

MAESMAWR SOLAR FARM DESIGN AND ACCESS STATEMENT



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REPORT

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Contents

- 1 INTRODUCTION 3
- 2 SUMMARY OF THE PROPOSAL 4
- 3 THE BRIEF AND VISION 9
- 4 SITE AND CONTEXT ANALYSIS 12
- 5 PLANNING POLICY CONTEXT 13
- 6 INTERPRETATION 17
- 7 DESIGN DEVELOPMENT 18
- 8 THE PROPOSAL – DESIGN AND ACCESS CONSIDERATIONS 21
- 9 SUMMARY AND CONCLUSIONS 25

1 INTRODUCTION

- 1.1 This Design and Access Statement (DAS) has been prepared on behalf of Elgin Energy EsCo Ltd in respect of a full planning application for a solar farm with a generation capacity of approximately 30MW and ancillary development at Maesmawr, on land between Church Village and Treforest Industrial Estate in Rhondda Cynon Taf County Borough Council (RCTCBC). By virtue of the fact that the proposal exceeds 10MW energy generations it constitutes Development of National Significance (DNS) as stated in the Specified Criteria and Prescribed Secondary Consents (Wales) Regulations 2016.
- 1.2 This DAS has been prepared in accordance with the requirements of:
- The Town and Country Planning (Development Management Procedure) (Wales) Order 2012 (as amended);
 - Planning Policy Wales, Edition 11, published February 2021 (PPW11);
 - Technical Advice Note 12: Design, published July 2016 (TAN12); and
 - Design and Access Statements in Wales: Why, What and How, published April 2017.
- 1.3 Consideration has also been given to the relevant policies within the Rhondda Cynon Taff Local Development Plan (LDP), adopted March 2011.
- 1.4 The remainder of the DAS is organised as follows. Section 2 provides a summary of the proposed development. Section 3 sets out the brief and vision, Section 4 describes the site and its context analysis, Section 5 sets out the planning policy context and then Section 6 sets out how this has been interpreted. Section 7 then explains the iterative design process and Section 8 details the proposals in terms of:
- character;
 - access;
 - movement
 - environmental sustainability; and
 - community safety.
- 1.5 Finally, Section 9 provides a summary and conclusion.

2 SUMMARY OF THE PROPOSAL

- 2.1 The application proposes the installation of a solar photovoltaic electricity generating station (or 'solar farm') with an installed generation capacity of approximately 30MW and associated ancillary development, including a substation. The power generated by the proposed solar farm would be enough to power approximately 7,000 typical family homes and result in an approximate saving of 360,000 tonnes of CO2 per annum.
- 2.2 The solar farm will generate electricity every day of the year for an anticipated project lifespan of 40 years, following which the site will be decommissioned and can be returned to its former agricultural use.
- 2.3 The main components of a solar farm are:
- Solar panels and frames;
 - Inverters;
 - Transformers;
 - Cabling; and
 - Substation.

Solar Panels and Inverters

- 2.4 The panels will be arranged in series of rows up to a height of approximately 3.2m at the highest and 0.8m at the lowest points and tilted southwards at an angle of 10-25 degrees. The panels themselves will be bifacial and will be approximately 2.4m by 1.3m in size. The underside of a bifacial panel has a transparent material that allows the panel to also collect light which reflects from the ground.
- 2.5 The panels are likely to be dark blue or black consisting of crystalline cells of silicon wafers and semi-conducting materials applied to a glass plate. When sunlight hits the solar cells, a voltage develops between the treated silicone and the semi-conductor material and direct current (DC) is generated. The panels are designed to absorb, rather than reflect, sunlight and result in limited nuisance or light pollution.
- 2.6 The support frame uprights are pile driven into the ground. The distance between the rows of panels will vary depending on the gradient of the topography but will typically be spaced between 2m and 8m apart.
- 2.7 Inverters are required to convert the DC generated by the photovoltaic (PV) panels to grid compatible alternating current (AC).





Substation

- 2.8 Cabling from panels and inverters are routed to the substation via a network of shallow backfilled trenches. The substation comprises a small, prefabricated building, approximately the size of a small portacabin, containing switchgear to increase the voltage to feed into the National Grid.

Fencing

- 2.9 A 2.4 m timber post and wire deer proof fence is erected around the site for health, safety and insurance purposes. Matching gates are provided at key access points at the site.



