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LANDSCAPE & VISUAL IMPACT ASSESSMENT

Ballyloo SID Substation & Grid Connection

Ballyloo, Co. Carlow

Prepared by Macro Works Ltd of Ballyloo Solar Farm Ltd

November 2025



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This LVIA should be read in conjunction with the LVIA Photomontages produced by Macro Works Ltd



1. LANDSCAPE AND VISUAL IMPACT ASSESSMENT

1.1 INTRODUCTION

This Landscape and Visual Assessment (LVIA) has been prepared to accompany a planning application for either a 110kV or 220kV electricity substation and underground grid connection, which is proposed in the townlands of Ballyloo in County Carlow.

For clarity, it should be noted that the terms 'proposed development' and 'proposed substation and grid connection' are interchangeable in this report and, where contextually relevant, references are also made to the permitted Ballyloo Solar Farm which is located adjacent to the proposed substation. It is noted that the permitted Park Solar Farm (planning ref: 2460205) and proposed Ballybannon Solar Farm (planning ref: 2560137), whilst located outside of the study area for the proposed development, will also connect into this substation and where relevant these developments are also referenced.

This LVIA describes the landscape context of the proposed substation and grid connection development and, given its proximity, the Ballyloo Solar Farm and assesses the likely landscape and visual impacts of the scheme on the receiving environment. Although closely linked, landscape and visual impacts are assessed separately.

- Landscape Impact Assessment (LIA) relates to assessing effects of a development on the landscape as a resource in its own right and is concerned with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character.
- Visual Impact Assessment (VIA) relates to assessing effects of a development on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements. Visual impacts may occur from; Visual Obstruction (blocking of a view, be it full, partial or intermittent) or; Visual Intrusion (interruption of a view without blocking).

1.1.1 Approach and Statement of Authority

This LVIA adopts an approach that is founded in the following best practice guidance documents:

- Landscape Institute and the Institute of Environmental Management and Assessment (IEMA) publication entitled Guidelines for Landscape and Visual Impact Assessment, 2013 (GLVIA3);
- Environmental Protection Agency (EPA) publication 'Guidelines on the Information to be contained in Environmental Impact Statements (2022); and
- 'Photography and Photomontage in Landscape and Visual Impact Assessment', Landscape Institute Technical Guidance Note 06/2019.

This LVIA was prepared by Macro Works Ltd of Cherrywood Business Park, Loughlinstown, Dublin 18; a consultancy firm specialising in Landscape and Visual Assessment and associated maps and graphics. Macro Works' relevant experience includes a broad range of infrastructural, renewable energy, industrial and commercial projects since 1999, including numerous urban, residential, and mixed use development projects.

1.1.2 Description of the Proposed Development

The proposed substation will be either an Air Insulated Switchgear (AIS) or Gas Insulated Switchgear (GIS) tail fed substation with the associated grid connection comprising underground cabling which will connect into the existing 220/110kV Kellis substation.

The applicant proposes design flexibility for the following development, as follows:

- The substation will be either 110kV or 220kV voltage. The 110kV substation will use Air Insulated Switchgear (AIS) switchgear, whilst the 220kV substation might use AIS or Gas Insulated Switchgear (GIS) depending on the requirements of EirGrid.
- The underground cable grid connection from the proposed substation to the existing 110/220kV Kellis substation will be at either 110kV or 220kV voltage.
- The underground cable grid connection is located primarily in the public road network. However, there are two options proposed for its final entry into the existing 220/110kV Kellis substation.
 - Option A is to leave the L30535 local road and enter onto private lands where it will cross agricultural farmland into the existing 220/110kV Kellis substation.
 - Option B is to be situated within the L30535 local road which provides road access into the existing 220/110kV Kellis substation.
 - It should be noted that the options described above apply to both the 110kV and 220kV underground grid connection cables.

It should be noted that the red line development application boundary is identical for the substation options and the grid connection options. This assessment considers all substation and grid connection options.

The operational lifetime of the solar farms is assumed to be 40 years. However, following the decommissioning of the solar farm, it is envisaged that the substation (and underground cable grid connection) will remain in situ as a valuable functioning and operational part of the electricity transmission network managed by the Transmission Systems Operator, EirGrid.

1.2 METHODOLOGY

This document uses methodology as prescribed in the previously mentioned GLVIA3, which follows the European Landscape Convention (ELC) definition of landscape:

‘Landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors’ (Council of Europe, 2000). Thus, GLVIA-2013 covers all landscapes from “high mountains and wild countryside to urban and fringe farmland (rural landscapes), marine and coastal landscapes (seascapes) and the landscapes of villages towns and cities (townscapes)” - whether protected or degraded.

1.2.1 Scope of the Assessment

GLVIA3 establishes guidelines and not a specific methodology. The preface recognises that:

‘This edition concentrates on principles and processes. It does not provide a detailed or formulaic ‘recipe’ that can be followed in every situation – it remains the responsibility of the professional to ensure that the approach and methodology adopted are appropriate to the task in hand.’

The methodology for this assessment has therefore been developed specifically for this assessment to ensure that it is appropriate and fit for purpose. The LVIA Methodology can be summarised as undertaking the following key tasks:

- Desk study and site visits in Summer 2025;
- Defining the Baseline Landscape setting and conditions;
- Identification and Evaluation of key components of the proposed development;
- Consideration of Mitigation Measures;

- Assessment of Landscape Effects;
- Assessment of Visual Effects; and
- Summary Statement of Significance.

It should be noted that the underground grid connection was scoped out for further assessment due to its underground nature.

1.2.2 **Study Area**

From similar studies, it is anticipated that the proposed development of solar farms (and associated substations and underground cable grid connections) is likely to be difficult to discern beyond approximately 5km and is not likely to give rise to significant landscape or visual impacts beyond approximately 2km. In the interests of a comprehensive appraisal, a 5km radius study area is used in this instance. However, there will be a particular focus on receptors contained within 2km, except where iconic or designated scenic viewpoints exist at greater distances out to 5km (refer to Figure 1.1). A study area of 5km has typically been used for solar projects in Ireland, Northern Ireland and Great Britain and this approach has been deemed acceptable by multiple planning authorities including Carlow County Council and An Coimisiún Pleanála. In the context of the proposed 110kV/220kV substation and grid connection which is the subject of this application to An Coimisiún Pleanála the 5km study area is considered conservative as the development area is of significantly smaller geographical scale than the associated solar farms.



1.2.3.1 Landscape Sensitivity

The sensitivity of the landscape to change is the degree to which a particular setting can accommodate changes or new elements without unacceptable detrimental effects to its essential characteristics. In accordance with GLVIA3, the sensitivity of a landscape receptor (Landscape Character Area or feature) is derived from combining judgements in relation to its susceptibility to change and its value. The judgement reflects such factors as its quality, value, contribution to landscape character and the degree to which the particular element or characteristic can be replaced or substituted. Landscape Sensitivity is classified using the following criteria set out in Table 1-1.

Table 1-1 Landscape Value and Sensitivity

Sensitivity	Description
Very High	Areas where the landscape character exhibits a very low capacity for change in the form of development. Examples of which are high value landscapes, protected at an international or national level (World Heritage Site/National Park), where the principal management objectives are likely to be protection of the existing character.
High	Areas where the landscape character exhibits a low capacity for change in the form of development. Examples of which are high value landscapes, protected at a national or regional level (Area of Outstanding Natural Beauty), where the principal management objectives are likely to be considered conservation of the existing character.
Medium	Areas where the landscape character exhibits some capacity and scope for development. Examples of which are landscapes, which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use.
Low	Areas where the landscape character exhibits a higher capacity for change from development. Typically, this would include lower value, non-designated landscapes that may also have some elements or features of recognisable quality, where landscape management objectives include, enhancement, repair and restoration.
Negligible	Areas of landscape character that include derelict, mining, industrial land or are part of the urban fringe where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of landscape improvements and/or restoration to realise a higher landscape value.

1.2.4 Magnitude of Change – Landscape

The magnitude of change is a product of the scale, extent or degree of change that is likely to be experienced as a result of the proposed development and to a lesser extent the duration and reversibility of that effect. The magnitude takes into account whether there is a direct physical impact resulting from the loss of landscape components and/or a change that extends beyond the immediate setting that may have an effect on the landscape character. Table 1-2 outlines criteria used to inform this judgement.

Table 1-2 Magnitude of Change – Landscape

Criteria	Description
Very High	Change that would be large in extent and scale with the loss of critically important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an extensive change of the landscape in terms of character, value and quality.

High	Change that would be more limited in extent and scale with the loss of important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to a considerable change of the landscape in terms of character, value and quality.
Medium	Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to noticeable changes in landscape character, and quality.
Low	Changes affecting small areas of landscape character and quality, together with the loss of some less characteristic landscape elements or the addition of new features or elements that would lead to discernible changes in landscape character, and quality.
Negligible	Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable leading to no material change to landscape character, and quality.

1.2.5 Visual Impact Assessment Criteria

This part of the LVIA provides an assessment of how the introduction of the proposed development will affect views within the landscape. It therefore needs to consider:

- Direct impacts of the proposed development upon views through intrusion or obstruction;
- The reaction of viewers who may be affected, e.g. residents, walkers, road users; and
- The overall impact on visual amenity.

It has been deemed appropriate to structure the assessment around a series of representative viewpoint locations. All viewpoints are located within the public domain and are representative of views available from main thoroughfares and pedestrian areas within the vicinity of the proposed development. The selected viewpoints are considered to be comprehensive in communicating the variable nature of the visual effects.

When assessing the potential visual effects of the development, the sensitivity of the visual receptor is weighed against the magnitude of the visual impact to determine the significance of the visual effect. Criteria outlined below are used to guide these judgements.

1.2.5.1 *Sensitivity of Visual Receptors*

As with landscape sensitivity, the sensitivity of a visual receptor is categorised as Very High, High, Medium, Low, and Negligible. Unlike landscape sensitivity however, the sensitivity of visual receptors has an anthropocentric (human) basis. It considers factors such as the perceived quality and values associated with the view, the landscape context of the viewer, the likely activity the viewer is engaged in and whether this heightens their awareness of the surrounding environment.

A list of the factors considered by the assessor in estimating the level of sensitivity for a particular visual receptor is outlined below to establish visual receptor sensitivity at each viewpoint location.

1.2.5.2 *Susceptibility of Visual Receptors to Change*

In accordance with GLVIA3, visual receptors most susceptible to changes in views and visual amenity are:

- “Residents at home;

- *People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focussed on the landscape and on particular views;*
- *Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience;*
- *Communities where views contribute to the landscape setting enjoyed by residents in the area;*
- *Travellers on road rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened”.*
- *Visual receptors that are less susceptible to changes in views and visual amenity include;*
- *“People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape;*
- *People at their place of work whose attention may be focussed on their work or activity, not their surroundings and where the setting is not important to the quality of working life”.*

1.2.5.3 Values attached to Views

The value attached to a view is determined by considering the following:

- Recognised scenic value of the view (Development Plan designations, guidebooks, touring maps, postcards etc). These represent a consensus in terms of which scenic views and routes within an area are strongly valued by the population because in the case of County Development Plans, for example, a public consultation process is required;
- Views from within highly sensitive landscape areas. These are likely to be in the form of Architectural Conservation Areas, which are incorporated within the Development Plan and therefore subject to the public consultation process. Viewers within such areas are likely to be highly attuned to the landscape around them;
- Primary views from residential receptors. Even within a dynamic city context, views from residential properties are an important consideration in respect of residential amenity;
- Intensity of use, popularity. This relates to the number of viewers likely to experience a view on a regular basis and whether this is significant at a national or regional scale;
- Provision of vast, elevated panoramic views. This relates to the extent of the view on offer and the tendency for receptors to become more attuned to the surrounding landscape at locations that afford broad vistas;
- Sense of remoteness and/or tranquillity. Receptors taking in a remote and tranquil scene, which is likely to be fairly static, are likely to be more receptive to changes in the view than those taking in the view of a busy street scene, for example;
- Degree of perceived naturalness. Where a view is valued for the sense of naturalness of the surrounding landscape it is likely to be highly sensitive to visual intrusion by distinctly manmade features;
- Presence of striking or noteworthy features. A view might be strongly valued because it contains a distinctive and memorable landscape / townscape feature such as a cathedral or castle;
- Historical, cultural and / or spiritual significance. Such attributes may be evident or sensed by receptors at certain viewing locations, which may attract visitors for the purposes of contemplation or reflection heightening the sense of their surroundings;
- Rarity or uniqueness of the view. This might include the noteworthy representativeness of a certain landscape type and considers whether the receptor could take in similar views anywhere in the broader region or the country;
- Integrity of the landscape character. This looks at the condition and intactness of the landscape in view and whether the landscape pattern is a regular one of few strongly related components or an irregular one containing a variety of disparate components;

- Sense of place. This considers whether there is special sense of wholeness and harmony at the viewing location;
- Sense of awe. This considers whether the view inspires an overwhelming sense of scale or the power of nature.

Those locations which are deemed to satisfy many of the above criteria are likely to be of higher sensitivity, and no relative importance is inferred by the order of listing.

It is recognised that a viewer's interpretation and experience of the landscape can have preferential and subjective components. Where relevant, judgements are made on those elements of the landscape that are considered to contribute more prominently and positively to the visual landscape resource as well as those elements that contribute negatively. Overall sensitivity may be a result of a number of these factors or, alternatively, a strong association with one or two in particular.

1.2.6 **Magnitude of Change – Visual**

The magnitude of change is again a product of the scale, extent, or degree of change that is likely to be experienced as a result of the proposed development. This is directly influenced by its 'visual presence / prominence', as experienced by visual receptors in the landscape. These terms are somewhat quantitative in nature, and essentially relate to how noticeable or 'dominant' the proposal is within a particular view. Aside from the obvious influence of scale and distance, a development's visual presence is influenced by the extent and complexity of the view, contextual movement in the landscape, the nature of its backdrop, and its relationship with other focal points or prominent features within the view. It is often, though not always, expressed using one of the following terms: Minimal; Sub-dominant; Co-dominant; Dominant; Highly dominant. Criteria used to inform judgements are provided in Table 1-3.

