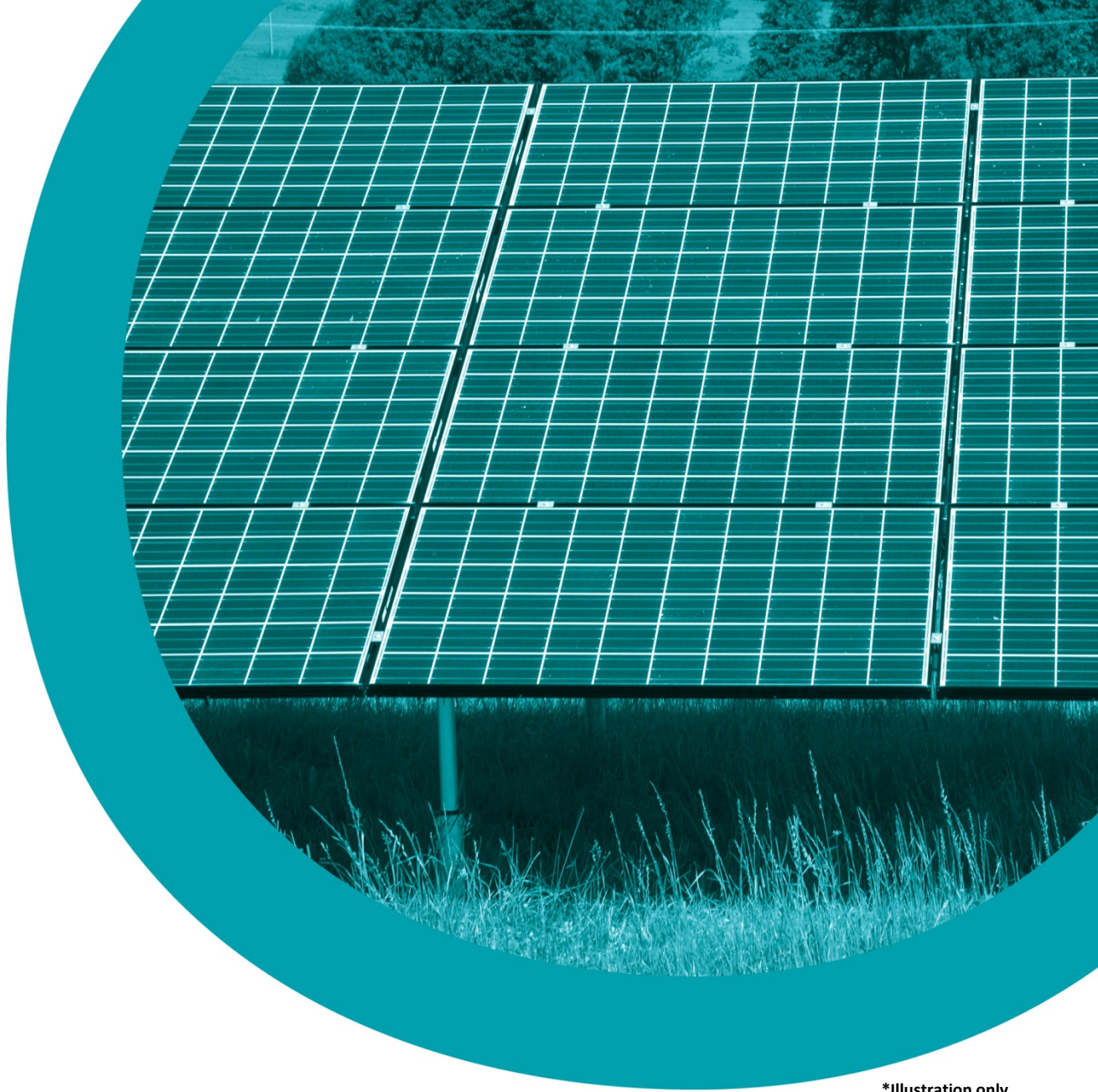




*Illustration only

Mynydd y Gwrhyd Solar Farm Design and Access Statement

Reference: E05419

May 2020

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1.1 PURPOSE OF THIS STATEMENT

