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Pen March Wind Farm Economic Impact Report

A report to RWE

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Executive Summary

The development, construction and operation of the Pen March Wind Farm will generate substantial economic benefits at a local and national level.

The proposal for the Pen March Wind Farm is for an up to 6 turbine development, situated on the border of Merthyr Tydfil County Borough Council (CBC) and Caerphilly County Borough Council. The expected investment for the project is estimated at £1.5m for development, £30m (indicative underestimate) for construction and £65m for operations and maintenance over the lifetime of the scheme. Whilst the application is for up to 35 years of operation, this report considers 30 years as a conservative case.

This report sets out the impacts across the development, construction and operations & maintenance phases of the Proposed Scheme, as well as decommissioning. We have assessed these benefits across three impact areas: a local area (defined as the local authority wards within 10km of the site), across Wales and across the UK.

During the development and construction phase, the Proposed Scheme will bring direct economic benefits through the contractors used to develop and build the wind farm as well as further benefits through the supply chain and induced spending by workers employed on the project. The development and construction phase is estimated to deliver:

- £11m in Gross Value Added (GVA) and 185 in full time equivalent (FTE) job years are expected to be created or safeguarded across the UK
- Of this £6.8m in GVA and 105 in FTE job years are expected to be created or safeguarded across Wales
- And of this £1m in GVA and 14 in FTE job years are expected to be created or safeguarded in the local area

During the assessed 30-year operation of the wind farm, the Proposed Scheme is expected to deliver:

- £44.2m in GVA and 24 FTE jobs each year are expected to be created or safeguarded in the UK
- Of this £32.2m in GVA and 18 FTE jobs each year are expected to be created or safeguarded in Wales
- And of this £5.3m in GVA and 2 FTE jobs each year are expected to be created or safeguarded for the local area

Further, during the operation, there are opportunities for additional benefits through a return on investment from a potential shared ownership model being developed with Merthyr Tydfil CBC and Caerphilly CBC, as well as a community benefit fund.

Beyond the direct impacts from the scheme itself, other economic impacts may arise including skill development, as the scheme contributes to the wider shift towards sustainable jobs and industries within Wales.

1. Introduction

Wavehill was commissioned by RWE to provide an independent assessment of the potential economic impact of the Pen March Wind Farm proposal. This report identifies the potential economic impact based on the latest literature insight, and the capacity of the local and national supply chain to respond to the opportunity.

1.1. Site Background

Pen March is an onshore wind farm proposal of up to six turbines north-west of Rhymney and north-east of Merthyr Tydfil town (see figure 1.1 below). The site sits mostly on Common Land comprising exposed moorland and rough grassland on south facing slopes to the south of the Bannau Brycheiniog National Park (BBNP) boundary. Overhead lines cross part of the site and to the south-west and south-east there are industrial developments and retail parks, as well as some terraced housing in Pant. The A465 Heads of the Valleys road runs east-west to the south of the site while the Brecon Mountains Railway, as well as The Taff Trail and National Cycle Network routes 46 and 8, run along the Pontsticill valley to the west of the site boundary.

There are a number of wind farms within 20km of the Proposed Scheme including a single turbine at the local Pengarnddu Industrial Estate (1.8km), a single turbine at Tafarnaubach Industrial Estate (2km), and 3 turbines at Pen Bryn Oer Wind Farm (3.1km). Other operational wind farms include 9 turbines at Mynydd Bwllfa (14.6km), 8 turbines at Maerdy (15.7km) and 8 turbines at Ferndale (16.1km). The large 76 turbine wind farm, Pen y Cymoedd, is 20km from Pen March. Pen March will therefore contribute to the growing renewable energy industry in this part of Wales.

Development of the Proposed Scheme is expected to take approximately six years in total, with investment having already been made in design and development work to get the site to planning application. Construction of the project is expected to take 12 months with the completed wind farm in operation for 30 years. The construction will require a significant supply chain and contractor operations to deliver materials and labour for installation as well as manufacturing of the turbines and grid themselves. Operation will involve regular site visits, maintenance and checks on blades, gearboxes and generators. For the purposes of this report, decommissioning is anticipated to involve the complete disassembly and removal of the turbines at the end of its operational life.

1.2. Methodology

This report addresses the potential economic impact of the Proposed Scheme with assessment of other environmental factors being considered in the Environmental Impact Assessment (EIA) as part of the planning application.

Economic impacts arising from the Proposed Scheme have been estimated using desk-based analysis supported by insight from local and industry stakeholders. Evidence has been collated through a literature review of previous onshore wind farm developments and the latest research from industry groups such as Renewable UK, as well as insight from previous assessments conducted by Wavehill. Policy targets by 2030 and the potential for the supply chain in the UK and Wales to respond have also been factored in. This information has been fed into an econometric model to provide estimated quantifiable impact figures. The economic indicators to be used for the assessment are:

- **Gross Value Added (GVA);** the amount of output generated through the economy as a direct and indirect consequence of the development, construction, operations and decommissioning phases of the Proposed Scheme. Assessment will be made based on expenditure and revenue generated by the investment, the sectors in which this expenditure will take place, the typical output to turnover ratios these sectors typically command (using Office for National Statistics (ONS) data) and the multiplier effects (using ONS input-output tables).
- **Employment;** the estimated number of job years¹ to be created and safeguarded as a direct and indirect consequence of the development of the Proposed Scheme. Figures will be collated from other comparable projects and conversions made from expenditure based on turnover to employment ratios (using ONS data) and multiplier effects (from input-output tables).

Investment into the wind farm drives the estimates of economic value created and figures have been provided by RWE which are based on their current estimates of total cost for each stage of the scheme. Following the granting of planning permission and a Final Investment Decision (FID) being taken to proceed by the developer, the project will move from its current development phase (DEVEX) to construction (CAPEX) and subsequent 30-year operation (OPEX). Figures for each stage of the process are used to demonstrate the economic impact, with construction investment being the most significant (on a per annum basis) and therefore generating the largest impacts.