Table 1-3 Magnitude of Change – Visual

Criteria	Description
Very High	Complete or very substantial change in view, dominant, involving complete or very substantial obstruction of existing view or complete change in character and composition of baseline, e.g., through removal of key elements.
High	A major change in the view that is highly prominent and has a strong influence on the overall view. This may involve the substantial obstruction of existing views or a complete change in character and composition of baseline, e.g. through removal of key elements or the introduction of new features that would heavily influence key elements.
Medium	Moderate change in view: which may involve partial obstruction of existing view or partial change in character and composition of baseline, i.e., pre-development view through the introduction of new elements or removal of existing elements. Change may be prominent but would not substantially alter scale and character of the surroundings and the wider setting. View character may be partially changed through the introduction of features which, though uncharacteristic, may not necessarily be visually discordant.
Low	Minor change in baseline, i.e. pre-development view - change would be distinguishable from the surroundings whilst composition and character would be similar to the pre change circumstances.
Negligible	Very slight change in baseline, i.e. pre-development view - change would be barely discernible. Composition and character of view substantially unaltered.

1.2.7 **Significance of Effect**

The significance of a landscape or visual effect is based on a balance between the sensitivity of the receptor and the magnitude of change, and is categorised as Profound, Substantial, Moderate, Slight, or Imperceptible. Intermediate judgements are also provided to enable an effect to be more accurately described where relevant. 'No Effect' may also be recorded as appropriate where the effect is so negligible it is not noteworthy.

The significance category judgement is arrived at using the Significance Matrix at Table 1-4 as a guide. This applies the principle of significance being a function of magnitude weighed against sensitivity, but employs slightly different terminology that avoids the potentially confusing use of the term 'significant' (as recommended by GLVIA3 Statement of Clarification 1/13 (Landscape institute, 10th June 2013)).

Indicative criteria descriptions used in relation to the significance of effect category are presented at Table 1-5.

Table 1-4 Significance Matrix

	Sensitivity of Receptor				
Magnitude	Very High	High	Medium	Low	Negligible
Very High	Profound	Profound-substantial	Substantial	Moderate	Slight
High	Profound-substantial	Substantial	Substantial-moderate	Moderate-slight	Slight-imperceptible
Medium	Substantial	Substantial-moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

Table 1-5 Indicative significance of effect criteria descriptions

	Landscape	Visual
Profound	There are notable changes in landscape characteristics over an extensive area or a very intensive change over a more limited area.	The view is entirely altered, obscured or affected.
Substantial	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the landscape. There are notable changes in landscape characteristics over a substantial area or an intensive change over a more limited area.	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the visual environment. The proposal affects a large proportion of the overall visual composition, or views are so affected that they form a new element in the physical landscape.
Moderate	An effect that alters the character of the environment in a manner that is	An effect that alters the character of the visual environment in a manner that is

	consistent with existing and emerging baseline trends. There are minor changes over some of the area or moderate changes in a localised area.	consistent with existing and emerging trends. The proposal affects an appreciable segment of the overall visual composition, or there is an intrusion in the foreground of a view.
Slight	An effect which causes noticeable changes in the character of the landscape without affecting its sensitivities. There are minor changes over a small proportion of the area or moderate changes in a localised area or changes that are reparable over time.	An effect which causes noticeable changes in the character of the visual environment without affecting its sensitivities. The affected view forms only a small element in the overall visual composition or changes the view in a marginal manner.
Imperceptible	An effect capable of measurement but without noticeable consequences. There are no noticeable changes to landscape context, character or features.	An effect capable of measurement but without noticeable consequences. Although the development may be visible, it would be difficult to discern resulting in minimal change to views.

It is important that the likely effects of the proposals are transparently assessed and understood in order that the determining authority can bring a balanced, well-informed judgement to bear when making a planning decision.

As such, whilst the significance matrix and criteria provide a useful guide, the significance of an effect is ultimately determined by the landscape specialist using professional judgement, and also in the context of occasionally using hybrid judgements to account for nuance.

Effects assessed as 'Substantial' or greater (shaded cells) are considered to be the most notable in landscape and visual terms, and may be regarded as 'Significant', albeit it is important to note that this is not a reflection on their acceptability in planning terms.

1.2.8 Quality of Effects

In addition to assessing the significance of landscape and visual effects, the quality of the effects is also determined. Within this LVIA, effects are described as negative/adverse, neutral, or positive/beneficial, and the following criteria has been used to guide these judgements.

- Positive/beneficial - A change which improves the quality of the environment, enhancing the existing view/landscape;
- Neutral - No effects or effects that are imperceptible, within normal bounds of variation e.g. will neither detract from nor enhance the existing view/landscape;
- Negative/adverse - A change which reduces the quality of the environment, detracting from the existing view/landscape.

In the case of new energy / infrastructure developments within rural and semi-rural settings, the landscape and visual change brought about by an increased scale and intensity of built form is seldom considered to be positive / beneficial. Effects in these contexts are generally considered to be adverse in nature, or neutral, where the effect has little influence on the landscape/views.

1.3 LANDSCAPE AND VISUAL POLICY CONTEXT AND DESIGNATIONS

1.3.1 Carlow County Development Plan 2022-2028

A landscape Character Assessment has been incorporated in the Carlow County Development Plan. This separates the county into four specific landscape character types (LCTs) (Figure 1.2 and Figure 1.3 refer). The proposed development and wider Ballyloo Solar Farm are situated in the LCA 'Central Lowlands' which is described as *"primarily rural...with medium to quite large fields defined by well maintained and generally low hedges and occasional to frequent hedgerow trees."* Within the LCA 'central lowlands', three landscape character types occur, with the proposed development and wider solar farm are situated across the LCTs 'farmed lowlands' and 'farmed ridges'.

The LCA 'central lowlands' is *"deemed to be moderately sensitive to development. It has capacity to absorb most types of development subject to the implementation of appropriate mitigation measures."* The majority of the 'central lowlands' LCA and the entirety of the 'Farmed Lowland' LCT are situated in a class 2(decreasing) /3(moderate) sensitivity designation, whilst the 'farmed ridges' LCT is classified with a '4-Increasing' landscape sensitivity (Figure 1.4 refers). Whilst no direct reference is made to electrical infrastructure within the landscape character assessment, it does state that the LCA 'central lowlands' has *"a relatively high capacity to accommodate wind farming", "a medium capacity to absorb rural housing and urban expansion"* and a *"low potential capacity to absorb plantation forestry or industrial development"* as examples. Nevertheless, it is important to note that the Table 9.2, Chapter 9 of the current CDP identifies slightly contradictory land uses capacities. With regard to the LCA 'central lowlands' it states that wind farming has a 'Moderate' potential to accommodate wind farming, a 'Moderate' capacity to accommodate forestry plantation, whilst the 'central lowlands' is still classified with a 'Low' capacity to accommodate industrial development.

Within the landscape character assessment of County Carlow a number of general recommendations are outlined with regard to the LCA 'central lowlands'. Some of these have been deemed relevant to the proposed development and are included below:

- *Maintain the existing grain of the landscape with its well-developed pattern of fields, hedgerows, trees and shelterbelts.*
- *Review the hedge maintenance regime. Overcutting reduces species richness and consequently, their contribution to biodiversity.*
- *Discourage the replacement of hedgerow boundaries with wire fences.*
- *Encourage the use of native and indigenous planting in new developments to integrate buildings into the surrounding landscape. Compile a list of suitable trees and shrubs for planting in the County.*
- *The use of traditional styles, materials and colours in new developments should be encouraged.*
- *New developments should not be sited in prominent locations such as ridges and areas with open exposed vistas.*

The landscape character assessment also outlines some general policy objectives regarding the 'central lowlands' LCA:

- *Conservation, restoration and enhancement of the existing landscape character.*
- *New developments to maintain integrity of landscape character area through careful location, siting and design.*
- *The current CDP also outlines landscape policies and objectives in section 9.8, some of which are relevant to the proposed development.*

Chapter 10 Natural Heritage

Chapter 10 of the development plan 'Built and Natural Heritage' incorporates subsection 10.6 that relates to woodlands, trees and hedgerows. Within this, it describes these resources as *"an important natural and landscape asset in County Carlow. They inform the landscape character of the county and enhance the movement of wildlife through it, providing a biodiversity function in the provision of food, habitat, and shelter in exposed areas. Woodlands, trees and hedgerows also provide wider environmental benefits, functioning as pollution filters and carbon sinks."* This section is of particular relevance to the proposed development and wider Ballyloo solar farm as the site has been designed to have a minimal impact on surrounding vegetation and to enhance any degraded portions of hedgerows. Objectives relating to woodlands, trees and hedgerows are included within the development plan, some of which are relevant to the site in question and are included below.

Woodland, Trees and Hedgerow – Policies:

WT. P1: *Protect and manage existing woodlands, trees and hedgerow which are of amenity or biodiversity value and/or contribute to landscape character and ensure that proper provision is made for their consideration, protection and management when undertaking, approving or authorising development.*

WT. P2: *Ensure that hedgerow removal to facilitate development is kept to an absolute minimum and, where unavoidable, a requirement for mitigation planting will be required comprising a hedge of similar length and species composition to the original, established as close as is practicable to the original and where possible linking in to existing adjacent hedges. Native plants of a local provenance should be used for any such planting.*

WT. P3: *Adhere to the provisions of the Wildlife Act 1976 (as amended) in prohibiting the cutting of hedges during the bird nesting season (1st March to 31st August), except in certain legally defined circumstances.*

WT. P4: *Encourage the protection of historic hedgerows or significant hedgerows which serve to link habitat areas to each other and the surrounding countryside.*

WT. P5: *Recognise the biodiversity and archaeological importance of townland boundaries, including hedgerows, and promote their protection and retention.*

WT. P6: *Protect individual or groups of trees which are important for environmental, recreational, historical, biodiversity and/or aesthetic reasons or by reason of contribution to sense of place, and to discourage the felling of mature trees to facilitate development.*

Woodland, Trees and Hedgerow – Objectives:

WT. O1: *Promote the Native Woodland and Neighbourwood schemes and other initiatives that aim to establish and enhance woodlands for recreational and wildlife benefits.*

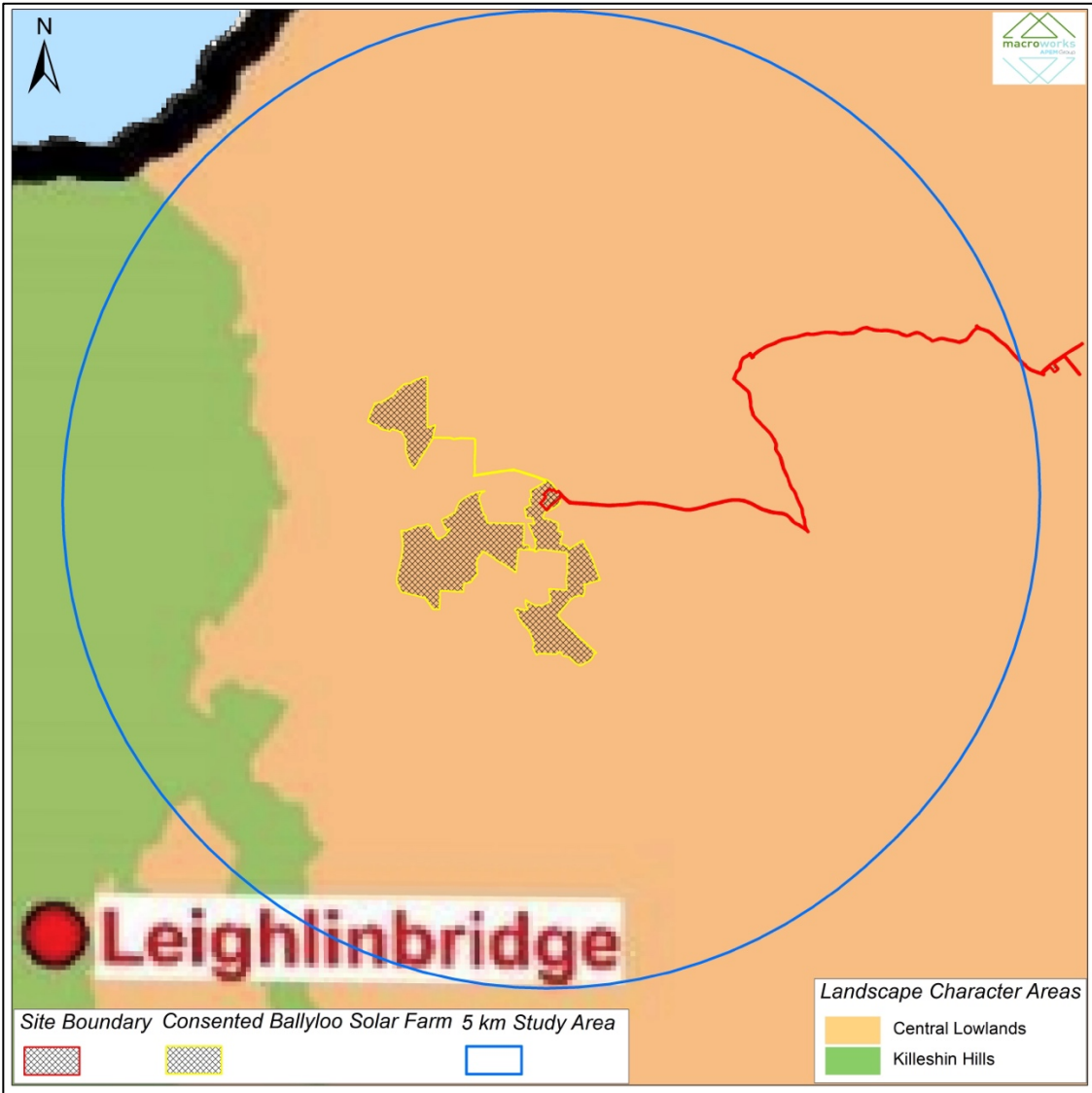


Figure 1.2 Excerpt from Carlow County Landscape Character Assessment, map 15 showing approximate location of proposed development and wider solar farms in relation to principal landscape character areas.

