

Chapter 6 - Socio-Economic

Introduction

- 6.1 This chapter assesses the potential direct, indirect and wider social-economic effects (primarily employment impact) associated with the construction and operation of the proposed wind farm project.
- 6.2 The first part of the chapter looks at the wider social and economic implications of wind energy projects at a national or international scale, which serves to set the scene and demonstrate the rapidly expanding employment opportunities within the wind energy sector. The second part of the chapter looks at the local economic effects, particularly focusing on predicted employment in the local and wider Welsh economy. The impact of wind farms on tourism and house prices are also examined.

Methodology

- 6.3 There is no prescribed methodology or commonly used standard criteria for assessing the socio-economic effects of developments within the UK. However, there are many studies available looking at the socio-economic impact of renewable energy, including a number specifically focused on wind farms. This assessment is based on a review and extrapolation of these studies to estimate the potential socio-economic impact in terms of employment and income generation.
- i. This chapter presents the results of a desk bases assessment, which draws upon relevant information readily available from published papers and secondary data sources. The assessment looks at the likely economic contribution that will be derived through the proposed wind farm development at four stages of activity:

- a. The development phase – including project design, environmental studies, legal agreements, project funding and planning permissions.
- b. The construction phase – including turbine manufacturing (the tower, blades and internal components); installation (activity and supplies required to install completed turbines which include civil and project management; roads and access; foundations and infrastructure) and grid connection.
- c. The operational phase – maintaining and operating the site over the lifetime of the proposed wind farm; and,
- d. The decommissioning phase - removing the turbines and restoring the site or repowering, at the end of the operation and maintenance period.

Socio-economic Baseline

- 6.4 The application site lies within the Haven Waterway Enterprise Zone. The Enterprise Zone aims to use the established energy industry in the area (in particular the Valero and Murco oil refineries) as a base to further develop expertise and supply chains in traditional and renewable energy generation.
- 6.5 According to the most recent NOMIS data (official labour market statistics), Pembrokeshire has a resident population of 125,800 (in 2019). The working age population is 56.9% (in 2019) of the total, compared to the Wales average of 61.1%. During the period between April 2019 and March 2020, 79.6% of the population (aged between 16 and 64), were economically active, of which 3.8% were unemployed (Wales 76.3%% economically active and 3.7% unemployed). In year 2019, approximately 9.3% of the population aged 16-64 do not have formal qualifications (Wales 8.5%) and 34.2% have NVQ Level 4 qualifications and above (Wales

36.3%). According to Regional Economic and Labour Market Profiles for Wales (2020)¹, the employment rate (the percentage of the population that is in employment) in Pembrokeshire is 72.9%, which compares to 73.5% for Wales.

6.6 The current (up to 2021) Pembrokeshire Local Development Plan (LDP)² was adopted since 2013, which acknowledges the changes to the Pembrokeshire economy over the last 30 years, due to the closure of power, oil and defence establishments, rationalisation in public services, agriculture and fishing; and on-going changes in tourism. The current economy of Pembrokeshire is dominated by agriculture, tourism, energy and public services. A summary of employee jobs by industry is provided in Table 6.1 below. Tourism related service sector (including 'Accommodation and Food Service Activities' and 'Arts, Entertainment and Recreation') is one of the largest employers but many of these jobs are part-time and seasonal in nature. There are a large proportion of small employers and a relatively high proportion of people are self-employed in Pembrokeshire.

¹ Statistics for Wales, 2020. Statistics Bulletin (January 2020).

² The LDP excludes the Pembrokeshire Coast National Park. Page 6-2 January 2014

Table 6.1: Summary of Employee Jobs by Industry in Pembrokeshire and Wales*

Industry	Pembrokeshire (%)	Wales (%)
B : Mining and Quarrying	0.3	0.1
C : Manufacturing	7.0	11.4
D : Electricity, Gas, Steam And Air Conditioning Supply	0.6	0.6
E : Water Supply; Sewerage, Waste Management And Remediation Activities	0.7	1.0
F : Construction	5.8	5.1
G : Wholesale And Retail Trade; Repair Of Motor Vehicles And Motorcycles	16.3	14.0
H : Transportation And Storage	4.1	3.3
I : Accommodation And Food Service Activities	16.3	8.0
J : Information And Communication	0.9	2.1
K : Financial And Insurance Activities	0.9	2.6
L : Real Estate Activities	1.4	1.6
M : Professional, Scientific And Technical Activities	4.7	5.6
N : Administrative And Support Service Activities	4.1	6.9
O : Public Administration And Defence; Compulsory Social Security	5.2	7.1
P : Education	8.1	9.1
Q : Human Health And Social Work Activities	18.6	16.9
R : Arts, Entertainment And Recreation	4.1	2.4
S : Other Service Activities	1.6	1.8

*Employee jobs excludes self-employed, government-supported trainees and HM Forces

Source: ONS Business Register and Employment Survey (ONS, 2018)

- 6.7 Some of the key issues cited by the LDP include lack of employment opportunities in rural areas, loss of skilled young people from the County, wage levels/seasonality of jobs and inadequate and/or inappropriate skills base in the local workforce.
- 6.8 The LDP Background Paper on the Economy states that “a prime economic development objective has been to increasingly diversify the local economy, encourage higher value business sectors such as renewable energy and the wider knowledge economy and to add value to existing sectors such as tourism, engineering and agriculture” and that “a significant challenge will be to capture investment in the new higher value growth sectors such as renewable energy and environmental goods and services whilst at the same time supporting indigenous business growth and encouraging innovation and R&D”.

