Preliminary Environmental Information Report

Chapter 3: Alternatives and Design Evolution

PEIR Chapters [PINS Ref: EN 010171]

Document Reference: EN 010171/PEIR CHP/3

Revision Number: 1

December 2025

Future Energy Llanwern Limited

Contents

3.0 Alternatives and Design Evolution

3.1 Introduction

3.1.1 This Chapter of the PEIR describes the consideration of alternatives and design evolution in relation to the Proposed Development, as well as providing a summary of the initial Site selection process that has been undertaken. A full description of the alternatives will be provided in the Environmental Statement (ES).

3.2 Legislation and Planning Policy

3.2.1 Regulation 14(2)(d) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref 3-1) sets out the requirement for *"A description of the reasonable alternatives studied by the applicant, 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 effects of the development on the environment."* to be presented in the ES.

3.2.2 The design process for the Proposed Development has taken full consideration of the Overarching National Policy Statement for Energy (EN-1) (Ref 3-2), the National Policy Statement for renewable energy infrastructure (EN-3) (Ref 3-3) and the National Planning Policy Framework, and Design Principles for National Infrastructure (Ref 3-4).

3.2.3 National Policy Statement EN-1 (Ref 3-2) provides confirmation that there is no general requirement to consider alternatives or to establish whether a development represents the best option. Paragraph 4.3.9 states:

"As in any planning case, the relevance or otherwise to the decision making process of the existence (or alleged existence) of alternatives to the proposed development is, in the first instance, a matter of law. [National Policy Statement EN-1] does not contain any general requirement to consider alternatives or to establish whether the proposed project represents the best option from a policy perspective."

3.2.4 However, the National Policy Statement recognises other specific legislative requirements and policies which require the consideration of alternatives such as requirements in relation to compulsory acquisition and habitats sites (Ref 3-4) and the subsequent sections of the National Policy Statement which highlights the avoidance of significant harm to biodiversity and geological conservation interests; food risk; and development within nationally designated landscapes, detailed in sections 5.4 and 5.8. Paragraph 4.3.17 notes

"Where there is a policy or legal requirement to consider alternatives, the applicant should describe the alternatives considered in compliance with these requirements."

3.2.5 Additionally, paragraph 4.3.15 of National Policy Statement EN-1 (Ref 3-3) provides further context noting that

"Applicants are obliged to include in their ES, information about the reasonable alternatives they have studied. This should include an indication of the main reasons for the applicant's choice, taking into account the environmental, social and economic effects and including, where relevant, technical and commercial feasibility."

3.3 The Applicant's Consideration of Alternatives

3.3.1 Considering the policy and legislative requirements as well as the iterative approach to the design to date, the following alternatives have been considered for the Proposed Development and are discussed further in this Chapter:

- Alternative sites and; and
- Alternative layouts / design.

3.3.2 The 'no development' scenario as an alternative to the Proposed Development has not been considered as a reasonable alternative to the Proposed Development as it would not deliver the additional electricity generation proposed to meet the UK's net zero targets.

3.4 Need for the Scheme

3.4.1 There has been an increasing need for the UK to further invest and strengthen their

renewable energy supply with the UK Government declaring an Environmental and Climate Change Emergency on 1 May 2019 (Ref 3-5). Following the research presented by the Intergovernmental Panel on Climate Change (IPCC) which concluded that global emissions would need to fall by approximately 45 percent from 2010 levels by 2030, with the aim of achieving net zero by approximately 2050. The UK Government declaration highlights the importance and the recognised need to promote low carbon energy supply technologies.

3.4.2 There are various legislative, regulatory and policy requirements which highlight the need to reduce carbon emissions and increase the capacity of renewable energy supply across Wales and the UK. Specifically, National Policy Statement EN-1 (Ref 3-2) has made clear that there is a critical national priority (CNP) for the provision of nationally significant low carbon infrastructure, which the Proposed Development constitutes. National Policy Statement EN-1 (Ref 3-2) directs the Secretary of State to give substantial weight to the need and benefits of Nationally Significant Infrastructure Projects. It states

"subject to any legal requirements, the urgent need for CNP infrastructure to achieving our energy objectives, together with the national security, economic, commercial and net zero benefits, will in general outweigh any other residual impacts not capable of being addressed by application of the mitigation hierarchy. Government strongly supports the delivery of CNP infrastructure, and it should be progressed as quickly as possible."

3.4.3 Please refer to **Section 3.2** for further information relating to National Policy Statement EN-1.

3.4.4 Notwithstanding the above, Paragraph 2.3.9 of National Policy Statement EN-3 (Ref 3-3) clarifies that there are 'no limits' on the need for renewable energy. Consequently, the National Policy Statement does not advocate for a sequential approach to site selection as a matter of principle, stating that:

'As most renewable energy resources can only be developed where the resource exists and where economically feasible, and because there are no limits on the need established in Part 3 of EN-1, the Secretary of State should not use a consecutive

approach in the consideration of renewable energy projects (for example, by giving priority to the re-use of previously developed land for renewable technology developments).'

3.4.5 The Climate Change Act 2008 (2050 Target Amendment) Order (Ref 3-6) which was published in 2019 furthered the UK's commitment and required a change in the reduction of greenhouse gas emissions outlined in the Climate Change Act 2008 from 80% to 100% when compared to 1990 levels.