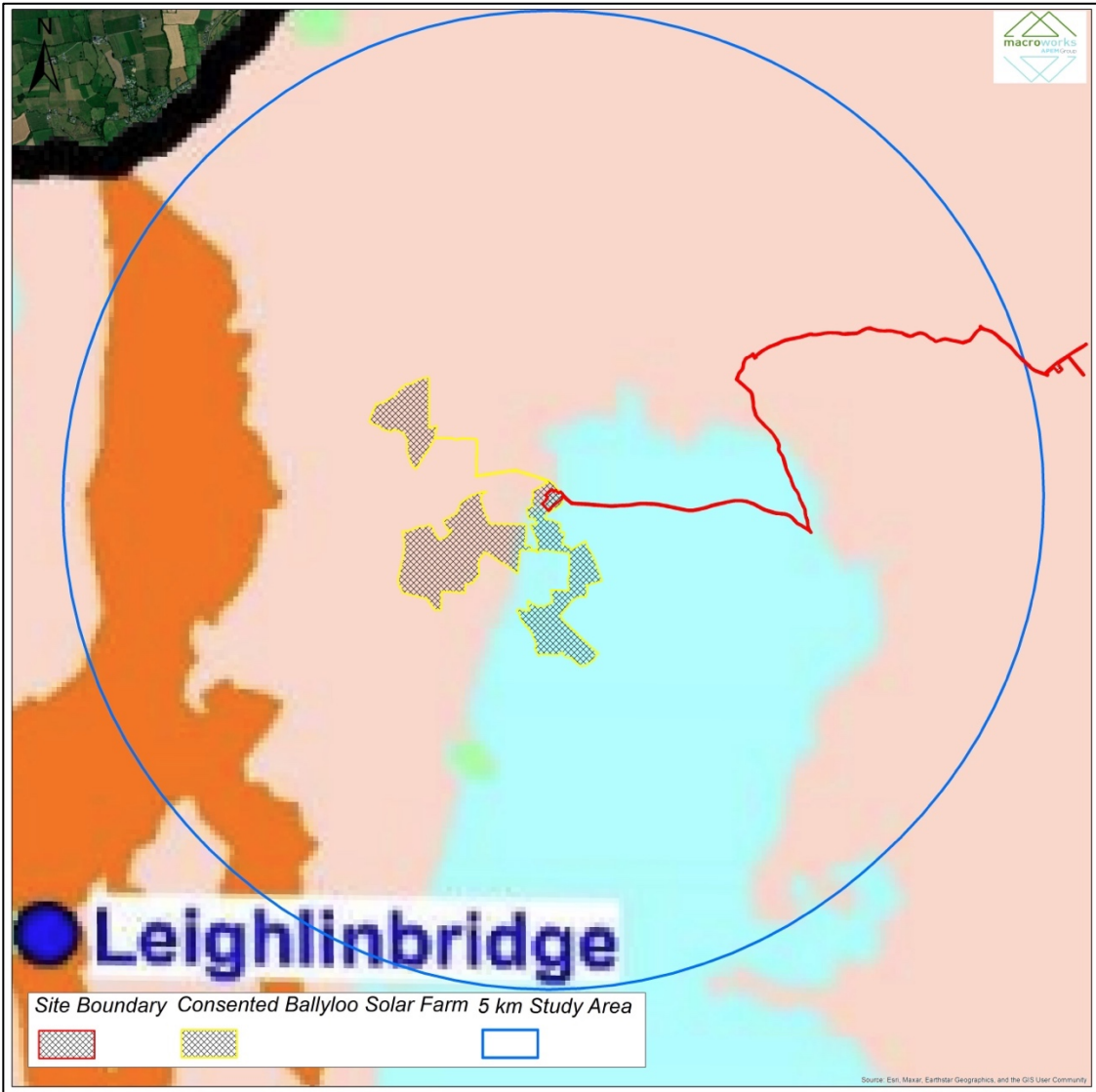


Figure 1.3 Excerpt from Carlow County Landscape Character Assessment, showing a location of proposed development (Red Line) and wider solar farms (Yellow Line) in relation to principal landscape character types.

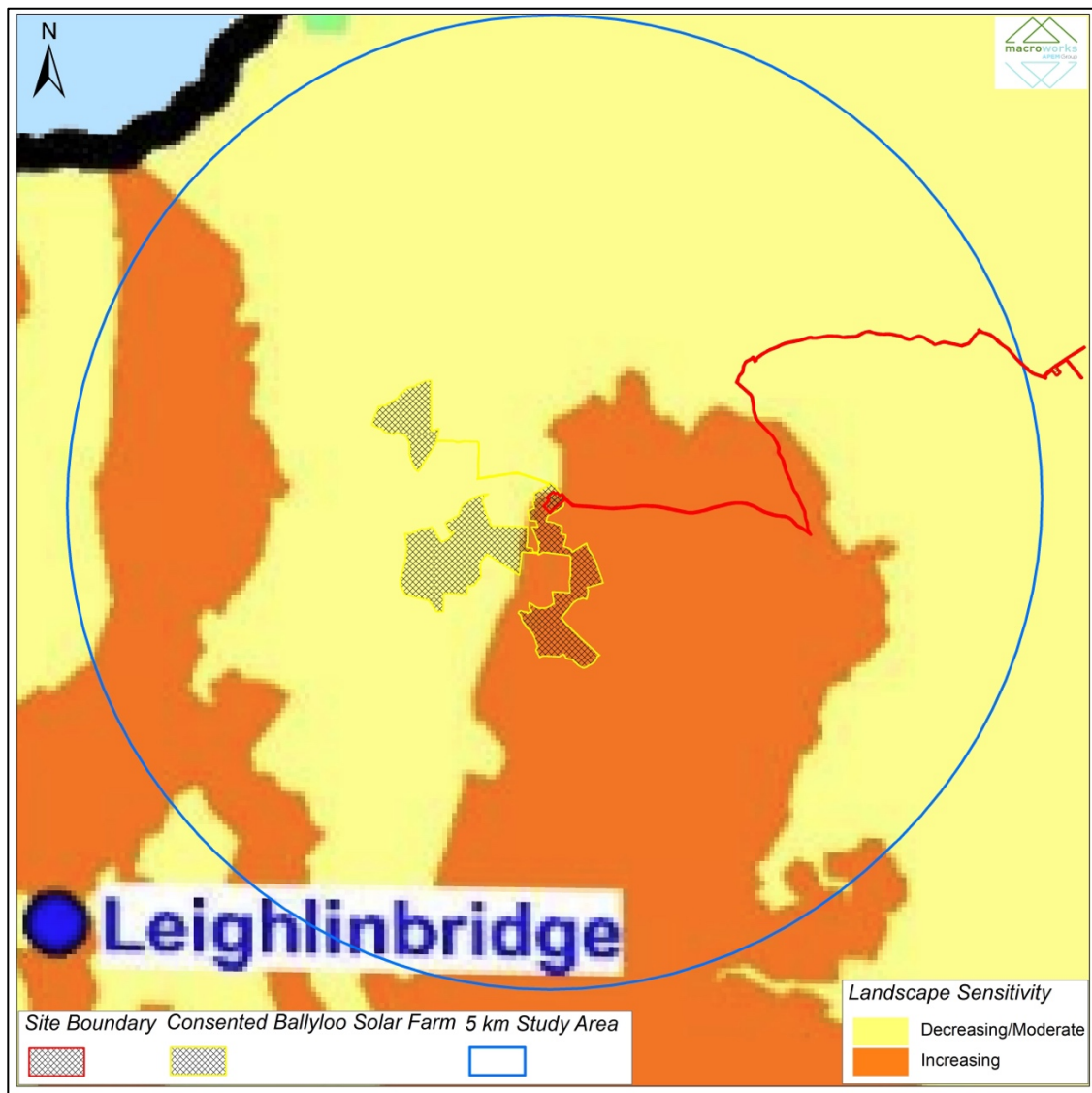


Figure 1.4 Excerpt from Carlow County Landscape Character Assessment, showing approximate location of proposed development (Red Line) and wider solar farms (Yellow Line) in relation to landscape sensitivities.

Carlow County Development Plan 2015-2021: Appendix 6 - Carlow Renewable Energy Strategy

A renewable energy strategy is included in Appendix 6 of the current Carlow CDP. Section 6.2 relates to solar energy and considers the solar energy resource in County Carlow, describing the resource and the associated energy conversion technologies. Section 6.2 includes a mapping exercise that applies a risk-based approach to suitability for solar farms. The risk levels are defined as follows:

- **High Risk:** natural constraint with high sensitivity or adjacent to sensitive receptor/material asset etc.
- **Medium Risk:** natural constraint with medium sensitivity or given distances from sensitive receptor etc.
- **Low Risk:** natural constraint with low sensitivity or further distance from sensitive receptor etc.
- **No identified Risk:** natural constraint with no identified risk or far from any sensitive receptor etc.

It is important to note that the CDP states “the presence of a risk category in and of itself does not support nor preclude solar development; it is a tool which flags areas of having a higher or lower concentration/distance from various sensitive receptors.” With regard to the consented Ballyloo Solar Farm development, the western half of the site is contained across and ‘Available Area with No Risk Identified, whilst the more elevated parts of the site to the east are contained across and area identified as ‘Available Areas with High Risk’ (refer to Figure 1.5). It should be noted that ACP consented the full extent of the Ballyloo Solar farm development, even those lands contained within the 'Available Areas with High Risk'.

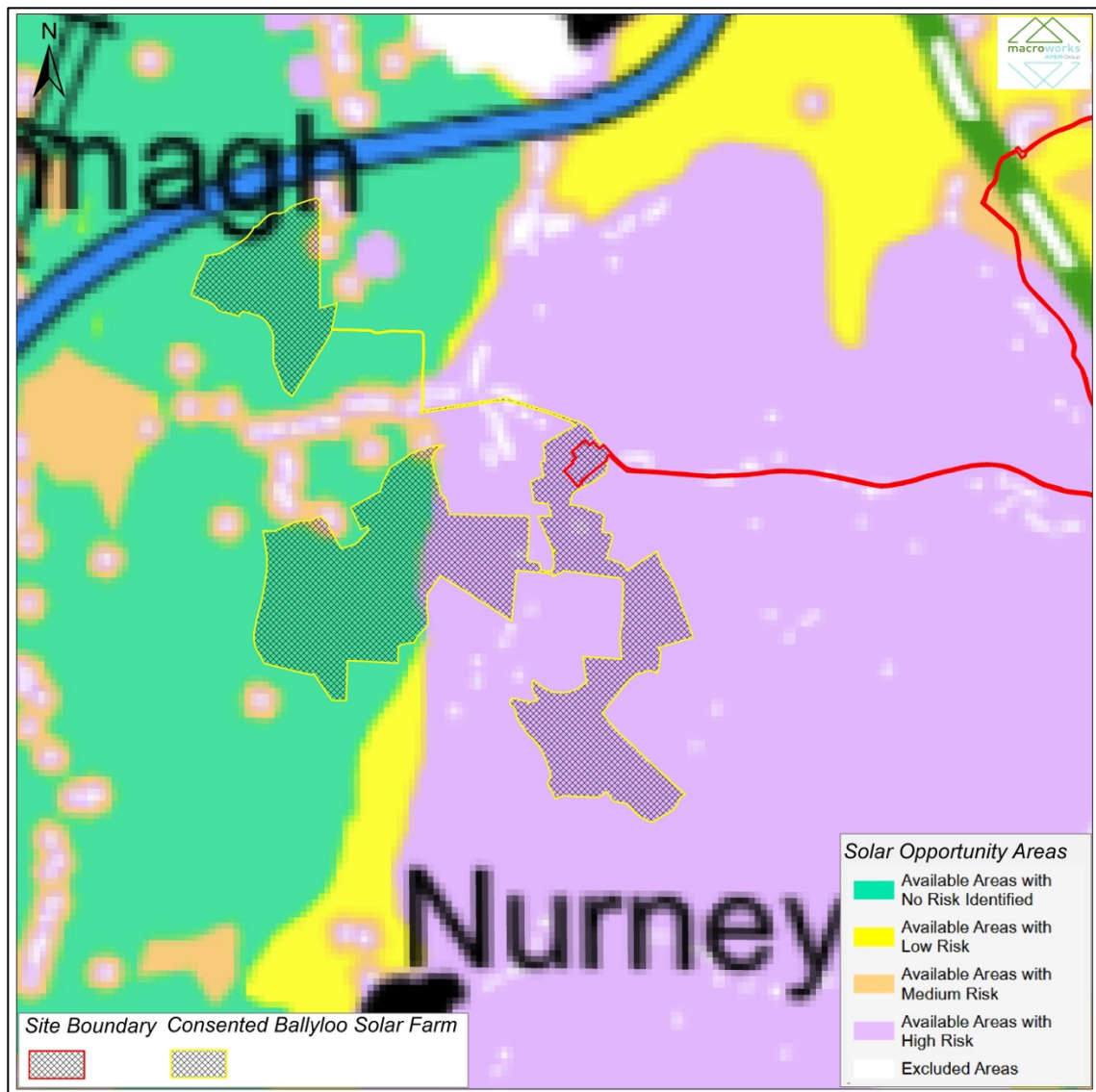


Figure 1.5 Excerpt from the Carlow Development Plan 2022-2028 showing solar opportunity areas in relation to the proposed development. (Yellow pattern denotes 'Available Areas with Low Risk', Green Pattern denotes 'Available Areas with No Risk', Purple Areas denote 'Available Areas with High Risk')

1.3.2 Views of Recognised Scenic Value – Carlow County Development Plan 2022-2028

Views of recognised scenic value are primarily indicated within Development Plans in the context of scenic views/routes designations, but they might also be indicated on touring maps, guide books, websites, road side rest stops or on post cards that represent the area.