CCTV System

2.10 CCTV will be installed at the site, pointing inwards, for monitoring and security purposes.



Construction

- 2.11 The construction phase of the development will take approximately 4 months. A site compound will be necessary for storage of equipment and housing of temporary site offices.
- 2.12 The limited noise and traffic associated with construction will be kept within reasonable daytime working hours.

Operation

- 2.13 The solar farm will begin operation following construction and grid connection. The panels will generate electricity every day for the project lifespan of 40 years.
- 2.14 The solar farm will not be manned permanently. The installation will be monitored remotely. There will, however, be regular maintenance visits by a team of engineers, in addition to regular landscape and cleaning maintenance.

Decommissioning

- 2.15 The solar farm is designed to be fully reversible at the end of its lifetime. Solar panels, cabling, inverters, sub-station and other paraphernalia are removed leaving only small holes, trenches and areas to be back filled. The land can then revert to its previous use.

Key Benefits

- 2.16 The proposal will result in several key benefits, including:
- Safe, stable and affordable electricity for approximately 7,000 homes;
 - The abatement of over 360,000 tonnes of carbon dioxide over the lifetime of the project;
 - Contributing to sustainable development and government carbon reduction targets;
 - Increased revenue from the energy sector to be spent in the local economy;
 - The construction phase will result in jobs and increased expenditure in local shops, eating and drinking establishments and overnight accommodation; and
 - The maintenance of the site will generate further opportunities for employment.

REPORT

- 2.17 As mentioned above, the solar farm is a temporary and fully reversible use, unlike housing, for example, with all equipment removed from site at the end of its operational life. The methods used in construction mean that remediation works following the removal of the panels and associated infrastructure are relatively minor and will return the site to its previous greenfield character.
- 2.18 The solar farm will also be designed to accommodate sheep grazing beneath and between the rows of panels, providing an efficient dual use of land for renewable energy generation and agriculture.

3 THE BRIEF AND VISION

3.1 The brief for the project provides the starting point for the design response. The brief and vision for the development is set out below.

The Brief

- Provide a circa 30MW solar farm on underutilised and unproductive land;
- Protect and enhance existing fauna and flora;
- Design to be sympathetic to the surrounding landscape.

The Vision

3.2 The vision for the development of the site is as follows:

‘Generate safe, stable and affordable renewable low carbon electricity for approximately 7,000 homes while minimising ecological and landscape impacts as far as possible.’

4 SITE AND CONTEXT ANALYSIS

Site Location

- 4.1 The site lies within the administrative boundary of RCTCBC and is located 13km north-west of Cardiff City Centre.
- 4.2 It is located on land between Church Village and Treforest Industrial Estate, to the east is the main railway line linking Cardiff and the Valleys. To the west lies the A473. Maesmawr Road runs through the site in a north-south direction and there is an existing solar farm (Maes Bach) located to the southeast of the site.
- 4.3 The site itself extends to approximately 40 hectares (98.8 acres) (including the cable route) and consists of several parcels of land. The parcels are irregular in shape and comprise a series of agricultural fields of varying sizes. They are currently primarily used for pasture grazing and are bound by a mixture of mature woodland, trees and hedgerows
- 4.4 The site is open in appearance from some vantage points with existing mature hedgerows, trees and or boundary fencing separating the fields forming the site.
- 4.5 Access to the site is achieved via a new dedicated access track from the Maesmawr Road.

Geology and Topography

- 4.6 The site is within an identified Mineral Resource Area, with the geology underlying the majority of the site containing secondary shallow coal resources, isolated areas of primary shallow coal resources and superficial glaciofluvial sand and gravel deposits. Whilst these deposits are present, they are recorded to extend significantly beyond the site boundary.
- 4.7 The topography of the site, based upon Ordnance Survey 1:10,000 mapping contours, generally slopes from the east to the west, ranging from 130m Above Ordnance Datum (AOD) on the eastern boundary to 100m AOD towards the western half of the site, where it plateaus at the unnamed stream running through the site.

Site History

- 4.8 A review of historical maps indicates that, since 1875 the land has remained undeveloped, but an old tramway once ran westerly along the northwestern boundary linking the former Llantrisant and Taff Vale Junction Railway and Maes Mawr Colliery to the northeast of the site.
- 4.9 The site is currently used for agricultural purposes, comprising of several agricultural fields, primarily used for pasture grazing, bound by a mixture of mature woodland, trees, hedgerows and fencing.

