

Culmullin 220kV Substation

Residential Visual Amenity Assessment

Energia Solar Holdings

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1. Residential Visual Amenity Assessment

1.1 Background

AECOM Ireland Limited have been appointed by Energia Solar Holdings (hereafter referred to as the 'Applicant') to carry out a Residential Visual Amenity Assessment (RVAA) as part of the Culmullin 220 kilo Volt (kV) Air Insulated Switchgear (AIS) substation project (hereafter referred to as the 'Proposed Development').

This RVAA considers the potential visual effects of the Proposed Development on lands at Woodstown, Co. Meath (the "Application Site") on individual and groups of residential receptors identified in the Landscape and Visual Appraisal (LVIA).

This report sets out the following:

- An overview of the Proposed Development.
- A description of the Residential Visual Impact Analysis Report.
- The Proposed Developments potential to interact with the environment following the criteria as outlined.
- A summary of findings.

This report also provides recommendations on further assessments and Mitigation that may be required. The purpose of this report is therefore to support a determination of Residential Visual Amenity in the area.

1.2 Introduction

The following report, tables and figures provide an addendum to Chapter 14 – LVIA, which assesses the potential impact experienced from locations accessible by the general public. The residential visual impact analysis provides a methodology how the potential for visual impacts on individual properties located within an approximately 1.5km radius study area of the proposed substation has been identified and assessed. A description of the Proposed Development is set out in Chapter 2 of the Environmental Considerations Report (ECR). That chapter describes the full nature and extent of the Culmullin Substation Development. A description of the existing landscape environment is contained in the Chapter 14 of the ECR. This chapter describes the landscape context and character and the landscape value.

It should be noted that this study area relates to the main elements of the development that are likely to have landscape and visual effects, most notably the proposed substation development. Other works, although not specifically referenced (including the access road and proposed passing bays on the L62051), are also included in this assessment.

The assessment area for the Proposed Development includes a small number of private residential properties within the 1km study area and some beyond. These properties are concentrated mainly along the two Cul de Sac public roads to the north and south of the Proposed Development Site. A number of properties are set back from public roads, with private access.

Site surveys have identified no residential properties within approximately 850m of the Proposed Development. Properties approximately 1km from the Proposed Development are most likely to experience some visual impacts, and that visual impact decreases with distance. Based on this, the study area for this assessment includes all relevant properties located within approximately 1km radius of the proposed substation development. These properties have been assessed in terms of potential visual impacts arising from both the construction stage and operational stage of the proposed development.

1.3 Methodology

This section describes the survey methods and assessment tools used at each stage of the chosen approach which included the following:

- Dividing the study into four main stages:
 - Initial Site Survey
 - Desktop Survey
 - Onsite Verification of Desktop Survey
 - Final Assessment.

Using aerial photography to identify Properties withing 1km of the substation boundary as well as properties lying within approximately 500m beyond the 1km study area.

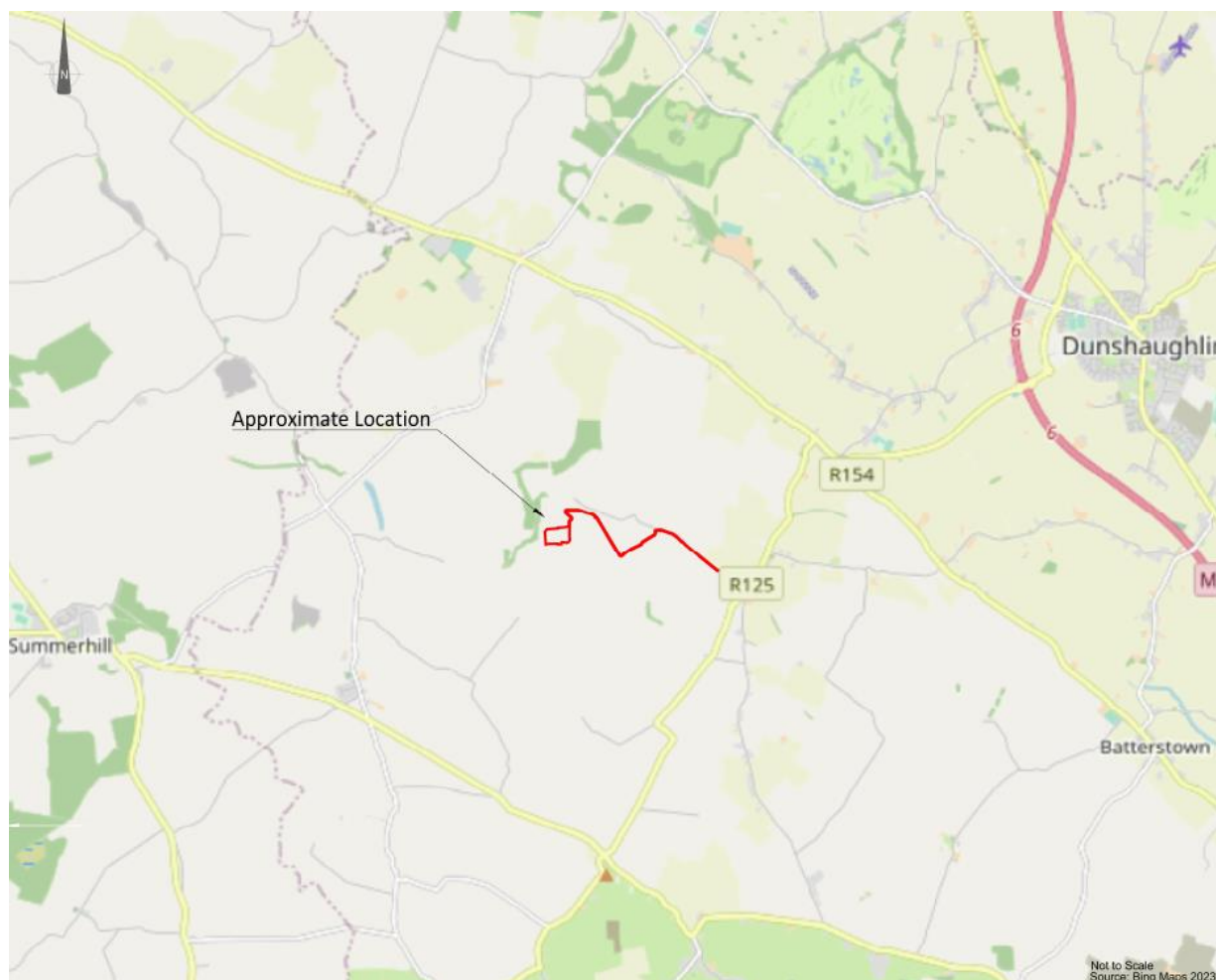
Gathering relevant documentation for assessment including:

