Chapter 2: Development Description and Reasonable Alternatives

Glyn Taff Solar Farm – Environmental Statement

02/03/2025

Disclaimer

Neo Environmental Limited shall have no liability for any loss, damage, injury, claim, expense, cost or other consequence arising as a result of use or reliance upon any information contained in or omitted from this document.

Neo Environmental Ltd	
Head Office - Glasgow: Wright Business Centre, 1 Lonmay Road, Glasgow G33 4EL T 0141 773 6262 E: info@neo-environmental.co.uk	**Bristol Office** Spaces 8th Floor The Programme Building Bristol BS1 2NB T: 01174 571 610 E: info@neo-environmental.ie
Warrington Office: Lakeview 600, Lakeside Drive Centre Park Square Warrington WA1 1RW T: 01925 661 716 E: info@neo-environmental.co.uk	**Rugby Office:** Valiant Suites, Lumonics House, Valley Drive, Swift Valley, Rugby Warwickshire CV21 1TQ T: 01788 297012 E: info@neo-environmental.co.uk
Ireland Office: C/O Origin Enterprises PLC, 4-6 Riverwalk, Citywest Business Campus Dublin 24, D24 DCW0 T: 00 353 (1) 5634900 E: info@neo-environmental.ie	**Northern Ireland Office:** 83-85 Bridge Street Ballymena, Co. Antrim BT43 5EN T: 0282 565 04 13 E: info@neo-environmental.co.uk

Prepared For:

Renantis UK Limited

Prepared By:

Russell Buckley MEnvSci MIEnvSc CEnv

	Name	Date
Edited By:	Russell Buckley MEnvSci MIEnvSc CEnv	02/03/2025
Checked By:	Conor Cochrane BSc MSc MRTPI MIPI	02/03/2025
	Name	**Signature**
Approved By	Russell Buckley	

Contents

2. INTRODUCTION

2.1. This Chapter of the ES provides a description of the Proposed Development and associated infrastructure and describes activities associated with the construction, operation and maintenance, and decommissioning. A summary of the components and design for the Proposed Development infrastructure is provided, with likely construction methodologies described. The Chapter also identifies the need for the Proposed Development and

DEVELOPMENT DESCRIPTION

2.2. Installation, operation and subsequent decommissioning of a renewable energy scheme comprising ground mounted photovoltaic solar arrays together with substation compound, transformer stations, internal access track, landscaping, biodiversity measures, boundary fencing, security measures, CCTV posts, monitoring house, storage containers access improvement and ancillary infrastructure. The solar arrays will have a combined capacity of up to 39.9MWp.

SITE DESCRIPTION

2.3. The area of the Proposed Development (the "Application Site") lies at an elevation of approximately 140m – 330m AOD and covers a total area of c. 70.9 hectares. It is centred around Bryntail Farm at approximate National Grid Reference (NGR) E 309333, N 189800. It is south of Eglwysilan Road. The site extends west of Bryntail Farm and east of the Bryn Tail Lane. The site is within the administrative area of Rhondda Cynon Taf Council.

2.4. The site comprises 38 agricultural fields that are currently in use for livestock farming. It is on the east side of the Taff Valley c. 1.6 km east of Ynysangharad War Memorial Park. Access will be gained from the Bryn Tail Lane.

2.5. The site is adjacent to the Twyn Hywel Energy Park a consented wind farm including 14 turbines (DNS/3272053).

THE NEED FOR THE DEVELOPMENT

2.6. The Environment Wales Act 2016 ('the Act')[1] sets the target for the Welsh Government to reduce greenhouse gas emissions by 80% by 2050 (from 1990 levels), with interim emissions targets such as 45% by 2030 and 67% by 2040. The Act also aims to enable Wales to manage resources in a more proactive, sustainable and combined way, while establishing a framework necessary to tackle climate change. The Welsh Government Net Zero Carbon Budget 2021[2] reports the progress to date which the Welsh Government has set in policy to combat climate change and how they plan to battle climate change over the coming decade. The Climate Change (Wales) Regulations 2021[3] set out the governments carbon budget targets and the emissions reductions targets for 2030, 2040 and ultimate a target of net zero for 2050.

