken in NI. In reality, it is more likely that it will all be undertaken in a single location, whether in or outside NI. The above can be seen as an average between these two outcomes.

Box 18-1: Type I and Type II Employment Multipliers

With respect to indirect and induced employment, the usual approach is to utilise estimated Type I and Type II Multipliers, derived from input-output tables. Unfortunately a comprehensive set of these is not available for Northern Ireland†, so Scottish values were chosen. Referring to the 2009 tables, and Industrial Order Classification (IOC) 41 Machinery & Equipment‡:

Type I employment multiplier (direct & indirect)	1.7
Type II employment multiplier (direct, indirect, induced)	2.1

Thus

- (i) the **indirect** impact equals 70% of the direct impact, and
- (ii) the **induced** impact is 23.5% of the combined direct and indirect impact ($[(2.1-1.7) \div 1.7]$).

† A high level set which relates to 2004-2005 is presented in <http://eservices.afbini.gov.uk/erini/pdf/EriniMon32.pdf>, but this only estimates output multipliers. A 2011 study by the Economic Advisory group of Northern Ireland on the impact of Corporation Tax rates used UK multipliers (<http://www.eagni.com/fs/doc/publications/impact-of-corporation-tax-on-ni-eag-report-final-report.pdf>), but this may overstate the case given the relative size of the jurisdictions in question.

‡ <http://www.scotland.gov.uk/Topics/Statistics/Browse/Economy/Input-Output/Downloads>

Local employment during construction and installation of the Project is likely to be modest. If it is assumed 20% of the direct impacts and 10% of the indirect and induced impacts (excluding turbine manufacture altogether) are captured by locally based workers/firms, this would imply local employment of approximately 35 work years:

Table 18-20 NI & local work years generated in construction phase

	Direct	Indirect	Induced	Total
NI	123	238	85	446
Local	25	6	4	35

There may also be potential opportunities for the creation of a small number of employment opportunities in relation to academic and scientific research as part of the environmental management and monitoring during installation of the Project.

Gross Value Added (GVA)

GVA impacts are considered in terms of local and national, and for construction / installation, operations and decommissioning stages of the Project, mirroring the employment impacts. GVA per person employed in NI was estimated in the baseline description at £37,200, and this can be applied to the employment impacts as measured in Section 18.4.3.

Referring back to Table 18-20, it was estimated that the construction / installation stage would generate some 446 work years in NI and some 35 work years locally. The GVA impact would therefore be £16.6 million for NI and £1.3 million for the local economy.

The sensitivity of receptor with respect to direct socio-economic impacts is considered to be medium. The magnitude and consequences of impact are considered major given that it will be greater than local scale (i.e. beyond the scope of the local economy to absorb). The impact is highly likely to occur, given that it is reasonable to assume that significant proportions of the additional opportunities can be captured at the local, regional and national levels. The Project has therefore been assessed as having a significant positive impact on GVA.

In addition, TVL understands the importance of community commitment initiatives, and supports the provision of financial contributions to local communities. It is TVL's intention to establish a community fund to benefit both the local and fishing communities. The benefits of this to the local community, as well as Commercial Rates paid to the local authority, would be in addition to the estimated benefits already identified.

Sensitivity and value of receptor	Magnitude of impact	Consequence	Significance
Medium	Positive	Positive	Significant

Mitigation relating to Impact 18.1 – GVA & employment
The GVA and employment impacts of the construction phase of the Project have been identified as being positive. There are a number of national, regional and local initiatives involving NI Government Departments, InvestNI and other regional and local development agencies, notably Moyle LGD and InvestNI, with the aim of identifying and enhancing supply chain opportunities in the marine renewables industry. These will assist in realising and maximising the opportunities locally and nationally and where appropriate TVL will support these initiatives.

18.6.2 Impact 18.2 - Tourism & recreation

This section focuses on the potential impacts of the Project on tourism and recreation during construction and installation of the TSSs, turbines, inter-array and export cables. This includes potential impacts on the local tourist industry, tourist attractions in the area (e.g. Antrim Coast and Glens AONB) and marine tourism activities e.g. sea angling (coastal and offshore), sightseeing and wildlife watching by boat and diving.