3.4.6 Additionally, Net Zero Wales (Ref 3-7) was published in 2021 which set the requirement for Wales to meet the required average reduction of 37% in greenhouse gas emissions (GHG) against the baseline for Carbon Budget Two (CB2) in order to reach Net Zero GHG emissions by 2050. The Welsh Energy Targets (Ref 3-8) which were published in 2017, detail the renewable energy targets which form part of Welsh Governments' commitment for a more sustainable future. These included a target of producing 70% of the electricity consumed in Wales from renewable sources by 2030. In January 2023 the Welsh Government announced an updated target to meet 100% of its electricity needs from renewable sources by 2035 and to achieve 1.5GW of renewable energy capacity within local ownership by 2035, these targets have now been formally adopted.

3.4.7 Additionally, Planning Policy Wales (PPW) (Edition 12) (Ref 3-9), published in 2024, acknowledges Wales has been set a 95% net zero target for 2050 by the 2019 Climate Change Committee and that in October 2021 the Welsh Government published its Net Zero Wales CB2 Plan and Carbon Budget 3 (CB3) Plan which are establishing the pathway to net-zero.

3.4.8 Paragraph 5.7.7 of PPW explains 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".

3.4.9 It should be noted the Welsh Government declared a climate change emergency on 29 April 2019 (Ref 3-10) signalling their commitment to address climate change. This was further cemented with the publication of Prosperity for All: A Low Carbon Wales

(Ref 3-11) which was published March 2019 and detailed 100 policies and proposals with the aim of achieving the 2020 interim emissions targets.

3.4.10 **Chapter 4: Legislation and Policy** addresses the legislative, regulatory and policy requirements relevant to the Proposed Development further.

3.4.11 The suite of applicable policy reinforces the importance of delivering energy generation from renewable sources to meet the energy needs of Wales and the UK. The Proposed Development will contribute towards reducing carbon emissions and increase the capacity of renewable energy generation within Wales and the UK.

3.5 Site Evaluation

3.5.1 The Proposed Development requires a large site area to accommodate the amount of solar arrays necessary to make full use of the available grid capacity and to make the grid connection financially viable. The Proposed Development will comprise an area of approximately 159.6ha of developable land on which Solar Panels would be installed, this represents the amount of land required to maximise the availability of the Grid Capacity which exists at the Whitson substation through which the project would be connected.

3.5.2 The siting of the Proposed Development must also take account of key development management considerations (laid out through the relevant national and local planning policy guidance), and the operational needs and requirements of the Proposed Development.

3.5.3 The process for site selection and a review of potential other alternative sites was initially guided by a review of parameters which are key to ensuring the viability of a Solar Farm Development are discussed in **Table 3-1** and include:

- Proximity to the transmission network with available capacity;
- Satisfactory irradiance levels;
- Land use (urban and wooded locations excluded) and neighbouring land use;
- Topography and accessibility;
- Availability of the land for the lifetime of the Proposed Development;

- Compatible uses and neighbouring uses
- Previously developed land;
- Landscape and visual considerations;
- Site specific allocation;
- Agricultural Land Classification;
- Site orientation and size (capability of accommodating the required quantum of solar panels); and
- Deliverability and accessibility of the Site.

Network Capacity and the Point of Connection

3.5.4 The Applicant engaged with National Grid to discuss availability within its transmission network with the south of Wales for integrating a utility scale Solar project.

3.5.5 Through the discussions with National Grid, it was identified that Whitson Substation had suitable availability due to the decommissioning of the Llanwern Steel Works. Given the response from National Grid and the presence of other constraints, as set out below, Whitson Substation was identified as a suitable Point of Connection (PoC) and therefore the location to start the site selection process.

3.5.6 Paragraph 3.10.98 of National Policy Statement EN-3 (Ref 3-3) recognises the need to maximise the use of existing grid infrastructure and acknowledges that applicants may choose a site based on nearby available grid export capacity. Paragraph 3.10.35 further emphasizes the importance of the proximity of the grid connection to deliver a viable solar farm.

Land Ownership and Availability

3.5.7 Land availability is a key consideration for site selection, as utilising land with a willing landowner to lease their land is preferable to land which would otherwise need to be acquired through compulsory purchase powers. The Applicant will seek as far as possible to avoid the use of compulsory purchase as part of the Proposed Development.

3.5.8 All other things being equal, land which is readily available with a willing landowner is preferable to a land which would otherwise need to be acquired using compulsory purchase powers. In this regard, land must be available for the duration of the proposed period of energy generation to give certainty that the scheme can be delivered. Site availability is determined by the willingness of the landowner to enter into an option agreement and in this instance the proposal is for an operational period of 40 years.

3.5.9 Concurrently with the agreements reached with National Grid, the Applicant was identifying potential sites and landowners within vicinity of the National Grid Substation. The Applicant conducted a qualitative search exercise, accounting for specific barriers to development and policy designations, attempting to identify suitable land within a viable distance to the Point of Connection for landowners who wished to participate in the Proposed Development.

3.5.10 As per National Policy Statement EN-3 (Ref 3-3) a typical 50MW solar farm will require circa 125 to 200 acres (50ha). Given the available grid connection, a minimum land take of 354ha was required to generate 350MW, noting requirements for buffer zones, cable runs and mitigation and enhancement measures, a search was undertaken for areas of land available over 500ha.

Environmental Considerations

3.5.11 The initial site selection process was completed via a desk-based study, which focussed on specific planning, environmental and landscape sensitivities. This included the consideration of the following:

- Designated International and National Ecological Sites;
- Nationally Designated Landscapes;
- Best and Most Versatile Land and Urban Landscapes; and
- Areas of Ancient Woodland.