5 PLANNING POLICY CONTEXT

5.1 National and development plan design and access policies relevant to the project are summarised below.

National Planning Policy

5.2 Planning Policy Wales (PPW) 11th Edition published February 2021, and the accompanying Technical Advice Notes (TANs) set out the national planning policies of the Welsh Government and are material considerations in the determination of individual planning applications.

5.3 PPW paragraph 1.18 states that the planning system provides for a presumption in favour of sustainable development to ensure that social, economic and environmental issues are balanced and integrated, at the same time, by the decision-taker in taking decisions on individual planning applications.

5.4 PPW recognises that good design means the relationship between all elements of the natural and built environment. It should go beyond aesthetics and consider social, environmental and economic aspects of the development. PPW objectives of good design are as follows:

- Access;
- Character;
- Community Safety;
- Environmental Sustainability; and
- Movement.

5.5 PPW paragraph 3.4 states: *“Meeting the objectives of good design should be the aim of all those involved in the development process and applied to all development proposals, at all scales”*.

5.6 PPW paragraph 3.6 states that *‘developments should incorporate inclusive design principles to support a diverse range of people and provide design solutions that offer choice and flexibility’*.

5.7 PPW paragraph 3.17 states DAS’ should state the design principles and concepts adopted.

5.8 Section 5.7 of PPW – Energy – outlines the context to and the requirements of energy projects. Paragraph 5.7.1 states low carbon electricity must become the main source of energy in Wales and that renewable electricity will be used to provide both heating and transport in addition to power.

- 5.9 Paragraph 5.7.2 acknowledges that overall power demand is expected to increase as a result of growing electrification of transport and heat. PPW highlights that in order to ensure future demand can be met, significant investment will be needed in energy generation, transmission and distribution infrastructure. The system will need to integrate renewable generation with storage and other flexibility services, in order to minimise the need for new generation and grid system reinforcement.
- 5.10 Paragraph 5.7.6 stresses that the planning system should secure an appropriate mix of energy provision, which maximises benefits to our economy and communities whilst minimising potential environmental and social impacts. This forms part of the Welsh Government's aim to secure the strongest economic development policies, to underpin growth and prosperity in Wales, recognising the importance of decarbonisation and the sustainable use of natural resources, both as an economic driver and a commitment to sustainable development.
- 5.11 Paragraph 5.7.7 states:
- “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.” (our emphasis)*
- 5.12 It continues that the Welsh Government is committed to using the planning system to (inter alia):
- integrate development with the provision of additional electricity grid network infrastructure;
 - optimise energy storage;
 - optimise the location of new developments to allow for efficient use of resources;
 - maximise renewable and low carbon energy generation.
- 5.13 Section 5.9.19 sets out the key issues in determining applications for renewable and low carbon energy technologies. It states planning authorities should consider:
- The contribution a proposal will make to meeting identified Welsh, UK and European targets;
 - The contribution to cutting greenhouse gas emissions; and
 - The wider environmental, social and economic benefits and opportunities from renewable and low carbon energy development.

- 5.14 PPW paragraph 5.9.20 states planning authorities should also identify and require suitable ways to avoid, mitigate or compensate adverse impacts of renewable and low carbon energy development. The construction, operation, decommissioning, remediation and aftercare of proposals should take into account:
- the need to minimise impacts on local communities, such as from noise and air pollution, to safeguard quality of life for existing and future generations;
 - the impact on the natural and historic environment;
 - cumulative impact;
 - the capacity of, and effects on the transportation network;
 - grid connection issues where renewable (electricity) energy developments are proposed; and
 - the impacts of climate change on the location, design, build and operation of renewable and low carbon energy development. In doing so, consider whether measures to adapt to climate change impacts give rise to additional impacts.
- 5.15 Prior to an application being submitted, developers for renewable and low carbon energy developments are encouraged, wherever possible, to consider how to avoid, or otherwise minimise, adverse impacts through careful consideration of location, scale, design and other measures.
- 5.16 TAN12: Design states that a DAS is a statutory requirement for certain applications for planning permission in order to outline how the design of the proposal has been considered in relation to its context.

