



*Illustration only

Mynydd y Gwrhyd Solar Farm Design and Access Statement

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1.1 PURPOSE OF THIS STATEMENT

- 1.1.1 This 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 (for location see Figure 1-1 Site location).
- 1.1.2 This DAS has been prepared to accompany the planning application for the solar farm to Neath Port Talbot County Borough Council 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) is also considered best practice.
- 1.1.3 Further advice available from the local planning authority has been considered during the development 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.

1.2 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. Multiple arrays will be arranged as part of an overall solar farm development, the purpose of which is to generate renewable energy for export into the local distribution network, thereby reducing the UK's reliance on fossil fuel derived power generation and the associated polluting emissions to the environment.

1.3 ENVIRONMENTAL SUSTAINABILITY

- 1.3.1 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 kWh¹. The proposed development, therefore, contributes to global efforts on environmental sustainability and will also reduce the UK's dependence upon imported sources of

¹ 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/>

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.

- 1.3.2 There will be a 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 new hedgerows along the southern boundary and adjacent to the proposed battery storage units. In addition, species rich margins will be planted in areas around the site, in consultation with the site ecologist. This is expected to result in a positive net benefit overall to ecological biodiversity at the site.

1.4 THE DESIGN COMPONENT

Context

- 1.4.1 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, Mynydd Uchaf.
- 1.4.2 In devising the design for the development, the applicant sought and considered the views of the local communities (see planning document *Mynydd y Gwrhyd Solar Farm Statement of Community Involvement*) and statutory advisors (see Chapter 1 of the Environmental Report). Their contribution has shaped and informed the development through advice on local sensitivities and features relevant to the area.
- 1.4.3 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 duly informed 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 requirements of Planning Policy Wales.

Land Use

- 1.4.4 The predominant land use in which the proposed development is situated is farmland, which is used for grazing. There are no public rights of way within the site.

Purpose

- 1.4.5 The purpose of the development is for the generation of renewable electricity. The solar farm will generate electricity through harnessing the energy of the sun. The electrical output of the solar farm will be exported to the local electricity distribution network which will transport and deliver the electricity generated to areas within the region.
- 1.4.6 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

- 1.4.7 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 location).
- 1.4.8 The proposed installed capacity of the entire installation is 2.23MW, comprising approximately 6972 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.
- 1.4.9 The solar panels, mounting frames and inverter will be delivered to site in approximately 20 articulated lorry loads, which themselves will be staggered

throughout the 10 week construction period due to the preferred approach to construct the scheme. Ground mount steel frames will be required for the panels, which will be anchored to the ground using piles (see Figure 1-3 for details).

- 1.4.10 In terms of the amount of electricity to be generated, it is estimated that the 2.23MW solar will produce electricity equivalent to the annual domestic electricity requirements of approximately 672 households per year and will result in annual savings in carbon dioxide equivalent to 1,331 tonnes.
- 1.4.11 In accordance the local DAS guidance, the proposed 2.23MW capacity solar farm is the maximum size of scheme that would be delivered. Any requirement to renegotiate this capacity in the event that the scheme is approved will be taken up by the Applicant with the local authority. The proposed size of scheme is justified on the basis of maximising the potential for renewable energy generation whilst designing a scheme suitable to the local landscape characteristics and avoiding areas of more sensitive ecology.

Layout, including Design Considerations

- 1.4.12 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.
- 1.4.13 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 has therefore further influenced the layout and features of the proposed solar farm.

Scale of the Proposed Scheme

- 1.4.14 The proposed scheme red line boundary outline will cover an area of approximately 3.3 hectares, however the area of the operational solar park within the security fence will be approximately 3.16 hectares.

1.4.15 The number of solar panels and the design of the arrays are described above. The inverter substation will be approximately 15.5 x 2.2m x 2.5m. The external transformer will require a fenced enclosure, which will be slightly wider than the main inverter at 4.8m, as shown on Figure 1-4 Typical Inverter Substation.

1.4.16 The panels will be approximately 1.6m x 1.0m, and will be elevated to a maximum height above ground level of 2.6m.

1.5 CHARACTER

1.5.1 Generally, the proposed development is not expected to have a significant effect upon landscape character or visual amenity. Also the proposed development will not result in the removal of landscape elements, although the solar farm will constitute a change to the existing landscape character within the fields in which they will be situated.

Appearance

1.5.2 As shown on the Zone of Theoretical Viability (ZTV), the solar farm will only be visible from a minimal area, predominantly to the south of the site. The proposed solar farm will not alter the sense of tranquillity afforded by the rural climate and environment. 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.

1.6 ACCESS

Proposed Access Arrangements

1.6.1 Construction vehicles, including vehicles delivering materials to the site, will use the A474. An existing site entrance will be used to access the site. An existing track is available for use to access the site.

1.6.2 Further details are provided in a Construction Traffic Management Plan.

1.7 MOVEMENT

Public access and movement in respect of the Proposed Access

- 1.7.1 A Construction Traffic Management Plan (CTMP) has been prepared as part of this application, and is included as Appendix 3 of the Environmental Report. The Plan will protect local residents during the construction phase.
- 1.7.2 The purpose of the CTMP will also 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 would not be possible.

- 1.8.2 As the proposed scheme is on private land and there should be no threats to the public through the construction stage of the development. Temporary fencing around the construction compound would be requirement for security, which will in turn prevent any potential threat of injury by preventing people from entering the site. Visitors would be required to report to site.
- 1.8.3 The solar farm would not encroach on any public right of ways and as such there are no issues to address.
- 1.8.4 The operational history of solar farms in Europe and the UK has established that they are not a threat to public safety.