- Google aerial mapping, notes and site photography from initial site survey, Ordnance Survey Ireland (OSI) mapping at 1:50,000.
- Preparation of survey record sheets.
- Property assessment (both desktop and onsite).
- Preparation of assessment summary and conclusions.

1.3.1 Property Categorisation

The Proposed Development will comprise a new 220 AIS substation (Culmullin 220kV Substation) looped into the existing Maynooth – Gorman 220kV OHL. The Proposed Development is located at Woodstown, Co. Meath (Figure 1-1). The redline boundary of the Proposed Development covers an approximate area of 7.3 hectares (ha), with the substation boundary covering approximately 2.24ha.

Figure 1-1: Site Location¹



It is intended that three solar energy projects will connect to the proposed substation via underground cables with a maximum voltage of 33kV which are considered to be exempted development under Class 26 of the Planning and Development Regulations 2001, as amended. The substation is required to support, secure and transport the supply of electricity from these renewable energy developments, as part of its place on the wider solar scheme.

The Substation and grid connection will be constructed by the applicant to EirGrid specifications and ownership will be transferred to Electricity Supply Board (ESB)/EirGrid following construction. All works will be contained within the boundary of the Site (Figure 1-2).

¹ Source: Bing Maps (2023).

The Proposed Development comprises:

- A new 220kV substation compound (approximately 2.24ha) consisting of:
 - Outdoor AIS equipment rated for the system voltage of 220kV equipped with 4 number 220kV cable bays.
 - Two number single storey buildings including an EirGrid standard control building with ancillary services, and a customer Medium Voltage (MV) module.
 - Two 180 megavolt amperes (MVA) oil-filled step-down power transformers within banded enclosures.
 - 14 lightning protection masts (25m in height).
 - A 2.6m tall palisade fence.
- Two new Line Cable Interface Mast (LCIMs), under existing OHL to facilitate the removal of a short section (approximately 60m) of the existing 220kV lines.
- Approximately 120m of new underground cables to connect the substation to the grid.
- Adjacent telecoms mast area (225m²) for substation communications between Maynooth and Gorman 220kV substations at either end of the existing 220kV OHL.
- Five passing bays on the L62051.

In addition to the above the Proposed Development will include the following:

- New site access off the L62051 and internal site access road.
- Car parking.
- Drainage infrastructure.
- All associated and ancillary site development works.

The total Proposed Development area is approximately 7.3ha, including the telecoms mast area.

Figure 1-2: Indicative Site Location and Surrounding Environment²



² Source: Google Earth (2023)

1.3.2 Residential Visual Effects Analysis Criteria

The 'Guidelines for Landscape and Visual Impact Assessment (GLVIA), 3rd Edition, 2013, Landscape Institute (UK) & IEMA' set out best practice guidance for the identification and description of visual effects which then feed into the determination of their significance. For the purposes of this Residential Visual Impact Analysis, only visual impacts are being considered. The definitions of the visual criteria used for the impact analysis are the same as for the main landscape and visual impact assessment contained in Chapter 14. The relevant criteria defining visual impacts are stated below. The significance of an effect or impact is determined by two distinct considerations:

- The nature of the RECEPTOR likely to be affected, namely:
- The susceptibility of the receptor to the type of change arising from the proposed development.
- The susceptibility to change is related to the value attached to the receptor.