The Wider Economic Perspective - Wind Energy

- 6.9 Wales is committed to a binding target that 70% of its energy consumption should be from renewable sources by 2030. Future Wales – The National Plan 2040, which addresses key national priorities through the planning system, states:

‘Wales is abundant in opportunities to generate renewable energy and the Welsh Government is committed to maximising this potential. Generating renewable energy is a key part of our commitment to decarbonisation and tackling the climate emergency. We have set the following ambitious targets for the generation of renewable energy:

For 70% of electricity consumption to be generated from renewable energy by 2030.

For one gigawatt of renewable energy capacity to be locally owned by 2030.

For new renewable energy projects to have at least an element of local ownership from 2020.’

- 6.10 Most of the growth in renewable energy in the UK is from electricity generation and most of the extra renewable generation is expected from wind turbines. Table 6.2 shows

the share of renewables capacity in the UK in 2019, which suggests that onshore wind is the biggest source followed by Solar PV.

Table 6.2: Share of Renewable Capacity in the UK by Technology in 2019.

Source of renewables	Share
Onshore Wind	30%
Solar PV	28%
Offshore Wind	21%
Bioenergy	17%
Hydro	4%

[Source: Department for Business, Energy and Industry Strategy (2020). The Digest of UK Energy Statistics.]

- 6.11 Wales has the potential to deliver 34.5kWh/d/p from renewable resources (Welsh Government, 2010)³. Onshore and offshore wind, biomass and tidal energy are seen as the main areas of opportunity.
- 6.12 The Assembly Government published its Energy Policy Statement in March 2010 “A Low Carbon Revolution –The Welsh Assembly Government Energy Policy Statement”, which set out a target to have 4.5 kWh/d/p (equating to 2GW) of installed onshore wind generation capacity by 2015/2017.
- 6.13 According to Regional Renewable Statistics (2020)⁴, the total installed capacity of onshore wind farms in Wales was 8,112 MW generating 17,323 GWh electricity between year 2008 and 2019.
- 6.14 The Pembrokeshire LDP Renewable Energy Assessment Report (National Energy Foundation, 2017)⁵ estimated that wind energy could contribute to 16% of the total

³ Welsh Government, (March 2010). A Low Carbon Revolution - The Welsh Assembly Government Energy Policy Statement.

⁴ Available at: <https://www.gov.uk/government/statistics/regional-renewable-statistics>

⁵ National Energy Foundation (April, 2017) LDP Renewable Energy Assessment, Report to Pembrokeshire County Council.

potential electrical energy generation capacity from existing renewables in Pembrokeshire by 2032.

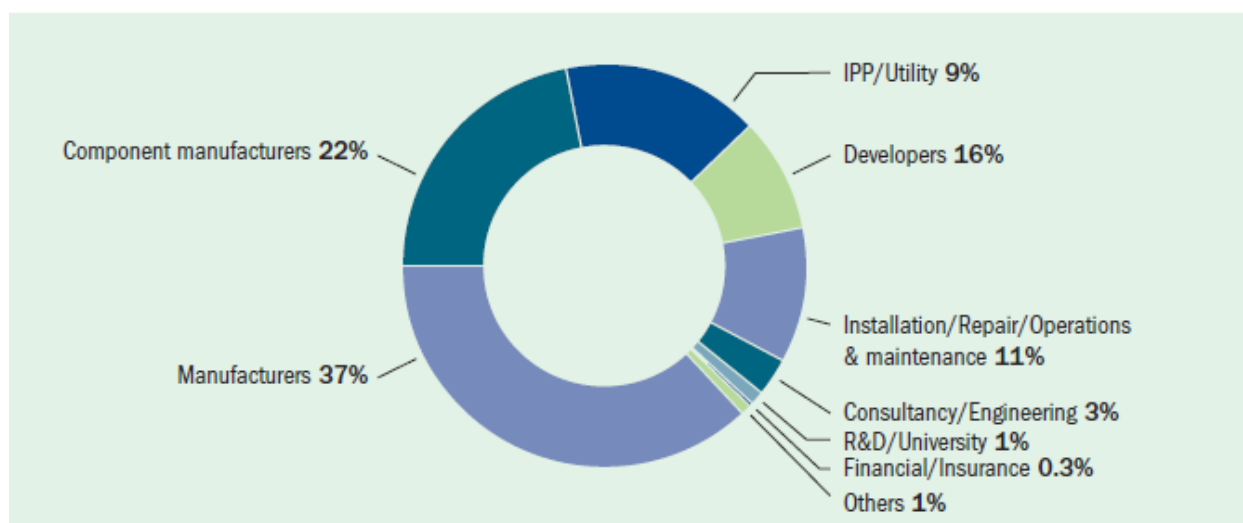
- 6.15 In terms of economic impact, employment potential is the most frequently cited socio-economic benefit of renewable energy and the wind energy in literature.
- 6.16 There are two categories of jobs in relation to wind energy: (a) direct jobs and (b) indirect jobs. According to the definition by the European Wind Energy Association (EWEA) (2009)⁶:
- i. Direct jobs refer to the employment in wind turbine manufacture, component manufacture, wind energy project developers including installation, operation and maintenance, utilities selling electricity from wind energy, major research and development, engineering and specialised wind energy services.
 - ii. Indirect jobs relate to the employment in any other company producing intermediates or components, providing services or sporadically working in wind-related activities.