2.7. Planning Policy Wales (Edition 12[4]) states that:

"*The benefits of renewable and low carbon energy, as part of the overall commitment to tackle the climate emergency and increase energy security, is of paramount importance.*"

2.8. Going on to state that:

"Local authorities should facilitate all forms of renewable and low carbon energy development and should seek cross-department cooperation to achieve this. In doing so, planning authorities should seek to ensure their area's full potential for renewable and low carbon energy generation is maximised and renewable energy targets are achieved."

2.9. Future Wales also offers support for all forms of renewable energy technology, stating:

2.10. "*Wales can become a world leader in renewable energy technologies. Our wind and tidal resources, our potential for solar generation, our support for both large and community scaled projects and our commitment to ensuring the planning system provides a strong lead for renewable energy development, mean we are well placed to support the renewable sector, attract new investment and reduce carbon emissions*".

2.11. As such, it is clear that the Welsh Government give great importance to the need to address the climate change energy and recognise the renewable energy resources Wales has and the important role that solar plays in achieving the long-term net zero target. The Proposed Development is therefore critical to helping Wales address these challenges as well as

[1] Welsh Government (2016) The Environment Wales Act 2016. Available at: https://www.legislation.gov.uk/anaw/2016/3/contents
[2] Welsh Government (2021) *Net Zero Wales Carbon Budget 2 (2021 to 2025)*. Available at: https://gov.wales/sites/default/files/publications/2021-10/net-zero-wales-carbon-budget-2-2021-25.pdf
[3] Welsh Government (2021) *The Climate Change (Wales) Regulations 2021*. Available at: https://gov.wales/sites/default/files/pdf-versions/2021/7/5/1625823413/climate-change-wales-regulations-2021-integrated-impact-assessment.pdf
[4] Welsh Government (2024) *Planning Policy Wales – Edition 12*. Available at: https://www.gov.wales/sites/default/files/publications/2024-07/planning-policy-wales-edition-12.pdf

addressing the country's over dependence on imported fossil fuels and will also offer opportunities such as:

- Provision of clean energy whilst minimising environmental impacts;
- Contributing to renewable energy targets which will continue to drive down the overall cost of energy with benefits to the Irish consumer.
- The Proposed Development will create additional jobs and will encourage continued investment in the renewable industry in Wales.

DETAILED DEVELOPMENT DESCRIPTION

2.12. The Proposed Development can be summarised as follows;

2.13. Application Site Area – **70.9** hectares (**709,391m²**)

Solar Farm

Up to:

- 1,333 module racks in total. Total Area = 92.7m²
  - Large Racks – 897 Racks / 50,232 Modules / 8,970 pile driven poles

    Total Area – 71.8m²
  - Small Racks – 435 Racks / 12,180 Modules / 2,610 pile driven poles

    Total Area – 20.9m²

- 13 x Transformers (3.8m (L) x 3.8m (W)) – Total Area = **187.7m²**
- Fence is mesh fencing with wooden posts at 3.5m centres. The fence is 2m high with a 0.1m gap at the bottom. The total length is 7,500.8m with a total of 2,143 posts. Total Area = **64.3m²**
  - CCTV Posts are 3.5m in height and we have 58 (0.65m x 0.75m foundations) Total Area = **28.3m²**
- The internal access track is 3.5m wide and will involve an average of 300mm depth of soil removed. Local widening at turns for access reasons. Occasionally they will use a geosynthetic reinforcement or soil stability to reduce depth. Total length approximately **2,455.5m** (**8,594.1m²** in total)
- Cable trenches are circa 1m deep and up to 1m wide. Estimated at **3,250m** in length.
- 1 x Temporary Construction Compounds (50.0m (L) x 60.0m (W)) – Total Area = **3,000m²**