At each stage, the capacity of the domestic and local supply chain to respond to the opportunity determines the extent to which investment is retained with UK based organisations. This draws on the wider literature evidence and allows computation of direct impacts against the variables above.

¹ Job years are used to detail jobs created or safeguarded which might span more than one year. It enables values to be converted into comparable jobs, for instance, £50m of construction spending over 3 years might safeguard 300 job years during that time, though this would equate to 100 jobs each year. Ten job years is then treated as one permanent full-time job.

Direct impacts cover the impacts associated with Tier 1 contractors and suppliers including their employment of staff and generation of revenue and profit. Secondary, indirect impacts will also be generated and are based on multiplier effects through the supply chain, with one company's expenditure acting as a lower supply chain firm's income, securing further employment and output. Type 2 multipliers are also used to account for the induced spending effects of those employed (as a consequence of the intervention) from their wages being spent in the economy (including temporary location of construction labour generating surpluses for local businesses).

As well as these economic impacts generated by the investment into the wind farm, other wider economic impacts will occur:

- **Some skill development** in the local labour market, improving the experience of suppliers, and generally growing the industry and opportunities locally.
- **Shared ownership** is being offered for the Proposed Scheme with RWE working towards an agreement for a proportion of shared ownership² by the two local authorities in which the site sits, Merthyr Tydfil County Borough Council (CBC) and Caerphilly County Borough Council. If an agreement is reached, this will generate an annual return providing local government revenue for reinvestment into local amenities and services.
- **A community benefit fund**³ is also expected as part of the scheme which will offer an annual source of funding for investment in local initiatives that may bring a mixture of quantitative benefits and qualitative impacts, depending on the nature of the activities and investments pursued.

The evidence provided in a Welsh Government report,⁴ as well as other research,⁵ suggests that impacts of onshore wind farms on tourism are minimal, with tourism data showing increases in visitor numbers in the last few years in south Wales despite development of multiple wind farms.⁶ As such, consideration of these impacts has not been included further in this assessment.

² Shared ownership is a model whereby external parties to the developer can take a stake in the investment and ownership of a project or scheme and therefore benefit proportionately from any revenue generated. It is an ambition of Welsh Government is to increase local ownership in renewable energy projects to 1GW by 2030.

³ Community benefit funds are an established method of providing local opportunities and investment where an area is hosting significant renewable energy infrastructure. Good practice in the UK is for developers to offer £5,000 per MW of production capacity.

⁴ Welsh Government (2014) Study into the Potential Economic Impact of Wind Farms and Associated Grid Infrastructure on the Welsh Tourism Sector, https://gov.wales/sites/default/files/publications/2019-06/potential-economic-impact-of-wind-farms-on-welsh-tourism_0.pdf

⁵ The economic impacts of wind farms on Scottish tourism, A report for the Scottish Government, 2008

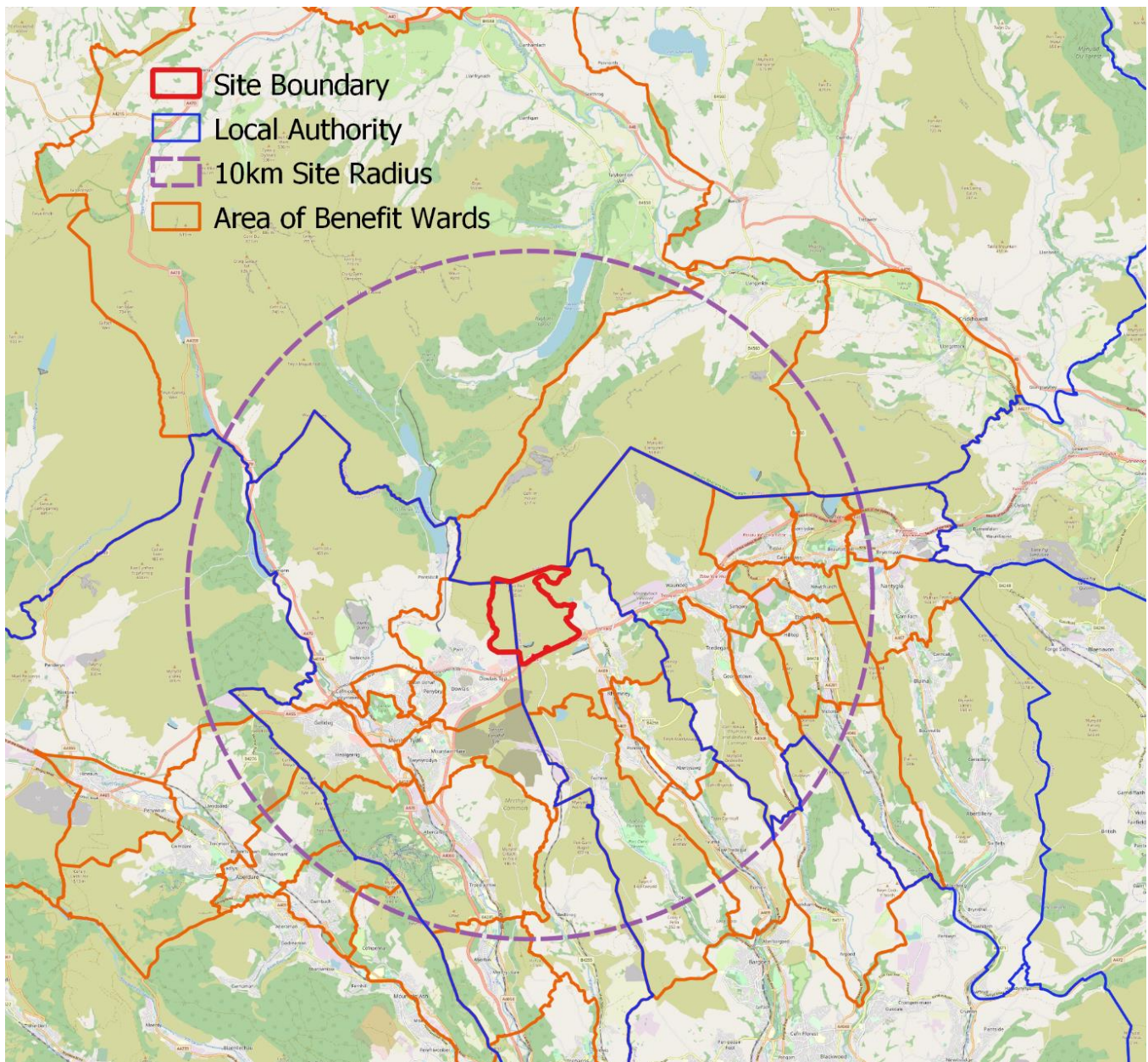
⁶ Regeneration and Sustainable Development Cabinet Board, Tourism Update Report, Neath Port Talbot County Borough Council, March 2019. Accessed at: <https://democracy.npt.gov.uk/documents/s45353/SB%20Tourism%20Update%20Report.pdf>