Overview of Socio-economic Impact of Wind Farm Development

- 6.17 In terms of the composition of direct jobs, wind turbine and component manufacturers enjoy the biggest share of direct employment, which is estimated at 59% (See Figure 6.1 below for a detailed breakdown by sector of direct employment in the wind energy industry in the EU).

⁶ EWEA (January, 2009). Wind at Work: Wind energy and job creation in the EU. Available at: http://www.ewea.org/fileadmin/ewea_documents/documents/publications/Wind_at_work_FINAL.pdf.

Figure 6.1: Direct Employment by Type of Company in the Wind Energy Sector, Based on the Results of the EWEA Survey.



Source: EWEA (2009). Wind at Work: Wind energy and job creation in the EU]

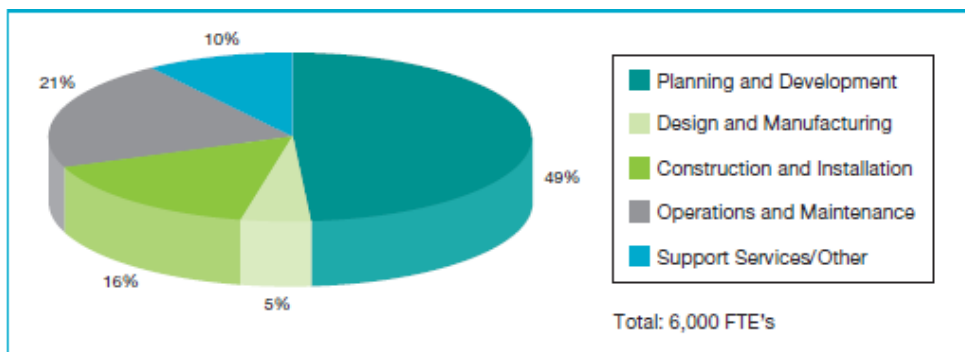
6.18 A more recent socio-economic impact evaluation of Wind Energy on the European Union (Deloitte, 2017)⁷, suggested that the wind energy industry accounted for 0.26% of the total value of goods and services produced in the EU in 2016; 47% of which was generated from wind energy developers, 27% from wind turbine manufacturers, 9% from component manufacturers and 12% from service providers.

6.19 In the UK context, wind energy is the fastest growing energy sector creating jobs with every megawatt installed. It is estimated in a report by Renewable UK and Energy & Utility Skills (EU Skills) (2011)⁸ that 6,000 direct Full-Time-Equivalent (FTEs) jobs are sustained in the UK’s large-scale onshore wind industry. A breakdown of these FTEs by sector shows that nearly half of these FTEs, 2,900 are in Planning and Development (see Figure 6.2 below); a further 1,200 FTEs are employed in Operations and Maintenance, whilst almost 1,000 FTEs are employed in Construction and Installation.

⁷ Deloitte (November 2017). Local impact, global leadership: the impact of wind energy on jobs and the EU economy. A report to Wind Europe (windeurope.org).

⁸ RenewableUK and Energy and Utility Skills (EU Skills), February 2011. Working for a Green Britain-Employment and Skills in the UK Wind and Marine Industries. Available at: http://www.bwea.com/pdf/publications/Working_for_Green_Britain.pdf Page 6-6 January 2014

Figure 6.2: Direct Employment in Large Scale Onshore Wind (2010)



[Source: Working for a Green Britain Employment and Skills in the UK Wind & Marine Industries (February 2011)]

- 6.20 A survey in 2010 of the wind energy sector in Wales estimated that the sector would be employing 1,041 people (full-time equivalent) on high average salaries (£44,000 per annum) in Wales by 2012 (Welsh Government, 2011)⁹. The survey also found that in total the wind energy sector contributed £103 million directly to the Welsh economy, which increased to £158 million if considering the multiplier effect by applying a standard industry multiplier coefficient (1.53) to the direct expenditure.
- 6.21 For onshore wind energy sector, the study by RenewableUK and EU Skills shows that the 6,000 FTEs employed in the sector relates to 3.5GW of installed capacity which implies a ratio of 1.7 FTE/MW. However, it should be noted that there is wide variance in reported values of jobs/MW in past research due to different definitions and methodologies, as illustrated by a study in Ireland (Dalton, G.J. and Lewis, T., 2011)¹⁰.
- 6.22 Overall, there is considerable secondary evidence suggesting that the wind sector generates employment opportunities throughout the life of the project, particularly during development and construction stages.