- 1.1.1 This Design and Access Statement (DAS) outlines the design principles and access issues that have been applied in the selection, scaling and sizing of the proposed Mynydd y Gwrhyd Solar Farm (see *Figure 1-1 Site Location*).
- 1.1.2 The DAS is prepared to accompany a planning application for the solar farm proposal to Neath Port Talbot County Borough Council in order to fulfil the requirements of The Planning & Compulsory Purchase Act 2004 (paragraph 42) and TAN12, Communities and Local Government '*Guidance on information requirements and validation*' 2016, and with regard to advice set out in the Design Commission for Wales guidance '*Design and access statements in Wales: Why, What and How*' (updated 2014). A DAS is also a typical requirement of the majority of schemes that are defined as Major Developments¹, which is the case with this proposal.
- 1.1.3 Pre-application advice provided by the local planning authority (see Appendix 1-2 of the Environmental Report) has been considered during the design phase of the proposed solar farm scheme.
- 1.1.4 An explanation of the design principles as required by the above guidance is set out below, whilst a full description of the scheme resulting from the application of the site design criteria is set out in full in Section 3 of the Environmental Report.
- 1.1.5 The Applicant has additionally considered the guidelines contained within *Lighting in the countryside: towards good practice* (ODPM, 2006) in order to design a scheme that avoids light pollution in the night sky, glare hazards and potential nuisance to nearby properties. Given that lighting of the development is not proposed beyond the short construction stage no issues are anticipated.
- 1.1.6 The requirements to consider the potential effects of the development on trees have also been fulfilled, specifically in relation to the requirements of British Standard 5837: 2005 Trees in relation to construction. Felling of trees is not a requirement of the proposed development and as such no issues are anticipated.

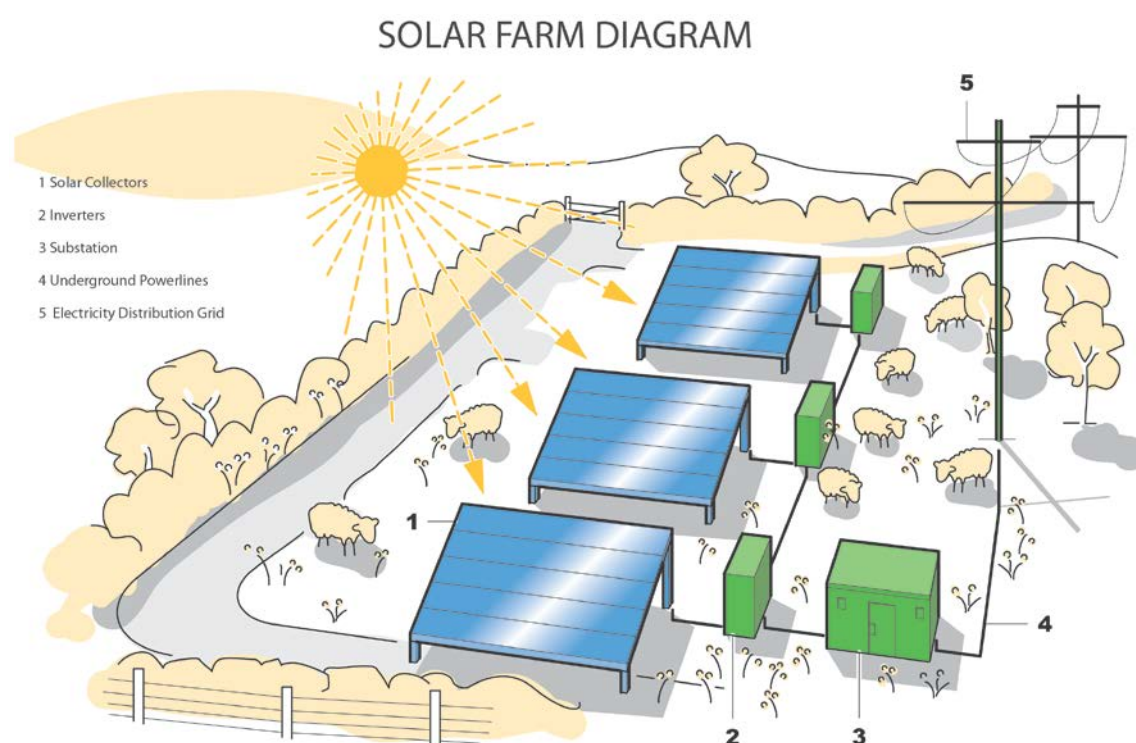
¹ The Town and Country Planning (Development Management Procedure (Wales) (Amendment) Order 2016

