

Planning Application for Solar Park and Battery Storage Facility at Land to the North of Maelor Gas Works, Marchwiel, Wrexham, LL13 0UN

Design and Access Statement

Novus Renewable Services Limited

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Unit 3
The Old Dairy
Yanworth
Cheltenham
Gloucestershire
GL54 3LQ

tel: 01285 721072

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1 Introduction

This Design and Access Statement (DAS) has been prepared to accompany a planning application for a solar park and battery storage facility along with associated works and landscaping at Land to the North of Maelor Gas Works, Marchwiel, Wrexham, LL13 0UN.

It is a statutory requirement that most applications for planning permission are accompanied by a design and access statement¹ to:

- a) explain the design principles and concepts that have been applied to the development;
- b) demonstrate the steps taken to appraise the context of the development and how the design of the development takes that context into account;
- c) explain the policy or approach adopted as to access, and how policies relating to access in the development plan have been taken into account; and
- d) explain how any specific issues which might affect access to the development have been addressed.

This DAS has been prepared in accordance with the Welsh Government guidance² and therefore covers the following matters:

- Description of the site and context
- Principles of a solar park and battery storage
- Character
- Environmental sustainability
- Community safety
- Access and movement

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

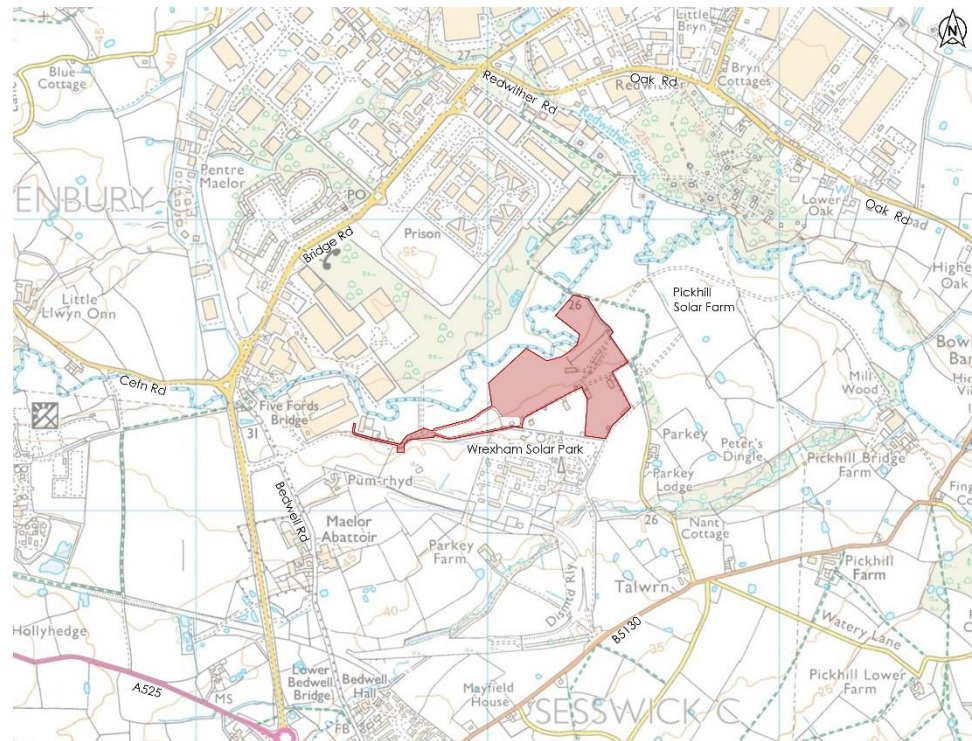
² Technical Advice Note 12 : Design (2016)

2 Description of the site and context

2.1 Site location

The site is located to the east of Wrexham, to the south of the Wrexham Industrial Estate (WIE) and to the north of the former Maelor gas works. The location of the site is shown at Figure 1.

Figure 1: The application site is outlined in red



2.2 Site analysis

Access: The site is accessed from the west by an unclassified highway known as “Tetra Pak Road”. This road connects to Bedwell Road which provides access to the Cefn Road roundabout to the north and to the B5130 to the south. An alternative, and more practical access to Tetra Pak Road, is from Sesswick Way, to the west of Bedwell Road. This road was completed nearly ten years ago and connects to the Cefn Way roundabout to the north, and the Cros Land Roundabout (with access to the A525) to the south. There is a Public Right of Way (PRoW) to the west of the site.