⁹ Welsh Government, (March 2010). A Low Carbon Revolution - The Welsh Assembly Government Energy Policy Statement.

¹⁰ Dalton, G.J. and Lewis, T., (2011). Metrics for measuring job creation by renewable energy technologies, using Ireland as a case study. Renewable and Sustainable Energy Reviews 15 (2011) 2123–2133.

Socio-economic Effects

6.23 This section focuses on the potential socio-economic effects, including employment resulting from the development, construction and the operation stages of the proposed wind farm.

Total Investment

6.24 In order to estimate the scale of investment and economic impact at all stages of the wind farm development, the installed costs should be estimated first for the proposed wind farm.

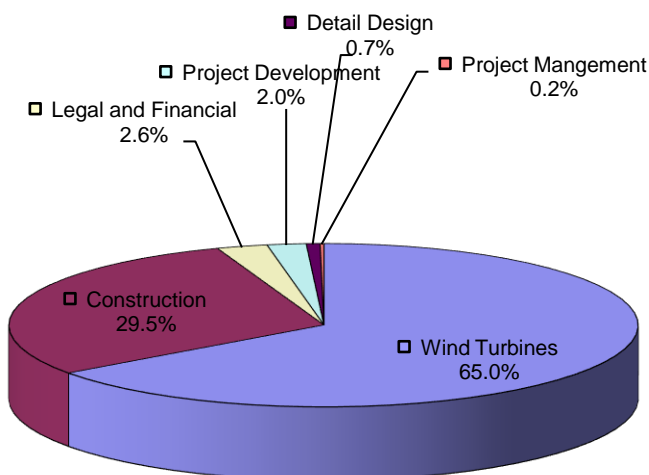
6.25 The Proposed Development is estimated to result in a total capital spend of approximately £8,385,000 in nominal prices. The total construction spend is estimated at £2,473,575.

Economic Effects

Development and Construction Period Effects

6.26 A detailed breakdown of capital cost at development and construction stages is presented in Figure 6.3 below. This shows the cost of wind turbines is the biggest element of the capital costs and accounts for 65% of the total investment. Construction cost is about 30% of the total capital cost.

Figure 6.3: Breakdown of Capital Cost



6.27 This estimate is in line with the DECC and Renewable Energy study (2012)¹¹, which suggests that the turbine contracts account for the majority of the value at 65.1%, the balance of plant contracts (installation) account for 27.3%.

6.28 Since the wind turbine is by far the largest single element of the project capital cost, the majority of the benefits of the capital investment goes to the manufacturers and their supply chains. As recognised in the “Energy Industry Market Forecast report on the Wind Market” (AEA Technology, 2009), the UK supply chain is limited with respect to turbine and turbine components manufacture. As there is no major facility for turbine manufacture in Wales, it is assumed that expenditure on turbine supply will leak fully out of Wales.

6.29 The UK presence of international companies is also starting to grow with a number of European companies setting up offices in the country to respond to the increase in wind turbine deployment in the UK. The UK base for the supplier REPower is in Edinburgh

¹¹ DECC and RenewableUK (May, 2012). Onshore Wind: Direct & Wider Economic Impacts.

with service centres in Dumfries, Peterborough, Preston and Hirwaun in South Wales. A few major turbine manufacturers have established bases in the UK, including Nordex, GE Energy, Gamesa and Clipperwind.

- 6.30 In addition, these manufacturing companies would require support in craneage, transportation, labour, accommodation and subsistence, much of which can be sourced locally. Many turbine suppliers are sensitive to local issues and endeavour to source contract content locally where possible. The location of the proposed development within the Haven Waterway Enterprise Zone would indicate that this development is likely to be able to more readily access local expertise than would be the case with other similar projects elsewhere in Wales.
- 6.31 A Scottish study conducted by O’Herlihy & Co. Ltd. in 2006¹² looking at the economic impact of wind farm construction of three wind farm developments in Scotland gave a more detailed breakdown of local and regional elements for each component spend. The estimated local and Scotland element of investment of these wind farm developments are shown in Table 6.3. Although these examples are in the context of the Scottish economy.

¹² O’Herlihy & Co. Ltd., (2006). Windfarm Construction: Economic Impact Appraisal. Final Report to Scottish Enterprise.

