

# 12. Socioeconomics, Land Use and Public Access

## Introduction

### Background and the Proposed Wind Farm Development

- 12.1 To date RES has developed five onshore wind farms in Wales, including the recently completed 17 turbine 34 MW Garreg Lwyd Hill Wind Farm in Powys. RES is committed to investing in Wales and commissioned Oxford Economics in July 2018 to undertake a socioeconomic impact report of the proposed Upper Ogmores Wind Farm and Energy Storage Facility within the Bridgend County Borough Council area, hereafter referred to as the “Proposed Development”.
- 12.2 The Proposed Development will consist of seven turbines, with a capacity of approximately 25.2 MW. It has a planned operational lifespan of 35 years.
- 12.3 It is anticipated that the Proposed Development will have a capacity factor of approximately 38%, generating enough energy to power nearly 22,000 homes.

### Structure of the chapter

- 12.4 The first part of this chapter, prepared by Oxford Economics, considers the likely socioeconomic effects associated with the construction and operation of the Proposed Development. It is structured as follows:
- Firstly, it considers the estimated quantifiable benefits of the construction and operational phase of the Proposed Development - focussing on employment, gross value added (GVA)<sup>1</sup> and wages. An assessment of the potential fiscal and environmental benefits is also included;
  - Secondly, the chapter provides an overview of the pertinent socioeconomic conditions at the regional and local level, as well as insight into current global and national topics;
  - Next, it provides a brief analysis of links concerned with tourism and visitor perceptions; and
  - Finally, conclusions are drawn relating to the socioeconomic impact of the Proposed Development.

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<sup>1</sup> Gross value added (GVA) measures the value of goods and services produced in an area, industry or sector of an economy and is equal to output minus intermediate consumption.

- 12.5 The second part of this chapter considers likely effects on land use and public access associated with the construction and operation of the Proposed Development.

## Socioeconomics

### Caveats

- 12.6 Specific information related to the Proposed Development was provided where possible by RES. The estimated benefits are based on a mix of this information, published data and evidence-based assumptions. The quantifiable impacts calculated by Oxford Economics and outlined in this chapter come from an Economic Impact Model which uses an input-output framework, standard economic underpinnings, published data and clearly documented reasonable working assumptions.
- 12.7 The cost of construction could inflate or deflate depending on movements in variables such as exchange rates, demand for wind turbines and metal prices. As such the information is the best current estimate at the time of writing.
- 12.8 This economic impact study has been developed to form part of the environmental information to be provided to the decision maker. As such, if and when the time comes that the Proposed Development is granted full planning permission and has been built, the economic environment may look different.
- 12.9 The analysis assumes all facilities contained in the Proposed Development are fully developed. We have considered the possibility of displacement<sup>2</sup> during both the construction and operational phases of the Proposed Development. It is our view that given the current and likely future performance of the local economy, there is little scope for displacement, therefore we have assumed zero levels of displacement in the modelling - see section 12.22 to 12.30 for further discussion.
- 12.10 We have not considered the impact of the investment on income distribution and deprivation levels in the area. This is outside of the scope of this piece of work.

### Glossary of definitions

- 12.11 **Backward linkages:** Backward linkages refer to the channels through which money, materials or information flows between a company and its suppliers, creating a network of economic interdependence. In terms of this study, it refers to the fact that the construction phase of the Proposed Development will require the purchase

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<sup>2</sup> In other words we have considered whether the development would reduce economic activity elsewhere in the economy.

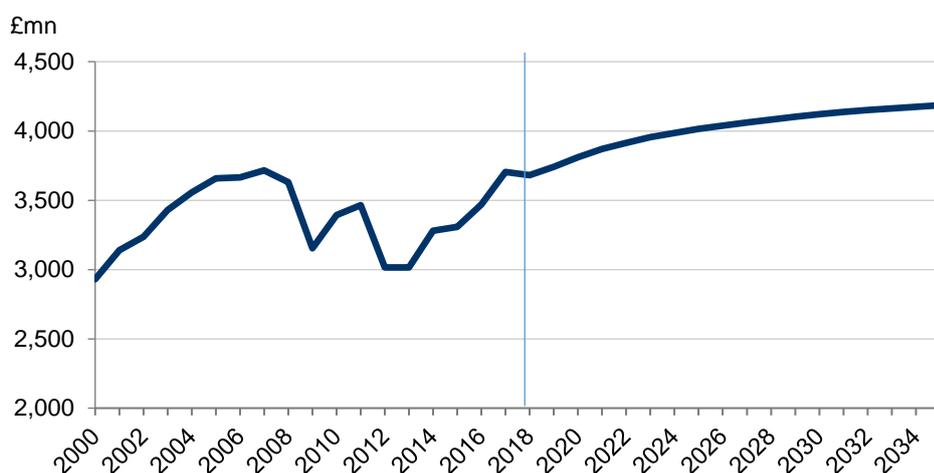
- and use of raw materials from sectors like building materials; steel, architectural services etc., which themselves will create supply chain jobs in the economy.
- 12.12 **Full-time equivalents (FTE):** All the modelling completed by Oxford Economics and all the impacts associated with this modelling assume that employment is expressed in terms of FTE, which is important given the prevalence of part-time working especially in the construction sector. Accordingly, two part-time workers make up one full-time equivalent worker.
- 12.13 **Gross value added (GVA):** GVA measures the value of goods and services produced in an area, industry or sector of an economy and is equal to output minus intermediate consumption.
- 12.14 **Direct impact:** The direct impact is defined as the economic activity and numbers of people employed by the Wind Farm (both in construction and in on-going roles).
- 12.15 **Indirect impact:** The indirect impact is defined as the economic activity and employment supported in the Wind Farm's supply chain, because of the purchasing of inputs of goods and services from suppliers.
- 12.16 **Induced impact:** The induced impact is defined as economic activity and employment supported by those directly or indirectly employed spending their wage income on goods and services in the wider UK economy.
- 12.17 **Jobs:** Any references to the employment benefits from the on-going phase once the Proposed Development becomes operational are expressed in terms of "jobs" per year. As noted above, these jobs are full-time equivalent in nature.
- 12.18 **Job years:** Any references to the employment benefits from the construction phase of the Proposed Development are expressed in terms of "job years". This is necessary given that construction phase activity normally spans more than a single year. A job year does not necessarily mean one job. Instead it refers to the amount of activity that is required. So, for example two people could be employed for six months - this would equate to one job year of work. Alternatively, one person could be employed for two years - this would equate to two job years of employment. We do not need to use the term job years when talking about the operational phase, as these benefits are all expressed in per year terms as discussed above.
- 12.19 **Nominal prices:** Nominal prices are those which reflect the current situation and are not adjusted for seasonality or inflation.
- 12.20 **Real prices (2015 prices):** Real prices refer to values that have been adjusted to remove the effects of inflation and are thus measured in terms of the general price level in a base reference year. They give a more accurate measure. In this case,

2015 is the base year as it is consistent with the base/reference year used within UK ONS National Accounts: the Blue Book.