Development Plan

Rhondda Cynon Taff County Borough Council Local Development Plan

- 5.17 The RCTCBC LDP identifies that the site access lies within a non-statutory Special Landscape Area (SLA) designation.
- 5.18 Policy SSA 23 – Special Landscape Areas states that development within the defined Special Landscape Areas will be expected to conform to the highest standards of design, siting, layout and materials appropriate to the character of the area.
- 5.19 Policy AW 5 – New Development supports development proposals where they are designed in a way so that there is no adverse impact on amenity and so that the development is well accessible with safe access onto the highway network.

5.20 Policy AW 8 – Design and Placemaking supports development proposals where they are of high-quality design and exhibit good placemaking principles.

Other Design Policy Considerations

5.21 The Welsh Government’s ‘Design and Access Statement in Wales: Why, What and How, published April 2017,’ guidance (DAS guidance) prepared by the Welsh Government suggests a structure as follows for DASs:

- a. Summary of the Proposal
- b. The Brief and Vision
- c. Site and Context Analysis
- d. Interpretation
- e. Design Development
 - i. The Proposal
 - ii. Character
 - iii. Access
 - iv. Movement
 - v. Environmental Sustainability
 - vi. Community Safety

5.22 The DAS guidance states this broadly follows the stages of the design process so, as each stage of the process is undertaken, the content of the document can be developed.

6 INTERPRETATION

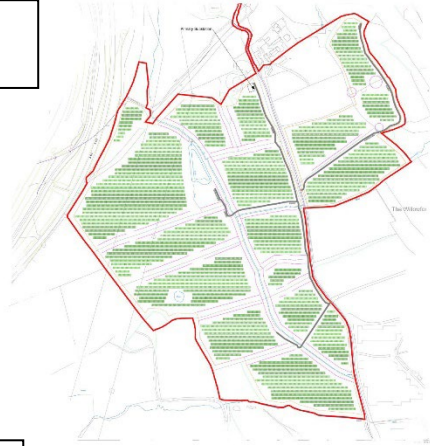
- 6.1 Having regard to the context of the site and the surrounding area, the following principles were applied to the development of the site:
- Design and materials to help the transition from darker existing vegetation to the panels;
 - Maintain a minimum 5m ecology buffer around existing vegetation, hedgerows and trees;
 - Provide appropriate mitigation either onsite or offsite in relation to potential ecological and landscape and visual effects.
- 6.2 The brief and vision for the project required a circa 30MW solar farm on underutilised and unproductive farm land whilst protecting the existing flora and fauna and respecting the surrounding landscape.
- 6.3 The combination of the above principles and the brief and vision guided the development of the design, which is documented in the following section.

7 DESIGN DEVELOPMENT

7.1 This section explains the iterative design process and why design decisions have been made. As this DAS is a pre-application consultation document it does not include any discussions on consultation with the local community, statutory and non-statutory consultees and stakeholders currently.

Initial Sketch Proposals

Initial Sketch – Oct 2021



RevA – November 2021:
Revised site boundary



RevB – March 2022:
Revised layout based on
topographical survey and
overhead lines



