



## 23 CUMULATIVE EFFECTS

23.1.1 Schedule 4 of the EIA Regulations states that an ES must include a description of the likely significant effects of the development, including reference to possible cumulative effects.

23.1.2 When considering potential significant cumulative impacts, the assessments have (where appropriate) considered:

- Intra-cumulative effects (i.e. those occurring because of the Proposed Development in isolation); and
- Inter-cumulative effects (i.e. those occurring because of the Proposed Development in combination with other development).

23.1.3 An assessment of the potential cumulative effects has been undertaken within each of the technical chapters.

23.1.4 A summary of the cumulative effects of the Proposed Development are provided below and within Table 23-3, with further details provided within each technical chapter.

23.1.5 The EIA Regulations outline cumulative schemes as being “*other existing and / or approved development*” therefore the schemes in Table 23-1 and Table 23-2 are either operational / permitted schemes (under construction or not yet implemented) or submitted schemes (with the potential for applications to be determined prior to determination of the Proposed Development application).

**Table 23-1: Cumulative Wind Farm Developments**

Development	No. of Turbines	Blade tip height (m)	Local Authority	Status
Abergorki	3	150	Rhondda Cynon Taff County Borough Council	Consented
Abertillery	6	200	Blaenau Gwent County Borough Council	Scoping
Bedlwyn Farm	1	86.5	Caerphilly County Borough Council	Operational



Blaentillery Farm	2	45	Blaenau Gwent County Borough Council	Operational
Bryn Ysgawen Farm	1	77	Caerphilly County Borough Council	Operational
Bryntail Farm	2	71	Rhondda Cynon Taff County Borough Council	In Planning
Bwlfa Farm	1	76	Rhondda Cynon Taff County Borough Council	Operational
Castell Llwyd Farm	1	77	Caerphilly County Borough Council	Operational
Cefn Bach Farm	1	78	Caerphilly County Borough Council	Operational
Cfen Fforest Farm	1	77	Merthyr Tydfill County Borough Council	Operational
Coed y Gilfach Farm	2	45	Blaenau Gwent County Borough Council	Operational
Cruglwyn Manmoel Road, Manmoel Blackwood	1	86	Caerphilly County Borough Council	Operational
Cruglwyn 2 (off Manmoel Road)	1	86	Caerphilly County Borough Council	Operational
Eurocaps Ltd, Crown Business Park	2	45	Blaenau Gwent County Borough Council	Operational
Fforch Nest Wind Farm	4	115	Bridgend County Borough Council	Operational
Mynnydd Pwllyrhebog (part of Fforch Nest)	7	115	Rhondda Cynon Taff County Borough Council	Operational



Ferndale (Penrhys)	8	76	Rhondda Cynon Taff County Borough Council	Operational
Former Tech Board Site (Rassau Industrial Estate)	1	78	Blaenau Gwent County Borough Council	Operational
Gelli-wen Farm	1	77	Caerphilly County Borough Council	Operational
Graig Fatha Farm	1	126	Rhondda Cynon Taff County Borough Council	Consented
Groesfaen Farm	1	77	Caerphilly County Borough Council	Operational
Grouse Farm	1	11	Blaenau Gwent County Borough Council	Operational
Cwmbargoed Disposal Point	1	126	Merthyr Tydfil County Borough Council	Consented
Land at Graig-yr-hufen road	1	77	Caerphilly County Borough Council	Consented
Llwyncelyn Farm	2	131	Rhondda Cynon Taff County Borough Council	Consented
Lynfi Afan Renewable Park	12	118	Bridgend County Borough Council	Operational
Maerdy	9	145	Rhondda Cynon Taff County Borough Council	Operational
Maesgwyn	14	125	Neath Port Talbot Council	Operational
Maesgwyn (extension)	3	125	Neath Port Talbot Council	Consented