1.3. Area of Economic Benefit

The Proposed Scheme spans both Caerphilly and Merthyr Tydfil CBC areas, and borders the southern edge of the Powys CC (which includes BBNP). Given the economic impact is therefore likely to cover several local authority areas a radial area of benefit has been established for the project covering 10km from the site (see figure 1.1 below). This is likely to include many of the companies providing ancillary services to the development and where the workforce is likely to be based (temporarily during construction). This 10km radius covers much of Merthyr Tydfil CBC, the northern part of Caerphilly CBC, the southern edge of Powys County Council (CC) and parts of north-west Blaenau Gwent. It includes the towns of Merthyr Tydfil, Rhymney, Tredegar and Ebbw Vale. The local authority wards within this area are:

- Aberdare East
- Aberdare West/Llwydcoed
- Argoed
- Badminton
- Beaufort
- Bedlinog
- Brynmawr
- Cwm
- Cwmbach
- Cyfarthfa
- Darren Valley
- Dowlais
- Ebbw Vale North
- Ebbw Vale South
- Georgetown
- Gurnos
- Llangattock
- Llangynidr
- Merthyr Vale
- Moriah
- Mountain Ash East
- Nantyglo
- New Tredegar
- Park
- Penydarren
- Plymouth
- Pontlottyn
- Rassau
- Rhigos
- Sirhowy
- Talybont-on-Usk
- Town (Merthyr Tydfil Town Centre)
- Tredegar Central and West
- Twyn Carno
- Vaynor

Figure 1.1: Map of the area of economic benefit



Given that the lowest level for the most appropriate publicly available data is the local authority (CCs and CBCs) and the site is on the intersection of Merthyr Tydfil CBC, Caerphilly CBC and Powys CC, these areas will be used for assessing the economic context. Where figures are provided from the modelling for the local area, these are considered to be the three local authorities of Merthyr Tydfil CBC, Caerphilly CBC and Powys CC. Further impacts are then estimated for Wales and for the UK.

1.3.1 Limitations

The figures in this report are based on modelled estimates drawing on a range of assumptions. These assumptions are underpinned by the latest information available and insight into supply chain spending and retention in the UK. Over time this is likely to change and the input cost estimates for RWE will be

refined. This will lead to changes in the model output figures when the project is completed and, during the intervening years, other contextual changes may take place that are impossible to predict but may have an effect on the estimated impact.

Where appropriate, impact estimates have been monetised in line with current best practice⁷ and to provide comparability between factors and assessments. This should not reduce the importance of qualitative factors and it is important to note that expression as monetary values may be simplistic and not consider all aspects of a variable. For instance, community benefit fund impacts are assessed on their contribution of jobs and GVA, as with the rest of the report, though the value placed by local residents on the community assets the fund could enable may be greater than the monetary value given.

⁷ See HMT Green Book

2. Context

This section presents the local and national level policy and economic context to the proposed Pen March Wind Farm.

2.1. Policy Context

Wales is committed to reaching net zero targets by 2050, aligned with the target for the UK.⁸ The Welsh Government is also committed to reaching 70% of energy consumption from renewable sources and 1GW of local ownership by 2030. These are both targets that the proposed Pen March development will contribute to.

Future Wales: The National Plan 2040 builds on the pillars in the Well-being of Future Generations (Wales) Act 2015 in setting out how the country will maximise the social and economic opportunities it has in a sustainable manner. There is an ambition to deliver more renewable energy and reduce the use of carbon alternatives alongside creating jobs (particularly in rural areas) where inequality and lack of opportunities can be higher. Corresponding action policies in Future Wales include natural resource utilisation, rural economic regeneration and a thematic area on renewables and low carbon energy infrastructure. Through its development, the Pen March site will bring impacts aligned to these areas and support the realisation of the National Plan 2040.

Prosperity for All: A Low Carbon Wales includes the existing policy on decarbonisation and sets out the benefits that can be achieved from creating a low carbon economy, including clean air and water, improved health, clean growth and quality jobs.⁹ This supports Capturing the Potential, the Welsh Government's green jobs strategy to use the low carbon sector as an opportunity for economic improvement which has subsequently been incorporated into other policy.¹⁰ Following the Covid-19 pandemic there has been an emphasis on the Green Recovery and supporting a transition to a low carbon economy that encourages sustainability as well as resilience.¹¹ By drawing on technological innovation, unlocking supply chain opportunities and investing in skills and sustainable developments, onshore wind farms such as Pen March help to drive forwards the economy while creating the economies of scale that can unlock more opportunities.