RevC – March 2022:
Revised to include
ecology mitigation and
enhancement



RevD – March 2022:
Revised fence line to
accommodate public
footpaths

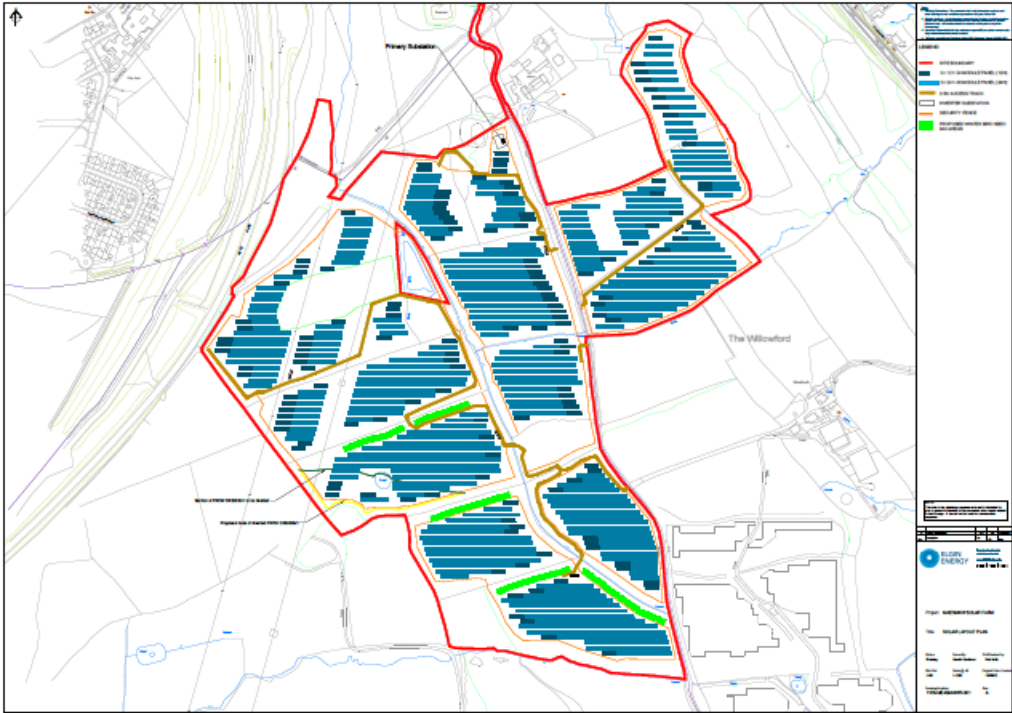


RevE – End March 2022: Updated fence
line and layout to accommodate tree survey
and root protection zones.



Final Design for Statutory Consultation

The current project layout is below. Following consultation with RTCBC's Ecology Officer further comments were received in relation to the potential for deep peat on parts of the site. Further site investigations were therefore undertaken and have resulted in an amended layout in order to avoid areas of deep peat.



8 THE PROPOSAL – DESIGN AND ACCESS CONSIDERATIONS

Character

Placemaking

- 8.1 The site comprises several small to medium sized fields approximately 13km north-west of Cardiff City Centre.
- 8.2 The site topography is gently undulating and segmented by existing mature hedgerows and trees. The field boundaries surrounding the site are a combination of remnant hedgerows, mature hedgerow trees and post and wire fencing. Views encompass a generally homogenous landscape of small to medium sized irregular patterned grazing fields bound by a combination of hedgerows and post and wire fencing interspersed with hedgerow trees.

Amount and Density

- 8.3 The proposal will make use of approximately 40 ha (98.8 acres) and will have an output of approximately 30MW – taking into account site constraints and proposed mitigation.

Spaces and Public Realm

- 8.4 Due to the nature of the development, there can be no public access to the site.

Scale

- 8.5 The scale of the proposal (in terms of its viability as a solar farm) is determined by the topography of the site, grid connection and ownership constraints. The scale of the proposal is considered to be acceptable in its context seeking to maximise the amount of renewable energy generated whilst minimising any adverse impacts.
- 8.6 The proposed solar farm will be made up of dark blue or black solar panels of 2.4m x 1.3m. The solar panels will be mounted in pairs, one above the other, on static aluminium frames, giving an overall maximum height of approximately 3m above the ground. The panels are tilted, typically at an angle of 10-25 degrees from horizontal, south.
- 8.7 The proposed development is set to have a capacity of up to 30MW enough to supply electricity for approximately 7,000 homes and the abatement of approximately 360,000 tonnes of carbon dioxide over the lifetime of the project.

Layout

- 8.8 The layout has been designed in such a way as to retain the existing field boundary features such as trees, hedges and ditches so not to change the nature of the existing field boundaries within the landscape context. The final layout as shown in the previous section of this DAS is a result of numerous revisions in response to various technical and environmental assessments and takes account of site constraints and proposed mitigation measures.

Detail Design

- 8.9 As mentioned above, the proposed solar farm will be made up of dark blue or black solar panels of 2.4m x 1.3m consisting of crystalline cells of silicon wafers and semi-conducting materials applied to a glass plate.
- 8.10 The panels are designed to absorb, rather than reflect, sunlight and result in limited nuisance or light pollution. The other elements of the development are the perimeter fencing which is timber post and fence to blend in with the upland agricultural character of the site. The substation building will be dark in colour to ensure it is recessive in the landscape and blends with the darker solar panels.

Vehicular Access

- 8.11 Access to the site will be via the existing Maesmawr Road to the north of the site.
- 8.12 The access will be sufficient to accommodate passage of a single HGV. The contractor will ensure that deliveries are coordinated such that two vehicles will not be required to pass each other on the access roads leading to the site. At all times the contractor will ensure that vehicles entering the site will be afforded priority to those exiting. This will ensure that vehicles entering the site can turn off the highway network without detriment to the passage of through vehicles.