Maesgwyn extension	1	125	Neath Port Talbot Council	Operational
Manmoel	5	180	Blaenau Gwent County Borough Council	Scoping
Mynachdy farm	2	67.89	Rhondda Cynon Taff County Borough Council	Operational
Mynydd Bwlfa	9	125	Rhondda Cynon Taff County Borough Council	Operational
Mynydd Carn-y-Cefn	8	180	Blaenau Gwent County Borough Council	In Planning
Mynydd Llanhilleth	8	180	Torfaen County Borough Council	Scoping
Mynydd Maen	13	150	Torfaen County Borough Council	Scoping
Mynydd Portref	11	86	Rhondda Cynon Taff County Borough Council	Operational
Mynydd Portref Extension	6	110	Rhondda Cynon Taff County Borough Council	Operational
Mynydd y Glyn	7	155	Rhondda Cynon Taff County Borough Council	Scoping
Nant-y-Gwyddon former landfill site	1	99	Rhondda Cynon Taff County Borough Council	Consented
Oakdale Business Park	2	130	Caerphilly County Borough Council	Operational
Pant y Wal	9	125	Bridgend County Borough Council	Operational



Pant y Wal Windfarm Extension	9	125	Bridgend County Borough Council	Operational
Pen Bryn Oer	3	100	Caerphilly County Borough Council	Operational
Pen y Cymoedd	76	143.5	Neath Port Talbot Council	Operational
Pen y Fan Ganol Farm	1	73.5	Caerphilly County Borough Council	Operational
Penbwach Isaf Farm	1	20	Rhondda Cynon Taff County Borough Council	Consented
Pengarnddu Ind. Est (plot 5)	1	77	Merthyr Tydfill County Borough Council	Operational
Penrhiw Farm	1	18	Merthyr Tydfill County Borough Council	Operational
Penrhiwfer Farm	1	22	Rhondda Cynon Taff County Borough Council	Operational
Penrhiwgwaith Farm	1	87	Blaenau Gwent County Borough Council	Operational
Pen-y-fan (Ind Est)	1	123	Caerphilly County Borough Council	Operational
Pengarddu Industrial Estate (Land adjacent to unit 3)	1	77	Merthyr Tydfill County Borough Council	Consented
Pengarddu Industrial Estate (Land adjacent to unit 3) (2)	1	65	Merthyr Tydfill County Borough Council	Consented
Pentwyn Uchaf Farm	1	17	Rhondda Cynon Taff County Borough Council	Consented



Penyfan Leisure Park	3	31	Caerphilly County Borough Council	Consented
Pen-yr-hoel Farm	1	77.9	Caerphilly County Borough Council	Operational
Rhigos Road	1	78	Rhondda Cynon Taff County Borough Council	Consented
Silent Valley Waste Services Ltd.	1	103	Blaenau Gwent County Borough Council	In planning
Pengarnddu Ind Est (Unit 3) (Meat Factory)	1	77	Merthyr Tydfill County Borough Council	Operational
Taff Ely	20	110	Rhondda Cynon Taff County Borough Council	Operational
Taff Ely Reowering	7	110	Rhondda Cynon Taff County Borough Council	Consented
Tir Cook Farm	1	77	Merthyr Tydfill County Borough Council	Operational
Tir Y Ferch Gryno Farm	1	36	Caerphilly County Borough Council	consented
Twyn Hywell Energy Park	14	200	Caerphilly County Borough Council	Scoping
Ty Sirid Farm	2	12	Caerphilly County Borough Council	Operational
Tyle Cwrth	1	76	Merthyr Tydfill County Borough Council	Operational
Unit 29, Tafaranaubach Industrial Estate	1	74	Blaenau Gwent County Borough Council	Operational



Unit 15 Rassau Industrial Estate	1	72	Blaenau Gwent County Borough Council	Operational
Unit 18 (Rassau Ind Est)	1	80	Blaenau Gwent County Borough Council	Consented
Unit 19 Rassau Industrial Estate	1	80	Blaenau Gwent County Borough Council	Consented
Upper Ogmore	7	130	Bridgend County Borough Council	Consented
Valley Heights Filling Station	1	unknown	Merthyr Tydfil County Borough Council	Consented
West Monmouthshire Golf Club	1	78	Blaenau Gwent County Borough Council	Scoping
West of Rhiwfeilin	1	60	Rhondda Cynon Taff County Borough Council	Operational

**Table 23-2 Cumulative Solar Developments**

Development	Local Authority	Development Status
Hafod-Y-Dafal Farm	Blaenau Gwent County Borough Council	Operational
Arail Farm Road	Blaenau Gwent County Borough Council	Planning Application Withdrawn
Roseheyworth Business Park - Solar Array & Battery Storage	Blaenau Gwent County Borough Council	Planning Permission Granted
Seaview Farm	Bridgend County Borough Council	Operational
Court Colman solar park	Bridgend County Borough Council	Operational
Stormy Down Solar Farm	Bridgend County Borough Council	Operational
Land at Darran Farm	Caerphilly County Borough Council	Operational