⁸ Wales' pathway to achieve net zero emissions, Lesley Griffiths, Minister for Environment, Energy and Rural Affairs, February 2021

⁹ Prosperity for All: A low carbon Wales, Welsh Government, 2019

¹⁰ Capturing the Potential, A green jobs strategy for Wales, Welsh Government, 2009

¹¹ Energy Generation in Wales 2018, Regen on behalf of Welsh Government, 2019

A key aspect of the Cardiff Capital Region (CCR) Strategic Business Plan is responding to the climate crisis and pushing forward with decarbonisation.¹² The CCR Energy Strategy¹³ sets out the vision for the region to:

Transition to a carbon neutral economy and society in the CCR, using low carbon energy as an enabler of economic regeneration, growing our regional income whilst maintaining guardianship of our environment through a laser focus on clean growth.

As well as reducing energy consumption, the strategy recognises the various potential pathways to achieve energy system transformation, of which renewable energy generation forms an important part. The strategy further in modelling the potential economic benefit of the energy transition suggesting that the electricity generation planned will require a net increase of 7,400 jobs and generate £853m, compared to a business as usual scenario. The economic impacts of the Proposed Scheme outlined below are a direct contribution to the Energy Strategy for the CCR and the expected economic outcomes.

Environmental wellbeing has been put at the heart of Merthyr Tydfil CBC's wellbeing objectives alongside best start, working well and living well.¹⁴ Communities should protect, enhance and promote the environment and countryside by maximising efficient use of materials and resources and increasing the use of renewable and low carbon technology. In the recent update of Focus on the Future,¹⁵ Merthyr Tydfil CBC includes renewable energy generation as a solution and aligns this to the Economic Recovery Plan. In the Economic Vision 2021-2035 Merthyr Tydfil CBC transitioning to a low carbon economy is part of the core ambitions.¹⁶

Caerphilly CBC has its own decarbonisation strategy setting out how it will reduce the council's carbon footprint while building a sustainable green economy is central to the updated Foundation for Success regeneration strategy.¹⁷ The strategy also links in the need for more green skills to support the transition to a sustainable economy which will support the renewable energy opportunities and bring value to the local economy.

Powys County Council declared a climate emergency in 2020 and agreed to a cross party motion on climate change. Subsequently the Council published a Strategy for Climate Change, setting out how the Council, through its activities and role, can support greater sustainability and achieve its net zero targets.¹⁸ The climate strategy supports the wider corporate plan which aims to create a sustainable economy and place to live in Powys, aligned to the goals of the Welsh Government Wellbeing for Future Generations Act.¹⁹

¹² CCR Strategic Business Plan 2021-2026, Cardiff Capital Region, 2021

¹³ Cardiff Capital Region Energy Strategy, Cardiff Capital Region, 2021

¹⁴ Statement of Wellbeing 2021/2022, Version 5, Merthyr Tydfil County Borough Council

¹⁵ Focus on the Future: Wellbeing in our Communities 2017 to 2022, Version 6, Merthyr Tydfil County Borough Council, 2022

¹⁶ Economic Recovery Plan, Merthyr Tydfil County Borough Council, 2021

¹⁷ Recovery from Covid; A Foundation for Success 2018-2023, Regeneration Strategy, Caerphilly County Borough Council, 2018

¹⁸ A Strategy for Climate Change, net positive Powys 2021-2030, Powys County Council, 2021

¹⁹ Vision 2025: Our Corporate Improvement Plan 2022-2025, Powys County Council, 2022

Given the policy context and direction, the Proposed Scheme aligns closely with the priorities and ambitions at a local and national policy level.

2.2. Economic Context

The economic characteristics of the three local authorities in which the Proposed Scheme sits or borders are compared below with the averages for Wales and the UK. Indicators for the local authority areas of Merthyr Tydfil CBC, Caerphilly CBC and Powys CC are drawn from mainly ONS sources with other sources referenced in the footnotes.

As of 2020, the local authority area of Merthyr Tydfil CBC had a population of 60,400, Caerphilly CBC 181,700 and Powys CC 133,000.²⁰ 70.9% of Merthyr Tydfil CBC's population is economically active, which is lower than Caerphilly CBC (74.3%) and Powys CC (81.4%). The average in Wales is of 76.4%, below the UK average of 78.4%.²¹ The percentage of Merthyr Tydfil CBC's population currently in employment (66.9%) is also lower than Caerphilly CBC (72.3%) and Powys CC (78%). In Wales the average employment rate is 73.1%, while in the UK the average is 74.8%.

Of the economically inactive, 18.7% of those in Merthyr Tydfil CBC, 19.7% in Caerphilly CBC and 27.4% in Powys CC were students, compared to Welsh and UK averages of 27.2% and 28.1% respectively. The main reason for economic inactivity in Merthyr Tydfil CBC and Caerphilly CBC is long-term sickness (40.1% in Merthyr Tydfil CBC and 40.5% in Caerphilly CBC) which is higher than Welsh and UK averages of 30.2% and 24.6%.²² In Powys long term sickness accounts for 22.4% of economic inactivity with higher rates of retirement (20.6%) than in the other two local authority areas and Wales (12.5%) and the UK (13.7%).

The economic composition of Merthyr Tydfil CBC, Caerphilly CBC and Powys CC are similar and dominated by Manufacturing, Health & Social Care, and Retail. The largest industry in Merthyr Tydfil CBC is Health & Social Care employing 8,000 people followed by Retail (3,000 jobs) and Manufacturing (3,000 jobs).²³ In Caerphilly CBC, 11,000 people are employed in Manufacturing, 7,000 in Health and Social Care and 7,000 in Retail. In Powys Retail dominates with 7,000 jobs and Manufacturing and Health and Social Care each employing 6,000 people.