## Quantifiable benefits: background and assumptions

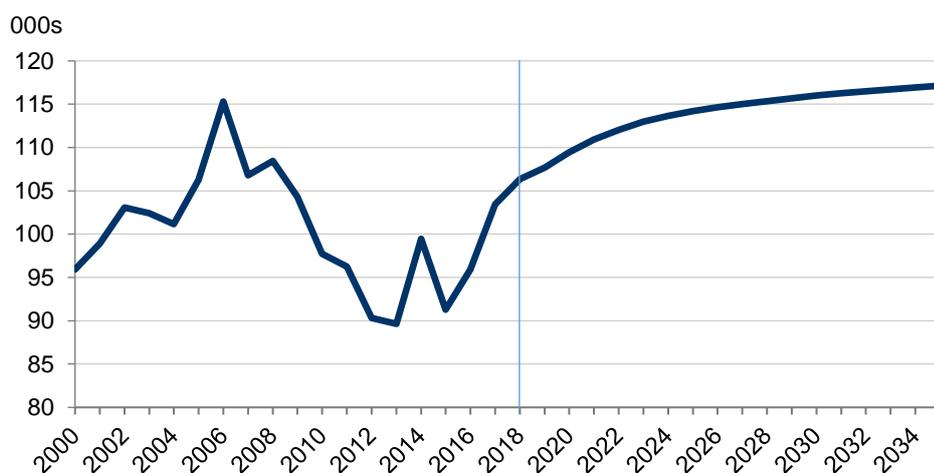
- 12.21 This section analyses the estimated quantifiable benefits of the construction and operational phases of the Proposed Development - concentrating on employment, GVA and wages, as well as assessing fiscal and further benefits.
- 12.22 A key assumption behind Oxford Economics' analysis relates to displacement. We have assumed that there will be zero displacement during both the construction and operational phases of the Proposed Development. Displacement assumptions are subjective, but we have provided an analysis below to show how we arrived at our modelling assumptions.
- 12.23 Construction output and employment in Wales were heavily impacted by the financial recession. Figures 1 and 2 present the scale of the decline. Recovery in both output and employment terms has been slow. Between 2008 and 2012, construction output shrank by 16.9 percent while employment fell by 16.7 percent. Furthermore, our latest estimates show a significant period of lost growth between 2007 and 2018. Indeed, construction employment in Wales still remains notably below those recorded in 2007.

Figure 1: Construction GVA in Wales



Source: Oxford Economics

Figure 2: Construction employment in Wales



Source: Oxford Economics

- 12.24 In addition, wage growth has been modest. Weekly (median) wages in the sector have increased by 13 percent between 2010 and 2017, largely in line with the regional average (11 percent). If there was strong demand for construction labour, a limited supply of construction skills or a mix of both then we might have expected to see faster wage inflation. Therefore, we can conclude that the construction sector in Wales is likely to have sufficient spare capacity to accommodate the Proposed Development. As such we have applied a zero rate of displacement on our construction phase impacts.
- 12.25 We also apply a zero-displacement rate for our operational phase impacts. We understand that the western area of the Proposed Development site, on Llangeinor Common, will be replaced with land of equal size, and so there will be no reduction in common land. In addition, RES has confirmed that the existing Werfa telecommunications masts will not be affected by the Proposed Development. The site is currently used for grazing livestock and the Proposed Development will not affect grazing and therefore there will be no negative impact on the land users. Indeed, the land owner will benefit from rental income for the lifetime of the development, which should boost local spending.
- 12.26 Given the above and that the fact that the number of on-going jobs is limited in volume terms and specialised in nature, our estimates for the benefits arising from the operational phase assumes no displacement of economic or leisure activity.
- 12.27 It could be argued that increased wind farm developments could displace jobs in fossil fuel activity. However, given the size of the Proposed Development it would

not in isolation displace any actual activity away from the various fossil fuel power stations in Wales (see Figure 3).

Figure 3: List of power stations in Wales operational at the end of May 2017

|                 |                |
|-----------------|----------------|
| Aberthaw B      | Deeside        |
| Aberthaw GT     | Dinorwig       |
| Baglan Bay CCGT | Ffestiniog     |
| Baglan Bay OCGT | Pembroke       |
| Barry           | Severn Power   |
| Connahs Quay    | Uskmouth Power |

Source: Department for Business, Energy & Industrial Strategy<sup>3</sup>

- 12.28 While it could be acknowledged that cumulatively and in the long-run there may be displacement from the fossil fuel industry because of the on-going drive for increased renewables as a collective, to meet the 2030 targets for energy production<sup>4</sup>; this is itself implicit in government policy promoting such renewables in the first place. A report by the National Assembly for Wales titled ‘A Smarter Energy Future for Wales’<sup>5</sup> (published March 2016), reiterates the push towards production of renewable energy in Wales. A key objective set by the Welsh Assembly is for Wales to meet all of its energy requirements from renewable sources, and to reduce carbon emissions by at least 80 percent by 2050. The report also stresses the importance of localised responsibilities to meet the national carbon emissions and energy demand reduction targets, by, in part, developing local supply chains to support renewable energy technologies and energy efficiency measures. Welsh Government has since increased its target to reduce carbon emissions by 95% , with an ambition to achieve net zero by 2050.
- 12.29 In addition, a report<sup>6</sup> produced by the UK energy Research Centre’s (UKERC) Technology and Policy Assessment (TPA) function finds “...a reasonable degree of evidence that in general, renewable energy and energy efficiency are more labour-intensive in terms of electricity produced than either coal- or gas-fired

<sup>3</sup> Department for Business, Energy & Industrial Strategy: *Power stations in the United Kingdom*, May 2017 <[https://www.gov.uk/government/uploads/system/uploads/...data/.../DUKES\\_5.11.xls](https://www.gov.uk/government/uploads/system/uploads/...data/.../DUKES_5.11.xls)> [accessed: 25 July 2018]. Fuel types included: CCGT, pumped storage, OCGT, coal and gas/oil.