3.5.12 The proposed Site was initially screened out against these criteria due to the presence of the Site of Special Scientific Interest. However, the screening of the wider area identified that there were no suitable pockets of land on which the site could be located within a viable proximity to the PoC. Land to the north of the

substation was reviewed, however, this was subject to constraints, including Best and Most Versatile (BMV) land, and the presence of the M4 and London to Cardiff Railway line made this area cost prohibitive.

Irradiance and Site Topography

3.5.13 Paragraph 2.10.19 of National Policy Statement EN-3 notes that topography and irradiance levels are key considerations for the site selection process.

3.5.14 Flat coastal areas are preferred as they generally experience higher total levels of solar irradiance due to the prevailing weather conditions in these areas. Flat and south facing slopes are considered the most suitable, making the coastal areas of the south of Wales particularly suitable for renewable energy.

Proximity of a Site to Dwellings

3.5.15 Paragraph 2.10.27 of National Policy Statement EN-3 sets out the need for the consideration of the proximity of a site to dwellings. The design considerations and proximity to dwellings relate, for example, to visual amenity, glint and glare and noise.

3.5.16 The Gwent levels by its nature is covered in sparse settlement patterns. The immediate surrounds of the Site are characterised by individual properties and villages. The design of the Proposed Development took due consideration to the proximity and effects of residential receptors and their occupants. **Section 3.5** describes the process through which the design has been amended and refined, including amendments to the Site boundary to configure the Proposed Development away from dwellings, with the Site set back from villages and properties.

Agricultural Land Classification

3.5.17 In accordance with National Policy Statement EN-3 (Ref 3-3), the Applicant has looked to identify poorer quality land instead of higher quality and avoiding Best and Most Versatile (BMV) agricultural land.

3.5.18 The Agricultural Land Classification: Predictive Map (Ref 3-12) was utilised to screen the Site, the mapping identified that the Site was predominantly Grade 3b: Moderate Quality, whilst BMV comprises Grade 1, 2 and 3a.

3.5.19 As part of the design process, the Applicant has consulted further with Land Quality Advisory Service (LQAS) to minimise the impact of the Proposed Development on agricultural land. As part of this process, it has been agreed that the predictive mapping is correct, and no further surveys are required to confirm this. Therefore, the Site that has been selected will not impact upon any BMV agricultural land.

Previously Developed Land

3.5.20 National Policy Statement EN-3 (Ref 3-3) states that applicants, where possible, should look to utilise suitable previously developed land.

3.5.21 The Applicant reviewed potential locations within the proximity of the PoC, however, there were no suitable brownfield sites that could accommodate the Proposed Development and utilise the full grid offer due to the scale of the proposal and its required land take. Therefore, development on previously developed land was deemed unviable and not considered a reasonable alternative.

Rooftops

3.5.22 No commercial rooftops or combined premises of an adequate area to facilitate a utility-scale solar project or provide a viable network of sites in proximity to the PoC were identified.

Accessibility

3.5.23 The accessibility and ability to accommodate potential Abnormal Indivisible Loads (AIL) and Heavy Goods Vehicles (HGV) is an important factor to ensure that the Site was technically feasible. The road network surrounding the Site is dominated by the M4 and A4810, the remaining roads are more rural in nature.

3.5.24 The proximity of the M4 to the Site ensures that significant traffic loads will utilise the Strategic Road Network more proficiently before having to utilise smaller more rural roads.

3.5.25 According to Paragraph 5.4.8 of National Policy Statement EN-1:

"Development on land within or outside a SSSI, and which is likely to have an adverse effect on it (either individually or in combination with other developments),

should not normally be permitted. The only exception is where the benefits (including need) of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of SSSIs."

3.6 Alternative Sites Locations

3.6.1 In the first instance, a 'no development' scenario has not been considered as an alternative. This is because 'no development' is not considered to be a reasonable alternative to the Proposed Development as it would not deliver the proposed generation capacity and therefore not support the transition to net zero.

3.6.2 Following the confirmation from National Grid that the PoC at the National Grid Substation had suitable capacity to connect a utility-scale solar farm, the Applicant focussed their search within the proximity of the substation. The reasonable alternatives to the location of the Site that were studied by the Applicant, are described below.

3.6.3 When reviewing these sites, consideration has been given to key environmental and planning policy constraints, including the potential for environmental impacts to occur and conflicts with existing or proposed land uses. The assessment has also considered the suitability of alternative sites to accommodate the development, which optimises the use of land and the benefits of the Proposed Development. As set out in **Section 3.5.12** this search focussed on areas south of the M4 and the Cardiff to London Railway due to technical and cost constraints and was subsequently ruled out.