1.2 GENERAL DESIGN PRINCIPLES

Solar Power Generation

- 1.2.1 The solar photovoltaic (PV) modules are generally manufactured from silicon PV cells. These are typically categorised into either monocrystalline or multicrystalline modules. This gives the panels a distinctive, shingled appearance. Most panels are in a rectangular format for ease and efficiency of installation.
- 1.2.2 A solar panel (PV module or PV panel) is a packaged, interconnected assembly of solar cells, also known as PV cells. The solar panel can be used as a component of a larger PV system to generate and supply electricity in commercial and residential applications. Because a single solar panel can produce only a limited amount of power, many installations contain several or a large number of panels.
- 1.2.3 A commercial solar farm installation will comprise multiple solar panels arranged in arrays that are orientated in a southerly direction (in the UK) and tilted at a certain angle to maximise their potential to absorb the sun's rays. The general configuration of a solar farm is demonstrated in the following illustration:

Plate 1: Solar Farm Typical Arrangement



- 1.2.4 Multiple solar arrays are arranged as part of the overall solar farm infrastructure, and the power output is directed through inverters into the local substation facility, whereby the generated renewable energy is exported to the local distribution network. Such renewable energy generation and capacity reduces the UK's reliance on fossil fuel derived power generation and the associated contribution to global warming and polluting emissions to the environment.

1.3 THE DESIGN COMPONENT

Context

- 1.3.1 The application site is located on land to the south east of Tairgwaith, Neath Port Talbot. The site is adjacent to the existing Awel Wind Farm, situated on Mynydd Uchaf.
- 1.3.2 In devising the design for the development, the Applicant sought and considered the views of statutory advisors (see Section 1 of the Environmental Report for details) through a pre-application consultation exercise with the Council and through an EIA screening exercise. Their contribution has shaped and informed the development through advice on local sensitivities and features relevant to the area.
- 1.3.3 Prior to fixing the design of the proposed scheme, the Applicant engaged in a formal Pre-Application Consultation exercise at the request of the Council on account of the scheme being 'Major Development', and as a result of the introduction of the Planning (Wales) Act 2015 which prescribes mandatory consultations for all Major Developments. Consultations with the local community and stakeholders were conducted in the form of pre-application consultation which is mandatory in Wales. The outcomes of the consultation are described in the PAC Report submitted with the planning application, inclusive of any observations, advice or comments on the design of the scheme arising from stakeholders have been considered by the Applicant.
- 1.3.4 Due consideration of the information gathered on the environment, amenity, socio-economics and relevant planning regime through the undertaking of original surveys and consultations has informed the evolution and design of the proposed

development. The scale and layout of the development, volumes and amounts of infrastructure and materials, landscaping proposals and the final proposed appearance of the scheme have all been shaped in the design process. The outcome of this process has been the formulation of a proposal that is considered sustainable in its effects and longevity, and as such accords with the ambitions of the Well-being Act and the guidance within Planning Policy Wales.

Land Use

- 1.3.5 The predominant land use in which the proposed development is situated is farmland, which is used for grazing, mainly sheep and horses. There are no public rights of way or other rural or recreational uses within the Site.
- 1.3.6 To the north of the Site the land is currently utilised for wind power generation, in relation to which there is a substation facility for the management and export of the power from the wind turbines. In preference to creating a new substation facility for the solar farm, this existing facility will act as an integrate facility for both renewables schemes.