Within the 5km extent there are a number of designated scenic views and routes which are outlined below:

Scenic Views

- Scenic View 24 – Vista 280-320, of Burren River Valley
- Scenic View 25 – View southeast, of tree ridge and church
- Scenic View 26 – Vista southeast, panorama of central plain to Blackstairs
- Scenic View 27 – View 280-340, of hill with forest at Newtown/Bradley's Cross
- Scenic View 28 – Vista west, of Killeshin Hills

Scenic Routes

- Scenic Route 4 – R725-17, Central Plain at Grangford Road
- Scenic Route 5 – L3052-42, Mixed landscape low level to west at Ballyryan
- Scenic Route 9 – L3041-19, Panorama across central plain, Tomard Lower

All scenic designations within the study area have been visited during fieldwork investigations. Where there is potential for visibility of the proposed development, a representative view has been included within the visual impact appraisal.

1.4 EXISTING ENVIRONMENT

1.4.1 Landscape Baseline

The landscape baseline represents the existing landscape context and is the scenario against which any changes to the landscape brought about by the proposed development will be assessed. A description of the landscape context of the proposed substation, Ballyloo solar farm and wider study area is provided below under the headings of landform and drainage, vegetation and land use, centres of population and houses, transport routes and public amenities and facilities. Although this description forms part of the landscape baseline, many of the landscape elements identified also relate to visual receptors i.e. places and transport routes from which viewers can potentially see the proposed development. The visual resource will be described in greater detail in **1.4.2**.

1.4.1.1 *Landform and Drainage*

The site of the proposed substation and wider solar farm comprise a mix of flat to low rolling terrain in County Carlow's Central Plain. The western extents of the study area, comprise more open flat lands, whilst the site of the proposed substation is located across the west-facing extent of a locally elevated farmed ridge that rises to a maximum height of c. 208m at Newtown Hill, which is situated some c. 3km south of the substation. Whilst the eastern and south-eastern aspects of the study area are influenced by this locally elevated plateau of ridges and hills, the western and northern half of the study is contained in relatively flat areas of terrain, with the River Barrow presenting as the most notable landscape feature. The River Barrow flows through the study area in a southerly direction and is located some 4km west of the substation development at its nearest point. The Burren River also flows through the study area throughout its eastern and northern extents and is located some 4.8km northeast of the proposed substation at its nearest point. In the wider western extents of the study area, the terrain begins to rise swiftly towards the Castlecomer Plateau, a broad elevated plateau that backdrops many of the elevated views afforded to the west within the central study area.

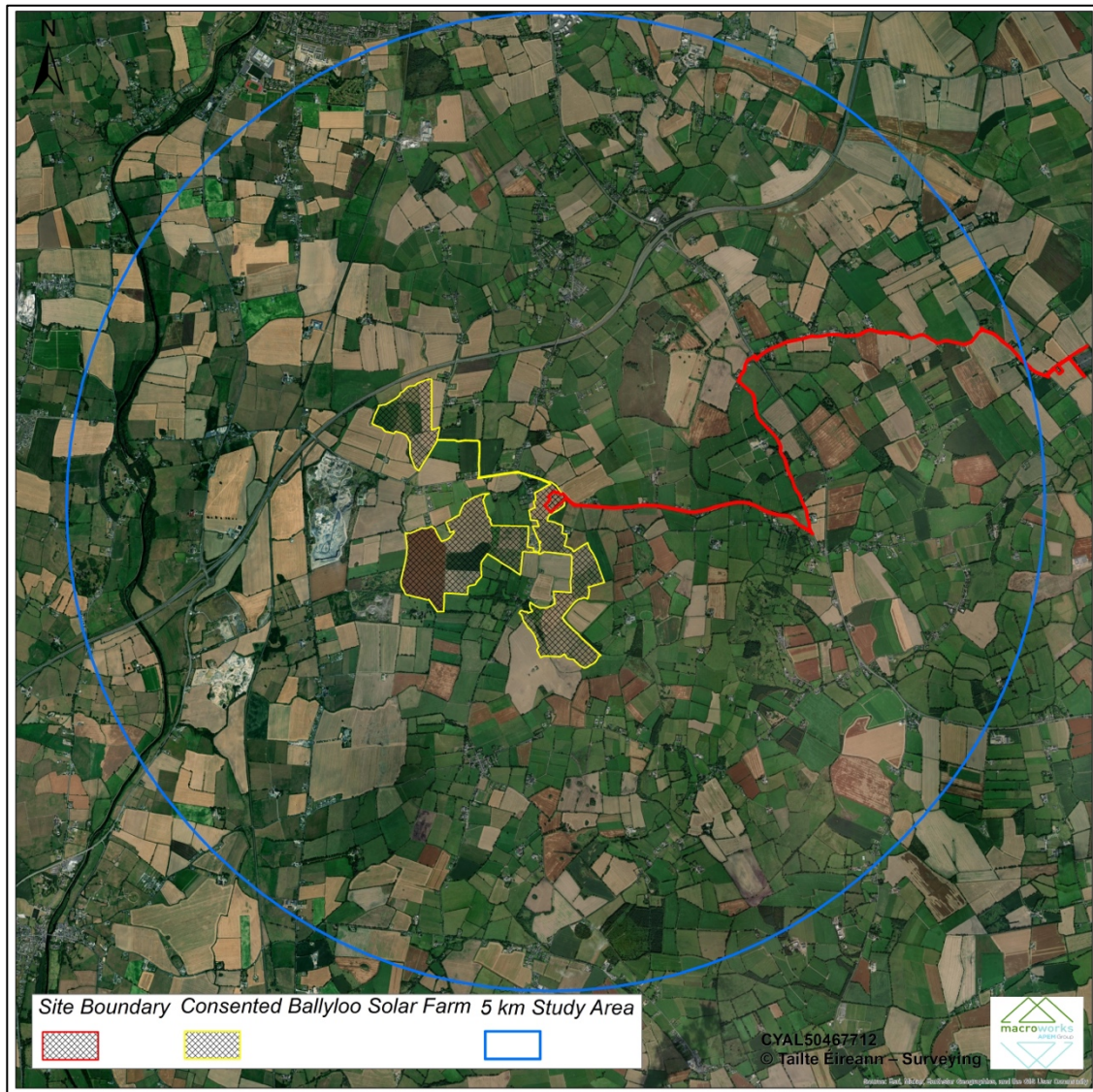


Figure 1.6 Landscape Context of the study area

1.4.1.2 Vegetation and Land Use

The predominant land use within the site, central study area and wider landscape is a mix of large to medium-sized pastoral fields bound by networks of mixed hedgerow vegetation and intervening mature trees. Nonetheless, whilst typical rural and pastoral land uses are the predominant land cover type, the study area also comprises a notable mix of highly anthropogenic land uses, including large existing quarries, the nearest of which is immediately west of the site. The M9 motorway corridor, the N80 national secondary route corridor and the National Railway Line are also notable linear land uses within the study area, whilst the settlement of Carlow Town accounts for the most notable area of urban land cover within the 5km study extent. Small blocks of conifer forest are also dotted throughout the wider landscape, whilst linear swathes of riparian woodland typically cloak the corridors of the main rivers within the study area.

1.4.1.3 *Centres of Population and Housing*

The principal centre of population within the study area is Carlow Town, the outskirts of which occur along the northern periphery of the 5km study extent and is located just under 5km north of the substation at its nearest point. The nearest settlement to the proposed development is the small cross-road village of Nurney, situated along locally elevated west-facing terrain some 2.8km south of the proposed development. The village of Tinyland is situated just under 2km northeast of the proposed development on the northern side of the M9 motorway. Aside from this, the immediate surrounds of the proposed development and wider solar farm comprise a modest rural population that principally comprises linear clusters of dwellings and isolated farmsteads. A relatively notable rural population occurs along the local roads in the surrounds of Ballyloo Cross Roads some c. 500m northwest of the proposed substation.

1.4.1.4 *Transport Routes*

The primary transport route in relation to the proposed development is the M9 motorway, which is situated 1.6km north of the proposed substation at its nearest point. The M9 meanders through the northern and western extents of the study area in a general northeast-by-southwest direction. The N80 national secondary route is another notable transport route and is located in the eastern extent of the study area, some c. 2.5km east of the proposed substation at its nearest point, whilst the proposed grid connection will intersect this road corridor. Other major route corridors within the study area include the R448, located 3.5km west of the site. Aside from these routes, the study area also encompasses a dense web of interconnecting local roads, several of which pass immediately adjacent to the proposed development and wider solar farm and include the L3050, L3051 and L3052 local roads. A section of the National Railway Line passes through the western half of the study area and is located some c. 3km west of the site at its nearest point.

1.4.1.5 *Tourism, Heritage and Public Amenities*

The River Barrow is one of the principal amenity features within the study area and encompasses the Barrow Way National Waymarked walking trail, a long-distance walking trail which follows the original towpath of the river corridor. The trail is over 114km long and passes through several picturesque settlements and a number of notable heritage features. The River Barrow and Barrow Way is some 4.2km west of the site at its nearest point, where it passes Milford Mill, a notable heritage feature within the study area. A local woodland walking trail in Clogrennanae Woods is also located in the northwest quadrant of the study area along elevated terrain. Aside from the River Barrow corridor, the study area is not considered to be highly synonymous with recreation. Indeed, much of the recreational amenity within the study area relate to local amenity features such as golf courses and local sports facilities. It is also important to note that a full Archaeological Impact Assessment (AIA) was undertaken for the Ballyloo solar farm, which identified 148 sites of archaeological, and/or cultural heritage significance within the defined study area. Refer to the AIA for a full assessment of impacts at all surrounding sites of archaeological, and/or cultural heritage significance.

1.4.2 Visual Baseline

1.4.2.1 Analysis of ZTV (Zone of Theoretic Visibility) Mapping

Only those parts of the receiving environment that potentially afford views of the proposed substation development are of concern to this section of the assessment (visual impacts associated with the proposed underground cable grid connection have been screened out). A computer-generated Zone of Theoretical Visibility (ZTV) map has been prepared to illustrate where the Ballyloo solar farm is potentially visible from. The ZTV map is based solely on terrain data (bare ground visibility), and ignores features such as trees, hedges or buildings, which may screen views. Given the complex vegetation patterns within this landscape, the main value of this form of ZTV mapping is to determine those parts of the landscape from which the proposed substation development will definitely not be visible, due to terrain screening within the 5km study area.

Substation Option 1 - 110kV AIS Substation

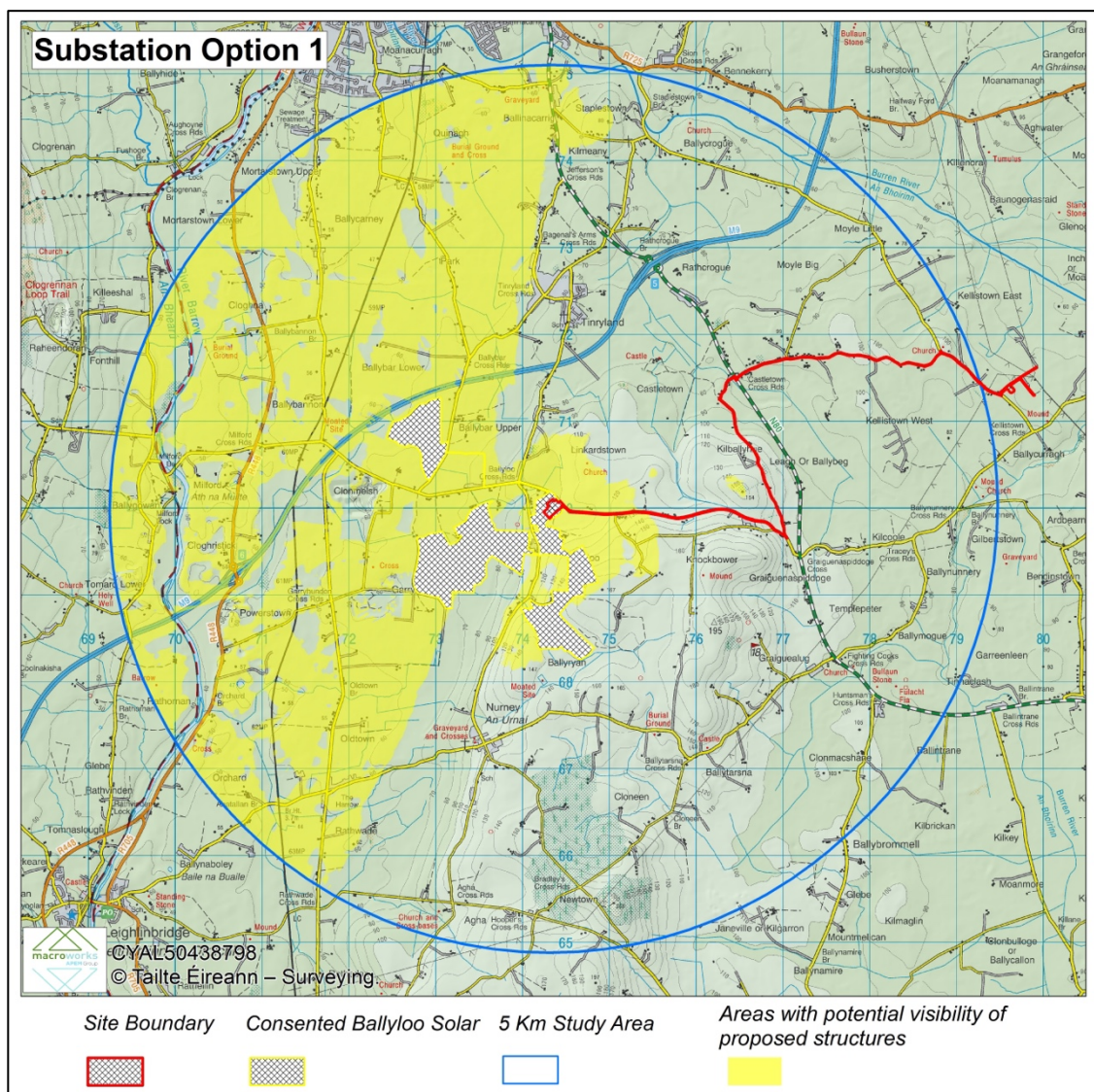


Figure 1.7 Standard (bare-ground) ZTV map 110kV AIS Substation

The following key points are illustrated by the 'bare-ground' ZTV map (see Figure 1.7 above):

- Due to the sloping west-facing terrain along which the proposed development is situated, much of the theoretical visibility is contained within the immediate surroundings of the site and the wider western extent of the study area.
- There is potential for visibility of the proposed substation development along the local road immediately to the north and west of the site, beyond which the theoretical visibility pattern is eliminated within the surrounding central study area.
- In the wider eastern extent of the study area, the potential for visibility is almost entirely eliminated, aside from the summits of several local rolling hills.
- The wider western extent of the study area comprises the most notable area of theoretical visibility and includes more low-lying terrain within the study area, particularly in the surroundings of the River Barrow.