- 4 x Storage Container (13.7m (L) x 2.4m(W)) – Total Area = **131.5m²**
- Aux Transformer (2.9m (L) x 2.3m (W)) – Total Area = **6.7m²**
- Substation (7.7m (L) x 2.6m (W)) – Total Area = **20.0m²**
- Monitoring House (3.9m (L) x 3.2m (W)) – Total Area = **12.5m²**

Overall

2.1. Overall, the proposed footprint constitutes a relatively small percentage of the total area of the Application Site (**70.9ha**):

- **15,137.5m²** for infrastructure (c. 2.13% of the Application Site area); and
- **157.0m²** for piling (c. 0.02% of the Application Site area).

2.2. The total ground disturbance area resulting from the Proposed Development is therefore **15,294.5m²** or c. **2.15%** of the Application Site area.

The Solar Panels

2.14. For detailed plans of all Proposed Infrastructure, please see **Volume 4**. The Proposed Development will consist of:

- Access tracks
  - Access to the site will be from the Bryn Tail Road which approach the site from southwest. Access for heavy goods vehicles will require some temporary surfacing and hedgerow trimming.
  - Where possible, existing internal farm access tracks will be utilised. Where necessary, access tracks will be laid throughout the site at the onset of the construction phase to allow for movement of delivery vehicles through the site, bringing infrastructure components and subsequent gravel/stone for further track laying. These tracks will connect the main site entrance to the internal substation and inverter/transformers for the duration of the Proposed Development's lifespan to allow for maintenance and servicing of infrastructure. They will also be used by landscapers who will maintain the screen and enhancement planting and for the landowner for agricultural purposes. The internal access tracks will measure approximately 3.5m wide with a total combined length of 2,456m (total area 8,594m^2) and will be formed by the initial topsoil stripping followed by the laying down of a geotextile/geogrid upon which crushed rock will then be layered and compacted by a roller. Please see **Volume 4, Figure 6** for access track details.

- Solar Arrays
  - The installation of southwest facing, ground mounted solar arrays on metal frames running from typically from northwest so southeast across the site. The mounted solar panels will have a maximum height of 3.0m above ground level and at the lower end will be 0.8m above the ground, allowing for sheep to graze the grass beneath the panels. The glass surfaced panels are coated to maximise daylight absorption and therefore minimise glare potential. It is proposed that two panels will be attached in a portrait configuration to mounting frames at an angle of between 10 and 30 degrees, to optimise daylight capture. The panels are fixed in place and will not move to 'track' the sun. The mounting frames will be made of either galvanized aluminium or steel and will have a rough matt finish, rather than a polished finish. The mounting frames are pile driven into the ground, and no concrete foundations are required. The base of the frame piles are a thin 'H' or 'Z' shape; thus, they have very little impact on the ground and do not require any prior excavation. The frames are driven to a depth of approximately 1.5m. Small inverters will be attached to the solar array piles, below the panels. At the end of their operational life when the site is decommissioned, the frame piles are simply pulled out from the ground causing minimal ground disturbance. Please see Volume 4 Figures 4, 5 and 8 for the solar array details.

- One temporary construction compound.
  - One temporary construction compound will be located in field 18. These compounds will be constructed by the stripping of topsoil and subsequent layering of crushed stone similar to the process for the site tracks. They will contain the site offices, chemical toilets, canteen, and a drying room. They will measure approximately 50m x 60m, giving a footprint of 3,000m^2. The temporary compounds will be removed upon completion of the construction phase and PV arrays will be located in this space. The compounds will be fenced for security purposed for the duration of the construction period. Please see Volume 4 Figure 7 for compound details.

- 13 Transformers
  - The 13 transformers will be located on a concrete pad measuring 3.8m x 3.8m. The transformer will either be housed externally, surrounded by a fence which will be 3m in height. Each transformer unit will therefore have a ground disturbance of 14.4m2 (total ground disturbance area of 187.7m^2) and are found throughout the site. Please see Volume 4 Figure 11.