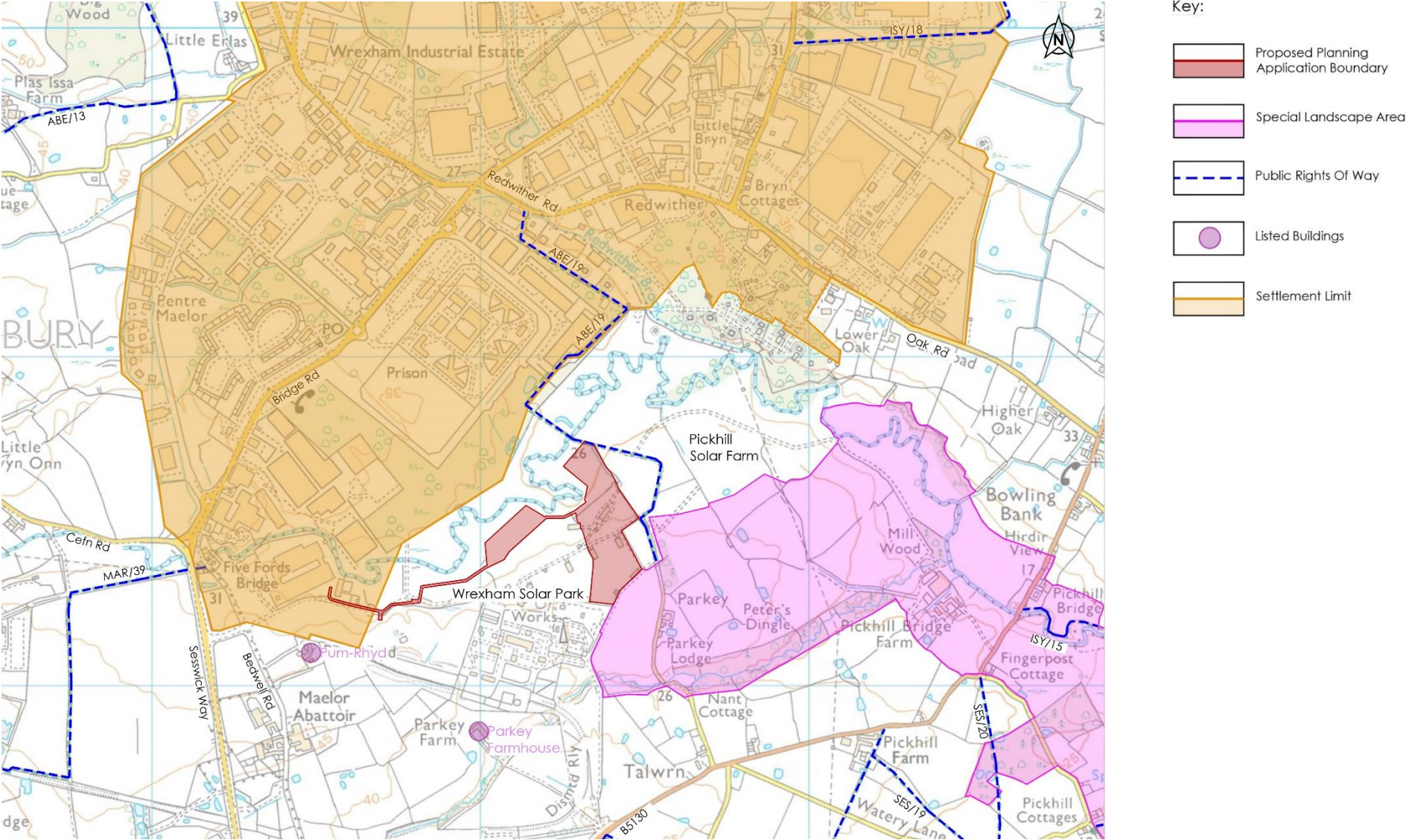
Ecology: A Preliminary Ecological Appraisal submitted with the application has identified that the site is currently improved grassland sward, with the potential to support a number of species. The nearby Wrexham Industrial Estate (WIE) is a locally designated site and is known to support Great Crested Newts.

Flood zone: The site partly lies within a zone with a low risk of flooding, with some parts within Zone C2 as defined by Natural Resources Wales.