Table 6.3: Local and Scotland Content of Wind Farm Developments

Activity	Scotland Proportion	Local Proportion
1. Wind assessment and feasibility review	100%	15%
2. Land agreement	100%	100%
3. Planning process	100%	20%
4. Construction (roads)	100%	40%
5. Construction/erection services	33%	0%
6. Internal grid and grid connection	50%	40%

[Source: O’Herlihy & Co. Ltd. (2006). Windfarm Construction: Economic Impact Appraisal. Final Report to Scottish Enterprise.]

- 6.32 The DECC and Renewable UK (2012) study has also made estimates on the shares of the benefits that can be retained locally, within the region/UK countries. The results are summarised in Table 6.4, which shows that at the development stage, 8% of the direct economic benefits (in terms of turnover) will be retained locally and 41% will be retained in the wider region.
- 6.33 At the construction stage, fewer shares of the direct economic benefits will be retained locally or regionally. It is estimated that 7% of the direct economic benefits (in terms of turnover) will be retained locally and 29% will be retained in the wider region.

Table 6.4: Shares of Benefits of Wind Energy Retained Locally, in the Region/Nation, and the UK Economy

Stage	Weighted Spend (£m)	Local	Region/Nation	Local benefits*(£m)	Benefits to Wales* (£m)
Development	£461,175	8%	41%	£36,894	£189,081.75
Construction	£2,473,575	7%	29%	£173,150.25	£717,336.75
Total Capital Investment	£2,934,750	-	-	£210,044.25	£906,418.50

Source: DECC and Renewable UK (May 2012). Onshore Wind: Direct & Wider Economic Impacts.

* Own calculations based on the results from the DECC and Renewable UK study.

6.34 However, direct economic contribution only partially reflects the overall impact and contribution to the Welsh economy. There are indirect benefits from the development and construction stages of the wind farm on the local economy which would typically include the provision of food and accommodation for on-site construction staff, the management team and visiting staff during the construction works. Those benefiting will include hotels, B&Bs, pubs, restaurants, taxi firms, fuel and repair garages, cinemas and other attractions and local shops. This indirect expenditure will be passed on in the form of further rounds of spending induced by the initial expenditure.

6.35 To account for these indirect and induced effects, a multiplier should be applied to the direct expenditure figure. If using a standard industry multiplier of 1.53 as indicated in

the study of “The Economic Value of Wind to Wales” (RenewableUK, 2010)¹³, the overall economic contribution to allow for indirect and induced impact of the proposed wind farm would bring approximately £320,000 to the local economy and £1,385,000 to the Wales economy.

- 6.36 It should be noted that the multiplier used represents the effect to the Welsh rather than the local economy. Multipliers of the local economy tend to be lower due to the reduced capacity to retain expenditure. Nevertheless, in the absence of estimates on multipliers of the local economy the multiplier used represents the best estimate that is available. As noted elsewhere in this chapter, an existing energy industry supply chain already exists in the local area through the Haven Waterway Enterprise Zone. This will enable the development to retain more expenditure in the local area than would otherwise be the case.

Operational Period Effects

- 6.37 The wind farm will be designed to operate for a period of 35 years and will need to be regularly maintained and serviced to ensure efficient operation. Whilst such regular planned maintenance is scheduled to take place at six monthly intervals, there will be a requirement for full time and part time staff throughout the operating life of the project for unscheduled maintenance issues. Wind turbine manufacturers generally employ local labour and can provide good training and career opportunities to those they employ. The companies also generally like to source a lot of consumable items (tools, fuels, oils etc.) and plant hire locally to help improve response times to unplanned maintenance requirements and keep the wind farm operating efficiency as high as possible.
- 6.38 The DECC and RenewableUK (2012) study estimates that the operation and maintenance of a wind farm would generate a turnover of £52,659 per MW per annum over its life time, 29% of which will be retained in the local economy and 65% will be

¹³ RenewableUK Cymru, May 2010. The Economic Value of Wind to Wales-A Survey. Available at: http://www.bwea.com/pdf/publications/Wales_economic_report2010.pdf

retained in the regional economy (see Table 6.6). Based on these estimates, the proposed wind farm (12.9MW) would generate approximately £195,000 locally and £440,000 in Wales annually during its lifetime.

Table 6.6: Economic Benefits of Operating and Maintaining Wind Farms to the Local, Regional and UK Economy

Stage	Weighted Spend per MW	Local	Region/Nation	UK	Local benefits*	Benefits to Wales*
Operation and Maintenance, per annum	£52,659	29%	65%	90%	£195,000	£440,000

[Source: DECC and Renewable UK (May 2012). Onshore Wind: Direct & Wider Economic Impacts]

*: Own calculations based on the results from the DECC and Renewable UK study.

6.39 Regeneris Consulting (2013)¹⁴suggests that the expenditure at Operations and Maintenance stage were estimated at £38,600 per MW per annum and 76% of this expenditure was expected to be retained in Wales. Although this estimate was lower in terms of the total spend than the estimate from the DECC and RenewableUK (2012) study, the percentage of what would be retained in the Welsh economy was higher.