Substation Option 2 - 220kV AIS Substation

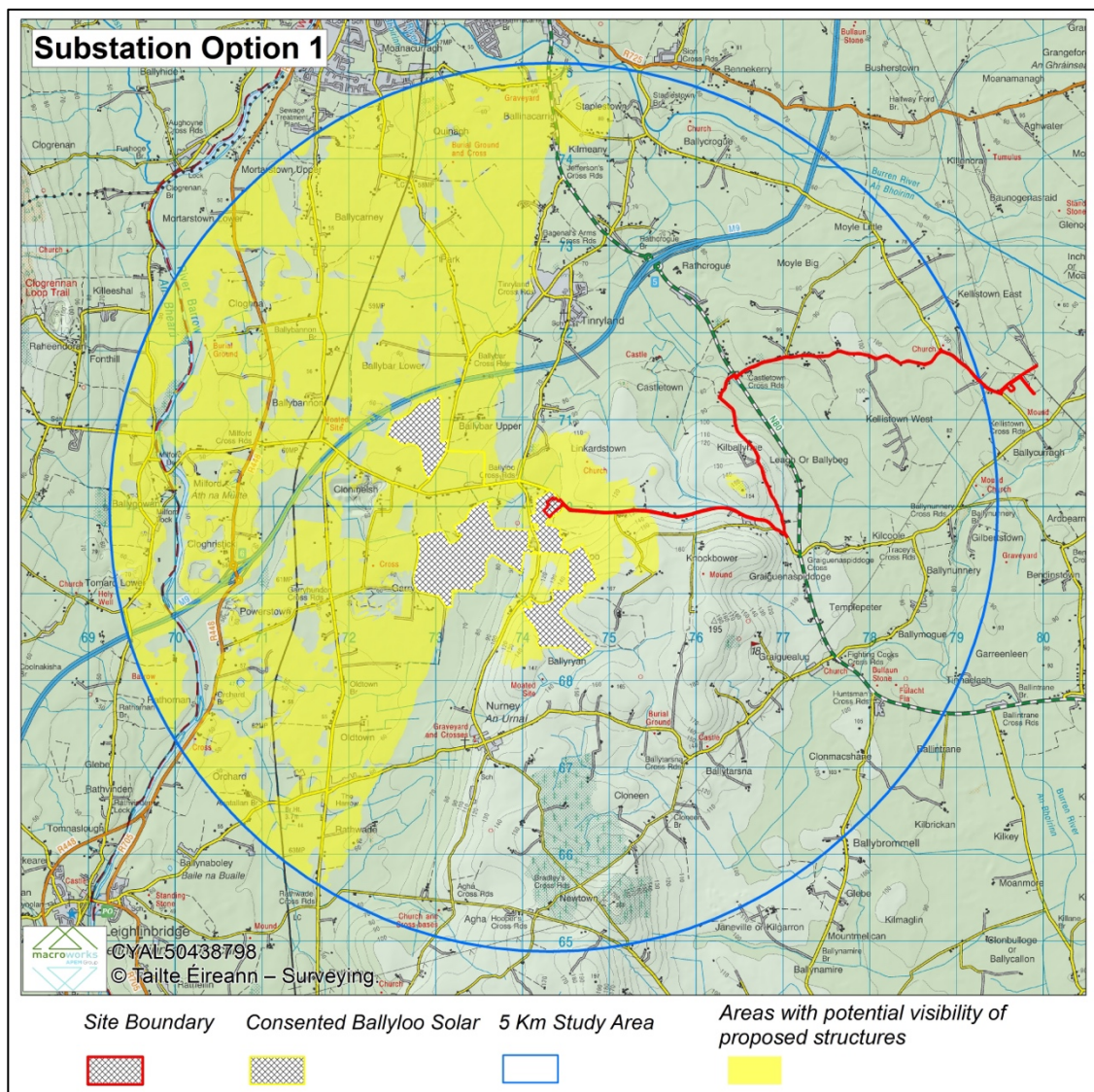


Figure 1.8 Standard (bare-ground) ZTV map 220kV AIS Substation

The following key points are illustrated by the 'bare-ground' ZTV map (see Figure 1.8 above):

- The 220kV AIS visibility pattern is almost identical to that of the 110kV AIS option, as both options comprise nearly identical components; however, the 220kV option occupies a larger area of land.

- Overall, the principal theoretical visibility pattern is contained within the western extent of the study area, with potential visibility of the proposed Option 2 substation development limited to its immediate east. Indeed, the wider eastern extent of the study area will have no potential to afford views of the proposed development.

Substation Option 3 - 220kV GIS Substation

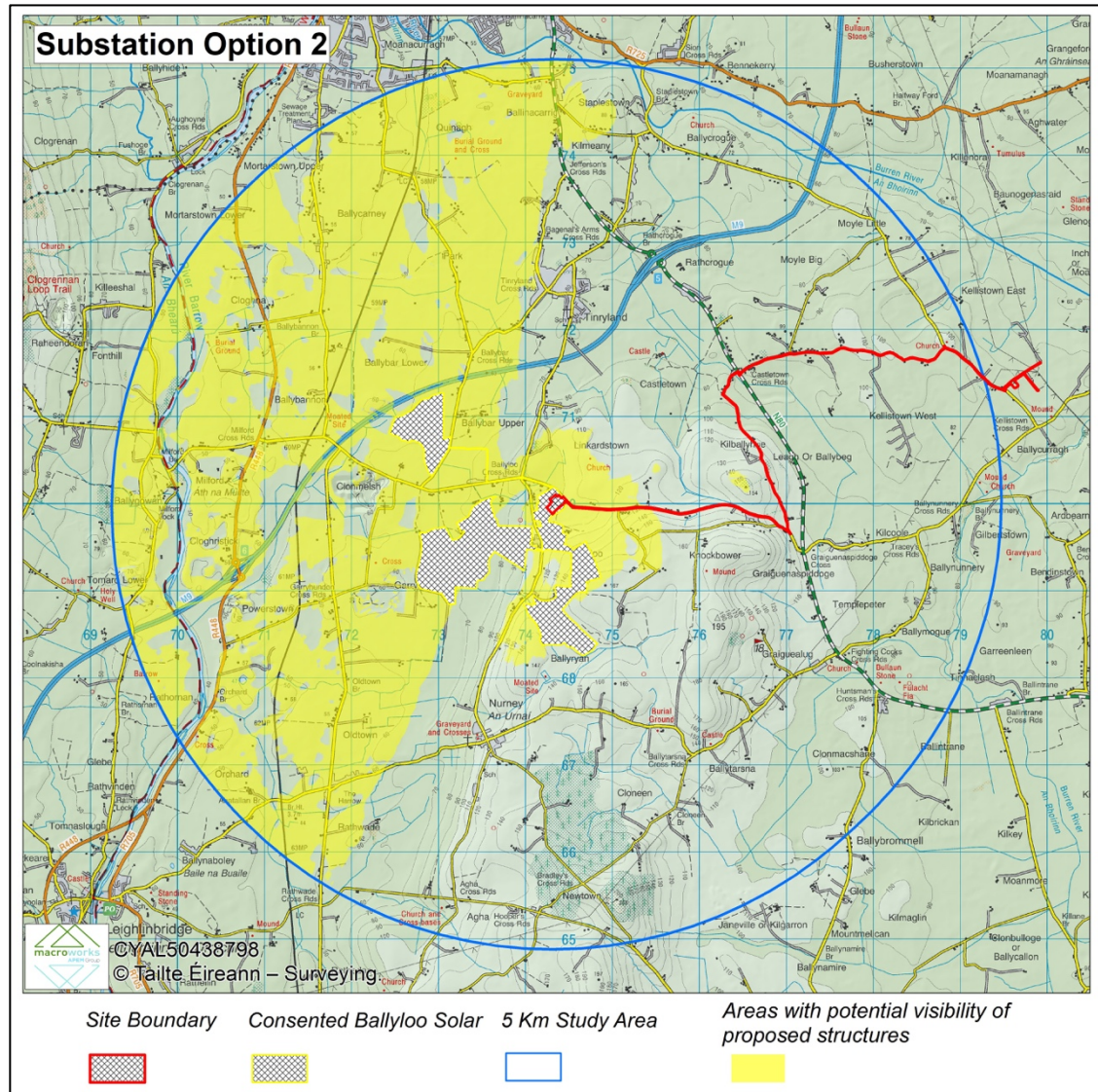


Figure 1.9 Standard (bare-ground) ZTV map 220kV GIS Substation

The following key points are illustrated by the 'bare-ground' ZTV map (see Figure 1.9 above):

- In comparison to option 1 and 2, there is a modest increase in the degree of theoretic visibility pattern, much of which is contained around the sites immediate context along the local roads to the north and west of the development due to increased height.
- A modest increase in the theoretic visibility pattern is also noted to the east of the site due to increase in scale of the proposed GIS building, however, much of the eastern extent of the study area still will have no visibility of the proposed development.

The most important point to make in respect of this 'bare-ground' ZTV map is that it is theoretical. Whilst the proposed substation buildings (GIS building/Control buildings) will have a more notable degree of visual exposure across the surrounding landscape, the surrounding study area comprises a notable degree of vegetation in the form of existing hedgerows, mature tree lines and other forms of built development that will result in a much lesser degree of actual visibility.

1.4.2.2 Identification of Viewshed Reference Points as a Basis for Assessment

Viewshed Reference Points (VRP's) are the locations used to study the visual impacts of a proposed substation development and wider solar farm in detail. It is not warranted to include each and every location that provides a view of a development as this would result in an unwieldy report and make it extremely difficult to draw out the key impacts arising from the proposed development. Instead, the selected viewpoints are intended to reflect a range of different receptor types, distances and angles. The visual impact of a proposed substation development and wider solar farm is assessed by Macro Works using up to 6 no. categories of receptor type as listed below:

- Key Views (from features of national or international importance) (KV);
- Designated Scenic Routes and Views (SR/SV);
- Local Community views (LCV);
- Centres of Population (CP);
- Major Routes (MR);
- Amenity and heritage features (AH).

VRP's might be relevant to more than one category and this makes them even more valid for inclusion in the assessment. The receptors that are intended to be represented by a particular VRP are listed at the beginning of each viewpoint appraisal. The Viewshed Reference Points selected in this instance are set out in the Table 1-6 and Figure 1.10 below. It should be noted that the ZTV above (refer to Figure 1.7) dictated the location of the representative viewpoints to be used in the SID substation application.

Note: Due to the sub-surface nature of the proposed underground cable connection, representative viewpoints for assessment have not been included for this aspect of the proposed SID project. Indeed, there will be no residual visual effects during the operational phase of the project resulting from the underground cable connection.