Heritage: There are no designated heritage assets within or immediately adjacent to the site. The nearest listed buildings are Parkey Farmhouse, approximately 600m to the south-west and Pum Rhyd approximately 630m to the west. There are a number of brick structures within the site, and in the wider area, that are associated with the use of the WIE area during World War Two as an Ordnance Factory.

Landscape and land use: The site does not lie within a nationally or locally designated landscape. The majority of the site lies within the Deeside and Wrexham National Landscape Character Area as defined by the National Landscape Character Areas for Wales (NRW, 2013). A small part towards the south-eastern boundary is located within the Maelor National Landscape Character Area. There is a Special Landscape Area (SLA), as identified by the adopted Local Plan, towards the south-east of the site. There is a tall, ruderal boundary to the north at the river bank. There are several hedgerows at the eastern boundary and individual trees located across the site. The site is used for the grazing of sheep. The SLA, PRoWs and the extent of the WIE are shown at Figure 2.

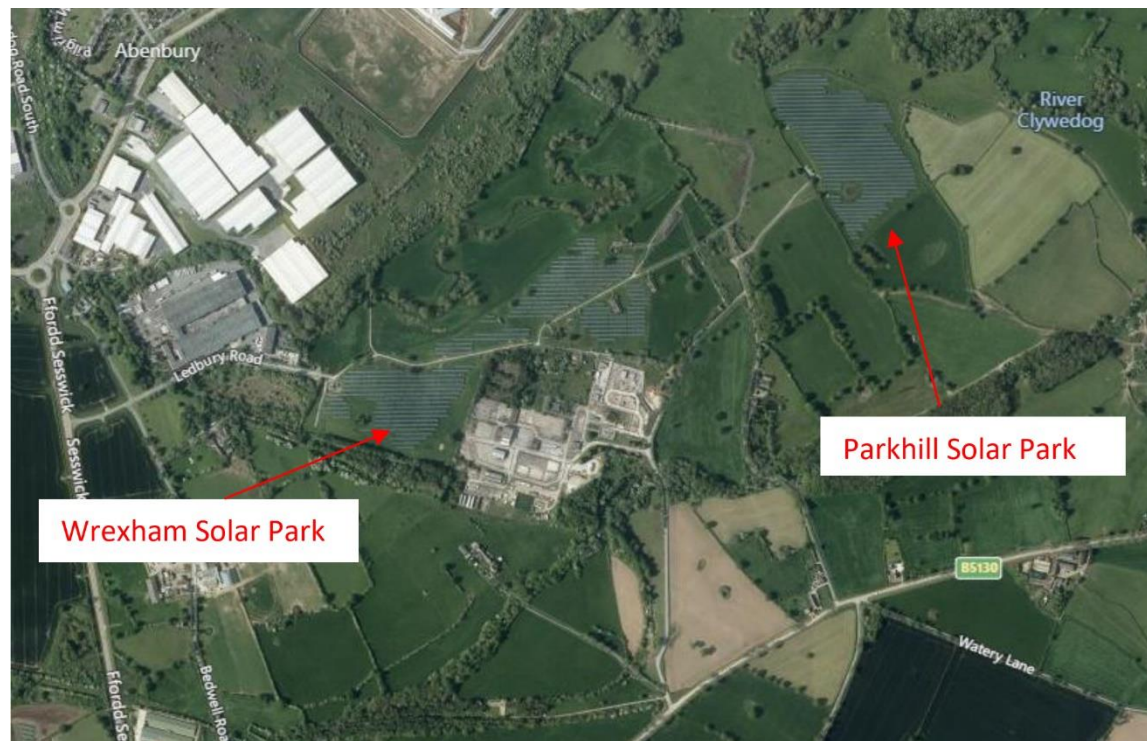
Figure 2: Constraints



Land to the North of Maleor Gas Works, Wrexham

Planning: The site is adjacent to an existing solar park that was granted planning permission in 2015 (LPA reference SES P/2015/0463). That site has been generating electricity for over 5 years. For the purposes of this application, it will be referred to as “Wrexham Solar Park”. The location of Wrexham Solar Park and Parkhill Solar Park further to the east can be seen at figure 2. The site lies to the south of WIE which is a nationally important location for business, industry and employment. There are proposed changes to the boundary of the WIE under the emerging local plan. The location of the proposed solar park in relation to the existing solar parks is shown at Figure 3.