General impacts

Tourism and related sectors are important in the Moyle LGD. Some 6.5% of the local workforce is engaged in Accommodation & Food Service Activities, while a further 4.5% is engaged in Arts, Entertainment & Recreation; Other Service Activities, giving a total of approximately 10% of the workforce involved in areas directly or indirectly related to tourism. Some 36% of the businesses listed in the online Moyle District Council Business Directory are in the Hospitality sector. There would also be spillovers into retail and other sectors.

A large proportion of the workforce on the Project during the construction phase will be non-local, and could be expected to generate business for the above sectors locally. The economic impact of this is included in the indirect and induced impacts measured above.

Given that the tidal turbine array will be fully submerged and therefore not be visible during operation, any landscape, seascape and visual impacts associated with the Project will be related to the presence of vessels off Torr Head during installation, maintenance and decommissioning. The potential for the presence of vessel during installation to impact the amenity value and experiential quality of the AONB was considered as part of the Seascape, Landscape and Visual Assessment (SLVIA) (Chapter 17). This assessment concluded that installation activities associated with the offshore Project would not have any significant impacts on landscape or seascape character or visual amenity within local Torr Head area or the wider AONB area. It is also possible that installation activities off Torr Head might attract more sightseers to the area, thus mitigating any negative effect.

For tourism & recreation in general, the sensitivity of receptor is considered to be medium as defined in Section 18.5.2. The magnitude and consequences of impact are considered to be minor. There will be a minor visual impact during the construction phase (see Chapter 17 for more information). However, there is potential that the economic activity related to the construction phase will act to mitigate any negative impacts by generating some visitor numbers in its own right. Therefore overall the potential impact of construction and installation activities on tourism and recreation are assessed to be not significant as summarised below.

Sensitivity and value of receptor	Magnitude of impact	Consequence	Significance
Medium	Minor	Minor	Not significant

Mitigation relating to Impact 18.2 – general tourism & recreation
No mitigation measures have been identified for this impact as it was concluded that the impact was not significant

Marine tourism

Consultations with the AFBI, Moyle LDC and local businesses have confirmed that the sea off Torr Head is used for angling excursions by a number of small private fishing enterprises. These enterprises operate chartered vessels from small surrounding ports such as Ballycastle. Boats are also involved in sight-seeing and diving.

In terms of coastal sea angling access to the coast will be maintained during the construction and installation phase except during landfall operations when access to the preferred landfall location will be restricted temporarily (couple of months). However, these temporary restrictions will only apply to a short section of the coast at the landfall (e.g. will be contained within one of two bays (Portaleen or Loughan Bay). Access to other sections of the coast around Torr Head will, however, be kept open during this period ensuring that alternative locations are available for coastal sea angling activities to continue in the local area.

To ensure the safety of all personnel involved in the installation of the TSSs and turbines and to minimise the risk of collision between installation vessels and other vessels in the area it will be necessary to implement safety zones of up to 500 m radius on a rolling basis around areas where installation activities are taking place at any given time. Given that sea angling and diving activities offshore will not be permitted within a safety zone, this will lead to temporary displacement of these activities within these areas while installation takes place. Once the TSSs and turbines are installed, vessels will be allowed back into the area. However, due to the potential risk of angling gear snagging on installed turbines it sea angling activities are unlikely to be able to resume in these areas. It is expected that diving activities will also be restricted in the immediate vicinity of the installed turbines.

The construction of the tidal array will occur over two years (Phase 1 and Phase 2). It is therefore likely that offshore sea angling and diving activities in the AfL area will become increasingly limited as the installation of the TSSs and turbines progresses.

Boat based sight-seeing and wildlife tours will also not be permitted within the safety zones, leading to temporary displacement of these activities from the safety zone areas. Given that there will be a minimum clearance of 8 m between sea surface at Lowest Astronomical Tide (LAT) and turbine blade tip, once the TSSs and turbines are installed and the safety zone is removed, boats involved in sight-seeing and wildlife tours will be able to move freely throughout the AfL area.

All marine tourism activities in the Torr Head area are considered to be of regional importance and therefore are of medium sensitivity. Although Torr Head is a popular location for all activities the magnitude of the potential impact has been assessed as minor as any disruptions to these activities on the basis that displacement will only occur over a small area (maximum of 6.8 km² if safety zones cover the entire AfL area at one time which is very unlikely), will be temporary, short term and most activities will be able to resume once installation of the tidal array and activities at the landfall are complete. Given that offshore sea angling, diving and sightseeing tours occur along a number of locations along the North Antrim coast e.g. sea angling takes place along a 55 km stretch of the coast (AFBI, 2011), there will be a number of alternative locations available for these activities to continue throughout the installation period. Longer term impacts resulting from restricted sea angling and diving activities in the AfL area due to the physical presence of the turbines are covered under operational and maintenance (Impact 18.4) and not included in this assessment. The consequence of the impact is minor and overall the impact is not significant.