<sup>4</sup> <https://gov.wales/newsroom/environmentandcountryside/2017/170928-lesley-griffiths-high-on-ambition-for-clean-energy/?lang=en>

<sup>5</sup> National Assembly for Wales, *A Smarter Energy Future for Wales*, Environment and Sustainability Committee, ,March 2016 < <http://www.assembly.wales/laid%20documents/cr-ld10610/cr-ld10610-e.pdf>> [accessed 25 July 2018]

<sup>6</sup> UKERC, *Low Carbon Jobs, The Evidence for net job creation from policy support for energy efficiency and renewable energy*, 2014 <[www.ukerc.ac.uk/asset/0A611DB6-DCEA-4628-97FC16042EAD4F20/](http://www.ukerc.ac.uk/asset/0A611DB6-DCEA-4628-97FC16042EAD4F20/)> [accessed: 25 July 2018]

*power plant. This implies that at least in the short-term, building new renewable generation capacity or investing in greater energy efficiency to avoid the need for new generation would create more jobs than investing in an equivalent level of fossil fuel-fired generation. The magnitude of the difference is of the order of 1 job per annual GWh produced.”*

- 12.30 Nonetheless, the research also points out that despite reasonable evidence that renewable and energy efficiency programmes are more labour-intensive than fossil fuels, it does not necessarily guarantee higher employment in the economy overall. Much of the impact on jobs from investments in these technologies will depend on how these effects ripple through the economy, particularly the impact on disposable household incomes.

### Economic impact of the construction phase

- 12.31 The benefits associated with the construction phase of the Proposed Development (jobs, wages, GVA and fiscal) are presented as a range. This range results from the implementation of two separate methods for estimating direct construction phase impacts.
- 12.32 The first approach uses the value of investment expected to be realised in Wales. By assigning this to sectors of the economy we can estimate GVA levels, jobs and wages (using published and/or forecast data). The second approach uses full-time job year equivalent figures based on previous wind farm projects carried out by RES. These figures have been pro-rated to account for the seven-turbine Proposed Development at Upper Ogmore - see Figure 4.
- 12.33 An input-output model is used to estimate the indirect and induced impacts that are likely to flow from the investment/activity. An input-output table provides information on how sectors purchase from one another. It also shows how households spend their income. The UK input-output tables used in the model have been adjusted to the size and structure of the local economy.

### Method 1: Expenditure approach

- 12.34 The Proposed Development is estimated to result in a total capital spend of approximately £22.49 million in nominal prices. The total construction phase spend realisable within Wales is estimated at £8.18 million (in nominal prices)<sup>7</sup>.

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<sup>7</sup> For this analysis, the total construction phase spend is defined as the cost for turbines, Balance of Plant (BoP), food, fuel, plant hire, road maintenance, miscellaneous, grid connection and professional. We estimate that 80 percent of total professional costs will be realised in Wales. This is based on assumptions from previous wind farm studies that we have conducted.

- 12.35 This regional/total spend split (£8.18 million/£22.49 million) is within ballpark range of other reports. A report<sup>8</sup> compiled by Regeneris Consulting on behalf of RWE Npower Renewables Ltd considers the impact of the proposed Mynydd y Gwair wind farm. It too estimated a similar split of 36.5 percent.
- 12.36 The split between construction and professional services related spend in Wales is assumed to be £7.08 million and £1.09 million respectively. For the purposes of our modelling, we have converted all information on spending into 2015 real prices. This ensures consistency with our model inputs and national accounts publications.<sup>9</sup>
- 12.37 The construction phase of the Proposed Development is scheduled to commence in September 2022 and last 10 months, starting operations in June 2023. The analysis assumes a constant spend per month, leading to 40 percent of total spend being realised in 2022 and the remaining 60 percent in 2023. As such we use Oxford Economics baseline forecasts for GVA, productivity and wages to estimate the future impacts.

### Method 2: Job posts approach (more conservative estimates)

- 12.38 A recent previous RES wind farm, consisting of nine-turbines (totalling 18 MW) with a 24-month construction programme, created or sustained 110 job years of employment during the construction phase. We have used this information to estimate the direct construction phase impacts for the Proposed Development which has seven turbines. In doing so we have taken seven-ninths of the job year figures provided by RES. Given the definition of job years, it is our view that the same volume of work will simply be condensed into a shorter period. For this reason, no further adjustments are made.
- 12.39 This figure is then shared across the construction and professional sector, based on the split used in Method 1 - see above. The final job figures for the seven turbine Proposed Development used for modelling under this approach are outlined below (third column of Figure 4).

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<sup>8</sup> Regeneris Consulting, *The socio-economic benefits of the proposed Mynydd y Gwair Wind Farm*, August 2012.

<sup>9</sup> The construction phase and operational phase benefits within this section are expressed in real (or constant) prices with a 2015 base year – this is because 2015 is the base year used for all financial variables within Oxford Economics' suite of models – and thus the Economic Impact Model used to calculate this development's impacts. This is not to say 2015 data has been used – we have used the latest available data and the relevant forecast year in every case – 2015 simply refers to the base year for the constant price series. The construction spend figures have been adjusted accordingly for consistency. This base year is used as it is consistent with the base/reference year used within UK ONS National Accounts: The Blue Book.

Figure 4: Job year information provided by RES and adjusted figures used for modelling under Method 2

|                               | 9 turbine project | 7 turbine project |
|-------------------------------|-------------------|-------------------|
| Construction related          | 95                | 74                |
| Professional services related | 15                | 11                |
| <b>Total</b>                  | <b>110</b>        | <b>86</b>         |

Source: RES/Oxford Economics

Note: May not add due to rounding

### Results: direct construction phase impacts

12.40 All figures below present the likely benefits from the construction phase in Wales as a whole. The Proposed Development’s 10-month construction phase is estimated to create or sustain between 104 - 86 direct job years of employment, 82 - 74 of which will be in construction related activities and the remaining 22 - 11 in development/professional related activities (see Figure 5).

12.41 This direct employment during the construction phase is likely to create or sustain between £3.44 million and £2.81 million of additional direct wages in the Welsh economy. The investment is also estimated to directly contribute between £3.52 million and £2.93 million to regional direct GVA.

Figure 5: Direct benefits from the construction phase

| Direct benefits               | Job years       | Wages (£2015m)     | GVA (£2015m)       |
|-------------------------------|-----------------|--------------------|--------------------|
| Construction related          | 82 – 74         | 2.67 - 2.4         | 2.86 - 2.58        |
| Professional services related | 22 – 11         | 0.78 - 0.4         | 0.66 - 0.34        |
| <b>Total</b>                  | <b>104 – 86</b> | <b>3.44 - 2.81</b> | <b>3.52 - 2.93</b> |

Source: Oxford Economics.