Purpose

- 1.3.7 The purpose of the development is for the generation of renewable electricity. The solar farm would generate electricity through harnessing the energy of the sun. The electrical output of the solar farm would be exported to the local electricity distribution network which will transport and deliver the electricity generated to consumers within the region.
- 1.3.8 The use of renewable energy is strongly supported at international, national and local levels for supporting measures to address climate change, which itself is the result of the increase in greenhouse gases in the atmosphere. A significant proportion of greenhouse gases arise as a result of energy generation, as well as transport and agriculture. Renewable energy is promoted because operationally it results in the emission of hardly any greenhouse gases. Renewable energy also reduces our reliance on imported forms of energy.

Amount

- 1.3.9 The overall area required for the proposed solar farm will be approximately 3.3ha, including the areas between the arrays, fencing, inverters and the battery storage containers (see *Figure 1-2 Site Layout* for siting of the individual components).
- 1.3.10 The proposed installed capacity of the entire installation is 2.23MW, comprising approximately 6,972 solar PV panels. In addition, one inverter substation will be required, along with site cabling, and battery storage containers. The inverter will be connected back to the existing wind farm substation which in turn is connected to the local distribution network.
- 1.3.11 The solar panels, mounting frames and inverter will be delivered to site in approximately 109 articulated lorry loads, which themselves will be staggered throughout the 12 week construction period. Ground-mount steel frames will be required for the panels, which will be anchored to the ground using piles (see *Figure 3-2* for details of the mounting system).
- 1.3.12 The output of electricity to be generated is estimated at 2,219,505 kWh annually, which is equivalent to the annual domestic electricity requirements of approximately 672 households per year. The electricity output would result in annual offsetting of carbon dioxide emissions associated with fossil fuels equal to approximately 630 tonnes.

Layout, including Design Considerations

- 1.3.13 The layout of the solar farm has been designed to best harness the power of the sun's irradiation whilst ensuring that adequate separation distance is maintained from drainage ditches, pockets of more sensitive ecology and other on-site features.
- 1.3.14 The site layout has been influenced by a number of different on-site constraints, including a 5m buffer of the drainage ditches, and avoidance of more sensitive areas of ecology. Subsequent to the initial design of the scheme, statutory and public consultation was undertaken to seek views on the layout of the scheme. No responses were received that led to a deviation from the layout at that time.

Scale of the Proposed Scheme

- 1.3.15 The proposed scheme red line boundary outline encompasses an area of approximately 3.3 hectares.
- 1.3.16 The area of the operational solar farm within the security fence will be approximately 3.16 hectares.
- 1.3.17 The number of solar panels and the design of the arrays are described in 1.3.10 above. Each solar panel will be approximately 1.6m x 1.0m, and will be elevated to a maximum height above ground level of 2.6m.
- 1.3.18 The inverter substation, which will be sited upon a concrete foundation, will be approximately 15.5 x 2.2m x 2.5m. It will be located either integrally with a transformer unit of roughly the same dimensions or as units side by side within the area of the main solar arrays. The external transformer will require a fenced enclosure, which will be slightly wider than the main inverter at 4.8m, as shown on *Figure 3-3 / 3-4 Typical Inverter Substation*.

1.4 ENVIRONMENTAL SUSTAINABILITY

- 1.4.1 The proposed solar farm will use a natural renewable resource, i.e. solar radiation, to generate electricity. This will offset requirements for the use of fossil fuel derived electricity, which in the case of the Mynydd y Gwrhyd Solar Farm will be equivalent to approximately 672 households per year; this figure is calculated by dividing the total expected output of the proposed solar farm by the average domestic household annual electricity use of 3,300 kWh². The proposed development, therefore, contributes to global efforts on environmental sustainability and will also reduce the UK's dependence upon imported sources of energy, typically fossil fuel based generation such as gas and oil. The proposed development will provide a long-term, decentralised form of energy that will improve the sustainability of UK based energy supplies.

² Based on an average annual electricity consumption of 3,300 kWh of electricity for a domestic property, <http://www.solar-trade.org.uk/solar-farms/>

- 1.4.2 There will be a marginal net gain to biodiversity resulting from the development where the proposed enhancements are adopted. Current land use of the site will be augmented by the planting of a new shelter along the southern boundary.