- Substation
  - A substation will be located in Field 18 and will measure approximately 7.7m (W) by 2.6m (L) by 3.3m (H) (ground disturbance 20.0m^2). This building is for equipment to control the release of energy to the grid. Please see Volume 4 Figure 13
- Monitoring House
  - A monitoring house will be located in Field X and will measure approximately 3.2m (W) by 3.9m (L) by 3.3 (H) (ground disturbance 12.5m^2). This building is required to enable 24-hour remote monitoring of performance and security. The monitoring equipment rapidly identifies any faults, as well as relaying security camera footage. An aerial and/or satellite dish may be affixed to the cabinet if reception issues necessitate it. Please see Volume 4 Figure 14.
- Auxiliary transformer
  - An auxiliary transformer will be located in Field 18 and will measure approximately 2.9m (W) by 2.3m (L) by approximately 2.5m (H) (ground disturbance 6.7m^2). This building is required to enable 24-hour remote monitoring of performance and security. The monitoring equipment rapidly identifies any faults, as well as relaying security camera footage. An aerial and/or satellite dish may be affixed to the cabinet if reception issues necessitate it. Please see Volume 4 Figure 12.
- Storage Containers
  - Four storage containers will be located in blocks of two to house spare elements for maintenance and repair works on site. This will facilitate the ongoing maintenance of the site, and reduce the need for vehicle movements as it will not be necessary to bring tools and spare parts to the site for each maintenance or repairs visit. The container measures approximately 13.7m(L) by 2.4m (W) by 2.8m (H)m (ground disturbance 12.35m^2). Please see Figure Volume 4 Figure 15.
- 58 no. infrared CCTV cameras and security fencing
  - 58 CCTV cameras will be mounted on metal poles with a total height of up to 4.5m and will be inward facing. Each camera pole will encompass a concrete foundation base of 0.8m by 0.8m. This will result in a total ground disturbance of 28.3m^2 of the Application Site area (c. 0.64m2 per camera). Please see Volume 4 Figure 10.
- Fencing & Security

- Fencing will comprise mesh fencing with wooden posts at 3.5m centres. The fence will be 2m high with a 0.1m gap at the bottom. The total length is 7,500.8m with a total of 2,143 posts covering a total ground disturbance of 64.3m2. Please see **Volume 4 Figure 9.**

- Cabling
  - Approximately 3,250m in length of trenching will be required for the implementation of the cable routes within the Application Site boundary. Depending on the functionality of the trenches, they will measure approximately 1m wide. The trenches will be excavated to a depth of approximately 1m and will be backfilled after the cables have been laid.

- Landscaping measures
  - Structural landscape planting will consist of a mix of native hedgerow and tree species added to gaps along the field boundary edges. A grassland mix will be added to the lands between and beneath the arrays in order to allow the lands to retain an agricultural use by sheep grazing. The height of this new proposed planting (as supplied) ranges from 0.4m — 3.5m and are detailed further on **Figure 4.22a - Figure 4.22e of Appendix 4A and Volume 2 Chapter 4 LVIA**.
  - The proposed landscape planting will incorporate a number of ecological enhancements across the Application Site to help enrich the ecological enhancement measures.

- Biodiversity enhancement measures
  - Habitats that will be created at the proposed solar farm development will include:
    - Creation of 46.09ha of shade tolerant wildflower grassland;
    - Creation of 1.16ha of native species rich scrub;
    - Creation of 8.70ha of acid favouring wildflower grassland;
    - Creation of 2.65ha of Welsh species diverse wildflower grassland;
    - Enhancement of 1.41km of existing hedgerow habitat with native species rich planting;
    - Creation of 3.85km of native species rich hedgerow;
    - Creation of 0.53km of native species rich hedgerow and tree screening habitat;

- Four Herptile Hibernacula;
- Six bee banks;
- Three insect hotels;
- Bird, bat and insect boxes; and
- Hedgehog houses.