Note: may not add due to rounding

### Indirect and induced construction phase impacts

12.42 The supply chain (or indirect) impacts arising from the activity in the construction phase are estimated using the 2014 UK input-output tables (published by ONS), which are adjusted to take account of the structure and size of the Welsh economy. Oxford Economics use official employment data for the adjustments, to reflect the industrial structure and productive capacity in the Welsh economy. In doing so, our methodology uses so-called ‘Flegg-adjusted Location Quotients (FLQs)’, which are

- consistent with the latest approaches and evidence in regional input-output modelling and regional science.<sup>10</sup>
- 12.43 These models quantify the impact of procurement demands over the entire length of the supply chain, including the suppliers' suppliers, and so on. In other words, the models estimate the extent to which these demands can be met within the Welsh region, or elsewhere in the UK.
- 12.44 Construction activity typically has strong "backward linkages" with sectors such as building materials, architectural services, legal services and insurance. These linkages tend to result in job creation elsewhere in the local economy. This makes investment in construction particularly effective in fuelling economic growth. Typically offering high economic multipliers of 2.5 for the UK, meaning that for every £1 of direct output by the sector, an additional £1.50 is created in the wider UK economy.
- 12.45 Indirect GVA impacts in Wales are estimated to be approximately £0.85 million - £0.73 million, creating or sustaining an estimated 23 - 20 job years of employment, with associated wages of £0.72 million - £0.61 million.
- 12.46 As both direct and indirect wages generated through the construction phase are spent - a further round of benefits will spread through the region. This is known as the induced effect (or consumer spending impacts), which will support wider employment of approximately 22 - 19 job years alongside £0.56 million - £0.47 million of wages.

Figure 6: Total benefits from the construction phase

| Total (direct, indirect and induced) benefits | Job years        | Wages (£2015m)     | GVA (£2015m)       |
|---|------------------|--------------------|--------------------|
| Direct  | 104 - 86         | 3.44 - 2.81        | 3.52 - 2.93        |
| Indirect                                      | 23 - 20          | 0.72 - 0.61        | 0.85 - 0.73        |
| Induced                                       | 22 - 19          | 0.56 - 0.47        | 0.8 - 0.67         |
| <b>Total</b>                                  | <b>150 - 124</b> | <b>4.72 - 3.89</b> | <b>5.18 - 4.33</b> |

Source: Oxford Economics

Note: May not add due to rounding

- 12.47 Through the numerous rounds of supply chain and consumer spending, all sectors in the economy will experience some degree of benefit - see Figure 7. It is worth noting that the estimated benefits are for the region of Wales. An exact amount attributable to the Bridgend County Borough Council area is more difficult to

<sup>10</sup> Anthony T. Flegg and Timo Tohmo, "Estimating Regional Input Coefficients and Multipliers" (Working Paper, University of the West of England, Faculty of Business and Law, 2013), 5.

identify and outside the scope of this report. Invariably it depends on the location of the companies appointed that enjoy the direct benefits and the location of the suppliers who provide them with the materials.

- 12.48 It is RES intention to use local suppliers as much as possible. It makes sense, not least in terms of the costs and distance argument, to use local firms (e.g. looking at the cost of transporting aggregates). That is, local firms can prove to be more cost efficient given the closer proximity to required capital, personnel and resources. Indeed, the most recent wind farm constructed by RES in Wales, Garreg Lywd Hill Wind Farm, used several local suppliers during the construction phase. This means that the vast majority of the direct and indirect benefits from the construction of the Proposed Development are likely to be realised within Wales, with Bridgend County Borough Council area enjoying some uplift at the local level.

Figure 7: Total benefits from the construction phase, by sector

| Total (direct, indirect, induced) benefits                           | Job years        | Wages (£2015m)     | GVA (£2015m)       |
|--|------------------|--------------------|--------------------|
| Agriculture, forestry and fishing                                    | 1 - 1            | 0.02 - 0.01        | 0.01 - 0           |
| Mining and quarrying   | 0 - 0            | 0.01 - 0.01        | 0.02 - 0.02        |
| Manufacturing  | 2 - 2            | 0.07 - 0.06        | 0.16 - 0.14        |
| Electricity, gas, steam and air conditioning supply                  | 0 - 0            | 0.01 - 0.01        | 0.03 - 0.02        |
| Water supply; sewerage, waste management and remediation activities  | 0 - 0            | 0.01 - 0.01        | 0.01 - 0.01        |
| Construction   | 91 - 82          | 2.94 - 2.65        | 3.16 - 2.84        |
| Wholesale and retail trade; repair of motor vehicles and motorcycles | 9 - 7            | 0.21 - 0.18        | 0.26 - 0.22        |
| Transportation and storage   | 2 - 1            | 0.05 - 0.04        | 0.05 - 0.04        |
| Accommodation and food service activities                            | 6 - 5            | 0.13 - 0.11        | 0.1 - 0.09         |
| Information and communication  | 1 - 1            | 0.03 - 0.02        | 0.06 - 0.04        |
| Financial and insurance activities                                   | 1 - 1            | 0.02 - 0.02        | 0.07 - 0.06        |
| Real estate activities   | 1 - 0            | 0.02 - 0.01        | 0.21 - 0.18        |
| Professional, scientific and technical activities                    | 26 - 15          | 0.92 - 0.51        | 0.78 - 0.43        |
| Administrative and support service activities                        | 6 - 5            | 0.15 - 0.13        | 0.12 - 0.1         |
| Public administration and defence; compulsory social security        | 0 - 0            | 0.01 - 0.01        | 0.02 - 0.02        |
| Education  | 1 - 1            | 0.04 - 0.03        | 0.04 - 0.03        |
| Human health and social work activities                              | 1 - 1            | 0.03 - 0.03        | 0.03 - 0.03        |
| Arts, entertainment and recreation                                   | 2 - 1            | 0.04 - 0.03        | 0.02 - 0.02        |
| Other service activities   | 1 - 1            | 0.02 - 0.02        | 0.04 - 0.03        |
| Households   | 0 - 0            | 0 - 0              | 0 - 0              |
| <b>Total</b>   | <b>150 - 124</b> | <b>4.72 - 3.89</b> | <b>5.18 - 4.33</b> |

Source: Oxford Economics

Note: May not add due to rounding

- 12.49 The benefits quantified above have been analysed for robustness against reports compiled by Regeneris Consulting on behalf of RWE Npower Renewables Ltd which consider the impact of the proposed Mynydd y Gwair Wind Farm, Swansea.<sup>11</sup> Accounting for the scale of both developments, the estimates of GVA, wages and job year benefits were of similar magnitude.

## Economic impact of the operational phase

- 12.50 Aside from the direct, indirect and induced employment, wages and GVA benefits likely to come from the construction phase, the analysis also considers the impact of the operational phase of the Proposed Development.

<sup>11</sup> Regeneris Consulting, *The socio-economic benefits of the proposed Mynydd y Gwair Wind Farm*, August 2012.

12.51 To quantify the effects from the operational phase, direct job post figures provided by RES are used. These figures are based on their previous experience of operating projects across the UK. Using the direct impact as a starting point, indirect and induced effects are estimated using the modelling process described earlier.

### Direct operational phase impacts

12.52 Following the 10-month construction phase, the Proposed Development is expected to become operational in September 2023. As such the direct, indirect and induced impacts from the operational phase have therefore been estimated using Oxford Economics' 2023 forecasts for GVA, productivity and wages. Additional earnings/wages have been estimated using Oxford Economics' forecasts for average annual earnings per worker from the broad sectors 'Electricity, gas and steam' in 2023 (these forecasts are themselves based on published data in the Annual Survey of Hours and Earnings).