Upper Pant-Ysgawen Farm/Crumlin	Caerphilly County Borough Council	Operational
Manmoel Road Solar Park	Caerphilly County Borough Council	Operational
Cwmcaesingrug Farm	Caerphilly County Borough Council	Operational
Penrhiwarwydd Farm	Caerphilly County Borough Council	Operational
Hendai Farm	Caerphilly County Borough Council	Operational
Lamby Way Solar Farm	Cardiff Council	Operational
The Maltings East, Tyndall Street - Solar Panels	Cardiff Council	Planning Application Submitted
Abergelli Glas Solar Farm	City and County Council of Swansea	Operational
Cefn Betingau Farm	City and County Council of Swansea	Operational
Brynwhilach Solar Park	City and County Council of Swansea	Operational
Gelliwern Isaf Farm	City and County Council of Swansea	Operational
Rhyd-y-Pandy Solar Farm	City and County Council of Swansea	Operational
Cockett Valley	City and County Council of Swansea	Operational
Killan Farm Solar Array Extens	City and County Council of Swansea	Operational
Carn Nicholas Farm (Extension)	City and County Council of Swansea	Operational
Carn Nicholas Farm	City and County Council of Swansea	Planning Application Withdrawn
Tir John Solar Farm	City and County Council of Swansea	Planning Permission Granted
Gwenlais Uchaf Farm	City and County Council of Swansea	Revised





Carn Nicholas Farm	City and County Council of Swansea	Under Construction
Land At Cwm Bargoed	Merthyr Tydfil County Borough Council	Operational
Daisy Cottage, Ty-Canol Road - Solar Panels	Monmouthshire Council	Planning Permission Granted
Llancayo Solar Farm	Monmouthshire County Council	Operational
Manor Farm (Monmouthshire)	Monmouthshire County Council	Operational
Land at Lower House Farm	Monmouthshire County Council	Operational
Rhewl Farm	Monmouthshire County Council	Operational
Southbrook Solar Farm	Monmouthshire County Council	Operational
Oak Grove Farm	Monmouthshire County Council	Operational
Sun Fields, Gelli Bwch Farm -Solar Array	Neath Council	Planning Application Submitted
Caergarw Farm	Neath Port Talbot Council	Operational
Pant-Y-Moch Farm	Neath Port Talbot Council	Operational
Maesgwyn solar farm	Neath Port Talbot Council	Operational
Hendre Fawr Farm	Neath Port Talbot Council	Operational
Baglan Bay Solar Farm - Phase 1	Neath Port Talbot Council	Operational
Baglan Bay Solar Farm - Phase 2	Neath Port Talbot Council	Planning Application Withdrawn
Mynydd y Gwryhd Solar Farm	Neath Port Talbot Council	Planning Permission Granted
Clearwell Farm - solar	Newport City Council	Operational
Langstone Court Road Solar Farm	Newport City Council	Operational
Court Farm	Newport City Council	Operational
Land to North West of Lodge Farm (Park Farm)	Newport City Council	Operational
Newport (Began Road)	Newport City Council	Operational



Began Road - Ground Mounted Solar Pv array	Newport City Council	Planning Application Withdrawn
Coal Pit Lane	Newport City Council	Planning Application Withdrawn
Docks Way Solar Farm	Newport City Council	Planning Permission Granted
Court Farm	Newport City Council	Revised
Coed Ely - Solar Farm	Rhondda Council	Planning Application Submitted
Bryngolwg Farm, Hirwaun - Solar farm	Rhondda Cynon Taf	Planning Permission Granted
Rhiwfelin Fawr Farm, Heol Sticil-Y-Beddau - Solar Farm	Rhondda Cynon Taff Council	Planning Application Submitted
Amgen Cymru Limited, Bryn Pica Waste Disposal, Merthyr Road - Solar PV Array	Rhondda Cynon Taff Council	Planning Permission Granted
Rhiwfelin Fach Farm, Ynysmaerdy - Solar Photovoltaic Panels	Rhondda Cynon Taff Council	Planning Permission Granted
Maes Bach Farm	Rhondda Cynon Taff County Borough Council	Operational
Pen Rhiw Caradog	Rhondda Cynon Taff County Borough Council	Operational
Agricultural Land at Trecastle	Rhondda Cynon Taff County Borough Council	Operational
Berthlwyd Farm	Rhondda Cynon Taff County Borough Council	Operational
Rhondda Valley Solar Farm	Rhondda Cynon Taff County Borough Council	Planning Application Withdrawn
Cwrt Henllys Farm	Torfaen County Borough Council	Operational
Mamhilad Solar Farm	Torfaen County Borough Council	Operational