– Please see **Technical Appendix 9D Net Benefit for Biodiversity Assessment Report** for more details.

Grid Connection

2.15. The Proposed Development will connect to the Upper Boat substation at the northern end of the Treforest Industrial Estate. The route is not yet determined, with three indicative options identified.

Site Accommodation and Temporary Works

2.16. A temporary construction compound would provide space for:

- Temporary portable cabins for office accommodation, monitoring of incoming vehicles and welfare facilities;
- Self contained toilets with provision for sealed waste storage and removal;
- Containerised storage areas for tools, small plants and parts;
- Parking for up to 20 vehicles and storage of larger material items;
- Generator; and
- A bunded area for storing fuels, oils and greases.

2.17. The precise location and size of the compound within this indicative area will be determined by the appointed construction contractor. The area will be constructed by topsoil excavation in a similar manner to the access tracks, then surfaced with stone to provide an adequate vehicle load-bearing surface. During construction temporary fencing will be erected, as required around the construction compound.

2.18. An area of the compound will be used for the storage of fuel and oils, and this would be contained by a small bund constructed out of site arising material and lined with an impermeable membrane in order to prevent any contamination of the surrounding soils, vegetation and water table.

2.19. Alternatively, double protection containers / equipment will be used along with drip trays etc, where identified by environmental risk assessment.

2.20. Water for all construction activities would be supplied by water bowser. Temporary effluent disposal facilities would be provided by 'portaloo' type facilities and emptied as required. No mains sewers or water pipes are proposed.

Site Specific Safety and Emergency Procedures

2.21. Prior to commencement of the main construction works the appointed contractor would be required to act as Principal Contractor, as defined under the Construction, Design, and Management Regulations. This would require the preparation of a construction phase Health & Safety Plan to integrate with the Pre-Construction Health & Safety Plan as prepared by the Planning Supervisor.

2.22. An Operation and Maintenance Manual for the design life of the solar farm would also be prepared by the contractor which would also cover all operational and decommissioning safety related procedures.

2.23. Emergency Services Vehicle access would be addressed within the Pre-Construction Health & Safety Plan. The contractor will liaise with all of the emergency services prior to works commencing, to ensure that access for Emergency Services Vehicles would be maintained at all times and during the construction period.

REINSTATEMENT

Internal access tracks

2.24. After commissioning of the solar farm, at least 1m of the track shoulders would be graded and reinstated with topsoil and peat. The soil would be allowed to regenerate from the seed bank within the topsoil.

Temporary Construction Compounds and Storage Areas

2.25. On completion of the construction work these facilities will be removed, hard standing will be excavated and the respective areas will be reinstated by way of re-grading the land with the stockpiled topsoil to a natural profile and allowing the land to regenerate from the seed bank within the topsoil.

Cable Trenches

2.26. Where practicable, vegetation over the width of the cable trench will be lifted as tufts, and replaced after trenching operations, to reduce disturbance. Alternatively, cables may be installed using a cable plough, meaning that no tufts will be needed.

DECOMMISSIONING

2.27. The expected productive lifetime of the solar farm is estimated to be 35 years. At that time, the Proposed Development will be decommissioned in accordance with best practice and/or in compliance with any planning conditions. Current best practice includes the removal of all above ground structures; the removal of all underground structures to one metre below ground level; and reinstatement of disturbed areas. Landowners will be given the option to retain the access tracks for their own purposes.

2.28. It is estimated that decommissioning a solar farm of this size would take approximately 8 months.

REASONABLE ALTERNATIVES AND DESIGN EVOLUTION

2.29. Under the EIA Regulations it is a statutory requirement for an ES to include:

"a description of the reasonable alternatives studied by the applicant or appellant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the significant effects of the development on the environment"

2.30. Set out here are the steps undertaken in refining the Proposed Development down from the initial screening exercise to the design as set out in this ES.