The Proposed Development is likely to create or sustain one direct FTE job per year, in the capacity of asset/operations manager. This is likely to generate £0.04 million in wages and £0.13 million of GVA on a yearly basis. Over the lifetime of the Proposed Development, this translates to 35 job years, £1.49 million in direct wages and £4.58 million of direct GVA.

Figure 8: Direct annual benefits from the operational phase

| Direct benefits | Jobs     | Wages (£2015m) | GVA (£2015m) |
|-----------------|----------|----------------|--------------|
| Asset manager   | 1        | 0.04           | 0.13         |
| <b>Total</b>    | <b>1</b> | <b>0.04</b>    | <b>0.13</b>  |

Source: RES/Oxford Economics

Note: May not add due to rounding

### Indirect and induced operational phase impacts

12.53 The electricity industry is significant to the Welsh economy. Aside from real estate, it is the most productive sector in Wales and productivity (output per work) levels are by far higher than the average for the region.

12.54 Using the adjusted UK input-output tables to identify the supply chain spending, we estimate that the Proposed Development is likely to create or sustain another indirect job in the Welsh economy each year, with wages of £0.03 million and GVA of £0.06 million each year respectively.

12.55 Moreover, the combined additional wages of those in direct and indirect employment will result in induced activities as wages are, in part, spent on

products and services in the local and regional economies. This is estimated to create or sustain a further job in the economy as a whole and generate £0.02 million in both wages and GVA.

Figure 9: Total annual benefits from the operational phase

| Total (direct, indirect, induced) benefits | Jobs       | Wages (£2015m) | GVA (£2015m) |
|--|------------|----------------|--------------|
| Direct                                     | 1.0        | 0.04           | 0.13         |
| Indirect                                   | 0.6        | 0.03           | 0.06         |
| Induced                                    | 0.7        | 0.02           | 0.02         |
| <b>Total</b>                               | <b>2.3</b> | <b>0.08</b>    | <b>0.21</b>  |

Source: RES/Oxford Economics

Note: may not add due to rounding

## Impact on tax revenue and benefit savings

12.56 As part of this analysis it is assumed that approximately 34.2 percent<sup>12</sup> of total wages would be paid to the Treasury through the channels of taxation. This considers not only income tax as a percentage of gross income, but value added tax through the purchase of goods and services by those in direct, indirect and induced employment.

12.57 During the construction phase of the Proposed Development, tax receipts are likely to reach between £1.62 million and £1.33 million (including direct, indirect and induced wage impacts). The operational phase is estimated to generate approximately £0.03 million in additional tax receipts each year of operation (Figure 10). Over 35 years this would equate to £1.01 million in additional tax revenue.

Figure 10: Annual tax revenue arising from the proposed Development

|                    | Wages (£2015m) | Tax revenue (£2015m) |
|--------------------|----------------|----------------------|
| Construction phase | 4.72 - 3.89    | 1.62 - 1.33          |
| Operational phase  | 0.08           | 0.03                 |

Source: Oxford Economics

Note: May not add due to rounding

<sup>12</sup> ONS, *The Effects of Taxes and Benefits on Household Income, 2016/17 - Reference Tables*, FY 2017 <<https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/incomeandwealth/datasets/the-effectsoftaxesandbenefitsonhouseholdincomefinancialyearending2014>> [accessed 25 July 2018]

- 12.58 Employment creation will also provide benefit savings. That is, if each additional job attracts someone from the stock of unemployed (either directly or indirectly) or prevents someone from becoming unemployed, the construction or operational phase of the Proposed Development would reduce benefit payments. While the Proposed Development may take someone from their current job, a vacancy will become available and will need filling, and so on. So eventually, a job will be filled down the line by someone who would otherwise be unemployed, though not necessarily directly. As such the creation of a new job in the economy will lead to a reduction in the unemployed by a similar amount.
- 12.59 Currently, unemployment benefit (Job Seekers Allowance) varies between £57.35 and £113.70 per week. Using these lower and upper bounds, we estimate savings of between £0.37 million and £0.88 million during the construction phase of the Proposed Development.

Figure 11: Annual benefits savings arising from the construction phase

| Unemployment savings (£2015m) |                    |                    |
|-------------------------------|--------------------|--------------------|
|                               | Upper              | Lower              |
| Direct                        | 0.62 - 0.51        | 0.31 - 0.26        |
| Indirect                      | 0.14 - 0.12        | 0.07 - 0.06        |
| Induced                       | 0.13 - 0.11        | 0.07 - 0.06        |
| <b>Total</b>                  | <b>0.88 - 0.73</b> | <b>0.45 - 0.37</b> |

Source: Oxford Economics

Note: May not add due to rounding

- 12.60 Similarly, savings to benefits from the operational phase of the Proposed Development are estimated to provide unemployment savings between £0.48 million and £0.24 million over the 35-year project horizon.

Figure 12: Annual benefits arising from the operational phase

| Unemployment savings (£2015m) |             |             |
|-------------------------------|-------------|-------------|
|                               | Upper       | Lower       |
| Direct                        | 0.21        | 0.10        |
| Indirect                      | 0.15        | 0.08        |
| Induced                       | 0.12        | 0.06        |
| <b>Total</b>                  | <b>0.48</b> | <b>0.24</b> |

Source: Oxford Economics

Note: May not add due to rounding

## Other quantifiable benefits of the Proposed Development

### Business rates

- 12.61 Business rate calculations in Wales rely on the Rateable Value (RV) of a property and the non-domestic multiplier (“poundage”, or non domestic rate (NDR)), minus any applicable reliefs. The RV is determined by the Valuations Office Agency (VOA), while the NDR is set by the Welsh Government each year. As of 2018-19 the NDR, or “poundage”, has been set the same across all 22 Welsh Council areas. All NDR revenues are collected by individual councils and are given to the Welsh Government, which then redistributes them to local council areas based on their proportion of population aged 18 and over. This is regardless of the income raised by each council area. These funds are used to finance the Local Government budgets.
- 12.62 The 20 MW Pant Y Wal Extension Wind Farm, which is close to the Proposed Development, is subject to a rateable value charge of £37,000 per megawatt per year (as estimated from a published valuation list by the Valuations Office Agency). Using this rate and given that the Proposed Development will have a total capacity of approximately 25.2 MW, so £932,400 rateable value at 2018/19 Welsh multiplier of £0.514p gives £479,254 annual business rates payable to the Welsh Government. This is equivalent to £16.77 million over the course of the project (over the project’s operational phase).