Ty Coch Hollybush Way	Torfaen County Borough Council	Planning Permission Granted
Sutton Mawr Farm	Vale of Glamorgan Council	Operational
Garn Solar Farm	Vale of Glamorgan Council	Operational
Whitton Mawr	Vale of Glamorgan Council	Operational
Woden Park	Vale of Glamorgan Council	Operational
Treguff Farm	Vale of Glamorgan Council	Operational
Weycock Road	Vale of Glamorgan Council	Operational
West Hall Solar Farm	Vale of Glamorgan Council	Operational
Land At Court Farm	Vale of Glamorgan Council	Operational
Morfa Farm	Vale of Glamorgan Council	Operational
Llancadle Farm	Vale of Glamorgan Council	Operational
Port of Barry - Site 1	Vale of Glamorgan Council	Operational
Home Farm	Vale of Glamorgan Council	Operational
Biglis Farm	Vale of Glamorgan Council	Operational
Cwm Derwyn Farm	Vale of Glamorgan Council	Operational
Corntown Farm	Vale of Glamorgan Council	Operational
Port of Barry - Site 2	Vale of Glamorgan Council	Operational
Rosedew Farm	Vale of Glamorgan Council	Operational
Momentive Speciality Chemicals, Sully Moors Road - Solar Panels	Vale of Glamorgan Council	Planning Permission Granted
Aerospace Business Park	Vale of Glamorgan Council	Planning Permission Granted
Treguff Farm Solar Park	Vale of Glamorgan Council	Revised
Port of Barry	Vale of Glamorgan Council	Revised
Llanwern Solar Farm & Battery Storage	Newport City Council	Operational
Maes Mawr Solar	Rhondda Cynon Taff County Borough Council	Planning Application Submitted
Cwm Ifor - Solar Farm	Caerphilly County Council	Planning Application Submitted



Vianshill Farm, Parc Dyffryn - Solar Farm & Battery Storage	Vale of Glamorgan Council	Planning Application Submitted
Pancross & Oaklands Solar Farm	Vale of Glamorgan Council	Planning Application Submitted
Wauntysswg Farm, near Tredagar	Caerphilly County Council	Planning Permission Granted
Penpergwm Solar Farm	Monmouthshire County Council	Planning Permission Granted
Brynwell Farm	Vale of Glamorgan Council	Planning Permission Granted
Wentlooge Renewable Energy Hub	Newport City Council	Revised

### ***Intra-cumulative effects***

23.1.6 The EIA has taken into consideration where a significant residual impact is expected to occur on a particular receptor as a consequence of collective actions, aspects or effects of the Proposed Development. These inter-relationships have been considered within each technical chapter as relevant and no significant intra-cumulative effects were identified.

### ***Inter-cumulative effects***

23.1.7 In relation to inter-cumulative effects, the EIA has considered committed developments in the area surrounding the Site which, in conjunction with the Proposed Development, could collectively impose a significant impact on the environment.

<b>Table 23-3: Summary of Cumulative Effects</b>	
<b>Technical Chapter</b>	<b>Summary of Cumulative Effects</b>
<b>Ground Conditions</b>	None of the schemes detailed in the cumulative scheme list are considered to be within the Proposed Development ZoI and are located over 1km from of the Site. Therefore, it is very unlikely that any cumulative effects would arise from the interaction between these schemes and the Proposed Development.