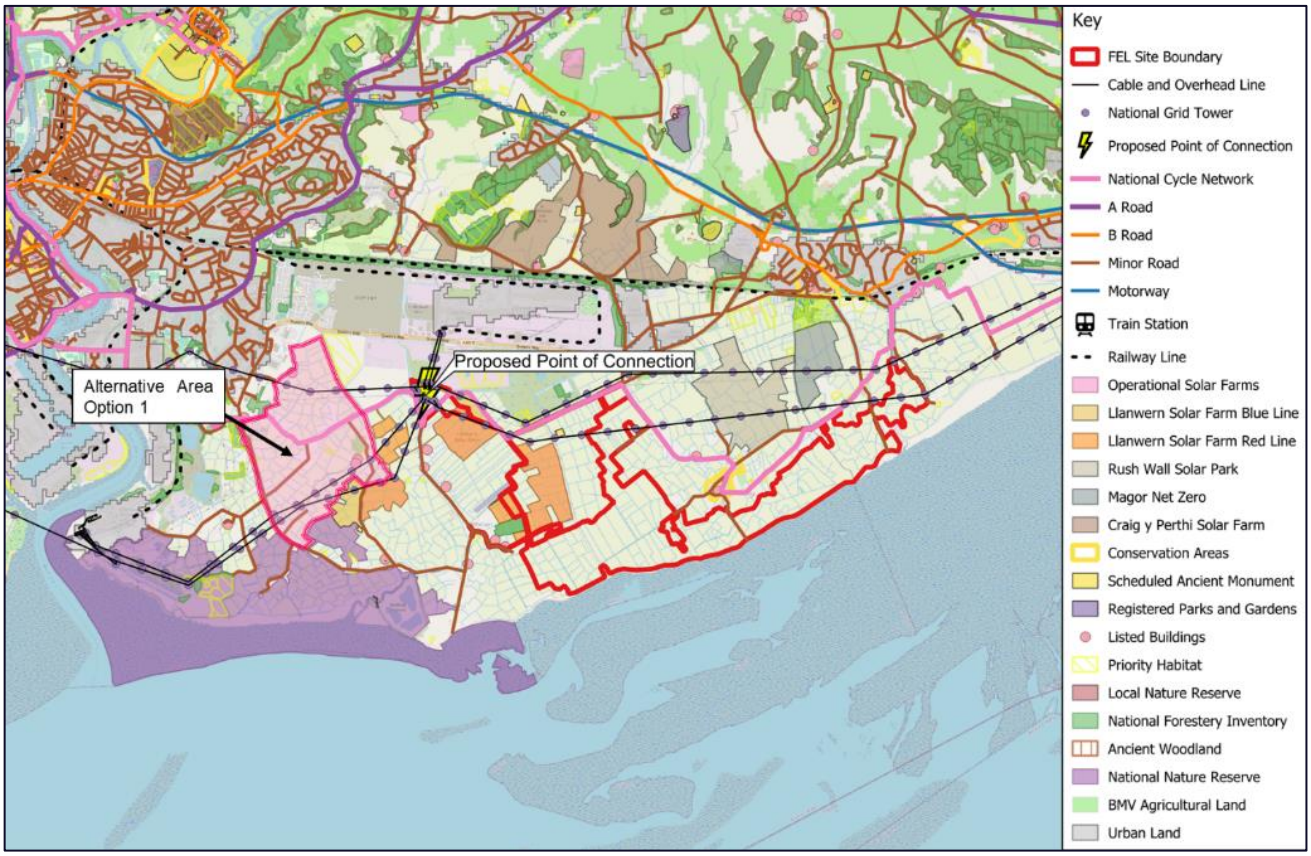
3.6.4 The alternative site areas will be reviewed against the same parameters for which the Proposed Development was identified including; Land ownership, environmental considerations, irradiance, proximity of a site to dwellings, land classification and accessibility.

Alternative Site One

3.6.5 **Plate 3-1** demonstrates one of the areas identified as a potential site for the Proposed Development.

3.6.6 The area shown is to the west of the PEIR Assessment Boundary, on land between the PoC and the urban extent of the city of Newport. It borders land which is allocated for development under the Local Development Plan and covers an area of similar agricultural land.

Plate 3-1 Alternative Site One



3.6.7 The alternative site area comprises a similar assembly of land. The land is comprised of multiple titles and is owned by different landowners, private and institutional, similar to the ownership of the PEIR Assessment Boundary.

3.6.8 As set out above, the alternative site comprises a greater number of trees along field boundaries which would likely be impacted by any development. Further, the alternative site is located within the SSSI, but also the Goldcliff Lagoons National Nature Reserve (NNR), which further supports the international designations to the south of both sites. In this respect the preferred and alternative sites were deemed equivalent.

3.6.9 The alternative area is equally flat and avoids north facing topography, as such it

would have similar irradiance levels. However, the alternative area does comprise more trees around irregular field boundaries which are crossed by significant lengths of overhead line. The trees and overhead lines would cause a degree of shading across the area and likely limit the output of a potential solar farm. In this respect the PEIR Assessment Boundary offers a better option with regard to maximising renewable energy generation to meet the grid connection offer.

3.6.10 Residential receptors adjacent to the alternative area are more prevalent than within proximity to the PEIR Assessment Boundary. As such, the potential for impacts upon residential amenity during construction and operational phases are therefore higher than the PEIR Assessment Boundary.

3.6.11 The available mapping data (Ref 3-12) indicates that the alternative area is predominantly lower grade (Non-BMV) land. However, there is a small pocket of BMV Land identified towards the eastern extent of the alternative area and this may indicate that the quality of the land is slightly better than the PEIR Assessment Boundary. However, in this respect the two sites are equivalent.

3.6.12 The alternative option is likely to be accessible as it is served by the minor road network and it is noted that there are a number of agricultural businesses operating in the area, however, it is further removed from the M4 and the A4810, therefore, potential impacts on the local road network would likely be greater for the alternative area than is predicted for the PEIR Assessment Boundary.

3.6.13 **Table 3-1** provides an overview of Alternative Site One within the context of the parameters defined in **Section 3.5**.