Public Transport Accessibility

- 8.13 It is not expected that staff will access the site via public transport due to its relatively remote location and the convenience of car sharing as an alternative.

Disabled Access

- 8.14 The site will not be open to members of the public and therefore will only be accessed by those authorised to do so (i.e. those tasked with constructing and maintaining the site).
- 8.15 Whilst it will be ensured that any construction and maintenance staff with disabilities will be able to access the site, it may not be possible to provide universal access due to the inherent characteristics of the development.

Movement

- 8.16 The majority of traffic associated with the proposal will be experienced during the construction phase.
- 8.17 The construction period is expected to take approximately 4 months. The site preparation phase will allow the site to receive delivery of equipment and establish areas for equipment storage plus housing of temporary prefabricated site offices.
- 8.18 During the construction period, delivery vehicles and construction staff will make vehicular trips to the site. The vast majority of deliveries will be undertaken by HGV. Deliveries will vary in amount per day during the construction period with an average of 6-8 deliveries (6-8 inbound plus 6-8 outbound movements) per day over the construction period.
- 8.19 It is expected that construction hours will be between 0800 and 1830 Monday to Friday and 0800 to 1300 on Saturdays.

Trip Generation - Staff

- 8.20 During the construction period, up to 40 staff could be present on site at peak periods, although there are likely to be fewer for the majority of the construction process (an average of 20). It is normal that teams of construction staff will commute in vans and cars and therefore the likelihood of vehicle sharing is high.
- 8.21 Due to the proposed hours of construction (0800 to 1830 hours weekdays) the majority of these trips are expected to take place outside of traditional peak periods.
- 8.22 The construction site will be laid out to accommodate all staff vehicles as well as the expected daily HGV delivery vehicles.

Site Operation

- 8.23 Following construction, the site will operate for a period of 40 years. During its lifetime the site does not require any permanent staff presence. Upkeep of the site is restricted to infrequent monitoring, cleaning and general maintenance.
- 8.24 The frequency of vehicular trips is expected to be between 10 - 20 visits per year, typically undertaken by a LGVs.

Environmental Sustainability

- 8.25 The proposal will contribute towards UK and Welsh Government renewable energy and carbon reduction targets and provide cost effective and clean electricity. The proposal is compliant with national and local environmental sustainability objectives and policies.

Community Safety

- 8.26 Regarding community safety, only authorised personnel will be permitted to enter the site which will be enclosed with a wooden post and wire deer proof fence. Matching gates will be provided. Inward facing CCTV cameras will be installed on site and monitored remotely with private security contracted to attend to any issues on site. In addition, the landowner will reside on site and continue to farm the land and surrounding area providing natural surveillance.
- 8.27 Consequently, the proposal raises no community safety issues

Response to Planning Policy

- 8.28 The national and local planning policy context is overwhelmingly supportive of renewable energy development. Increasing renewable energy generation is identified as a national and local planning policy objective.
- 8.29 Design and landscape matters are considered in the accompanying Landscape and Visual Impact Assessment (LVIA) and Landscape Chapter of the Environmental Statement (ES), which concludes that overall, the quality and character of the landscape and visual resources would be maintained and would have the capacity to accommodate the proposed development without significant effects.
- 8.30 Regarding access planning policies, the site is considered to be accessible to those that will require access to it and complies with relevant highways and transportation requirements, as set out within the accompanying Construction Traffic Management Plan (CTMP).

9 SUMMARY AND CONCLUSIONS

- 9.1 In summary, the proposed solar farm will generate approximately 30MW of electricity per annum and as a result constitutes a Development of National Significance as its overall output is in excess of 10MW. This scale of energy generation will contribute directly towards UK and Welsh Government targets for the supply of energy from renewable sources.
- 9.2 The development will give rise to a relatively small number of vehicle movements during the construction period. During the operation period a minimal number of additional trips are expected per annum. The new dedicated access is sufficient to cater for the expected vehicular movements during the construction period and within the lifetime of the development. There is no reason in access terms why the development cannot proceed.
- 9.3 Regarding design, the DAS demonstrates that the proposal can be accommodated on the site with acceptable landscape and visual impact, in particular it sets out how the design has been iterative, taking into account various constraints as assessment work has evolved.
- 9.4 The DAS therefore demonstrates that the proposal is fully in accordance with national and local planning policy objectives relating to renewable energy, climate change, design and accessibility.