Sensitivity and value of receptor	Magnitude of impact	Consequence	Significance
Medium	Minor	Minor	Not significant

Mitigation relating to Impact 18.2 – marine tourism
No mitigation measures have been identified for this impact as it was concluded that the impact was not significant

18.7 Impacts and mitigation during operations & maintenance

18.7.1 Impact 18.3 – GVA & employment through supply chain

Employment

Based on Scottish experience, it was estimated that an 86 MW facility in Caithness would generate approximately 50 permanent direct jobs: 30 offshore and 20 onshore. Grossing up to a 100 MW facility, as is envisaged by TVL, implies direct employment of 34 offshore and 24 onshore which would be a total of 58 permanent jobs.

Given the nature of these jobs, relatively few would be sourced locally, but the majority could be sourced from within NI. By reference to the multipliers described in Box 18-1 above, this implies that the:

- > Indirect impacts = $58 \times (1.7 - 1) = 41$ jobs created; and
- > Induced impacts = $58 \times (2.1 - 1.7) = 23$ jobs created.

Thus the combined direct, indirect and induced employment generated by the Project would be 122 FTE permanent jobs ($58 + 41 + 23$) throughout the operational phase (25 years), based on Scottish values.

The impacts however might not be as high as in Scotland, given the difference in size of the economies and the state of development of the offshore energy sector. In a simplistic manner, the population of NI is 34% of the population of Scotland, so it would be more realistic to expect 34% of the above calculated figure to apply.

However, it would be expected that the majority of the direct impact would be retained within NI, given the permanent nature of most of the employment, a proportion of which would be locally generated. It is therefore assumed that 80% would be retained in NI while 50% of the onshore direct impact would be local, i.e. $58 \times 80\% = 46$ and $24 \times 50\% = 12$.

With regard to the indirect impact, the population ratio applies, implying that the NI impact would be $41 \times 34\% = 14$; it is assumed that only 20% of this would be local.

Thus the combined direct and indirect impact would be:

- > National $46 + 14 = 60$ jobs created; and
- > Local $12 + 3 = 15$ jobs created.

The induced impact is 0.4 / 1.7 of the combined direct and indirect impacts (Box 18-1), implying a national impact of 14 jobs created and a local impact of four jobs created.

Thus the operations & maintenance phase employment impacts can be summarised as follows¹².

Table 18-21 NI & local permanent jobs generated during operational phase

	Direct	Indirect	Induced	Total
NI	46	14	14	74
Local	12	3	4	19

There may also be potential opportunities for the creation of a small number of employment opportunities in relation to academic and scientific research as part of the environmental management and monitoring during operation of the Project.

¹² These "Full Time Equivalent" jobs are the accumulation of all the employment impacts that occur over the lifetime of the Project. Individuals may be working part-time, seasonally, or even on a shorter basis, e.g. boats or divers hired for short periods, additional temporary jobs generated in local hotels, restaurants or shops catering for the increased number of people based locally during more intensive stages of the Project, additional work gained by local engineering/construction/manufacturing firms during the lifetime of the Project, etc. Some fulltime permanent jobs in the traditional sense might also be expected.

Gross Value Added (GVA)

It is estimated that 74 permanent jobs would be supported by the Project, taking the direct, indirect and induced impacts, and that 19 of these would be locally based.

The GVA impact would thus be £2.8 million for NI and £0.7 million for the local economy, per annum. Over an operational life of 25 years, these would sum to £69 million and £17.7 million respectively.

The sensitivity of receptor with respect to direct socio-economic impacts is considered 'medium'. The magnitude and consequences of impact are considered major on the basis that the impact is expected to occur on a greater than local scale (i.e. beyond the scope of the local economy to absorb). The impact is highly likely to occur, given that it is reasonable to assume that significant proportions of the additional opportunities can be captured at the local, regional and national levels. The operational phase of the Project is therefore expected to have a significant positive impact on GVA.