Figure 3: Existing solar parks



3 Principles of a solar park and battery storage

3.1 Solar Parks

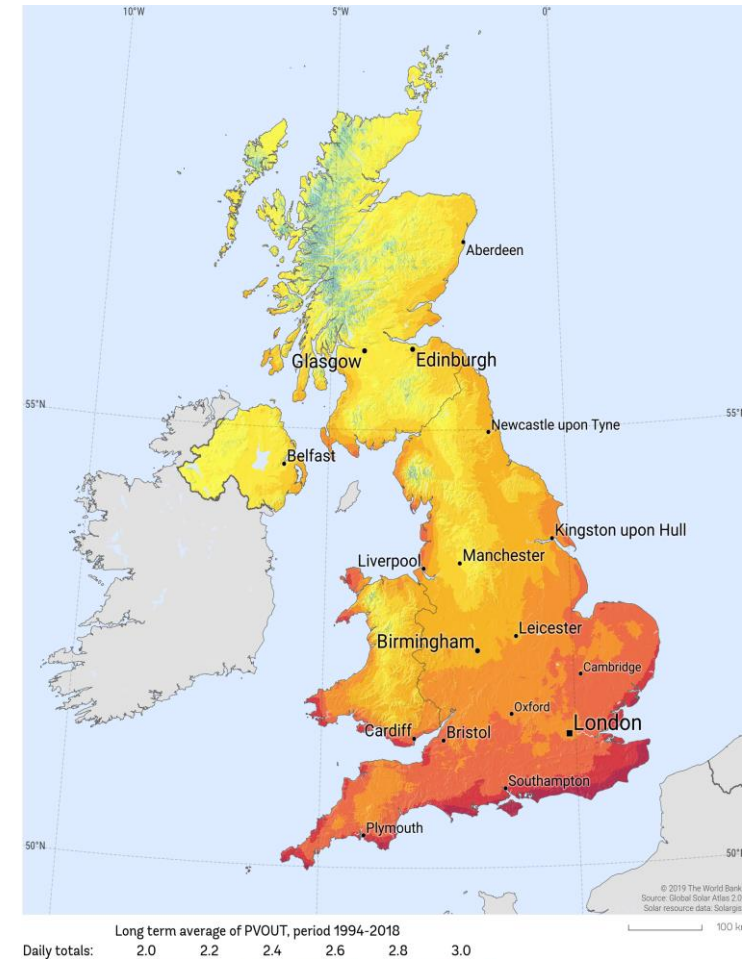
Solar parks (also referred to as solar farm) provide a source of renewable energy. Energy is captured using solar panels and, using inverters and transformers, converted to a form suitable for connection to the grid.

They can only be developed where a range of primary site development criteria are met, as follows:

- There is a suitable solar resource – taking into account orientation and absence of excessive shading. Figure.4 confirms the suitability of the site.
- Land is available - the landowner supports the development and is prepared to enter into an arrangement to accommodate the proposal
- There is a suitable electrical connection: and it is technically and economically viable to connect the site to the local electrical distribution system.
- Site sensitivities and potential impacts of development – there must be no clear barriers to potential development and preferably a relatively low impact on the local area. This DAS confirms the context of the area and design process.

The proposed solar park will be operated independently of Wrexham Solar Park.

Figure 4: Map of solar radiation in the UK



3.2 Battery Storage

Battery storage is a key component of supporting a reliable source of electricity to homes and businesses as the UK moves towards a Zero Carbon future with an increased reliance upon renewable electricity generation. Battery storage provides grid resilience by importing electricity from the grid at times of low demand and releasing it back into the grid at times of high demand.

Like solar parks, battery storage needs to be located in relatively close proximity to a connection point to the grid network. Co-location of battery storage and solar parks is becoming increasingly common due to the potential to share infrastructure and to store and manage solar generation at the local level.

4 Character

4.1 Amount

The proposed solar park will be able to generate 5.7MWp of electricity and the battery storage facility will have an import/export capacity of 16MWh.

Within the development, over 10,000 PV panels will be arranged on metal frames which are pushed into the ground. There is no requirement for foundations and therefore minimal disturbance to the ground. Panels are arranged on the frames so that water can drain through. In addition, the proposed layout includes swales to attenuate surface water.