Do Nothing Alternative

2.31. The 'do nothing' alternative would involve not constructing the solar farm. The solar farm is required to produce renewable energy in Wales and to help attain carbon reduction targets for 2030 and to meet the net zero target set out in the Climate Change (Wales) Regulations 2021[5]. If the solar farm is not constructed, the site will remain as agricultural land. The Proposed Development includes a Landscape and Ecology Management Plan and has been designed to achieve a net gain in biodiversity. Therefore, if the solar farm is not constructed in the 'do nothing scenario' the long-term positive effects for biodiversity will not be achieved

[5] Welsh Government (2021) *The Climate Change (Wales) Regulations 2021*. Available at: https://gov.wales/sites/default/files/pdf-versions/2021/7/5/1625823413/climate-change-wales-regulations-2021-integrated-impact-assessment.pdf

for this site nor will the site be able to contribute to the government's statutory net zero target.

Initial Screening

2.32. An initial high-level site identification exercise took place in 2021 to find areas within south Wales that were suitable potential development sites in accordance with the following criteria:

- That the site would be in accordance with the Welsh climate change and renewable energy policy context as set out in paragraph 2.6 – 2.11 above including The National Plan 2040 and the applicable planning practice guidance;
- That the site would be in accordance with the local development plan;
- That following an initial reviewing of the environmental constraints including ecology, cultural heritage, and flood risk, that the site would not cause undue environmental harm;
- That the effects on the local landscape would be acceptable;
- That a secure grid connection would be available within the required operational timeframe;
- The broader area was identified as being within Area 14 of the 'Assessment of on-shore wind and solar energy potential in Wales' undertaken by Arup on behalf of the Welsh Government. It should however be noted that in Future Wales: The National Plan 2040
- That the site would be of a suitable orientation and topography for a solar farm; and
- That suitable access to the site would be available to deliver the required heavy loads during the construction phase and that access could be maintained during both the operational and decommissioning phases.

2.33. The initial screening was followed by a land ownership investigation. Discussions with the land agents of relevant land holders in this region indicated that land at Bryntail Farm would be available for solar development with suitable access.

Alternative designs/layouts

2.34. The project has undergone a comprehensive design process with multiple iterations of the design. Key changes to the design from that presented at the non-statutory consultation stage include:

- The removal of a 18 hectares of land on the southeastern side of the site. This land was considered to be the most visible area of land from the surrounding area and its removal has reduced the overall landscape and visual impact.
- Internal access tracks have been redesigned to minimise the loss of hedgerow on site.
- The placements of solar panels has been redesigned to create an increased buffer distance to the two public rights of way that cross the site.
- Solar panels were removed from the field immediately south of Hendre Farm to ensure the landowner view would be maintained.

Alternative Technologies

2.35. Alternative technologies for producing electricity are not suited to this particular site or other surrounding sites. The suitable site for wind resource would be the adjacent sit to the northeast on the top of the hillside and this was approved for development as a wind farm in 2024 (DNS/3272053). The Site's south west facing topography and position further down the hillside away from the higher wind speeds make it preferable for wind. In addition, wind turbines have much larger components and abnormal loads, which Bryn Tail Road couldn't accommodate.

2.36. Coal, gas and other non-renewable energy types would be very difficult to accommodate due to the sloped topography of the site and available access. These are also fossil fuels which the Welsh Government is phasing out and would have a negative impact on both environmental and climate change targets.

2.37. Solar farms are one of the quickest and cheapest forms of renewable energy to install.

REASONS FOR THE SELECTION OF THE PREFERRED OPTION

2.38. The Proposed Development site was considered to offer a good combination of the assessment factors:

- Correct orientation for a solar farm;
- Viable scale of development;
- Low vulnerability to major accidents and disasters arising from, for example, flooding or sea level rise, due to location;
- Appropriate access;

- Available grid capacity and connection;
- Very few residential properties in close proximity to the site; and
- Anticipated minimal effects on the environment including ecology, cultural heritage and flood risk due to few identified constraints in the local area.