Table 1-6 Outline Description of Selected Viewshed Reference Points (VRPs)

VRP No.	Location	Representative of	Direction of view
VP1	L3050 at Ballyloo, north of site	LCV	S
VP2	L3050 at Ballyloo, east of site	LCV	W
VP3	L3052 at Ballyloo, west of site	LCV, SR	E
VP4	Local laneway at Ballyloo, east of site	LCV	W
VP5	L3052 at Ballyloo, south of site	LCV, SR	N
VP6	L3041 local road at Ballinbranagh	SR	E

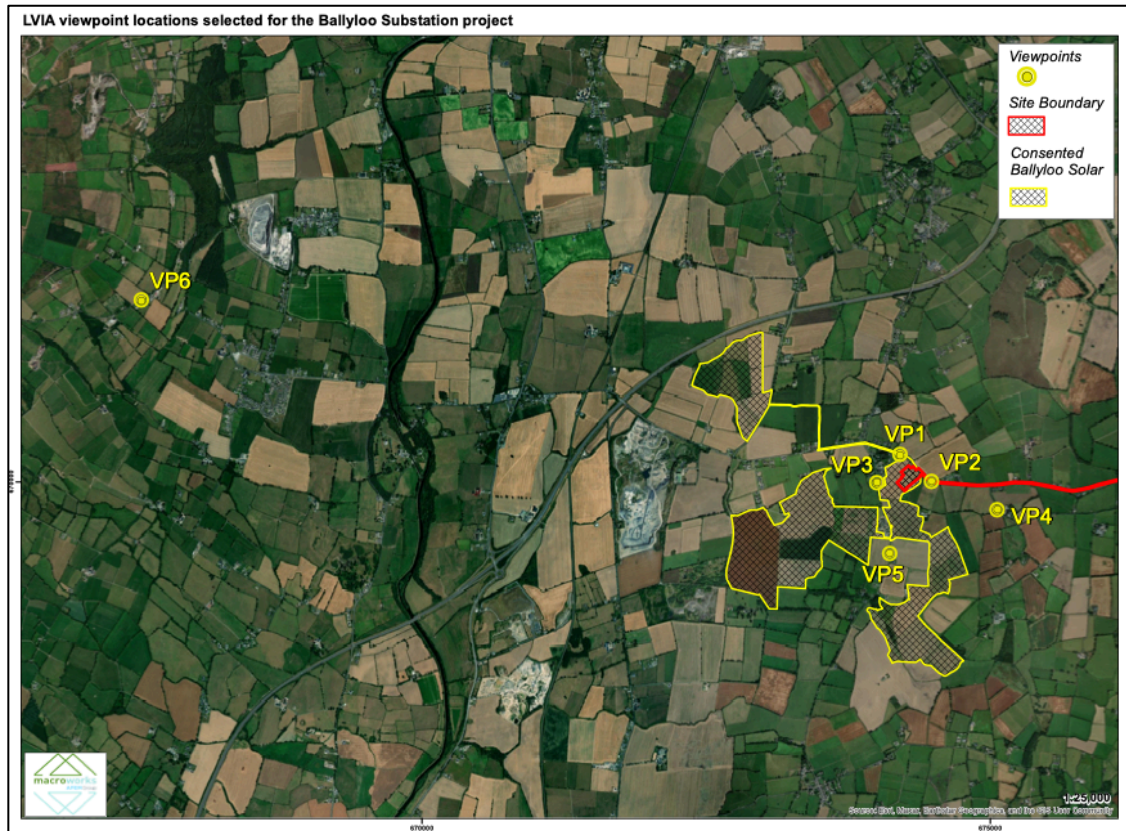


Figure 1.10 Viewpoint location map

1.5 MITIGATION AND RESTORATION MEASURES

The main mitigation by avoidance measure employed in this instance is the siting of the proposed development and wider solar farm in a robust rolling rural area that is currently heavily influenced by numerous other development types, including existing quarry facilities, the M9 motorway corridor and the urban settlement of Carlow Town. The study area also avails of a high degree of vegetative screening, so that more flat to low lying areas of the proposed development will not be a highly prominent feature within the surrounding landscape.

In addition to mitigation by avoidance measures, retention of existing hedgerow boundaries within and around the site aids visual screening, and maintains the existing field pattern. In this respect, the proposed development and wider solar farm is not perceived to impose itself on the existing landscape pattern.

In addition to retaining the existing hedgerows within around the proposed substation development and Ballyloo solar farm, it is also proposed to bolster existing perimeter and internal hedgerows with under-planting and inter-planting of whip transplants (i.e. Hedgerow Type 1 - see Figure 1.11 below) in order to ensure dense and consistent screening of the site in perpetuity. This will be undertaken where required to thicken and fill gaps in the existing hedgerow network prior to the construction phase, thus allowing for any growth in the period between a grant of planning permission and construction of the development. Advanced nursery stock in the form of 8-10cm girth trees will be used to fill any noticeable gaps and plant species will be selected to complement the existing broadleaf hedgerow species mix around the site and will be of local provenance. Where not already exceeded by existing vegetation, it is intended to manage hedgerows up to 3-4m in height. This height will be achieved by a combination of allowing lower sections of existing hedgerows to mature, filling obvious gaps with advanced nursery stock and providing an additional line of whip planting to selected hedgerows that require densification. Refer to the Landscape Mitigation Plan LD.BLLYLOO_SID 3.1-3.3 for details

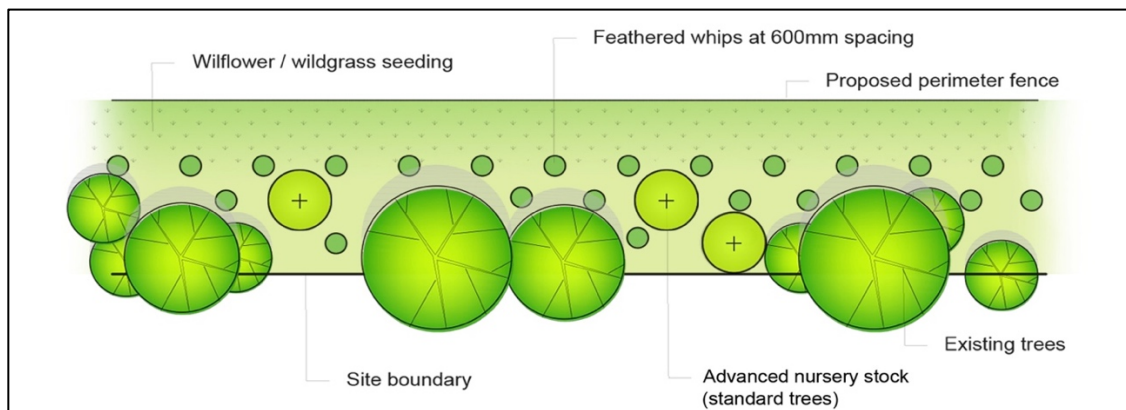


Figure 1.11 Hedgerow Type 1: indicative boundary planting detail showing the approach to inter-planting and under-planting of existing hedgerows (where consolidation is needed).

It is also proposed to plant extensive areas of new 'Type 2' hedgerows (Figure 1.12 refers), with whips and a high proportion of advance nursery stock trees (c.3m planted height), along the boundaries of some of the proposed substation and wider solar farm boundaries to further screen the proposed development from some of the nearest surrounding receptors (refer to Landscape Mitigation Plan drawing package LD.BLLYLOO and LD.BLLYLOO_SID). All of this planting will be allowed to mature up to a maintained height of 3-4m to aid in the screening and softening of the proposed development from nearby dwellings and surrounding local and regional roads.

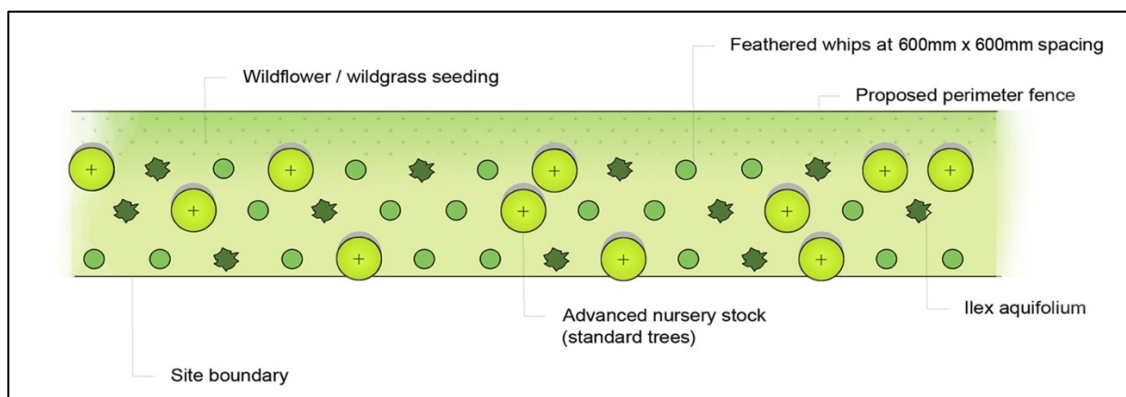


Figure 1.12 Indicative boundary planting detail showing the introduction of new boundary hedgerow TYPE 2

Furthermore, at an early stage of the design process, additional setbacks from some of the nearest residential dwellings to the proposed development and wider solar farm were included to mitigate the potential for visual impacts. Indeed, some notable buffer from the proposed substation are included to the north and west of the proposed substation options, which will be planted with new hedgerow vegetation as set out in the consented Ballyloo Solar Farm application.

It is also proposed to include early-stage planting within and around the site as part of the landscape mitigation proposals. It is proposed to undertake the early-stage planting during the first month of the proposed construction phase, which lasts a total of 24 months. As a result, the early stage planting will have up to two growing seasons to establish, prior to the implementation of the proposed solar panels, which will be included during at month 12 of the 24 month construction programme. Thus, once implemented, the proposed planting measures will soften and screen the proposed panels and some construction-related activities from surrounding receptors. By the time the proposed solar farm construction has concluded, the proposed planting will have been in place for more than two growing seasons, allowing the advanced nursery stock and whips to slightly fill out and further screen and soften the proposed development. It is important to note that the montage view in the submitted photomontage set represents the proposed development at construction month 12 when the panels have been implemented and the proposed mitigation planting has up to two growing seasons to fill out.

1.6 IMPACT ASSESSMENT

1.6.1 Do-nothing scenario

The 'do-nothing' impact refers to the non-implementation of the proposed development. The primary effect of this would be that the impacts and effects identified would not directly occur. In this regard the following issues are relevant. The site, which is currently contained in pastoral farmland, would likely be managed for typical agricultural practices, whilst the surrounding perimeter vegetation would continue to grow out, some of which would be maintained by the current landowners.

1.6.2 Assessment of Receptor Sensitivity – Landscape

Landscape value and sensitivity are considered in relation to a number of factors highlighted in the Guidelines for Landscape and Visual Impact Assessment 2013, which are set out below and discussed relative to the proposed development site and wider study area.

This is a robust rural landscape that comprises a broad range of land uses and landscape types. Whilst much of the surrounding landscape is typified by relatively flat pastoral lands, the eastern extent of the study area encompasses an area of locally elevated terrain that comprises low rolling hills and ridges. These more elevated areas provide some sense of scenic amenity in this landscape context as they afford views across the wider flat parts of Carlow's Central Plain and towards the broad Castlecomer Plateau that extends throughout the wider landscape to the west. In terms of land use, this is a relatively typical rural part of the country that is heavily influenced by agricultural lands. Whilst there is a pleasant pastoral aesthetic within some parts of the surrounding landscape, the study area is a highly modified setting and encompasses numerous highly anthropogenic land uses and landscape features. Several quarries are located to the west of the site, whilst the busy M9 motorway corridor has a notable influence on the landscape of the immediate study area. A section of the National Railway Line also traverses a short distance to the west of the site, whilst the urban settlement of Carlow Town is contained throughout the northern periphery of the 5km study extent.

In terms of landscape designations, the proposed development is situated across two landscape character areas. Parcel 1 and parcel 2 are contained within the more robust 'Farmed Lowlands', which is classified with a 'class 2(decreasing) / 3(moderate)' sensitivity designation, whilst the eastern extent of the site is situated in the 'Farmed Ridges' landscape character areas and is classified with a landscape sensitivity of '4-Increasing', which is likely due to its more elevated nature that affords broad views across the surrounding landscape. In terms of designated scenic amenity, several scenic views and routes identified in the current Carlow CDP are located throughout the study area, some of which are situated immediately adjacent to the site and afford broad views to the west across the wider Carlow Central Plain and are backdropped by the broad working ridge that forms part of the easternmost extent of the Castlecomer Plateau. Indeed, whilst there is some designated scenic amenity within the surrounding local landscape, many of the views are heavily influenced by working rural land uses and existing utilitarian land uses such as quarries and major route corridors.

Overall, landscape values are generally associated with productivity and rural subsistence rather than any sense of rarity or the naturalistic. Whilst there are some locally susceptible parts of the study area, such as the River Barrow corridor, these are typically well-contained and are offset from the immediate context of the site. It is considered that the landscape of the site and study area is relatively typical and not highly rare and instead combines numerous rural and anthropogenic land uses such as agriculture, the mineral extraction industry and major transport routes. Therefore, on balance of these factors and in accordance with the criteria outlined in in Table 1-1, the landscape sensitivity is deemed to be **Medium-low**, with localised areas of higher and lower sensitivity.

1.6.3 **Assessment of Receptor Sensitivity – Visual**

The study area generally presents as a typical rural landscape, albeit some receptors within the study area have a slightly heightened sensitivity due to the presence of locally elevated terrain that affords broad open views across the wider countryside and areas of high amenity that present with some sense of the naturalistic such as the River Barrow corridor and the Barrow Way.

The more elevated and scenic parts of the surrounding landscape are typically identified by the presence of scenic routes and view designations. Nonetheless, it is important to note that scenic views and routes within County Carlow all present with different degrees of sensitivities and values. Indeed, some scenic designations relate to views of local value, whereas others are recognised more for their regional and national values, i.e. scenic views and routes that contain views of more distinctive landscape features such as Mount Leinster and the Blackstairs Mountains or highly susceptible heritage features. Within the study area, many of the scenic designations are likely included as a result of their elevated nature, where views are afforded across the working rural landscape. It is important to note that while these routes and views generate a degree of scenic amenity, many of these views present with a longstanding sense of human intervention on the landscape and are influenced by an array of working and highly anthropogenic land uses such as major route corridors, quarries and urban settlements. The study area also comprises some locally susceptible areas that are afforded a strong sense of containment, such as the Barrow River corridor, which is noted for its recreational and naturalistic values. These parts of the landscape are typically highly susceptible to change and range in sensitivity between Medium to High-medium depending on their influence from other surrounding landscape areas.

Views of the working agricultural landscape are generally pleasant in terms of its rolling pastoral aesthetic and 'green', settled working character. The network of hedgerows and vegetation throughout it contributes to some sense of naturalness and, combined with its undulating topography, generates a sense of containment in many locations. However, whilst a pleasant pastoral aesthetic is noted throughout some parts of the study area, as noted above, the surrounding local and wider landscape is also influenced by an array of anthropogenic features such as major transport routes, urban settlements, and industrial development. Overall, the sensitivity of visual receptors within the more typical working landscape context tends to range between Medium and Medium-low, with those of a Medium sensitivity representing more open expansive views across the wider landscape.