6.40 The estimate based on the Regeneris study of the total economic benefits to Wales is £380,000 which is slightly lower than the estimate at Table 6.6 (£440,000).

6.41 The largest items of expenditure at operational stage include land rentals and access payments which are paid to local land owners. Community Benefit payments are also an important element of operational expenditure for local communities around wind farms and the resultant spending is largely local.

¹⁴ Regeneris Consulting (2013). Economic Opportunities for Wales from Future Onshore Wind Development. A report to RenewableUK Cymru. January 2013.

- 6.42 A Community Benefit fund for investment in local groups and projects will amount to £5,000 per MW per year (totalling an annual payment of £64,500) will be provided through the Development. The fund, over a 35 year period, will see approximately £2.25 million invested in the local area.
- 6.43 Rhoscrowther Wind Farm Ltd are continuing to explore ideas for investment through further discussions with local community councils, residents and community groups.

Decommissioning Period Effects

- 6.44 There has been limited evidence on the economic impact of decommissioning as the operating period for most wind farms is 35 years and there are few examples of sites being decommissioned. However, there is some evidence available from the case studies carried out by the DECC and RenewableUK (2012) which suggests that each turbine is anticipated to require work in the order of £60,000 in turnover when they are to be decommissioned. It is also recognised in the report that many of the sites that have come to the end of their operational period have been repowered which has allowed significant increases in capacity and therefore higher economic impact due to the higher capacity wind turbines that are now available.

Employment Effect of the Development

- 6.45 The proposed wind farm could potentially offer local economic benefits through short-term jobs created during the construction phase and some long-term employment during the operation and maintenance phase.
- 6.46 The estimate of 11-24 FTE jobs generated in Wales of the proposed wind farm is largely in line with the estimate suggested by the RenewableUK and EU Skills study (2011), which implied a ratio of 1.7 FTE/MW (6,000 FTEs employed in the onshore wind sector in the UK of 3.5GW installed capacity). If using 1.7 FTE/MW, the estimate would be 22 FTEs; bearing in mind this is for UK rather than Wales specifically.
- 6.47 Based on the results from the DECC and RenewableUK study (see Table 6.7), it is estimated that the proposed wind farm would create:

- i. 1.8 local job and 7 jobs in Wales at the development stage, which equates to 0.3 FTE locally and 1.1 FTE jobs in Wales assuming that the development stage is over four-year period;
- ii. 11 local short-term jobs and 41 short-term jobs in Wales at the construction stage, which equates 0.4 FTE locally and 1.6 FTE jobs in Wales assuming that the construction will take 10 months;
- iii. 1.2 FTE long-term local jobs and 3 FTE jobs in Wales over the lifetime of the proposed wind farm as a result of operation and maintenance of the site;
- iv. In total, the proposed project would generate 1.9 FTE locally and 5.7 FTE jobs in Wales.

Table 6.7: Employment Effects of Wind Farms

Stage	Jobs per MW (UK)	Jobs per MW* (local)	Jobs per MW* (Wales)	Local jobs created by the proposed project*	Regional jobs created by the proposed project*
Development	1.1	0.1	0.4	1.29	5.16
Construction	8.0	0.6	2.3	7.74	29.67
Operation and Maintenance	0.3	0.07	0.17	0.9	2.2
Total*	-	-	-	9.93	37.03

[Source: Climate Change (DECC) and Renewable UK (May 2012). Onshore Wind: Direct & Wider Economic Impacts]

* calculated based on the employee/turnover ratio suggested by DECC and Renewable UK (2012).

6.48 In summary, the proposed wind farm development will generate positive impact on employment locally and in Wales. The local jobs that would be created are likely to be in the range of 2-7 and 6-30 for Wales.

Tourism and Recreation

6.49 A number of studies have been carried out to assess the perceived potential and actual effect of wind farms on the local economy, with a focus on tourism implications.

6.50 In 2003, Star Consultants produced a report for Friends of the Lake District to look at the impact of wind farms on tourism¹⁵. Opinions were sought from tourism organisations and tourists at locations near three existing wind farms and one proposed wind farm. This report stated 87% of tourists and 88% of tourism organisations felt reasonably positive about wind farm developments. It was also reported that 75% of the respondents felt that increases in the number of turbines in the next few years would not have any effect on them visiting in the future.