Sensitivity and value of receptor	Magnitude of impact	Consequence	Significance
Medium	Positive	Positive	Significant

Mitigation relating to Impact 18.3 – GVA & employment
The GVA and employment impacts of the O&M phase of the Project have been identified as being positive. There are a number of national, regional and local initiatives involving NI Government Departments, InvestNI and other regional and local development agencies, notably Moyle LGD, with the aim of identifying and enhancing supply chain opportunities in the marine renewables industry. These will assist in realising and maximising the opportunities in the local and wider areas and where appropriate TVL will support these initiatives.

18.7.2 Impact 18.4 - tourism & recreation

General impacts

For tourism & recreation in general, the sensitivity of the receptor is considered to be medium (having a regional importance). The magnitude and consequences of impact are considered to be minor on the basis that although tidal array will be fully submerged, there will be vessels present within the AfL area involved in maintenance activities and there may also be a requirement for physical aids to navigation to be installed to mark the corners of the array. This is dependent on the outcome of discussions with the Commissioner of Irish Lights (CIL) on the Navigational Risk Assessment (NRA). Should physical aids to navigation be required these will most likely be lit navigational buoys. The potential impact of both maintenance vessels and the presence of physical aids to navigation on seascape, landscape and visual amenity will not be significant (Chapter 16).

As part of TVLs proposed community commitment initiatives there may be opportunities to provide a permanent display or public information boards which would provide information about the Project to local communities and visitors to the area. This could have a positive impact on local tourism by encouraging people to visit the area to learn about the Project. Overall, during operation there is potential that the Project could have a positive impact on local tourism.

Sensitivity and value of receptor	Magnitude of impact	Consequence	Significance
Medium	Positive	Positive	Significant

Mitigation relating to Impact 18.4 – general tourism & recreation
No mitigation measures have been identified for this impact as it was concluded that the impact was not significant.

Marine tourism

Once operational the tidal array will have no impact on coastal sea angling as there will be no restrictions to access along the coast for this activity. There will also be no impacts on boat based sightseeing and wildlife tours as all boats will be able to move freely above the submerged turbines (minimum clearance between sea surface at LAT and turbine blade tip will be 8 m).

There is potential that offshore sea angling and diving activities will be restricted within the AfL area once the array is fully installed and operational. This is mainly due to a risk of sea angling gear snagging submerged turbines. Although both activities are popular in this area and are considered to be of medium sensitivity due to the regional importance, they also occur at a number of locations along the North Antrim coast. Therefore although there will be longer term displacement of these activities from within the AfL area, the maximum area affected will be 6.8 km² which in comparison to the 55 km stretch of coast used for sea angling (AFBI, 2011) is a small area. The magnitude of the impact is therefore assessed as minor on the basis that it will be possible for these activities to take place at alternative locations nearby. There is also potential that the Project may generate opportunities for the boats and divers to be involved in operations and maintenance activities. The consequence of the impact is assessed as minor with the resulting impact being not significant.

Sensitivity and value of receptor	Magnitude of impact	Consequence	Significance
Medium	Minor	Minor	Not significant

Mitigation relating to Impact 18.4 – Marine tourism
No mitigation measures have been identified for this impact as it was concluded that the impact was not significant.

18.8 Impacts and mitigation during decommissioning

Potential socio-economic impacts are expected to be similar, if not slightly less significant than those experienced during the construction and installation phase of the Project. It is expected that decommissioning will generate an estimated 230 work years for Northern Ireland and 37 work years locally and will have a related GVA impact estimated at £8.6 million for Northern Ireland and £1.4 million for the local economy.

Impacts on tourism and recreation will be similar to those that are likely to occur during installation with respect to temporary displacement of marine activities e.g. sea angling, diving and sight-seeing. These have been estimated to be not significant. To reduce the potential for any effects on tourism and recreation during this period, TVL will work closely with local businesses to ensure disruption to different activities is kept to a minimum.

18.9 Potential variances in environmental impacts

The impact assessment above has assessed the worst case options for the Project with regards to impact to Socio-economics. However, it should be noted from a socio-economic perspective the worst case option would be if the Project did not go ahead. A number of the socio-economic impacts identified are positive and are based on the assumption that the Project will generate a certain level of employment and GVA. However, if the Project does not go ahead, these positive impacts would not occur as the source of employment and GVA would be removed.