Table 3-1 Review of Alternative Site One

Alternative Area Alternative Site One Siting Considerations	Review of Alternative Site Suitability against the PEIR Assessment Boundary
Levels of solar irradiation	Alternative Site One is equally flat and also avoids north facing topography. It lies within a coastal area and would benefit from a broadly equivalent level of solar irradiation. Alternative Site generally comprises more trees around tight knit, irregular field boundaries and is also crossed by

Alternative Area Alternative Site One Siting Considerations	Review of Alternative Site Suitability against the PEIR Assessment Boundary
	significant lengths of overhead transmission cables. Both would cause a degree of shading across the site area which has the potential to limit the efficiency of the scheme. Such features are less prevalent within the PEIR Assessment Boundary.
Compatible land use and neighbouring uses	Alternative Site avoids woodland and significant waterbodies (lakes ponds and reservoirs) but does comprise a greater number of trees along the field boundaries. As explained Alternative Site equally lies within the SSSI but it also borders the Goldcliff Lagoons National Nature Reserve (NNR). The nature reserve is renowned for its birdlife and was deliberately created to mitigate the impacts caused by the development of Cardiff Bay in the 1990s. Although specific bird survey data has not been obtained for the area surrounding the NNR it is reasonable to assume that the areas immediately bordering the designated reserve are likely to be more ecologically sensitive due to their proximity and the functional relationship between species. On this basis the Alternative Site is considered less optimal when compared to the PEIR Assessment Boundary which is located further away from the NNR. Alternative Site is also closely located to existing residential development along the local road network and towards the city limits. As such, the potential for impacts upon residential amenity during construction and operational phases are therefore higher than at the PEIR Assessment Boundary, where a consistent buffer

Alternative Area Alternative Site One Siting Considerations	Review of Alternative Site Suitability against the PEIR Assessment Boundary
	distance to residential dwellings of at least one field has been observed across the development boundary.
Previously developed land	Alternative Site does not comprise or include previously developed land and is 'open countryside' for planning purposes. In this respect it is equivalent to the PEIR Assessment Boundary, which is also open countryside.
Landscape and visual considerations	Alternative Site is similarly flat and is agricultural in its general character. The site also lies within the Gwent Levels Landscape of Outstanding Historic Interest. On the north western extent the Alternative Site One borders land which is allocated for commercial development under the Newport City Council Local Development Plan. Alternative Site is crossed by existing infrastructure in the form of overhead lines and minor roads. The primary landscape and visual sensitivities are the presence of two listed buildings around the eastern area of the Alternative Site One and also the National Cycle Network which runs east-west across the area. Alternative Site is also located close to a number of residential dwellings and farmsteads in and around the village of Goldcliff. Although Alternative Site One is similar in its landscape character and designations, there are key sensitivities in and around the site which would suggest that it is generally less favourable than the PEIR Assessment Boundary.

Alternative Area Alternative Site One Siting Considerations	Review of Alternative Site Suitability against the PEIR Assessment Boundary
A site of suitable size, and orientation that can accommodate the Proposed Development	Alternative Site is slightly smaller than the overall area of the PEIR Assessment Boundary, but could potentially have been utilised depending upon the results of bird survey work and if necessary, in combination with Alternative Site 2 which is also considered in this report. It is equally flat and does not include unsuitable topography. However, the field pattern is highly irregular and the fields are generally smaller than those within the PEIR Assessment Boundary. Alternative Site One area also contains a number of trees which would shade the field areas and restrict the feasible development footprint. Therefore, although the Alternative Site One is similar in its flat topography the smaller field sizes and constrained boundaries indicate that it would be less suitable than the PEIR Assessment Boundary.
A suitable site that is available for the duration of the solar development's operational life	The land is under multiple titles and is owned by different landowners, private and institutional, similar to the ownership of the land on the PEIR Assessment Boundary. Having completed an initial planning assessment it was determined that Alternative Site One did not represent a preferred alternative and so further investigations were not explored to establish the availability of the land for the necessary ecology survey work or for the lifetime of the development itself.
Site specific allocation	Alternative Site One itself is not allocated for development or renewable energy use under any local development plan. However the land adjoining the north

Alternative Area Alternative Site One Siting Considerations	Review of Alternative Site Suitability against the PEIR Assessment Boundary
	western extent of the site is allocated as site EM1(ii) an EM1 (iv) under the Newport City Council Local Development Plan (2011-2026). These allocations propose employment land and would not be sensitive to residential amenity impacts. Option One is considered to be comparable to the PEIR Assessment Boundary in this regard.
Avoiding 'Best and Most Versatile' agricultural land	The available mapping data indicates that the site is predominantly lower grade (Non-BMV) land. However, there is a small pocket of BMV Land identified towards the eastern extent of the site and this may indicate that the quality of the land is slightly better than that of the PEIR Assessment Boundary which comprises no BMV land.
Deliverability and accessibility of the site	Alternative Site One is likely to be accessible as it is served by the minor road network and it is noted that there are a number of agricultural businesses operating in the area. It is also a flat site, generally free from obstructions. However, the irregular field boundaries and small nature of the fields would make the site more challenging during the construction phase. It is also noted that the site may not prove large enough to accommodate the Proposed development on its own, and if so, additional land would be required meaning that the overall site boundary would become fragmented, with cabling required to connect each parcel. This would represent a sub-optimal development option and is to be avoided where possible. Conversely, the PEIR Assessment Boundary represents a largely contiguous development area which is more easily connected.