Key differentials in terms of visual receptor sensitivity relate to the occupation of the visual receptor and whether views of the surrounding landscape are an inherent part of the experience. Static residential receptors are considered generally more susceptible to changes in views over those where views are experienced transiently by those travelling through the landscape, particularly on major transport routes where road infrastructure and traffic volume draw from visual amenity. Likewise, receptors located in closer proximity to the site are considered more susceptible to changes in views over those where views are experienced at a distance.

On the basis of the site-specific factors outlined above and in accordance with the general visual receptor sensitivity considerations contained in the methodology Section 1.2.5, visual receptor sensitivity judgement are provided for each representative viewpoint in the table below in section 1.6.7 below.

1.6.4 **Magnitude of Landscape Effects – Construction Stage**

In terms of physical landscape effects, the proposed substation options will require some localised excavation works to facilitate the foundations of the proposed control/GIS buildings and their ancillary electrical infrastructure equipment. Some sections of new internal access/service tracks will be constructed to service the substation(s) and these will be similar in nature to farm tracks that can be found throughout this rural context. The proposed substation options will require minor reprofiling of the terrain within the substation compound result in areas of cut and fill as well as removal of the prevailing grassland land cover. The substation development will be accessed for both the construction and operational phases by means of an entrance from the local road to the northeast of the substation compound.

There is currently consent for the removal of total of c. 17 linear meters of hedgerow throughout the Ballyloo solar farm development to facilitate the construction of access tracks throughout the site. Furthermore an additional removal of some 30 linear meters of scrubby hedgerow vegetation will be required to facilitate the proposed SID substation access, whilst an additional c. 1m of removal will be required where one of the proposed grid connection options intersects with hedgerow vegetation in the vicinity of the existing Kellis 220kV substation, however this c. 1m of hedgerow vegetation will be fully reinstated prior to the completion of construction. Notwithstanding the above mentioned removal, this will be offset by the proposed planting of c. 3773 linear meters of new hedgerow located along the perimeter of the proposed substation and wider Ballyloo solar farm.

It is proposed to connect the proposed substation options to the existing 220kV Kellis substation by means of an underground grid connection which is up to approximately 8.9 km in length. The grid connection travels east from the substation development located primarily in the public road network. However, at a distance of some 8.292km from the substation site, there are two options:

- Option A is to leave the L30535 local road and enter onto private lands where it will cross agricultural farmland into the existing 220/110kV Kellis substation.
- Option B is to be situated within the L30535 local road which provides road access into the existing 220/110kV Kellis substation.

Whilst option A will generate a slightly greater landscape impact as it will result in some localised removal of hedgerow vegetation and will trench through existing farmland, these effects will be highly localised.

All substation and grid connection works will be carried out in accordance with international best practice and full compliance with health and safety requirements. Construction of the proposed substation is estimated to take 24 months to complete. Construction related effects are, therefore, brief in nature and will only result in short-term landscape and visual impacts. Overall, the magnitude of construction stage effects is deemed Medium.

Combined with the Medium-low landscape sensitivity of the study area, the significance of construction stage effect is deemed Moderate-Slight and of a Negative quality.

1.6.5 **Magnitude of Visual Effects – Construction Stage**

During construction, the main visual impacts will arise from frequent heavy vehicle movements and worker vehicles travelling to and from the site and using the site entrance. In addition, there will be construction machinery on site, which may rise above intervening vegetation and buildings. There will also be some localised stockpiles of stripped topsoil, construction materials awaiting use and a small construction compound located on the site. The GIS substation option may require the erection of tower cranes, which will be visible over a wider area.

However, aside from the site's immediate vicinity, a large part of this short-term activity within the site will remain screened and partially screened from view the surrounding mature layers of intervening vegetation. Furthermore, construction-related activity is short-term in nature and will cease once the development becomes fully operational. Thus, construction stage impacts are likely to result in a visual effect no greater than Medium in the immediate surroundings of the site.

Coupled with the Medium and Medium-low visual receptor sensitivities in the immediate surrounds of the site, the construction stage visual impacts in the immediate vicinity of the site will be no greater than Moderate, and will reduce considerably beyond 500m-1000m from the site, where the proposed substation development and wider solar farm will be heavily screened. As a result, construction stage visual impacts are not considered to be significant.

1.6.6 **Magnitude of Landscape Effects – Operational Stage**

There will be some very localised physical landscape effects in the immediate context of the proposed substation compound, however, overall the terrain of the site will remain largely unaltered. In fact, the consented landscape mitigation measures, which comprises the planting of c. 3773 linear meters of new native hedgerow across the substation and wider Ballyloo solar farm will generate some localised positive landscape effects during the operation phase of the proposed development.

Whilst the wider solar farm will be decommissioned after 40 years, the proposed substation will remain as part of the electricity transmission network, and thus, landscape effects generated by the proposed substation development are deemed Permanent in terms of duration. It is important to note that existing electricity cables and pylon structures are characteristic features of this rural landscape, and thus, the introduction of the proposed substation represents the intensification of an established land use as opposed to the introduction of a new and unfamiliar one. Furthermore, due to the relatively contained nature of the study area and the discreet siting of the proposed development, there will be limited parts of the study area that will afford visibility of the proposed substation. Thus, the limited visibility of the proposed substation development and wider solar farm will heavily diminish the development's potential to alter the surrounding landscape character.

With reference to the significance matrix (Table 1-4) above, the **Medium-low** landscape sensitivity judgement attributed to the study area, coupled with a **Medium** magnitude of landscape impact in the immediate vicinity (<500m) of the proposed development is considered to result in an overall significance of no greater than **Moderate-slight** for the proposed substation and grid connection options and wider solar farm, with the remainder of the 5km radius study area likely to experience **Slight** or **Imperceptible** landscape impacts.

1.6.7 Magnitude of Visual Effects – Operational Stage

The assessment of visual impacts at each of the selected viewpoints is aided by photomontages of the proposed substation development and wider Ballyloo solar farm. Photomontages are a 'photo-real' depiction of the scheme within the view utilising a rendered three-dimensional model of the development, which has been geo-referenced to allow accurate placement and scale. For each viewpoint, the following images have been produced:

1. Imminent Baseline view (showing the consented Ballyloo Solar Farm - planning ref ACP: 2460043);
2. Outline view (yellow outline showing the extent of the proposed substation options and pink line showing the proposed solar farm including all associated overground works overlaid on the photograph);
3. Montage view (landscaping at Construction Month 12 – Solar Panels and proposed Substation Installed – early stage planning after two growing seasons) – this includes a fully rendered view of the proposed substation options;
4. Montage view with mitigation established.

The solar panels proposed on the Ballyloo Solar Farm may range from 2.0m – 3.25m in height. The photomontages that provide the basis for this visual impact assessment include panels rising to a height of 3.25m, representing a worst-case scenario in terms of potential panel visibility and wider impact assessment considerations. It is not considered that panels in the lower ranges of this panel design envelope will generate any additional visual impacts other than those stated below. Indeed, the smaller panels have the potential to be furthered screened by surrounding hedgerow vegetation and generate marginally reduced visual impacts. It should be noted that the photomontages have been selected to represent a worst-case scenario in terms of potential visibility. Indeed, for large parts of the study area, the proposed development and wider solar farm will be entirely screened.

VP NO.	IMMINENT BASELINE VIEW	VP SENSITIVITY	VISUAL IMPACT MAGNITUDE (PRE & POST MITIGATION)	POST MITIGATION SIGNIFICANCE / QUALITY / DURATION OF IMPACT
VP1	<p>L3050 at Ballyloo, north of site: This view is afforded from a local road in the townland of Ballyloo, adjacent to a residential dwelling on the southern side of the road corridor. The depicted view extends across the front garden of the residential property and is truncated at the side boundary of the dwelling by an established hedgerow.</p> <p>The consented solar farm will be fully screened here by the enhanced hedgerow vegetation along the southern boundary of this residential landholding.</p>	Medium-low	<p>The proposed substation options will be well screened here, even from this near distance. The two AIS options will be largely obscured, with only brief views of the lightning masts and some ancillary structures visible above the nearby boundary hedgerow. The proposed GIS substation will have a slightly greater visual presence due to its larger built form but will still benefit from a notable degree of screening provided by the neighbouring hedgerow that will be enhanced as part of the consented mitigation proposals that form part of the consented solar farm application.</p> <p>It is important to note that the proposed development options will be viewed side-on from this residential property and will not encroach upon any sensitive viewing aspects from this location. Indeed, the most notable aspects of visual amenity from this locally elevated position are directed in the opposite direction, towards the distant Castlecomer Plateau.</p> <p>Overall, the residual magnitude of visual effect is expected to reduce to Negligible for the two AIS options and to Low for the proposed GIS option.</p>	Imperceptible (AIS) to Slight (GIS) / Permanent / Negative
VP2	<p>L3050 at Ballyloo, east of site: This is a partially contained view afforded from a local road in the townland of Ballyloo that is representative of local community receptors. To the west along the southern side of the local road, the view is contained at the roadside edge by a dense mature hedgerow.</p> <p>The consented solar farm will be fully screened from here by the dense vegetation that encloses the western side of the local road corridor.</p>	Medium-low	<p>All three of the proposed substation options will be largely screened along this section of the local road due to the dense, mature vegetation to the south. The most notable visual change is associated with the approximately 30 m of hedgerow removal required to facilitate the proposed site entrance on the southern side of the road. A brief view into the proposed substation will be possible through the area of removed vegetation; however, this view will only be momentarily experienced by road users travelling along this section.</p> <p>The consented mitigation screen planting that forms part of the solar farm application is expected to have a limited effect from this already well-contained local road corridor. Overall, the residual visual effect is deemed Low.</p>	Slight / Permanent / Negative

VP NO.	IMMINENT BASELINE VIEW	VP SENSITIVITY	VISUAL IMPACT MAGNITUDE (PRE & POST MITIGATION)	POST MITIGATION SIGNIFICANCE / QUALITY / DURATION OF IMPACT
VP3	L3052 at Ballyloo, west of site: This is a view of the local road that passes between the eastern and western portions of the consented Ballyloo solar farm development, and it represents local community receptors. To the east, the land rises gently towards a domed, farmed ridge with limited enclosure by hedgerow vegetation, which is generally low and tightly clipped where it does exist. Downhill to the west, there is a higher degree of enclosure by roadside vegetation and a treelined hedgerow.	Medium	<p>The proposed substation options will be visible to varying degrees, located uphill from the local road at a distance of just over approximately 150 m. The two AIS options will be partially visible, with the consented hedgerows forming part of the solar farm application heavily screening the low-lying infrastructure within the substation compound. The proposed GIS option presents a notably more visually prominent form, appearing as a larger built mass. While none of the three options appear highly prominent or obstruct any sensitive viewing aspects, the proposed GIS option results in a more noticeable degree of visual change and is likely to attract attention.</p> <p>Nonetheless, there is a degree of balance between the more prominent built form of the GIS substation and the more complex and cluttered forms characteristic of the AIS options. Indeed, the AIS options both present as highly industrial in nature, whereas the GIS option has the potential to be perceived as resembling a large agricultural shed.</p> <p>Overall, the three options will result in an intensification of built development within this local context, most notably for residential receptors along the eastern side of the local road corridor. The two AIS options will have a reduced visual presence and are classified as having a Medium–Low magnitude of effect, whereas the larger built form of the GIS development is classified as having a Medium residual magnitude of effect.</p>	Slight (AIS) to Moderate-slight (GIS) / Permanent / Negative
VP4	Local Laneway at Ballyloo, east of site: This view is afforded from an agricultural field entrance within an otherwise established hedgerow, located on locally elevated terrain in the townland of Ballyloo, and is representative of surrounding local receptors. The depicted fleeting view is oriented westwards and extends	Medium	<p>All three substation options will be visible from this location, situated downslope from the local road context at a distance of approximately 800 m. Both AIS options present a lesser visual presence than the GIS option, which appears to rise above the intervening vegetation and presents as a distinct block form. However, it should be noted that all options are viewed against the backdrop of the distant elevated ridge and do not break the skyline.</p> <p>Both AIS options are well assimilated into this view in terms of scale, with the substation compounds largely screened and anchored within the pre-</p>	Slight-imperceptible (AIS) to Slight (GIS) / Permanent / Negative

VP NO.	IMMINENT BASELINE VIEW	VP SENSITIVITY	VISUAL IMPACT MAGNITUDE (PRE & POST MITIGATION)	POST MITIGATION SIGNIFICANCE / QUALITY / DURATION OF IMPACT
	<p>across sloping pastoral fields and layers of hedgerow vegetation. In the distance, the elevated terrain along the eastern extent of the Castlecomer Plateau forms the background of the view.</p> <p>Only a glimpse of the consented panels is likely to be afforded here, well contained within the pre-existing field network. Indeed, they may go unnoticed in this brief but open view.</p>		<p>existing field pattern. The built block form of the proposed GIS option contrasts more with the surrounding organic tones and textures of this predominantly pastoral landscape; however, it does not appear incongruous within the working character of this setting, which is influenced by other anthropogenic elements such as overhead cable corridors, scattered built development, and distant partial views of rotating wind turbines.</p> <p>Overall, the magnitude of effect for both AIS options is deemed Low–Negligible, while the GIS option is classified as having a residual Low magnitude of effect.</p>	
VP5	<p>L3052 at Ballyloo, south of site: This is a locally elevated panoramic view afforded from an open section of the L3052 local road, which forms part of a designated scenic route in the townland of Ballyloo, located between the consented solar parcels. This viewpoint is representative of the scenic route designation and surrounding local community receptors.</p> <p>To the east, an uphill view is afforded across an open pastoral field, contained by the summit of a nearby ridge approximately 400 m from the local road corridor. To the west, a broad and expansive view extends across the near and distant landscape, where pastoral farmland is the</p>	High-medium	<p>The proposed substation options will be largely screened from this local road scenic route by the established vegetation forming part of the consented solar farm development. Both AIS options will be fully screened by the newly established section of hedgerow vegetation located within the pastoral field to the east of the local road alignment, north of this viewpoint. Only a brief view of the proposed GIS substation will be visible, rising just above the newly established hedgerow.</p> <p>Of most significance, the principal aspect of visual amenity, and the likely reason for this scenic designation, relates to views westwards across the wider Barrow Valley and towards the more distant Castlecomer Plateau, which forms the backdrop to this view and lies in the opposite direction to the proposed substation options. Overall, the residual magnitude of visual effect is deemed Negligible for both AIS substation options and Low for the proposed GIS option.</p>	<p>Imperceptible (AIS) to Slight (GIS) / Permanent / Negative</p>