18.10 Cumulative and in-combination impacts

Having considered the information available at present in the public domain on the projects for which there is a potential for cumulative or in-combination impacts, Table 18-22 indicates those with the potential to result in cumulative or in-combination impacts from a socio-economic perspective. The consideration of which projects could result in potential cumulative or in-combination impacts is based on the results of the Project-specific impact assessment together with the expert judgement of the specialist consultant.

Table 18-22 Summary of potential cumulative and/or in-combination socio-economic impacts

Project title	Potential for cumulative and/or in-combination impacts	Project title	Potential for cumulative and/or in-combination impacts
Fair Head Tidal Project	✓	Strangford Lough (Minesto 1) Tidal Project	✓
Mull of Kintyre, Argyll Tidal Project	✓	Isle of Islay offshore wind Tidal Project	✗
Sanda Sound Tidal Project	✗	First Flight offshore wind (Northern Ireland)	✗
Isle of Islay Tidal Project	✗	Celtic Array offshore wind - Irish Sea	✗
Sound of Islay Tidal Project	✓	Western HVDC Link Interconnector	✗

The following sections summarise the nature of the potential cumulative and in-combination impacts for each Project phase:

- > Construction and installation;
- > Operations and maintenance; and
- > Decommissioning.

18.10.1 Potential cumulative and in-combination impacts during construction and installation

From a socio-economic point of view, there is clear potential for synergies and economies of scale between the impacts of the Project and similar marine renewable projects for:

- > Firms in the NI supply chain;
- > Firms involved in marine tourism;
- > Other stakeholders; and
- > Public bodies and officials involved at a regulatory level (planning, environmental and economic).

The most obvious potential lies with the nearby Fair Head Tidal Energy Project. It may also apply to the Strangford Lough project and the Scottish projects listed above. The actual scope of the potential will depend on the timeframe and the technology eventually adopted.

Spillover / wider effects can also have combined impacts, particularly in the case of the Fair Head Tidal Project, where for example the impacts on marine tourism may be greater than if the two projects were further apart in time or distance. A greater combined footprint may potentially have a more serious impact as the scope for relocations of activities within a defined area may be more constrained.

However, there may also be greater scope for mitigation measures, through for example synchronised scheduling of activities, sharing of facilities such as export cabling, and so on where possible. Having two similar projects in close proximity may also generate sufficient critical mass to support alternative economic activity for boats potentially displaced and income lost through impacts on marine tourism. More widely, the same applies to firms in the local and NI supply chain, in generating critical mass to support business activity and investment in physical and human capital, to supply these and other similar projects.

Once again, the actual scope will depend on the timeframe and the technology eventually adopted. On the face of it, the more similar the technical solutions chosen, the greater the potential for synergistic benefits.

18.10.2 Potential cumulative and in-combination impacts during O&M Phase

The same points made above with regard to the construction phase apply to the O&M phase. The potential impacts are more substantial as the timeframe is longer. Indeed, synergistic impacts would likely be generated by a combination of the construction and O&M phases, given the relative shortness of the former.

18.10.3 Potential cumulative and in-combination impacts during decommissioning

The same points made above with regard to the O&M phase apply to the decommissioning phase, but would be dependent on decommissioning being undertaken at the same or similar time.

18.10.4 Mitigation requirements for potential cumulative and in-combination impacts

No mitigation is required over and above the Project-specific mitigation.

18.11 Proposed monitoring

No monitoring has been proposed for this topic.

18.12 Summary and conclusions

The Project has potential to generate positive impacts for both the Northern Ireland and the local labour force and supply chain. In particular there is a potential opportunity to establish a local Northern Ireland offshore renewable energy industry supply chain through synergies with similar projects. This would not only provide services for this Project but through continued development of the skills, knowledge, experience of individuals, firms and other stakeholders and building a strong supply chain, this will help attract future Project and additional investment to Northern Ireland.

Potential negative impacts may occur as a result of disruption to marine tourism activities (sea angling, sight-seeing from boats, diving), but these are concluded to be not significant. TVL also understands the importance of community commitment initiatives, and supports the provision of financial contributions from operating developments to local communities. It is TVL's intention to establish a community fund to benefit both the local and fishing communities. In addition to this there may be opportunities to create permanent public displays providing information on the Project to local communities and local visitors. This could also have a positive impact on local tourism by encouraging more people to visit the area to find out about the Project.

There may also be potential opportunities for the creation of a small number of employment opportunities in relation to academic and scientific research as part of the environmental management and monitoring aspects of the Project.

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