The site has previously been used for agriculture, primarily grazing. It is proposed to use the land to generate renewable energy whilst allowing for sheep grazing to continue. The solar park is temporary in nature, consequently there is no permanent loss of agricultural land. At the end of the installation's life, the equipment can be removed, and the land restored.

Electricity from the panels will be converted from DC to AC by inverters, either mounted on the rear of panel strings or located in housings adjacent to rows of panels and steps up voltage via transformers to supply the grid network in the required form. The power generated is conveyed to the grid by means of underground cabling via the client sub-station and then the existing Distribution Network Operator (DNO) substation which is located toward the west of

the site. The red line of the application site extends to the Manetti factory at Tetra Pak Road, to allow for the possibility of a private wire providing electricity directly to the factory in addition to, or instead of a connection to the grid.

Battery storage works by importing electricity from the distribution network at times of low demand, converting the Alternating Current (AC) from the grid to Direct Current (DC). The electricity is then stored within the battery modules (usually lithium-ion batteries as proposed within this application). The process is reversed when electricity is exported back to the distribution network at times of high demand. In a co-located project such as this, the battery store will have the potential to charge directly from the solar park to “load-shift” electricity generated throughout the day to match demand.

Figure 5: Sheep grazing within Wrexham Solar Park



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4.2 Layout

The layout of the site has been designed to maximise the energy generation of the panels, whilst retaining existing features within the site, such as the brick structures, trees and hedgerows.

The access tracks within the site will be retained and utilised. Additional sections of track are proposed to provide access across the site for both construction and on-going management and maintenance. Figure 6 shows an access track within the site.

Trees and hedgerows are important landscape features and provide habitats for several species. The development has been designed to retain these with panels sited away from the root protection zones of individual trees.

The battery storage facility has been located in the area known to have the lowest risk of flooding according to the flood risk maps produced by Natural Resource Wales.

4.3 Scale and appearance

Solar arrays are, as within the existing solar park, proposed to be arranged in west-east rows. The extent is sufficient to generate an installed capacity of 5.7MWp. Panels will be arranged in a two-panel portrait layout on the frames (as in supplied cross sections) and angled to face due south to maximise the capture of solar energy.

Panels are finished in a non-reflective dark colour to maximise absorption, and the rows are spaced to facilitate the maximum solar energy capture whilst retaining field boundaries, hedgerows and trees.

Figure 6: Photograph of an existing track within the site. In the background is Wrexham Solar Park



The housings for transformers and storage container are proposed, like the approved scheme, to be of compact design and no higher than 3m. The locations are selected to combine efficient operation and minimal visibility, and the housings will be finished in a colour that will blend into the landscape, such as grey or dark green.

Figure 7: Examples of infrastructure associated with a solar park.



The battery storage facility will comprise eight container type structures sited either side of inverter and transformers along with a switch room structure.

The containers will be grey or dark green in colour and sited on gravel. Figure 8 shows an example of a battery storage facility, albeit of a scale that is much larger than proposed within this planning application.

Figure 8: Example of a battery storage facility



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5 Environmental Sustainability

5.1 Moving towards a zero-carbon future

There is widespread awareness of the need to reduce dependence on fossil fuels and an encouragement to increase the generation and use of renewable energy. The UK Government has a legal obligation in relation to generating renewable energy. In April 2019, the Environment Minister (and the Welsh Assembly Member for Wrexham) Lesley Griffiths declared a “Climate Emergency” and the LPA also declared a Climate Emergency a few months later in September 2019.

The planning statement accompanying this planning application discusses the targets set by the Welsh Government to achieve a low carbon future which includes a target for the country to generate 70% of its electricity consumption from renewable energy by 2030.

The proposal is for a solar park to generate electricity from a sustainable source, and it is therefore inherently environmentally sustainable.

The proposed solar park will make a modest, but important contribution towards that target. The proposed export capacity will be 5.7MWp; to provide some context, that will be enough electricity to power over 1800 homes within the Borough, or enough to fully charge 157, 178 Nissan Leaf cars within a year. Over the 40-year operational lifetime of the development, it is estimated that approximately 58,000 tons of carbon will be saved.

Many renewable sources of energy generation are intermittent and battery storage enables National Grid to efficiently manage the differences between generation and demand.

It is anticipated that wherever possible, equipment, materials and workers required for construction would be sourced locally (subject to usual commercial tendering arrangements, suitability, and availability).