Merthyr Tydfil CBC has a higher percentage of people without qualifications than the Welsh average at 21.3% compared to 10.3% in Caerphilly CBC and 8.2% in Wales. The proportion of the working age population with no qualifications in Powys CC is lower at 5.7%. 57.4% of Merthyr Tydfil CBC's population have achieved GCSE equivalents (Level 2) which is lower than Caerphilly CBC (71%) and the Welsh average of 75.4%.²⁴ Again Powys CC is above the Welsh average as it is across all levels, with 79.2% of the

²⁰ Population estimates, ONS, 2021

²¹ Annual Population Survey, ONS, April 2022

²² *ibid*

²³ *ibid*

²⁴ Annual Population Survey, ONS, June 2022

working age population qualified to Level 2 and above. Figures for the UK are above most of the Welsh local authorities and Wales average with 87.5% qualified to Level 2 and above and 43.6% qualified to Level 4 and above, compared to 38.6% in Wales.

GVA per head in Merthyr Tydfil CBC in 2019 is £17,228, which is below the Welsh average of £21,010.²⁵ In Caerphilly CBC GVA per head is £18,026, above Powys CC at £17,025. This is aligned to lower resident earnings with weekly pay in Merthyr Tydfil CBC averaging £525.10 compared to £536.80 in Powys CC and £562.70 in Caerphilly CBC. All figures are lower than the Welsh median average of £570.60 and the UK of £613.10.²⁶

The lower income also effects deprivation. Of the 1,909 Lower Super Output Areas (LSOAs)²⁷ in Wales, 36 are in Merthyr Tydfil CBC, 110 in Caerphilly CBC and 79 in Powys CC.²⁸ Overall, of the 0-10% most deprived LSOAs in Wales, 8 are within the Merthyr Tydfil CBC local authority area, 11 in Caerphilly CBC and 1 in Powys CC. Therefore approximately 22.2% of the population of Merthyr Tydfil CBC live in the 10% most deprived parts of Wales. In Caerphilly CBC approximately 10% of the population live in the 10% most deprived parts of Wales while in Powys CC it is only 1.3%. These figures point to some of the deep-rooted deprivation challenges facing Merthyr Tydfil CBC while Powys has relatively less deprivation.

Aligned to the other socio-economic indicators outlined above, deprivation in Merthyr Tydfil CBC is mainly driven by employment and education factors, as well as the physical environment, earnings and health. In Caerphilly CBC employment challenges drive deprivation as well as community safety. In Powys it is mainly employment opportunities that are the reasons for the pockets of deprivation.

²⁵ GVA estimates by local authority, ONS, 2021

²⁶ Annual Survey of Hours and Earnings, ONS, 2021

²⁷ Lower Super Output Areas are a geospatial area determined by population and typically contain 1,500 resident people.

²⁸ Welsh Index of Multiple Deprivation, Stats Wales, 2019

3. Assessment

This chapter highlights the economic impact anticipated from the Pen March Wind Farm. For the purposes of this assessment the latest design and costing figures have been used. These are for an approximately 30MW site²⁹ with up to 6 turbines and associated grid connection.

3.1. Economic Impact

A total estimated expenditure of £97.5m is anticipated for the Proposed Scheme through development, construction, operation and decommissioning phases. This expenditure will go through several Tier 1 suppliers who will make further expenditures through their own supply chains creating direct and then indirect effects. The economic impacts of the Proposed Scheme are broken down into the four project phases: development, construction, operation and decommissioning.

3.1.1 Development Phase

In the development phase a large proportion of the estimated £1.5m expenditure is expected to be retained within the UK (96%) with both internal and external spending from the developer. This covers engineering and design, legal and consenting, including local expenditure for site visits and public communications. Given the capacity of the supply chain, 41% of the expenditure is anticipated to be retained in Wales of which 8% is in the local area of benefit around the site (see map above).

These figures suggest that over an approximately six year development period, £120,000 is expected to be spent in the local area, a further £496,500 in Wales and £823,500 in the rest of the UK. This can be converted into anticipated employment and GVA impacts using ONS turnover to GVA and employment ratios for the sectors supporting this phase. This shows that development spending will create or safeguard 12 direct FTE job years in the UK, of which 5 FTE job years are expected to be in Wales, of which 1 direct FTE job years are expected to be in the local area of benefit. Direct GVA impacts are expected to be around £550,000 for the UK economy, of which £270,000 is expected to be in Wales and £55,000 in the local area.

Indirect effects from the development phase investment will lead to 6 additional FTE job years created or safeguarded in the UK, of which 2 FTE job years are expected to be in Wales and 0.3 FTE job years in the local area. The total FTE job years created or safeguarded by the project will therefore be 18 FTE job years in the UK, of which 7 FTE job years are expected to be in Wales and 1.3 in the rest of the UK. These created or safeguarded job years can be divided by the 6 years of the development phase which suggests 3 FTE jobs are created or safeguarded per annum in the UK, of which 1 FTE job per annum is expected to

²⁹ However the installed capacity could exceed 30MW

be in Wales and 0.2 in the local area. For GVA, the indirect effects are around £250,000 in additional UK benefit is expected to be generated, of which £70,000 is expected to be in Wales and £10,000 in the rest of the UK. Total GVA from the development phase is estimated at £800,000.