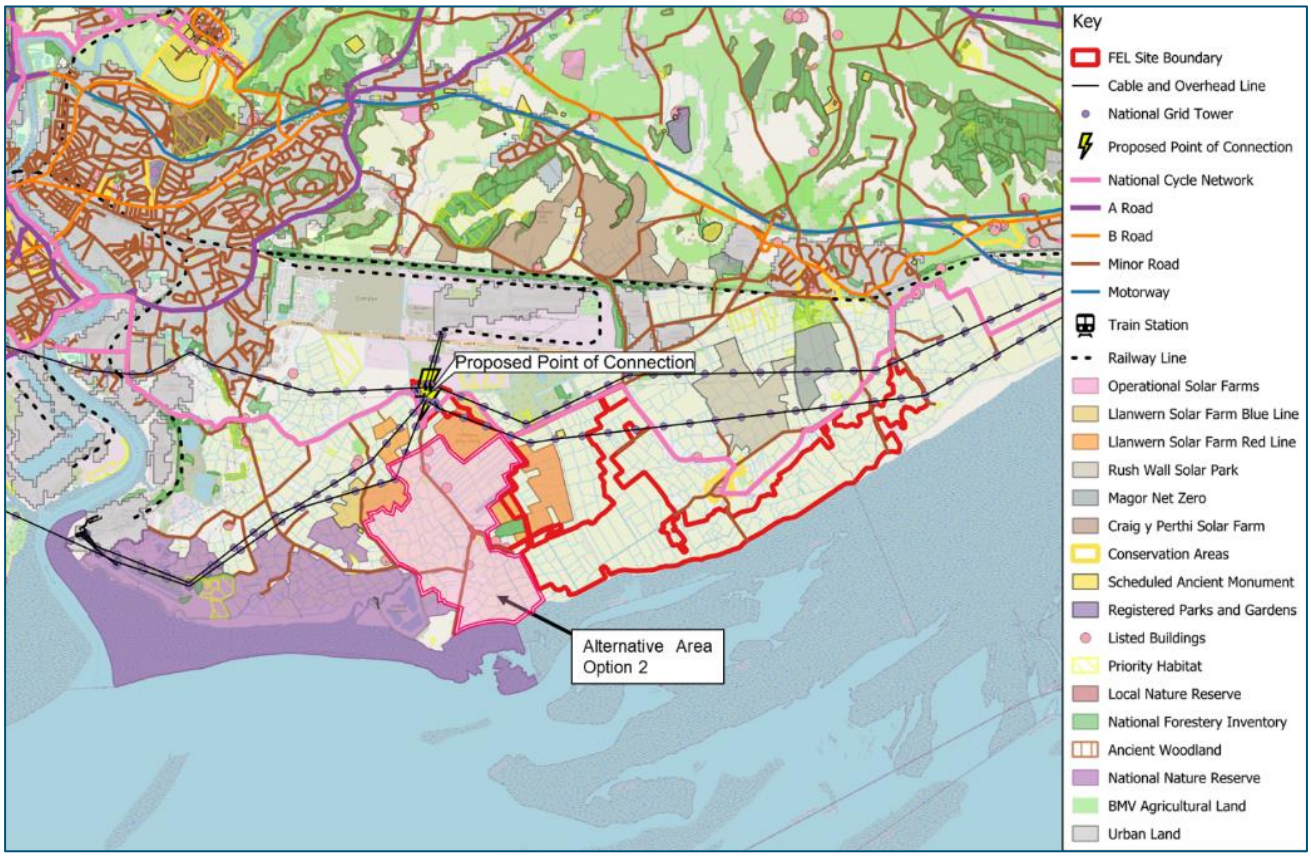
Alternative Area Alternative Site One Siting Considerations	Review of Alternative Site Suitability against the PEIR Assessment Boundary
Viability	The site area of Alternative Site One is broadly comparable to the PEIR Assessment Boundary in terms of the physical credentials which influence the viability of the development.
Overall summary against the PEIR Assessment Boundary	Alternative Site One is broadly comparable in its landscape character and its proximity to the point of grid connection. However it was considered to represent a sub-optimal option and was dismissed for the following key reasons: • Alternative Site One was considered to be more sensitive in ecological terms due to its proximity to the Goldcliff Lagoons NNR which is purpose built to mitigate ornithology impacts from the Cardiff Bay development (in addition to its proximity to the Severn Estuary SPA) and due to the increased tree cover on the field boundaries of Alternative Site One • In landscape terms Alternative Site One is bisected by the National Cycle Network. There were also listed buildings within the area which would prove sensitive to large scale development. • The smaller and irregular field boundaries, with more dense vegetation would likely impact upon the viability of the scheme and would complicate the construction phase • Alternative Site One is smaller in size overall and may not have provided sufficient land to accommodate the Proposed Development and maximise the benefits of the available grid connection(s) opportunity

Alternative Site Two

3.6.14 **Plate 3-2** illustrates Alternative Site Two which was considered at the outset of the site selection process.

3.6.15 The area shown is also to the west of the PEIR Assessment Boundary, on land between the PoC and between the existing Llanwern Solar Farm and adjacent to the Goldcliff Lagoons NNR and the coastline.

Plate 3-2 Alternative Site Two



3.6.16 As with Alternative Site One the land for Alternative Site Two is also under multiple titles and is owned by different landowners, private and institutional, similar to the ownership of the PEIR Assessment Boundary.

3.6.17 Alternative Site Two equally lies within the SSSI and borders the Goldcliff Lagoons NNR and the Severn Estuary SAC, SPA and Ramsar sites.