6.51 In 2004, as part of the Fullabrook Wind Farm proposal in North Devon, the University of West of England (UWE) was commissioned to undertake a study¹⁶ investigating the effect of wind farms on visitor numbers and the tourist experience. The study looked into the perceived potential effects of the proposed wind farm, and some evidence of the tourism-related effects of two existing wind farms in Cornwall (Bears Down and St Breock), and two in mid-Wales (Carno and Bryn Titli). Results showed that 58.2% of tourists in North Devon thought that the wind farm would have no effect on their visitor experience and 14.8% felt that it would enhance their visit. The results from North Devon found that 86.7% of those questioned said that the development of a wind farm would have no bearing on the likelihood of their visiting the area. The questionnaires in mid-Wales showed that only 5.4% of respondents opposed renewable energy in Wales and 57% thought more wind farms should be constructed onshore. In mid-Wales 47.8%

¹⁵ Star Consultants, Leeds Metropolitan University, (October 2003). A Study into the Attitudes of Visitors, Tourists and Tourism Organisations towards Wind Farms on the Boundaries of the Lake District National Park. A report for Friends of the Lake District (FLD).

¹⁶ University of the West of England, (2004). Fullabrook Wind Farm Proposal – evidence gathering of the impact of wind farms on visitor numbers and tourist experience. Available at: www.devonwindpower.co.uk/pdf/tia.pdf.

of respondents thought that a wind farm would have no overall impact on tourist experience.

6.52 NFO WorldGroup produced a report for Wales Tourist Board in 2003¹⁷ to look at the impact (both positive and negative) that the existing/proposed/anticipated development of wind farms in Wales is likely to have on tourism in Wales. The results showed that:

- i. 78% of all respondents had a neutral or positive view on wind farm development and 21% had a negative view;
- ii. 68% said it would make no difference to their likelihood to take holidays in the Welsh countryside if the number of wind farms increased; and,
- iii. Most respondents were in principle supportive of renewable energy and the development of wind farms in Wales.

6.53 A Scottish Government commissioned report in 2008¹⁸ concluded that wind farm developments have a minimal impact on tourism provided they are not visible from important tourism corridors. Results from the report showed that 93-99% respondents thought wind farms would have no impact on their decision to return to Scotland; 68% felt positive that a 'well- sited wind farm does not ruin the landscape' with a further 12% neutral about that statement.

6.54 In 2011 Visit Scotland commissioned omnibus research to learn more about consumer attitudes to wind farms and their effect on tourism¹⁹, in order to inform Visit Scotland policy (Insight Department, 2011). Questions were entered onto an omnibus study with OnePoll, an online market research company. 2,000 interviews were undertaken with a nationally representative UK sample with a further 1,000 interviews conducted with a Scotland representative sample (both samples being asked very similar questions). In

¹⁷ NFO Worldgroup, (2003). 'Investigation into the potential Impact of Wind Farms on Tourism in Wales'. A report prepared for Wales Tourism Board.

¹⁸ Glasgow Caledonian University, Cogent Strategies International Ltd and Moffat Centre for Tourism Development, (2008). The economic impacts of wind farms on Scottish tourism. A report for the Scottish Government. March 2008.

¹⁹ Insight Department (2011). Wind Farm Consumer Research Topic Paper.

the survey, it was asked whether the respondent felt that wind farms spoiled the look of the UK/Scotland countryside. 18.7% of UK respondents and 19.6% of Scotland respondents reported yes, while the majority (approximately 52% for both UK and Scotland respondents) do not feel that wind farms spoil the look of UK/Scotland countryside. The rest 28-29% of respondents did not express a clear view.

- 6.55 When asked whether the presence of a wind farm would affect their decision about where to visit or where to stay on a holiday or short break in UK/Scotland, 80% respondents stated that their decision would not be affected with 20% claiming that it would be affected. For the Scotland residents, 83% stated their decision would not be affected by the presence of a wind farm with 17% claiming that it would affect their choices.
- 6.56 A study commissioned by Renewables Cymru (YouGov plc, 2013)²⁰ reported that about 64% of the 1,003 respondents surveyed in Wales support continuing development of wind power as part of a mix of renewable and conventional forms of electricity generation. The percentage of people supporting wind farms is lower in South West Wales, with 56% supporting continuing development of wind power. When asked if they in general would be for or against the development of large-scale wind farm projects being built in their local council area, 64% of respondents in Wales reported that they are generally for and 20% are generally against wind farm projects with 11% being neutral and 5% not knowing. Again, the percentage of people who reported that they are generally for wind farm projects in their local area is slightly lower in the South West Wales with 61% respondents in these areas supporting local wind farm projects. When asked whether the presence of a wind farm would affect or not affect their decision of visiting that area, the majority (66%) of respondents reported that their decision would not be affected, 26% said it would be affected and the rest, 8%, mentioned that they do not know. In the South West Wales, the percentage is slightly higher (67% vs. 66%) of those who reported their decision would not be affected and a slightly higher

²⁰ YouGov plc, (2013). YouGov RenewableUK Cymru Poll Results. Commissioned by RenewableUK Cymru.

percentage (27%) of respondents in these areas reported that their decision would be affected.