Table 3.1: Total development phase economic impacts (figures rounded)

Impact Area	Retention Rate	Estimated Spend	Direct GVA	Total GVA	Direct Job Years	Total Job Years
Local	8%	£120,000	£55,000	£65,000	1	1.3
Wales	41%	£616,500	£270,000	£340,000	5	7
UK	96%	£1,440,000	£550,000	£800,000	12	18

3.1.2 Construction Phase

During the construction phase, a significant amount of investment is made to suppliers overseas due to the location of turbine manufacturers in Europe, the US and China. While other components may be sourced domestically and installation will use local contractors where possible, the lack of a major turbine manufacturing supplier in the UK reduces the retention of spending. An indicative estimate of £30m for the construction of the site has been allowed (which is likely a cautious underestimate). Of this CAPEX phase spend over a one year period, total expenditure in the UK is expected to be £13.8m (46%). £1.2m (4%) is expected to be retained in the local area and £7.2m (28%) in the rest of Wales with the remaining £5.4m in the rest of the UK. Given the construction period is one year, all figures are per annum.

The direct impacts of this spending will be to create or safeguard 115 FTE jobs in the UK, of which 70 are expected to be in Wales and 10 in the local area. The construction phase will generate £7.9m in direct GVA across the UK, of which £5.4m is expected to be in Wales and £775,000 in the local area.

Through the supply chain the multiplier effect will increase the total number of job years created or safeguarded. In the UK an additional 52 FTE jobs are expected to be supported bringing the total to 168. Of these 27 additional 27 FTE jobs are expected to be indirectly created or safeguarded in Wales, bringing the total to 98 jobs. Of these the construction phase will create or safeguard a further 2.5 indirect FTE jobs in the local area, bringing the total to 12.5. Similar indirect impacts will be generated for GVA. Total GVA for the UK is expected to be £10.2m, of which £6.5m will be in Wales and £985,000 in the local area.

Table 3.2: Total construction phase economic impact (figures rounded)

Impact Area	Retention Rate	Estimated Spend	Direct GVA	Total GVA	Direct Job Years	Total Job Years
Local	4%	£1,200,000	£775,000	£985,000	10	12.5
Wales	28%	£8,400,000	£5,415,000	£6,515,000	70	98

UK	46%	£13,800,000	£7,935,000	£10,200,000	115	168
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3.1.3 Operations Phase

The operational phase is anticipated to last for up to 35 years, but this assessment considers 30 years, and covers all activity related to the maintenance and function of the Proposed Scheme. This is likely to mostly be domestically resourced (though some parts may be required from overseas turbine manufacturers) and maintained day to day by a dedicated team from RWE alongside the rest of their onshore wind portfolio. Retention of spending is therefore anticipated to be 91% in the UK, with 64% in Wales and 10% locally. Over the lifespan of the scheme the total cost is expected to be approximately £65m with a total of £59.15m anticipated to be retained in the UK. Of this £6.5m is expected to be spent in the local area of benefit, £41.6m in wider Wales and £17.55m in the rest of the UK.

This expenditure will create or safeguard direct FTE jobs for each year of the project lifespan. 17 jobs are expected to be supported each year in the UK or a total of 495 FTE job years over the 30-year period. Of these, 12 FTE jobs per year are expected to be in Wales or a total of 348 FTE job years over the project lifespan. Of these 2 FTE jobs are expected to be created or safeguarded each year in the local area (or 54 FTE job years overall).

Direct GVA impacts can similarly be broken down over the 30-year period; on average each year of operation will generate £1.16m in GVA for the UK. Of this £895,000 is expected to be retained in Wales and of this £140,000 will be in the local area. This equates to £35m in direct GVA over the life of scheme in the UK, of which £26.8m is expected to be in Wales and of this £4.2m is expected to be in the local area.

The indirect effects from the operation will increase the number of jobs by 7 FTE jobs each year in the UK (24 FTE job years overall) to a total of 216 FTE jobs (710 FTE overall). Of these the indirect jobs in Wales are expected to be 6 FTE each year (183 FTE job years overall) bringing the total to 18 FTE each year in Wales (531 FTE overall). Across the local area, the operation phase will generate 0.5 indirect FTE jobs each year (2 FTE job years overall) for a total of 14 FTE jobs each year (68 FTE job years overall).

In the UK an additional £310,000 in GVA is expected to be generated each year for a total of £1.47m. Of this in Wales the additional indirect GVA impacts are expected to be £180,000 each year, for a total GVA benefit of £1m per annum. Of this, an additional £35,000 is expected each year in GVA for the local area bringing the total to £175,000. Over the 30 year lifespan of the scheme, GVA impacts are anticipated to be £44.3m in the UK, of which £32.3m will be in Wales and of this £5.3m is expected to be generated in the local area.

Table 3.3: Total operation phase economic impact per annum (figures rounded)

Impact Area	Retention Rate	Estimated Spend	Direct GVA	Total GVA	Direct Job Years	Total Job Years
Local	10%	£216,000	£140,000	£175,000	2	2.3
Wales	64%	£1,385,000	£895,000	£1,075,000	12	18
UK	91%	£1,970,000	£1,165,000	£1,475,000	17	24

Table 3.4: Total operation phase economic impact overall (figures rounded)

Impact Area	Retention Rate	Estimated Spend	Direct GVA	Total GVA	Direct Job Years	Total Job Years
Local	10%	£6,500,000	£4,190,000	£5,335,000	54	68
Wales	64%	£41,600,000	£26,820,000	£32,290,000	348	531
UK	91%	£59,150,000	£35,010,000	£44,280,000	495	710

3.1.4 Decommissioning Phase

Decommissioning is difficult to estimate given there is no evidence from other wind farm sites who have reached this phase and there are likely to be other factors in the intervening 30 years that affect what decommissioning entails. The core assumption here is that the turbines are dismantled and scrapped or recycled rather than the site being upgraded. This leads to a UK retention of 100% with 65% retained in Wales and 10% in the local area. Estimated costs of decommissioning the site are £1m therefore £100,000 is expected to be retained in the local area, £650,000 in Wales and £1m in the UK.