3.6.18 Alternative Site Two is equally flat and also avoids north facing topography. It lies within a coastal area and would benefit from a broadly equivalent level of solar irradiation. **Table** provides an overview of Alternative Site Two within the context of

the parameters defined in **Section 3.5**.

Table 3-2 Review of Alternative Area Option Two

Alternative Site Two. Siting Considerations	Review of Alternative Site Suitability against the PEIR Assessment Boundary
Levels of solar irradiation	Alternative Site Two is equally flat and also avoids north facing topography. It lies within a coastal area and would benefit from a broadly equivalent level of solar irradiation.
Compatible land use and neighbouring uses	Alternative Site Two avoids woodland and significant waterbodies (lakes ponds and reservoirs). However, it is more closely located to existing residential development around Whitson and Goldcliff. There are also a number of listed buildings within Alternative Site Two. As explained Alternative Site Two equally lies within the SSSI but it also borders the Goldcliff Lagoons National Nature Reserve (NNR). The nature reserve is renowned for its birdlife and was deliberately created to mitigate the impacts caused by the development of Cardiff Bay in the 1990s. Although specific bird survey data has not been obtained for the area surrounding the NNR it is reasonable to assume that the areas immediately bordering the designated reserve are likely to be more ecologically sensitive due to their proximity and the functional relationship between species. On this basis the site area is less optimal when compared to the preferred which is located further away from the NNR. As such, Alternative Site Two is considered to be more sensitive to this form of development than the PEIR Assessment Boundary which does not include listed buildings, avoids residential dwellings and is located away from Goldcliff Lagoons.

Alternative Site Two. Siting Considerations	Review of Alternative Site Suitability against the PEIR Assessment Boundary
Previously developed land	Alternative Site Two does not comprise or include previously developed land and is 'open countryside' for planning purposes. In this respect it is equivalent to the PEIR Assessment Boundary, which is also open countryside.
Landscape and visual considerations	Alternative Site Two is similarly flat and is agricultural in its general character. Alternative Site Two also lies within the Gwent Levels Landscape of Outstanding Historic Interest. Alternative Site Two is crossed by existing infrastructure in the form of overhead lines and minor roads. The primary landscape and visual sensitivities are the presence of six listed buildings located through Whitson and around Porton Road. The site is also located close to a number of residential dwellings and farmsteads in and around the villages of Whitson and Goldcliff. Although Alternative Site Two is similar in its landscape character and designations, there are key sensitivities in and around the site which would suggest that it is generally less favourable than the PEIR Assessment Boundary.
A site of suitable size, and orientation that can accommodate the Proposed Development	Alternative Site Two is similar in size to the preferred site. It is equally flat and does not include unsuitable topography. However, many of the fields around the northern area are very narrow making them unsuitable for solar development which favours large, open fields. Therefore, although the site is similar in its flat topography the narrow field boundaries present across Alternative Site Two indicates that it would be less suitable than the land within the PEIR Assessment Boundary.

Alternative Site Two. Siting Considerations	Review of Alternative Site Suitability against the PEIR Assessment Boundary
A suitable site that is available for the duration of the solar development's operational life	The land in Alternative Site Two comprises multiple titles and is owned by different landowners, private and institutional, similar to the ownership of the land within the PEIR Assessment Boundary. Having completed an initial planning assessment it was determined that this site did not represent a preferred alternative and so further investigations were not explored to establish the availability of the land for the necessary ecology survey work or for the lifetime of the Proposed Development itself.
Site specific allocation	Alternative Site Two itself is not allocated for development or renewable energy use under any local development plan. It is comparable to the land within the PEIR Assessment Boundary in this regard.
Avoiding 'Best and Most Versatile' agricultural land	The available mapping data indicates that Alternative Site Two is also of lower grade with no BMV Land present. This is equivalent to the land within the PEIR Assessment Boundary.
Deliverability and accessibility of the site	Alternative Site Two is likely to be accessible as it is served by the minor road network and it is noted that there are a number of agricultural businesses operating in the area. It is also a flat site, generally free from obstructions. However, the narrow field boundaries of many fields would make Alternative Site Two more challenging during the construction phase.
Viability	Alternative Site Two is broadly comparable to the PEIR Assessment Boundary in terms of the physical credentials which influence the viability of the development.
Overall summary against the PEIR Assessment Boundary	Alternative Site Two is broadly comparable in its landscape character and its proximity to the point of grid connection. However, it was considered to represent a sub-optimal option and was dismissed for the following key reasons:

Alternative Site Two. Siting Considerations	Review of Alternative Site Suitability against the PEIR Assessment Boundary
	There are a number of Listed Buildings within the boundary of Alternative Site Two which would be sensitive to large scale renewable energy development The narrow field boundaries in the northern area would likely impact upon the viability of the Proposed Development and would complicate the construction phase Alternative Site Two was considered to be more sensitive in ecological terms due to its proximity to the Goldcliff Lagoons NNR which is purpose built to mitigate ornithology impacts from the Cardiff Bay development (in addition to its proximity to the Severn Estuary SPA) and due to the increased tree cover on the field boundaries of Alternative Site Two.

3.7 Alternative Designs

Introduction

3.7.1 In addition to a review of the alternative sites, extensive consideration was also given to how a site layout / design might be configured within the Site to reduce potential effects of the Proposed Development. The layout of the Proposed Development has undergone an iterative design evolution and will continue to evolve as the EIA progresses, to ensure that environmental effects are considered appropriately, as well as taking into account and being shaped by the feedback received from stakeholders and public consultation.