Table 23-3: Summary of Cumulative Effects	
Technical Chapter	Summary of Cumulative Effects
<b>Agricultural Land</b>	No intra-cumulative effects have been identified and inter-cumulative effects on these receptors have been scoped-out from the cumulative assessment.
<b>Water Resources</b>	No significant cumulative effects identified as it is considered that other developments will need to comply with the strict planning guidance and regulation relating to the water environment to be acceptable in planning and permitting terms.
<b>Ecology</b>	Potential for intra-cumulative effects on commuting/foraging bats have been identified. No significant cumulative effects have been identified but these cannot be precluded with absolute certainty due to the limitations of available information.
<b>Ornithology</b>	Construction activities at nearby projects could result in cumulative disturbance and displacement effects when within close proximity to the Site if undertaken at the same time or consecutively. However, no significant cumulative effects have been identified. Only cumulative operational collision risks for important ornithological receptors (red kite and kestrel) have been considered as being potentially significant for the purposes of this assessment. Although some local level cumulative effects cannot be precluded, overall cumulative collision mortality risks to red kite and kestrel are therefore considered to represent no more than a Long-term, Low magnitude impact at any population level above local level, resulting in a Minor Adverse cumulative effect which is Non-Significant.
<b>Archaeology and Heritage</b>	Overall, the cumulative effect of the proposed development alongside the Pen Bryn Oer windfarm would result in a negligible or minimal magnitude impact on the setting of the Bute Conservation Area. This would result in a slight significance of impact.
<b>Landscape and Visual</b>	Broadly, significant cumulative effects are limited to within approximately 10km of the proposed development and are a result of the introduction of the in-planning Pen March and Manmoel schemes notably intensifying the influence of wind farm development in available views, and subsequently, the introduction of the proposed development would extend wind farm development across and wider extent of the view and/or bring wind turbine development closer to the observer due to its proximity.
<b>Transport</b>	No neighbouring developments with cumulative effects on the traffic study area are identified.
<b>Noise and Vibration</b>	The proposed turbines are south-west of an existing wind farm known as Pen Bryn Oer which features three Vestas V90 2MW wind turbines. There are other wind turbines in the area, but these are much further away. As



Table 23-3: Summary of Cumulative Effects	
Technical Chapter	Summary of Cumulative Effects
	<p>such, only the existing Pen Bryn Oer development has been considered in the cumulative effects assessment.</p> <p>For the receptors listed in the Pen Bryn Oer planning consent, the effect of the Proposed Development is very small with a maximum increase of 0.6 dB predicted (at Lechryd). The planning limits imposed on Pen Bryn Oer will not be exceeded.</p> <p>For the closest receptors to the west of Proposed Development, the effect is also small with cumulative noise levels below 35 dB <math>L_{A90}</math>.</p> <p>For the receptors to the east of the development, specifically those in Rhymney, there is a potential cumulative effect with predicted noise levels up to 36 dB <math>L_{A90}</math>. Note however such an increase cannot occur in practice as the predictions assume downwind propagation for all turbines and these receptors are generally in between the two schemes so cannot be downwind at the same time. In addition, noise levels in an urban environment are expected to exceed 35 dB <math>L_{A90}</math> most of the time. This will be confirmed with the noise survey and appropriate relative noise limits derived rather than using the fixed limit.</p> <p>In summary therefore the cumulative effect from the two schemes is negligible.</p>
Climate Change	<p>In terms of climate change, which is a global issue, comprehensive consideration of inter-cumulative effects would need to account for every other development and activity that generates carbon emissions or releases other greenhouse gas effects. As this encompasses, to varying degrees, most of the activity on the globe it is not practical to consider inter-cumulative effects with locally identified developments, beyond recognising that it is necessary to reduce carbon emissions across the board and each and every development has a duty to minimise its own emissions as far as technically viable. Intra-cumulative effects are also unrealistic to appraise. Climate change effects manifest as effects considered within other environmental disciplines (e.g. air quality and flood risk), but do not really have a quantifiable direct effect on local receptors. The effects act on a global receptor but the individual contribution from a single development of this scale is almost indistinguishable. It is the additive effects from all the other development going on around the world that poses the potential catastrophic threat.</p>
Socio-economics	<p>Cumulative impacts could have temporal, spatial and synergic effects due to workers from different projects placing a greater strain on existing services, aggregated traffic and accumulated changes to place-based attachment in the area.</p>



Table 23-3: Summary of Cumulative Effects	
Technical Chapter	Summary of Cumulative Effects
Health	Cumulative impacts could have temporal, spatial and synergic effects due to workers from different projects placing a greater strain on existing services, aggregated traffic and accumulated changes to place-based attachment in the area.