- 6.57 Another study²¹ commissioned by the Welsh Government (Regeneris, 2014) looking at the impact of wind farms on the Welsh tourism sector concluded that the areas most affected by wind farms at the time of the study account for a very small proportion of Wales's total visitor economy, which was likely to be an indirect consequence of planning policy focusing development away from Wales's key natural assets and visitor attractions, including areas of outstanding natural beauty and national parks. The study also stated that the evidence base showed a clear majority of people do not react negatively to wind farm developments or change their visiting behaviour as a result. The study has not shown there to be any evidence of a fall in visitor numbers as a result of disruption during construction. However, this was identified as a concern for many businesses in the case studies, particularly in relation to noise and traffic, and the closure and diversion of public footpaths or other popular routes. The study suggested that it is vital that these possible disruptions are minimised and mitigated wherever possible through the planning process. There are also several examples from the study showing that public rights of way or trails were enhanced during construction, and the study recommended that these improvements should be communicated to local residents and visitors.
- 6.58 Overall, evidence suggests that local tourism has seen no negative effect due to the wind farms operating in the UK. There is no clear evidence that wind farm developments would positively or negatively affect levels of tourism. There likely to be some disruptions during construction stage, which should be carefully managed in order to minimise the impact.

Impact on Property Prices

- 6.59 A Climate Xchange (2016) study examined the impact of wind turbines on house prices in Scotland suggested that there was no consistent negative effect of wind turbines or

²¹ Regeneris Consulting, 2014. Study into the Potential Economic Impact of Wind Farms and Associated Grid Infrastructure on the Welsh Tourism Sector

wind farms when averaging across the entire sample of Scottish wind turbines and their surrounding houses based on analysis of over 500,000 property sales in Scotland between 1990 and 2014. Most results either suggested no significant effect on the change in price of properties within 2km or 3km or found the effect to be positive but the results varied across different regions.

- 6.60 The evidence from the above-mentioned studies suggested that there is no clear relationship between the proximity to a wind farm and property values and there was no negative effect of wind farms on the values of residential properties in nearby areas. It should be noted however that the evidence base in the UK is limited.
- 6.61 The closest properties are located in Rhoscrowther village, adjacent to the western site boundary, approximately 615m west from the nearest proposed turbine and a farmhouse at Hoplass circa 605m to the south. It is important to note that the landscape to the north of the site is dominated by the extensive Valero Oil Refinery which is likely to have a larger influence on house prices than the proposed wind farm.

Mitigation and Enhancement

- 6.89 The highest value item in a wind farm development is the turbine and its components, which are typically estimated to account for approximately 65% of the overall development cost. Local content of the development may include services (legal, land agency, consultancy, planning advice); construction (roads, access, etc); cabling (throughout the site and from the site to the grid access point); and Operations and Maintenance. However, these are generally lower value activities (accounting for about 35% of the project investment).
- 6.90 Therefore, local sourcing of contractors, materials and labour is essential to retain as many benefits as possible within local areas. In this event the proposed wind farm could bring both direct and indirect economic benefits to the communities surrounding the development site and the wider region as a whole. A proactive local sourcing approach to procuring the wind farm infrastructure from local companies as far as possible (for

example, the civil and electrical engineering works) is desirable to maximise the benefits to the local economy.

Summary

- 6.91 Based on evidence from literature, it is reasonable to assume that 7-30% of the capital cost of the proposed wind farm project could be awarded to suitable local and Welsh companies. Including for direct and indirect economic effects, assuming a total project cost of approximately £8,385,000 this could equate to £650,000 for local economy and £2,431,650 for the Welsh economy.
- 6.92 Proactive local sourcing of materials and labour will ensure that maximum benefits can be retained in the local areas in the vicinity the proposed wind farm and minimise transportation.
- 6.93 It is therefore concluded that a proportion of the total project costs would be likely to benefit the local area during construction in the form of direct employment, the use of local contractors for suitable elements of the work and tertiary benefits in the form of the provision of accommodation, meals and leisure activities for those employed on the site. Furthermore, short- term jobs will be created during the construction phase; while long-term employment opportunities will arise for operational site management and maintenance, although this is on a much less significant scale compared to the impact at construction stage.
- 6.94 It is estimated that the proposed wind farm project would generate a minimum of 2 FTE jobs locally and 6 FTE jobs for Wales through development, construction and operation and maintenance stages over its lifetime (assuming 35 years). This estimate is based on figures at the lower end of the range for similar developments elsewhere in the UK, so can be regarded as conservative.
- 6.95 There is no clear evidence that wind farm developments positively or negatively affect levels of tourism. It is not considered likely that tourism and recreation in the vicinity of the site will be adversely affected by the proposal. However, the possible disruptions

during the construction stage should be carefully managed so that the impact is minimised.

- 6.96 A Community Benefit fund for investment in local groups and projects will amount to £5,000 per MW per year (totalling an annual payment of £64,500) will be provided through the Development. The fund, over a 35 year period, will see approximately £2,257,500 invested in the local area.
- 6.97 In conclusion, the proposed wind farm will have no detrimental socio-economic impact at the local or regional level. Instead, it will have a small positive effect on the economy and employment.