Decommissioning is expected to take up to one year (allowing for pre-site works as well as 6 months on site removal) and create or safeguard 12 direct FTE jobs in the UK. Of these 8 are expected to be in Wales and of these 1 FTE job is expected to be created or safeguarded for the year of decommissioning in the local area. Direct GVA impacts are anticipated to be £475,000 in the UK, of which £310,000 will be in Wales and £45,000 in the local area.

Indirect benefits of 5 FTE jobs are expected to be created or safeguarded for the year's duration of decommissioning in the UK bringing the total FTE jobs to 18. Of these an additional 3 FTE jobs are expected to be created or safeguarded in the supply chain in Wales leading to a total of 11 FTE jobs. In the local area a further 0.3 FTE jobs are expected to be supported for a total of 1.3 FTE jobs over the one year of decommissioning. Additional GVA of £160,000 is expected to be generated in the UK through decommissioning, of which £85,000 is expected to be in Wales and £15,000 in the local area. This brings total GVA from decommissioning to £635,000 in the UK, of which £395,00 will be in Wales and £65,000 in the local area.

Table 3.5: Total decommissioning phase economic impact (figures rounded)

Impact Area	Retention Rate	Estimated Spend	Direct GVA	Total GVA	Direct Job Years	Total Job Years
Local	10%	£100,000	£45,000	£65,000	1	1.3
Wales	65%	£650,000	£310,000	£395,000	8	11
UK	100%	£1,000,000	£475,000	£635,000	12	18

3.2. Shared Ownership

Welsh Government has set a target for increasing local ownership of renewable projects to 1GW by 2030 and every project having an element of local ownership from 2020 onwards.³⁰ As part of the Pen March Wind Farm proposal, the local authorities of Merthyr Tydfil CBC and Caerphilly CBC are being offered shared ownership stake in the scheme up to 20% of the project. The investment will be at fair market value which will be determined by the expenditure from RWE and the exposure to risk at the time of investment. Depending on whether investment is made at FID (assuming some risk during construction) or at Commercial Operation Date (COD – less risk), set rates of return will be established. Current estimates are for a rate of return of 5.2% if investment is made at FID and potentially reducing to 4.2% at COD, with RWE having taken the risk up to either of these points.³¹ These return figures should be caveated as speculative and will vary depending on energy prices and materials costs; final figures will be determined by a range of factors, though 4.2-5.2% provide indicative scenarios to use for this report.

For simplicity the estimated project CAPEX value used in this report of £30m has been assumed so up to 20% of the construction value of the project which be invested by the two local authorities would be £6m (10% or £3m each). For the purposes of this report, it is assumed that each local authority will invest equally with several scenarios modelled for different investment values to demonstrate what the potential benefits could be.

The high impact scenario assumes that 10% investment is made by both local authorities for a total of £3m each. Assuming a 5.2% return this would generate an annual return of 156,000 for each local authority or £126,000 for a 4.2% return. In a medium impact scenario each local authority makes a £2m investment generating a revenue of £104,000 per annum at 5.2% or £84,000 at 4.2%. For a low impact scenario, the local authorities choose to invest £1m each generating £52,000 each year for a 5.2% return and £42,000 at 4.2% for each Council.

³⁰ Energy Generation in Wales, Welsh Government, 2018

³¹ Risks during construction are tied to delays with the works schedule, cost changes for materials from suppliers (particularly overseas) and unforeseen civil engineering challenges. During operation residual risks depend on warranties and service agreements while there are sales risks associated with volume generated and price from Contracts for Difference or merchant value (including a combination).

These returns on the investment will provide additional resources for the local authorities to support their public service activities. However, there are inherent challenges with assuming public sector spending to GVA or jobs created ratios and public spending may have wider benefits depending on how the funds are allocated. Given these challenges it is not appropriate to assess economic impact of the returns beyond the figures above.

3.3. Community Benefit Fund

As well as a shared ownership offer, the Proposed Scheme will include a community benefit fund to support local activities. A community benefit fund (CBF) of up to £5,000 per MW (industry standard at time of writing, index linked) each year has been assumed. This will equate to up to £150,000 per annum for a 30MW scheme (though could increase if the installed capacity is higher), or £5.25m over the project lifetime. Community benefit funds can be used by the community for anything they consider important and/or present opportunities for substantial investment in local amenities, as well as for economic regeneration and development. At other wind farms, community benefit fund allocations have been used to support local voluntary groups, community facilities and supporting local businesses and reskilling. Consultations with voluntary groups around the Proposed Scheme have suggested current funding needs in the area are for support with the cost of living crisis. Other opportunities that have been suggested include support for energy saving measures/decarbonising for homes and community assets and exploring options to maximise the value of the investment by providing match funding. Other potential fund priorities suggested so far include support for mental health and community transport.

Based on evidence from other community benefit funds reviewed by the evaluator, spending in the local area can be divided into five thematic areas, as well as the administration cost. These five thematic areas of spending are economic (e.g. expenditure supporting local businesses and training), facilities (e.g. community centre costs), social (e.g. funding mental health support), infrastructure (e.g. community building or energy saving projects) and environment (e.g. community woodland). The economic impact of these activities are considered here, but it is important to note that wider social benefits and qualitative impacts may also arise from these investments such as community participation, wellbeing, cohesion and civic pride.

Each thematic area is assumed to generate different levels of economic benefit, with higher supply chain multipliers and GVA ratios for activities which are more complex or economically focused. For instance, activities developing community infrastructure development will have greater GVA and employment contributions than social activities. A 10% allowance for managing the fund has been made providing £135,000 each year in funding broken down to the thematic areas above based on proportions in other Welsh wind farms. As above the expenditure is then converted into GVA and job year estimates.