### Energy and environmental benefits

- 12.63 The renewable energy sector is important to the Welsh economy overall. According to a research briefing published by the Welsh Assembly<sup>13</sup>, the low carbon and renewable energy sector provided 11,000 jobs in 2015, along with an annual turnover of £1.78 billion in Wales. This is supported by the statistics published by the Office for National Statistics (ONS) on low carbon and renewable energy in Wales.
- 12.64 In addition to the economic benefits arising from the renewable energy sector, it also has positive implications for the environment while contributing to the overall supply of energy. The Proposed Development consists of seven turbines, each with an indicative capacity of 3.6 MW. The amount of electricity that could be produced by the Proposed Development, based on a predicted capacity factor of 38%, is

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<sup>13</sup> Jeni Spragg and Sean Evans, Welsh Assembly, *Research Briefing: Low carbon energy in Wales*, May 2017 < <http://www.assembly.wales/Research%20Documents/17-010%20Low%20Carbon%20Energy%20in%20Wales/17-010-Web-English.pdf> > [accessed 25 July 2018]

sufficient to meet the needs of nearly 22,000<sup>14</sup> homes each year. This is equivalent to over a third of the current (2016) housing stock in the Bridgend County Borough (derived by applying official local area average household size, published by the ONS, to Oxford Economics' local area population data).

- 12.65 Furthermore, the Proposed Development is likely to reduce CO<sub>2</sub> emissions by over 38,500 tonnes<sup>15</sup> each year. This is equivalent to the emissions from an estimated 29,200 newly registered cars<sup>16</sup>. This figure has been derived using the average CO<sub>2</sub> emissions for newly registered cars in Great Britain between 2010 and 2014, published by the Department for Transport Statistics. This information is then coupled with the average mileage covered by cars in England<sup>17</sup>, and our estimates of CO<sub>2</sub> emissions.

## Socioeconomic backdrop

### Bridgend County Borough Council area economy

- 12.66 Brexit is also likely to have implications for growth in the Bridgend County Borough economy. The following section considers the recent and future labour market performances of the local area.
- 12.67 Bridgend County Borough Council area is a relatively large source of employment in Wales. In 2017, the local area sustained 67,400 jobs - making it the eighth largest out of 22 Council areas in Wales. However, the County Borough has struggled to generate strong employment growth. Between 2007 and 2017 employment growth in the local area averaged 0.5 percent a year, notably lower than the average of Wales as a whole (at 0.8 percent a year). Indeed, the County Borough was among the weakest contributors to overall employment growth in Wales.
- 12.68 Looking ahead over the next decade, employment growth in the area is expected to continue to struggle, slowing further. Over the 2017 to 2027 period, growth in the local area is forecast to average 0.3 percent a year. This rate of growth is only

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<sup>14</sup> This figure is derived using the latest annual UK average domestic household consumption of electricity (both unadjusted and adjusted for temperature), published by BEIS. Source: BEIS, Energy Consumption in the UK (2018 update)

<sup>15</sup> CO<sub>2</sub> emissions savings are calculated using BEIS' "all fossil fuels" emissions statistics of 460 tonnes of CO<sub>2</sub> per GWh of electricity. This figure is consistent with the Digest of UK Energy Statistics (July 2018), table 5D, as published by BEIS. This figure is applied to the total amount of annual electricity generated by the Wind Farm.

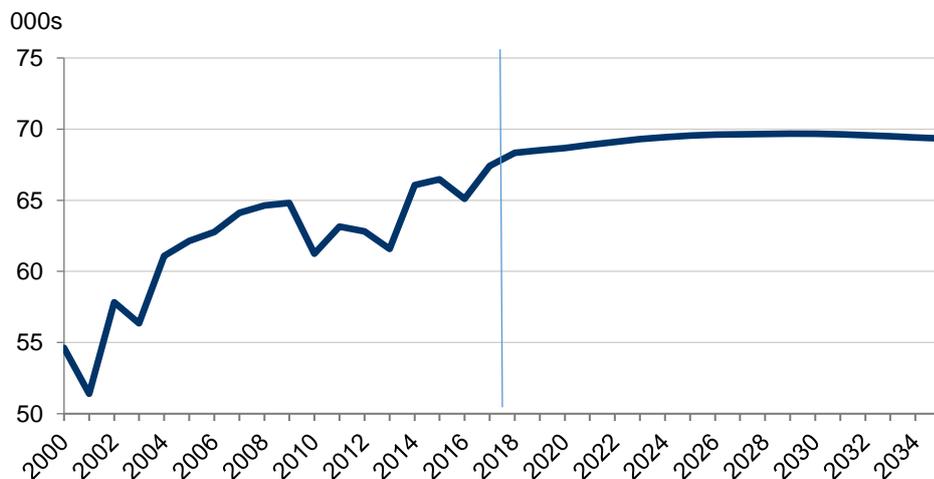
<sup>16</sup> To estimate this figure we make use of information from the National Travel Survey 2016, Department of Transport and our estimates of CO<sub>2</sub> emissions savings.

<sup>17</sup>

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/729521/national-travel-survey-2017.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/729521/national-travel-survey-2017.pdf)

slightly stronger than that expected for Wales (0.2 percent a year), and slightly weaker than the UK average (at 0.5 percent a year).

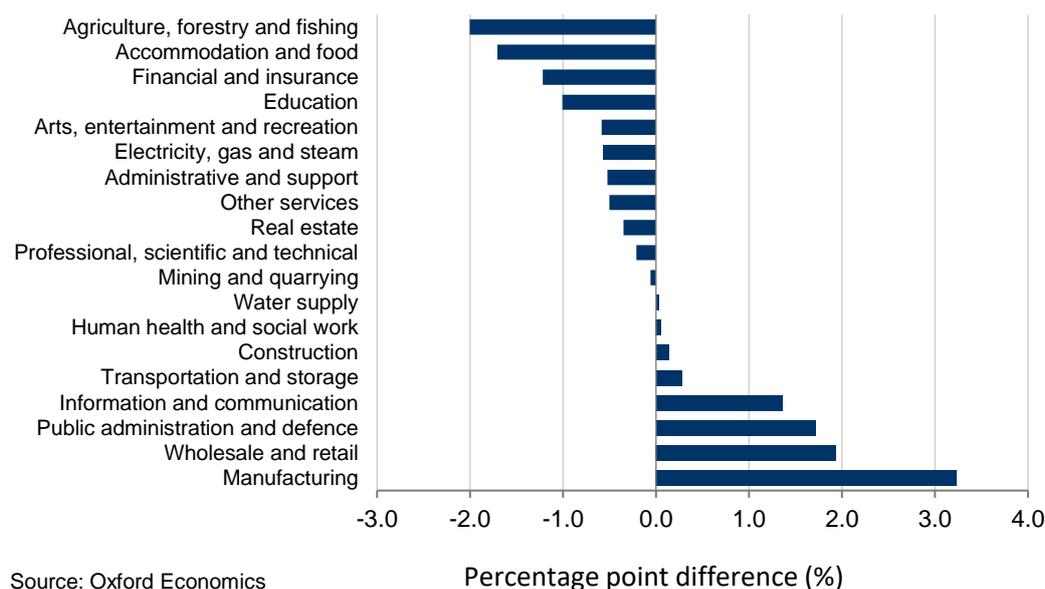
Figure 13: Total employment in Bridgend County Borough



Source: Oxford Economics

12.69 Employment growth prospects in the County Borough can be, in part, explained by the area’s employment structure. The figure below plots the percentage point difference between the share of employment by sector in Bridgend County Borough to the Welsh average. Sectors with a positive value employ a greater share of employment in the local area than in Wales as a whole. Conversely, sectors with a negative value employ a smaller share of employment in the local area compared to the regional average.