3.7.2 Specifically, consideration was also given to how a site layout might be configured within the area to the south east of the National Grid Substation. In this regard the same considerations were taken into account as when selecting the overall site area and the PEIR Assessment Boundary was refined on this basis.

3.7.3 **Table** describes the alternative layouts / design amendments considered for the Proposed Development.

Table 3-3 - Main Design Iterations for the Site

Stage	Proposed Site/Layout	Consultation and Surveys which influences the proposed layout at this stage	Design evolution
1 – Pre-Application	Initial Red Line Boundary	Discussions with landowners undertaken to determine viability of the Proposed Development in this area. Identified landowner willingness and resulted in identification of red line boundary for initial surveys.	Creation of initial red line boundary for the Proposed Development.
1.1 – Pre-Application	Initial Design	N/A	The maximum extent of the PV Arrays was reduced to accommodate for existing hedgerows, trees and field margins, including the implementation of 7m and 12m buffers to reens and ditches.
2 – Scoping Layout	Scoping Red Line Boundary	Completion of extensive Ecology and Ornithology Surveys.	Identification of fields that could exceed the 1% Special Protection Area (SPA) threshold, removal of these areas from proposals to be developed.
3 – Post Scoping Layout 1	Updated Design	N/A	Refinement of cable corridors to proposed Grid Connection and inclusion of contingency areas due to National Grid uncertainty on connection type.

Stage	Proposed Site/Layout	Consultation and Surveys which influences the proposed layout at this stage	Design evolution
3.1– Post Scoping Layout 1	Red Line Alterations	Desk-based visibility splay assessment and Bridge Surveys	Minor widening of redline to account for visibility splays at proposed access points. Bridge survey identified that crossing points along the existing TaTa Steel pipeline were viable for the construction of the Proposed Development. This would allow the Applicant to look to reduce traffic flows through sensitive receptors.
3.2 – Post Scoping Layout 1	Updated Design	Desk-based design drafted, including siting of Solar Panels, Transformers, Access Tracks, Cabling, Crossing Points and Grid Connection Infrastructure.	First full design which included siting of proposed infrastructure.
3.3 – Post Scoping Layout 2	Updated Design	Landscape and Visual Impacts	Following analysis, the maximum extent of the PV Arrays was reduced along the southern boundary to reduce expected effects on the Wales Coast Path (WCP). This was in response to views from the WCP and to include the potential for landscape/ecological mitigation.

Stage	Proposed Site/Layout	Consultation and Surveys which influences the proposed layout at this stage	Design evolution
3.4 – Post Scoping Layout 2	Updated Design	Ecological Mitigation	As set out above, due to the removal reduction of extent of the PV Array at the southern boundary a proposed “bee highway” has been implemented along this route to connect shrill carder bee habitat.
3.5 – Post Scoping Layout 2	Updated Design	N/A	To minimise effects on ecological features existing access tracks and routes were used as much as practicable within the updated design.
3.6 – Post Scoping Layout 2	Updated Design	N/A	The maximum extent of the PV Arrays was reduced to accommodate setbacks to North Row, ensuring that all roads were separated by one field from the Proposed Development.
3.7 – Post Scoping Layout 2	Updated Design	N/A	Two existing Public Rights of Way (PRoW) are proposed to be rerouted along existing field boundaries to maximise the renewable energy generation of the Proposed Development.

Stage	Proposed Site/Layout	Consultation and Surveys which influences the proposed layout at this stage	Design evolution
3.8 – Post Scoping Layout 2	Updated Design	Ecological Surveys	The maximum extent of the PV Arrays was reduced in Field 70 to accommodate Dormouse mitigation proposals.
4 – PEIR Layout	N/A	N/A	Accounting for all of the above amendments the design for the Proposed Development was chilled for the purposes of this PEIR.

Next Steps

3.7.4 The design process is iterative and following the completion of statutory consultation as part of this PEIR, the design and layout of the Proposed Development will be reviewed and amended as required. Any updates to the design and or layout of the Proposed Development will be set out within the ES.

3.8 References

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Ref 3-2 Department for Energy Security and Net Zero (DESN), (2024) National Policy Statement for Energy (EN-1), Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachm ent_data/file/47854/1938-overarching-nps-for-energy-en1.pdf [Date Accessed: November 2025].

Ref 3-3 Department for Energy Security and Net Zero (DESN), (2024) National Policy Statement for Renewable Energy Infrastructure (EN-3), Available at: https://www.gov.uk/government/publications/national-policy-statement-for-renewable-energy-infrastructure-en-3 [Date Accessed: November 2025].

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Ref 3-5 Committee on Climate Change (May 2019) Net-Zero: The UK's contribution to stopping global warming' https://www.theccc.org.uk/publication/net-zero-the-ukscontribution-to-stopping-global-warming/ [Date Accessed: November 2025]

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Ref 3-8 Welsh Energy Targets (2017), [Online], available at: https://www.gov.wales/sites/default/files/publications/2019-06/energy-generation-2017- report.pdf [Accessed November 2025].

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Ref 3-11 Prosperity for All: A Low Carbon Wales (2019), [Online], available at: https://www.gov.wales/sites/default/files/publications/2019-06/low-carbon-deliveryplan_1.pdf [Accessed November 2025].

Ref 3-12 Agricultural Land Predictive Mapping Tool (2025), [Online], available at: https://www.gov.wales/agricultural-land-classification-predictive-map [Accessed November 2025].