5.2 Landscape/Habitat

The site does not lie within a designated landscape. Although the site is currently undeveloped land, it is near to existing developments, i.e Wrexham Solar Park, Parkhill Solar Park, the former Maelor gas works and the WIE.

The scheme has been designed to retain trees and hedgerows, with additional planting of native woodland within two blocks.

The Landscape and Visual Impact Assessment submitted with the application has identified that the proposed development would not be harmful y

The Preliminary Ecological Assessment accompanying the application identified that the site could provide suitable habitat for a number of species and the development has been designed accordingly. For example, the brick buildings, which were identified as being potentially suitable for bats, will remain unaltered and there will be no external lighting used within the development. Biodiversity will be enhanced through the creation of hibernaculum and a pond, which will support a range of species but primarily Great Crested Newts. A wetland wildflower corridor will be created [surrounding the edge of the development in fields 1A and 2.

The operator of the solar park will manage and maintain the site to ensure that the mitigation and enhancement measures continue to function during the operational period of the development.

5.3 Water and Waste Management

The proposed development will not generate waste-water. It has been demonstrated that surface water can be attenuated within the site, therefore will not increase greenfield run off rates.

Figure 9: Photograph of a mature oak tree within the site which will be retained within the development



During the construction process, there is expected to be minimal waste and any that does arise, will be taken off site and recycled where possible.

Both the solar park and the battery storage facility are largely modular in their construction, which means that should one element fail, such as an individual PV panel or battery cell, it can be replaced, maintaining the overall performance of the development. On-going management and maintenance will ensure that the development continues to run as efficiently as possible for its operational period.

The decommissioning of the site will be undertaken in accordance with the environmental legislation and technology available at that time. The scheme of decommissioning can be agreed with the LPA and secured by condition.

Many of the component parts of the solar park and the battery storage facility can be dismantled, recycled, and re-used. This includes the battery cells and as the technology matures, it is expected that recycling or reconditioning processes will become more widespread and efficient.

6 Community Safety

Community safety has been considered in the design and construction arrangements of the proposed development.

The solar park site is, and will be retained as, private land and therefore has no public access. It will be surrounded by deer fencing, with palisade fencing around the battery storage facility. Examples of fencing are shown at figure 9. The site will be monitored by CCTV cameras and as security lighting is not proposed, the cameras will be infra-red.

The construction of the development will be undertaken in accordance with the Construction Traffic Management Plan to ensure that there will be no conflict between users of the local highway network and construction vehicles.

It is therefore considered that appropriate safety considerations have been taken into account.

Figure 10: Examples of fencing: Deer fencing is shown to the right and palisade to the left



7 Access and movement

The site will be accessed from Tetra Pak Road, which serves the existing solar park and agricultural land. The majority of vehicular movements will occur during the construction and decommissioning phases and these can be adequately accommodated for within the local highway network and managed through a Construction Management Plan (and decommissioning plan).

During the operational phase of the solar park, there will be limited vehicle movements to and from the site associated with on site management and maintenance.

The site will not be open to the public and the proposed development will not impinge upon the ability of the public to use the local PRow network.

8 Conclusion

This DAS has been prepared to support a full planning application for a solar park with battery storage facility.

It has been demonstrated that the site is not constrained by any statutory designations. It is available, has suitable irradiation, access and a point of connection to the grid. Therefore, the site meets the key requirements for solar electricity generation. There would be no permanent loss of higher grade agricultural land and once constructed, the solar park can still be used for the grazing of sheep.

The proposed development has been designed in response to the site context and constraints, with consideration to pre-application advice from the LPA and specialists in relation to flood risk, biodiversity, landscape and trees. Consideration has also been given to highway and community safety at both the construction and operational phases.

The proposed layout plans show the retention of landscape and habitat features, such as hedgerows and trees and the existing brick structures. Further enhancements will be achieved through additional planting and the creation of new habitats

The proposed development would provide a valuable source of renewable energy, contributing towards a reduction in reliance on fossil fuels and towards Wales' net zero carbon ambitions. The incorporation of battery storage will support this transition by providing additional resilience to the grid.

It has been demonstrated through this DAS and through the specialist reports and planning statement accompanying this application that the proposed development would be environmentally sustainable and would accord with national and local planning policies and guidance. Therefore, it is considered that the application should receive the support of the LPA and planning permission be granted for the proposed development.



Planning

Landscape

Architecture

Hydrology

Ecology