Figure 14: Sectoral concentration of employment, Bridgend County Borough vs Wales, 2017



Source: Oxford Economics

- 12.70 Compared to Wales as a whole, the local area is overrepresented in sectors which have weak employment growth prospects. The local area has a larger share of manufacturing and public administration employment than the regional average. Both these sectors are expected to see further job losses over the next decade. By the same token, the local area is largely underrepresented in sectors likely to drive employment growth at the national level - such as professional, scientific and technical services. Overall, the largest contributors to job growth locally are expected from wholesale and retail trade, administrative and support, and construction. Combined these sectors are forecast to create 2,100 jobs over the decade.
- 12.71 Analysis of other labour market indicators further support the economic need for new employment opportunities. Our data shows that not only is the inactivity rate (the people who are not in employment or unemployed such as the retired and long-term sick) for the local area above the regional average, but it also has a higher unemployment rate.
- 12.72 According to our latest estimates, the unemployment rate<sup>18</sup> for the local area stood at 5 percent in 2017, almost half a percentage point higher than the regional average. Furthermore, estimates from the Annual Population Survey show that working age economic inactivity rates within the local area are one of the highest in Wales. Over a quarter of working age residents were economically inactive in 2017. This is around two percentage points higher than the regional average. Combined, this highlights the need for new job prospects, including those stemming from the construction of the Proposed Development.
- 12.73 Over the last decade the level of workplace-based wages has been higher than residence-based wages. This suggests that the local economy's higher value jobs attracted commuters from outside the County Borough. Looking ahead, we expect strong growth in both resident- and workplace-based wages in the County Borough, both averaging growth of 2.8 percent a year in the decade to 2027.

### **Local skills: relatively high share of trade apprenticeships**

- 12.74 During the construction phase of the Proposed Development trade-based skills will be needed. The skills profile of the local area's working age residents is well-suited to these types of roles. According to the Annual Population Survey, the proportion of the local area's working age residents (those aged 16-64) with trade apprenticeships has grown over recent years, reaching 4.3 percent by 2017. This rate is also among the highest of all 22 Welsh Council areas and is notably higher than the Welsh average of 3.6 percent. This means that the construction of the

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<sup>18</sup> Using the ILO definition of unemployment.

Proposed Development could indeed utilise the skills available from the local labour pool.

### Links with tourism: existing evidence

- 12.75 Analysis on the potential impacts of onshore wind farms and associated grid infrastructure on the visitor economy is a hotly debated topic and there remains no consensus view on the impacts. There have been several studies into the attitudes of visitors, tourists and tourism organisations towards wind farms in the UK which suggest wind farms have their own tourism pull, while other independent UK studies have suggested adverse effects of wind farms on tourism are negligible.
- 12.76 A study by Regeneris Consulting and The Tourism Company (published in February 2014)<sup>19</sup> for the Welsh government concluded that, in areas where wind farms have had an established presence for a number of years (Powys, Anglesey and the South Wales Valleys), there was no evidence of significant impacts on tourism to date. The report cited local studies which show that the majority of visitors to those areas have either a positive or indifferent stance on the wind farms' presence. It was suggested that this was an indirect consequence of planning policy which focuses development away from key natural assets and visitor attractions in Wales.
- 12.77 Despite a lack of literature focussing on the impact of onshore wind farm development on tourism in Wales, there have been several others which look at Scotland. The main reports, and their findings, are summarised below.
- 12.78 A recent report by BiGGAR Economics, published in October 2017<sup>20</sup>, finds that there is no relationship between tourism employment and the development of onshore wind farms in Scotland as a whole. According to the study, this finding also holds true at the local authority level and in the areas near to wind farms. In fact, results from the study show that the tourism sector in most areas surrounding wind farms grew faster than the local authorities where they were located.
- 12.79 Indeed, the report further supports and builds on the findings from earlier editions, namely 'Wind Farms and Tourism Trends in Scotland, 2016'<sup>21</sup>. As part of this study, a survey of 380 tourists in six Scottish locations was undertaken. Of those interviewed, 75 percent felt that wind farms had a positive or neutral effect on the landscape. While only a small share, two percent, of those who had seen a

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<sup>19</sup> <https://gov.wales/docs/desh/publications/140404economic-impacts-of-wind-farms-on-tourism-en.pdf>

<sup>20</sup> <https://biggareconomics.co.uk/wp-content/uploads/2017/11/Wind-Farms-and-Tourism-Trends-in-Scotland-Oct17.pdf>

<sup>21</sup> <http://www.biggareconomics.co.uk/wp-content/uploads/2016/07/Research-Report-on-Wind-Farms-and-Tourism-in-Scotland-July-16.pdf>

wind turbine said it would influence their decision to revisit the area. According to the report's author:

- 12.80 “While this is just one piece of research, it is the first that has looked systematically at the situation before and after windfarms have been developed, and it clearly demonstrates that renewable energy and tourism can co-exist in a modern Scotland.” Graeme Blackett, Director of BiGGAR Economics<sup>22</sup>.
- 12.81 These results are also supported by independent research released by Visit Scotland in April 2012, which sought to understand more about consumer attitudes to wind farms and their effect on tourism. According to the survey, the presence of wind farms does not affect eight out of ten tourists to visit Scotland, and most people do not feel wind turbines spoil the countryside.
- 12.82 Earlier research also mirrors similar takeaways. A study released by the Scottish Government in 2008<sup>23</sup>, found the proportion of tourists that considered wind farms to have a positive effect on the landscape was around 40 percent. And of those interviewed, over 95 percent, were not affected by the current level of turbines in considering a future return to visit the area.
- 12.83 While a study by the University of Edinburgh found that wind farms had no economic benefit, either positive or negative, on local tourism, it further found that when combined with a visitor attraction, numbers may increase<sup>24</sup>.
- 12.84 Evidence from elsewhere suggest that wind farms could themselves be a tourist attraction. A wind farm located near Glasgow was the first wind energy project in Scotland to join the Association of Scottish Visitor Attractions (ASVA) in 2012. Indeed, Whitelee Wind Farm attracted almost 250,000 visitors between becoming operational in 2009 and June 2012<sup>25</sup>.
- 12.85 Furthermore, the project director of Whitelee Wind Farm, John Alexander, at the time said: <sup>26</sup>
- “We are very pleased that Whitelee Wind Farm will be joining Scotland's top tourist attractions as a fully-fledged member of the ASVA.”
  - “It is fantastic that people have shown so much interest in the wind farm, and it has surpassed all of our expectations.”