VP NO.	IMMINENT BASELINE VIEW	VP SENSITIVITY	VISUAL IMPACT MAGNITUDE (PRE & POST MITIGATION)	POST MITIGATION SIGNIFICANCE / QUALITY / DURATION OF IMPACT
	<p>predominant land use. While a pleasant pastoral aesthetic is presented here, the landscape is also influenced by notable anthropogenic elements, such as the industrial buildings and structures visible at the quarry to the west.</p> <p>The consented solar farm has the potential to be visible in several aspects from this section of the scenic route but will be most apparent to the west, downslope from the local road, within the wider context of the River Barrow valley.</p>			
VP6	<p>L3041 local road at Ballinbranagh: This is a broad, elevated view afforded from a local road scenic route in the townland of Ballinbranagh. The depicted view extends across the wider Carlow Central Plain, which is characterised by a matrix of typical rural land uses and dominated by agricultural fields and networks of hedgerow vegetation. The view is enclosed in the distant background to the southeast by Mount Leinster and the Blackstairs Mountains, while the Wicklow Mountains form the background to the northeast.</p>	High-medium	<p>All three substation options have the potential to be viewed from this location; however, they will appear as distant, small-scale features in the background and are likely to be difficult to discern from this distance. Indeed, if visible from here, the substation options would clearly present as ancillary features of the consented Ballyloo Solar Farm, which will be apparent along the surrounding sloping lands. Overall, the proposed substation options will generate no notable visual effects from this location due to their distance from the elevated lands and the broad, sweeping nature of the views afforded from here. Thus, the magnitude of visual effect is deemed negligible for all three options.</p>	<p>Imperceptible) / Permanent / Negative</p>



1.6.8 **Monitoring**

1.6.8.1 *Construction Phase*

Landscape tender drawings and specifications will be produced to ensure that the landscape work is implemented in accordance with best practice. A landscape management and maintenance schedule also formed part of the consented solar farm application. This document includes tree work procedures, soil handling, planting and maintenance. The contract works will be supervised by a suitably qualified landscape architect.

It is also proposed to include early-stage planting within and around the proposed substation and wider Ballyloo solar development as part of the landscape mitigation proposals. It is proposed to undertake the early-stage planting during the first month of the proposed construction phase, which lasts a total of 24 months (inclusive of proposed substation and grid connection). As a result, the early stage planting will have up to two growing seasons to establish, prior to the implementation of the proposed solar panels, which will be included during at month 12 of the 24 month construction programme. Thus, once implemented, the proposed planting measures will soften and screen the proposed panels and some construction-related activities from surrounding receptors. By the time the proposed solar farm construction has concluded, the proposed planting will have been in place for more than two growing seasons, allowing the advanced nursery stock and whips to slightly fill out and further screen and soften the proposed development. It is important to note that the montage view in the submitted photomontage set represents the proposed substation development and wider solar farm at construction month 12 when the panels have been implemented and the proposed mitigation planting has up to two growing seasons to fill out.

All tree protection requirements will be installed on commencement of the development and removed on a phased basis as stages of the development are completed.

1.6.8.2 *Operational Phase*

This will consist of weed control, replacement planting, pruning etc. All landscape works will be in an establishment phase for the initial three years from planting. All works will be monitored on an ongoing basis to ensure the quality of the development is maintained. Details of all monitoring and maintenance are outlined in the Landscape Management and Maintenance Schedule for the proposed solar development.

1.7 **CUMULATIVE IMPACT ASSESSMENT**

With regard to potential cumulative effects there are several consented solar farm developments within the study area and one solar development in-planning. One other solar farm development is located just outside the 5km study area and is currently refused but under appeal to ACP. These development are set out in the table below.

Table 1-7 Cumulative solar farm development within the wider surrounding landscape.

Planning Ref.	Name	Distance to the proposed SID substation	Status
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ACP Reference: 322347	Ballyloo Solar Farm	Immediately adjacent	Consented
Carlow County Council Planning Ref: 22163	Clonmacshane Solar Farm	3.5km east of the site	Consented
Carlow County Council Planning Ref: 20143	Garreenleen Solar Farm	4km east of the site	Consented (under construction)
Carlow County Council Planning Ref: 2460205	Park Solar Farm	c. 2.5 km northwest of the site	Consented
Carlow County Council Planning Ref: 2560137	Ballybannon Solar Farm	3.4 km west of the site	Proposed (pre- planning)
Carlow County Council Planning Ref: 24/60295	Rathrush Solar Farm	6.1km east of the site (outside of the 5km study area)	Refused (under appeal)

The most notable potential for cumulative effects to occur with regard to the proposed substation relates to the consented Ballyloo Solar Farm development, which the proposed substation located immediately adjacent to this solar farm. Indeed, there will be a clear increase in the intensity of development within the immediate surrounding landscape context as a result of the combined developments, with wider solar farm development representing one of the more notable single land uses within this local landscape. Nonetheless, the perceived scale and extent of the combined solar and substation development heavily diminished due to the comprehensive landscape mitigation measures that form part of the consented solar application.

With regard to wider solar development, the most notable cumulative landscape and visual effects relate to the cluster of consented and proposed developments to the south of Carlow Town. Both Park Solar Farm and Ballybannon Solar Farm are contained within a similar landscape context to the proposed development, albeit within flatter parts of the surrounding landscape. Indeed, there is a strong sense of separation between these two proposed developments and Ballyloo Solar Farm and SID substation, as they are located on the opposite side of the M9 motorway corridor, with Ballybannon Solar Farm also situated to the west of the National Railway Line corridor. The potential for any notable cumulative effects within the local landscape in the immediate surrounds of Ballybannon Solar Farm and the two other proposed developments is limited due to the high degree of existing mature vegetation within the intervening landscape. This, combined with the strong sense of separation provided by the M9 corridor, results in very few opportunities for intervisibility between the three developments.

Nevertheless, the potential for intervisibility of the three solar developments and the proposed SID substation development increases within the wider western extent of the study area as the terrain ascends towards the Castlecomer Plateau as represented by viewpoint VP6. From this elevated landscape context, broad views are afforded across the wider Carlow central plain and towards the distant landscape. Nevertheless, whilst the proposed substation options have the potential to be visible from these elevated lands, they will be barely discernible to the naked eye due to their distance from this elevated context and due to the sweeping nature of views afforded from here, which are influenced by a broad array of anthropogenic built forms and land uses. Indeed, even if viewed from this distance, the proposed substation options will be clearly perceived as an ancillary feature of the wider consented Ballyloo Solar Farm development. Overall, from this elevated context, the substation options will have no notable cumulative effect on the visual amenity afforded from this elevated context. Indeed, this assessment is in line with ACPs Inspectors report for the consented Ballyloo Solar Farm development (refer to ACP -322347-25), which states;

"it is in my opinion a product and consequence of the distance that exists between the site and the elevated views. With a minimum separate distance of 4.5km between the nearest elevated protected view and the site (Viewpoint 4 prepared by Macroworks (VP6 in this assessment)), it is difficult to distinguish most landforms and even structures such as the M9 motorway and Clonmelsh quarry buildings, which when you are close to them are significant, but are barely visible from that distance and are certainly not significant or detracting features in the landscape"

The inspectors report goes on to further state;

"From a distance such as viewpoint 4 (VP6 in this assessment), which is the closest viewpoint to the site, I am satisfied that the proposed development would not have a significant landscape of visual effect from the elevated viewpoints and scenic routes in the Killeishin Hills. From these elevated positions, the field network reads as a patchwork of fields of different sizes and shapes, bounded by trees and hedgerows. At different times of the year the fields are green (grass), brown (ploughed) and yellow (crops), while the weather also influences visibility. From the distance of the Killeishin Hills, I consider that the proposed solar panels would be viewed similar to a ploughed field, that the impact would not be significant and that it would not negatively impact the established appearance and aesthetic attributes of scenic routes or protected views from the Killeishin Hills."

Overall, there will be an increase in the intensity and scale of electrical infrastructure and renewable energy development across the study area. However, while the combined developments will become one of the more prominent single land uses within this landscape context, the perceived scale and intensity of the development will be considerably reduced for receptors within the study area. This is due to the combination of offsets between the developments and the considerable degree of screening provided by the terrain and intervening vegetation. If all solar developments are realised, solar farm development will become a more established land use within the study area. However, it is considered the combined developments can be well accommodated within this robust and modified landscape setting, and their combined perceived scale and extent will be considerably less than how they are perceived when viewed in combination in plan view. In terms of their scale and function, the cumulative effects of the proposed development in combination with the consented and proposed solar farms will not significantly detract from the working rural character of this landscape context that *"has capacity to absorb most types of development subject to the implementation of appropriate mitigation measures."*

Overall, the cumulative landscape and visual effects arising from the proposed substation development are deemed to be Not Significant.

1.8 CONCLUSIONS

In terms of landscape impacts, the proposed substation development is considered to have only a modest physical impact as it is consolidated within the existing hedgerow network and will not require significant excavation works to construct either the substation or underground cable connections.

In terms of impacts on landscape character, the proposed substation development will be clearly viewed as an associated development to the consented Ballyloo solar farm and will not appear incongruous. Indeed, in the context of this modified working rural landscape influenced by an array of other anthropogenic built features and land uses including quarries, major route corridors and existing overhead cables, the proposed development is not considered to be an inappropriate form of development in this context. Furthermore, despite its locally elevated location, the proposed substation is relatively discreetly located along a plateau ridge and will not be prominently visible beyond its immediate landscape context as it avails a notable degree of screening in the form of existing established hedgerow vegetation.

This is a modified rural landscape with typical working rural characteristics, and it is by no means highly rare or iconic. While there is some degree of scenic amenity within the central and wider study area, this is more a result of the elevated nature of the surrounding terrain than any notable sense of natural beauty or strong heritage associations. It is not considered a landscape heavily associated with outdoor recreation; instead, it holds typical rural landscape values associated with the subsistence of the local rural population. Indeed, the robust nature of this landscape is strongly reinforced by the variety of land uses and built development that define the surrounding area. Whilst the proposed development may slightly alter the 'landscape fabric' of the area, it does not markedly affect the prevailing landscape pattern or overriding rural landscape character of the area. It should be noted that with regard to the 'Available Areas with High Risk' category that the proposed substation options area contained within, ACP consented the full extent of the Ballyloo Solar farm development, even those lands contained within the 'Available Areas with High Risk'. In fact, it notes that existing precedent within the County already exists within such solar classification.

As a result of the reasons outlined above, combined with the 'Medium' magnitude of operational stage landscape impact, the overall significance of operational stage landscape effect was deemed no greater than 'Moderate-slight' and of a Negative quality for all substation options.

Visual Impacts were assessed at 5 viewpoints throughout the immediate and wider landscape context, representing various viewing distances, angles and receptor types. Whilst some localised parts of the landscape are considered sensitive to change, such as the scenic route to the south of the site, the surrounding landscape generally presents as a more typical rural landscape, with 4 of the 5 representative viewpoints classified with receptor sensitivity of Medium or less. Viewpoint VP5 was classified with a High-medium receptor sensitivity as it represents a section of the nearby scenic route designation.

In terms of visual effects, these range from Moderate-Slight to Imperceptible, with the GIS substation option generating marginally greater residual visual effects due to its larger scale and bulkier built form. Nonetheless, in some instances, there is a degree of balance between the larger built form of the GIS substation and the more cluttered and complex forms characteristic of the AIS substation options. The proposed substation options are most prominent from a section of the L3052 local road to the west of the proposed substation compound. It should be noted that this section of the local road is not designated as a scenic route.

The visual presence of the substation options is slightly accentuated by the uphill nature of views afforded here, with the proposed GIS option presenting the most notable visual presence, classified with a residual Moderate–Slight significance of effect, while both AIS options are classified with a residual Slight significance of effect.

Overall, the substation options benefit from their siting, which is well offset from the nearest surrounding visual receptors and afforded a notable degree of screening from the surrounding existing vegetation, some of which will be enhanced as part of the consented solar farm development. In addition, new sections of hedgerow are proposed around the substation compound, further assimilating the development into the local landscape context. Therefore, the proposed development is considered to be well sited and appropriately scaled, a conclusion reinforced by the approval of the neighbouring solar farm development.

1.8.1 **Overall Significance of Effect**

Based on the landscape and visual impact judgements provided throughout this LVIA, the proposed Ballyloo substation and grid connection options are not considered to give rise to any significant residual effects.

1.9 REFERENCES

- Landscape Institute and the Institute of Environmental Management and Assessment (IEMA) publication entitled Guidelines for Landscape and Visual Impact Assessment, 2013 (GLVIA3);
- Environmental Protection Agency (EPA) publication 'Guidelines on the Information to be contained in Environmental Impact Statements (2022); and
- 'Photography and Photomontage in Landscape and Visual Impact Assessment', Landscape Institute Technical Guidance Note 06/2019.