1.5 CHARACTER

Landscape

- 1.5.1 The development will result in a change to landscape character within the fields in which it would be situated but generally the proposed development is not expected to have a significant effect upon landscape character or visual amenity, as explained in Section 4 of the Environmental Report.
- 1.5.2 The proposed development will not result in the removal of landscape elements, and the proposed inclusion of tree shelter belts will make a slight positive contribution to habitat elements within the receiving environment.

Appearance

- 1.5.3 The proposed scheme will present a departure from its current visual appearance, altering from an area of unimproved grassland habitat to one that is more man-made in nature. The solar panels will appear as an expanse of blue, which is largely due to the anti-reflective coating in which they are finished. This expanse of blue will be visually contained within a much wider expanse of green and brown natural habitat and should not dominate the landscape. It is not possible to modify the appearance of the solar arrays, inverters, and fencing to accord with the local vernacular, however the applicant proposes to provide screening to the southern boundary.
- 1.5.4 As shown on the Zone of Theoretical Viability (ZTV) (Figure 4-1), the solar farm will only be visible from a limited area, predominantly to the south of the site in accordance with the site topography.
- 1.5.5 The proposed solar farm will not alter the sense of tranquillity afforded by the current rural climate and environment.

1.6 ACCESS

Transport Management

- 1.6.1 Full details of the proposed transport requirements for this proposed scheme are set out in Section 8 of the Environmental Report.

Proposed Access Arrangements

- 1.6.2 Construction vehicles, including vehicles delivering materials and workers to the Site, will use the A474 from the direction of Pontedawe.
- 1.6.3 An existing turning and public road to the right hand side of the highway when travelling northwards (opposite the Landfill Site turning) will be used to access the Site. An existing public highway onto Mynydd Uchaf will be used, which then terminates close to the property at Blaen-egel-fawr. At this point a track departs northwards and eastwards towards the wind farm; this track has suitable characteristics (as a result of wind turbine delivery) including running surface to transport solar infrastructure to the development site.

1.7 MOVEMENT

Public access and movement in respect of the Proposed Access

- 1.7.1 A Transport Management Plan has been prepared as part of this application, details of which are set out in Section 8 of the Environmental Report. The Plan will ensure agreement among stakeholders on the proposed routing, protection of the highway, and protection of local residents during the construction phase.
- 1.7.2 The purpose of the transport plan will be to ensure the continuing free movement of traffic along the highways principally during the construction phase when vehicle movements will be at their greatest; in addition the plan will address ongoing access during the operational phase, whilst a similar plan will be prepared in advance of the decommissioning phase. In this way, the Applicant will ensure minimum disruption to the public highways network.

1.7.3 In summary the following management measures are set out as part of the proposed development:

- Vehicles approaching the site will be scheduled outside peak hours;
- Deliveries will be scheduled to access the site outside of typical busy periods and during standard working hours only. No deliveries will take place on Saturday mornings;
- Local residents will be notified of the construction programme and vehicle movements. Such residents will also have details of the appointed contact for the applicant in order to ensure concerns are addressed;
- Any damage caused to the public highway during the development will have to be rectified at cost to the applicant; and
- All vehicles will be required to clean their wheels prior to leaving the site.

1.8 COMMUNITY SAFETY

1.8.1 The solar farm is located on private land; consequently public access to the solar panels is prohibited. However, given the potential for third parties to enter the land under untoward circumstances, the solar farm will be surrounded by suitable fencing to prevent entry into the Site.

1.8.2 It is proposed that the education facility to be provided with the scheme will be used to entertain community and school groups; such groups will be strictly managed and protected from any elements of the solar farm infrastructure that may be a threat to safety.

1.8.3 Any additional third party visitors with agreement to visit the Site would be required to report to a pre-arranged location and they would receive site inductions prior to entry to the Site.

1.8.4 The solar farm would not encroach on any public right of ways and as such there are no potential threats to amenity users.

1.8.5 The operational history of solar farms in Europe and the UK has established that such schemes are not a threat to public safety.