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<sup>22</sup> <https://www.independent.co.uk/news/business/news/windfarms-wind-turbines-tourism-biggar-economics-scotland-a7168071.html>

<sup>23</sup> <https://www.gov.scot/resource/doc/214910/0057316.pdf>

<sup>24</sup> Aitchison, Cara, 2012. Tourism Impact of Wind Farms, Submitted to Renewables Inquiry Scottish Government, April 2012.

<sup>25</sup> <http://www.bbc.co.uk/news/uk-scotland-scotland-business-18525763>

<sup>26</sup> <https://www.bbc.co.uk/news/uk-scotland-scotland-business-18525763>

- "One of our key priorities when building the wind farm was to ensure that it was accessible, and that people could enjoy interacting with it."

## Conclusions

- 12.86 The Proposed Development will offer economic and environmental benefits to the local area and region as a whole. Given the economic and social need to create new job opportunities, private sector investment should be viewed favourably. Construction of the Proposed Development will provide jobs suited to the skills profile of the local area.
- 12.87 During the operational phase of the Proposed Development, business rates payable to the local and regional government will increase. The Proposed Development will also further efforts to reach energy targets set by the Welsh Government and the UK Government.
- 12.88 The Proposed Development is estimated to involve a capital spend of £22.49 million (nominal prices). Of this amount, £8.18 million (nominal prices) will be realised in Wales. The 10-month construction phase is estimated to create or sustain an estimated 104-86 job years of employment, £3.44-2.81 million in wages and £3.52-£2.93 million in GVA to the Welsh economy.
- 12.89 The Proposed Development is also expected to create or sustain the equivalent of 35 direct job years of employment, £1.49 million in direct wages and £4.58 million in direct GVA over its 35-year operational lifespan.
- 12.90 We also expect a fiscal injection from the Proposed Development. During the construction phase tax receipts are likely to reach between £1.62 million and £1.33 million (including direct, indirect and induced wage impacts). While the operational phase is estimated to generate an addition £1.01 million in tax revenue.
- 12.91 Based on rateable values of £37,000 per MW - we calculate that the Development will increase rateable value by £932,400 per year. From these values business rates are calculated and collected for local councils and the Welsh Assembly. By applying the fixed non-domestic rate, common to all 22 Welsh councils, we estimate additional business rates of £479,254 each year.
- 12.92 The amount of electricity that could be produced by the proposed Development, is estimated to meet the needs of nearly 22,000 homes each year, over a third of the current (2016) housing stock in the Bridgend County Bourgh. In addition, the Proposed Development is likely to reduce CO<sub>2</sub> emissions by over 38,500 tonnes each year (equivalent to an estimated 29,200 newly registered cars).

## Public access & land use

### Public access

- 12.93 There are several public rights of way crossing the site, including a bridleway linking Cwmparc with the Garw Valley, and footpaths linking to the other surrounding valleys, and following the ridge of Mynydd Llangeinwyr south. Being unenclosed upland grazing, most of the site is open access land, with the exception of the enclosed pastures in the east.
- 12.94 Following consultation with Bridgend County Borough Council the Proposed Development includes proposals for permanent diversions to bridleway BW64GWV and footpath FP103GWV in order to maintain a suitable distance from the wind turbines. The proposed diversions are shown in Figure 12.1: Public Rights of Way Diversions. The permanent diversions represent an increase in length of approximately 260 m over the existing footpath and bridleway.
- 12.95 A temporary diversion, during the construction period only, to footpath FP31 OGV, is proposed to maintain a suitable set back distance from the borrow pits. Details of the proposed diversion is shown in Figure 12.1. The temporary diversion represents an increase in length of approximately 100 m over the existing footpath. Both the permanent and temporary diversions proposed all follow similar terrain to the existing routes and do not encroach into any environmental constraints, as described in Chapter 2: Design Evolution and Alternatives.
- 12.96 Should planning permission for the Proposed Development be granted, RES would lodge an application to divert the rights of way under the Town and Country Planning Act 1990, and any other consents that may be necessary, in consultation with Bridgend County Borough Council.
- 12.97 Given the relatively short length of the diversions, the similar nature of the terrain and the fact that no environmentally constrained areas will be affected, effects of the Proposed Development on public rights of way are not deemed to be significant. Effects on the footpaths from a landscape and visual perspective are considered in Chapter 5.

### Land use and common land

- 12.98 Land cover on the Application Site consists of upland grassland, used as rough grazing, and is partly on registered common land. The summit of Werfa features an OS trig point and two communications masts within a fenced compound. The compound is accessed via a track from the A4107 and is serviced by a low-voltage overhead power line on wood poles which runs from the Garw Valley.

- 12.99 Following the completion of construction of the Proposed Development grazing will be able to continue around the wind farm infrastructure.
- 12.100 RES has undertaken detailed consultation with commoners who may be affected by the Proposed Development. As a result of the Proposed Development RES would seek to de-register 16.81 ha of common land to make way for the wind farm infrastructure and temporary construction area. To off-set this RES has secured 16.81 ha of replacement land directly bordering the existing common, which will be available from the start of construction. The habitat of the replacement land is semi-improved grassland with areas of improved grassland, marshy grassland and flush habitats. The replacement land would develop into an acid and marshy grassland mosaic, reflective of the common land occupied by the Proposed Development, when taken out of active agricultural improvement.
- 12.101 RES has reached agreement with each of the active commoners to compensate them for any temporary disturbance during construction.
- 12.102 The proposed changes to the common land are illustrated in Figure 12.2: Common Land Swap Plan. An application to cover the proposed changes to the common land will be submitted along with the planning application and in accordance with the Commons Act (2006).
- 12.103 RES undertook consultation with the operators of the two communications masts at Werfa during the design stage of the Proposed Development. As a result the turbines have been located at suitable set back distances so as not to cause interference to the masts. Occasional access to the masts is required for maintenance via a small existing track, which crosses the proposed wind farm track at one location. RES will ensure that access to the masts is maintained during construction and throughout the lifetime of the Proposed Development. The 11 kV overhead line which serves the communications masts will be diverted and undergrounded in the vicinity of T7, in agreement with Western Power Distribution, to ensure suitable clearance distances are achieved. The route of this overhead line and the proposed diversion are included within the area of common land to be deregistered shown on Figure 12.2.
- 12.104 Taking into account the mitigation in terms of replacement common land, grazing compensation during construction, and the set back distances of the turbines from the existing communications masts and infrastructure, effects on land use are not deemed to be significant.