A 30MW site will generate approximately £50,000 in direct GVA each year through the community benefit fund. This will increase by £15,000 through the supply chain and induced effects for a total GVA impact of £65,000 for Wales and the UK. A total of 2 FTE jobs are expected to be created or safeguarded in the local area each year due to the community benefit fund, with a further 0.2 FTE jobs created or

safeguarded across Wales through indirect benefits. Over the 30-year lifetime of the scheme the £5.25m expenditure creates £1.55m in direct GVA for the local area with a further £505,000 in indirect benefits in Wales. Total GVA impact is therefore £2m for the UK and Wales, of which £1.55m is expected to be generated in the local area. A total of 51 FTE job years are expected to be created or safeguarded in the local area of benefit alongside 5 additional indirect job years in Wales.

These figures should not diminish or distract from the other potential social benefits.

Table 3.6: Annual impacts of community benefit fund (30MW scheme)

Impact	Total	Impact Area
Initial Investment	up to £150,000	Local
Direct Job Years Total	2	Local
Indirect Job Years Total	0.2	Wales
Direct GVA	£50,000	Local
Multiplied GVA	£15,000	Wales

3.4. Skills

Development of the renewable energy sector in Wales is generating demand for a sufficiently skilled domestic workforce to meet the requirements of designing, manufacturing, constructing and operating wind farms and other renewable energy sites. In order to meet the Low Carbon Acceleration strategy targets or the UK Energy Security Strategy, between 2,400 and 2,800 secure FTE jobs are expected to be required in renewables.³² In Wales, there is a skills gap of nearly 500 jobs with most of these classed as 'high skilled' roles; Level 3 to Level 7. 40% of these roles will be managerial and 50% in technical and skilled trade roles. Typical priority skill areas include electrical and mechanical engineers, construction, metal fabrication, digital and data analysis and environmental support, as well as project management.

Although it is a relatively small development, the Proposed Scheme will cumulatively contribute to this growing skills demand in Wales, alongside other RWE onshore and offshore wind farm projects. As part of their Wales wide work, RWE have, and will continue to, work in schools and colleges to raise aspirations and awareness of the opportunities and routes into working in the renewable energy sector. Working with partners Coleg Llandrillo, RWE have trained 40 apprentices in Wales. Further, RWE have also been working closely with the Regional Skills Partnerships, Careers Wales and Welsh universities to ensure skills align with the local priorities. In order to grow the labour force, RWE are also utilising the Armed Forces Covenant and the Employer Recognition Scheme to encourage more ex-service people into the sector which is being developed into a corporate strategy.

³² Powering the Labour Market: Skilled work in a low carbon energy system, Green Alliance, Policy Insight: July 2022

3.5. Monitoring and Enhancement

To maximise the benefits of the Proposed Scheme for the local area, RWE will continue to work closely with the supply chain and ensure they are aware of, and prepared for, the opportunities generated by the potential investment in the Proposed Scheme. As well as contractual stipulations for local content and retention for subcontractors, the project will seek to enhance the benefits for the local area and Wales as much as possible.

To support this, RWE will ensure that Tier 1 contractors retain and share their supply chain expenditure information to allow an interrogation of how and where the investment has flowed. This can support future assessments of the impacts of the Proposed Scheme through the supply chain spending as well as considering the location of staff and head offices.

4. Conclusions

Pen March Wind Farm is likely to bring sizeable economic benefits to Wales and the UK through the development and build, as well as to the local area in operation, and through the shared ownership and community benefit fund.

The review of relevant economic development strategies and national policy shows that the Proposed Scheme is consistently aligned with the local, regional and national policy objectives. The opportunities for the Proposed Scheme to create a sustainable economy through employment and Gross Value added will help the Cardiff Capital Region to realise its vision, and the agenda for Merthyr Tydfil CBC, Caerphilly CBC and Powys CC. This is in addition to the role renewable energy will play in supporting the decarbonisation agenda and reaching net zero in Wales and the UK.

The expected economic impacts generated by the Proposed Scheme are positive. As well as generating renewable energy to power homes and businesses in Wales, the development, construction, operation and decommissioning of the Proposed Scheme will produce £55.9m in GVA and safeguard or create 913 FTE job years. 647 of these job years are expected to be in Wales, as well as £39.5m in GVA, and of these 83 job years are expected to be in the local area of benefit, with £6.4m in GVA.

The Proposed Scheme will also generate economic impact through the local benefits that will arise from the community benefit fund and any shared ownership. Benefits of shared ownership will be in the form of income to the local authorities (Merthyr Tydfil CBC or Caerphilly CBC) that can be used to support public spending. Depending on the investment value this may range from £52,000 in annual benefit from a £1m investment at FID through to £156,000 annual return for a £3m investment. While each council will choose how this income is spent, and therefore affect the jobs and GVA generated, this may support a part time or full-time job role each year.

The community benefit fund will bring about economic impacts as well as qualitative and social benefits. These economic impacts for a 30MW site include £65,000 in GVA annually and create or safeguard 2 FTE jobs each year in the area of benefit, with a further 0.2 FTE indirect jobs in Wales.

Table 4.1: Summary of economic impacts for the Proposed Scheme

	Local		Wales		UK		
Impact	GVA	Job Years	GVA	Job Years	GVA	Job Years	Period (years)
Development Phase	£65,000	1.3	£340,000	7	£800,000	18	6
Construction Phase	£985,000	12.5	£6.51m	98	£10.2m	168	1
Operation Phase	£5.33m	68	£32.29m	531	£44.28m	710	30
Decommissioning Phase	£65,000	1.5	£395,000	11	£635,000	18	1
Community Benefit Fund	£1.55m	51	£2m	56	£2m	56	30
Total	£8m	134	£41.54m	703	£57.92m	970	N/A
Shared Ownership	£ 52,000 - £156,000 (annual income)		N/A		N/A		30

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