The nature or magnitude of the EFFECT (or IMPACT) likely to occur, namely:

- The size and scale of the visual effect (for example, whether there is a complete or minor change to a view)
- The extent of the areas that will be affected. e.g. ground floor, upper floor, garden as well as considerations in relation to angle of view.
- The duration of the effect and its reversibility – which can be related to the nature of intervening screening.

1.3.3 Visual Susceptibility

The GLVIA guidelines identify that the susceptibility of visual receptors to changes in views and visual amenity is a function of:

- The occupation or activity of people experiencing the view at a particular location.
- The extent to which their attention or interest may therefore be focused on the views and visual amenity they experience at particular locations.

For example, residents in their home, walkers whose interest is likely to be focused on the landscape or a particular view, or visitors at an attraction where views are an important part of the experience often indicate a higher level of susceptibility. Whereas receptors occupied in outdoor sport where views are not important or at their place of work are often considered less susceptible to change. Visual susceptibility is determined with reference to the three-point scale outlined in Table 1.1.

Table 1.1 Visual Susceptibility

Susceptibility	Classification Criteria
High	Receptors for which the view is of primary importance and are likely to notice even minor change
Medium	Receptors for which the view is important but not the primary focus and are tolerant of some change
Low	Receptors for which the view is incidental or unimportant and is tolerant of a high degree of change

1.3.4 Visual Sensitivity

Sensitivity to change considers the nature of the receptor, for example a person occupying a residential dwelling is generally more sensitive to change than someone working in a factory unit. The importance of the view experienced by the receptor also contributes to an understanding of the susceptibility of the visual receptor to change as well as the value attached to the view.

A judgement is also made on the value attached to the views experienced. This takes account of:

- Recognition of the value attached to particular views, for example in relation to heritage assets, or through planning designations.
- Indicators of the value attached to views by visitors, for example through appearance in guidebooks or on tourist maps, provision of facilities for their enjoyment (sign boards, interpretive material) and references to them in literature or art.
- It is important to note that the absence of view recognition does not preclude local value, as a view may be important as a resource in the local or immediate environment due to its relative rarity or local importance.

The visual sensitivity to change is based on interpretation of a combination of all or some of the criteria outlined in Table 1.2.

Table 1.2 Visual Sensitivity of Change Criteria

Visual Sensitivity	Classification Criteria
High	Users of outdoor recreational facilities, on recognised national cycling or walking routes or in nationally designated landscapes. Residential buildings.
Medium - High	Users of outdoor recreational facilities, in highly valued landscapes or locally designated landscapes or on local recreational routes that are well publicised in guidebooks. Road and rail users in nationally designated landscapes or on recognised scenic routes, likely to be travelling to enjoy the view.
Medium	Users of outdoor recreational facilities including public open space in moderately valued Landscapes. Users of primary transport road network, orientated towards the Proposed Development, likely to be travelling for other purposes than just the view.
Medium - Low	People engaged in active outdoor sports or recreation and less likely to focus on the view. Primary transport road network and rail users likely to be travelling to work with oblique views of the project or users of minor road network.
Low	People engaged in work activities indoors, with limited opportunity for views of the Proposed Development.

Considering the nature of the proposed development to private residences, the proposed substation (within up to 1.5km distance of the site boundary), the susceptibility and sensitivity of residential receptors is considered high.

1.3.5 Magnitude of Visual Change

Visual effects are direct effects as the magnitude of change within an existing view will be determined by the extent of visibility of the proposed development. The magnitude of the visual effect resulting from the development at any particular viewpoint or receptor is based on the size or scale of change in the view, the geographical extent of the area influenced and its duration and reversibility. The variables involved include:

- The scale of the change in the view with respect to the loss or addition of features in the view and changes in its composition, including the proportion of the view occupied by the development.
- The degree of contrast or integration of any new features or changes in the landscape form, scale, mass, line, height, skylining, back-grounding, visual clues, focal points, colour and texture.
- The nature of the view of the development, in relation to the amount of time over which it will be experienced and whether views will be full, partial or glimpses.
- The angle of view in relation to the main activity of the receptor, distance of the viewpoint from the development and the extent of the area over which the changes will be visible.
- The duration of the effects (short term, medium term or long term) and the reversibility of the effect (whether it is permanent, temporary or partially reversible).

The magnitude of visual effects resulting from the proposed road development at any particular viewpoint or receptor is based on the interpretation of the above range of factors and is set out in Table 1.3.

Table 1.3 Magnitude of Visual Change Criteria

Magnitude	Criteria
None	No change in the existing view
Negligible	The development will cause a barely discernible change in the existing view
Low	The development will cause very minor changes to the view over a wide area or minor changes over a limited area
Moderate	The development will cause modest changes to the existing view over a wide area or noticeable change over a limited area
High	The development will cause a considerable change in the existing view over a wide area or a significant change over a limited area
Very High	The development will cause significant changes in the existing view over a wide area or a change which will dominate over a limited area

After considering both the nature of the receptor and the nature of the effect, the significance of the effect is stated according to the following definitions set out in the table below. These effects may be adverse (negative), neutral or positive as outlined in Table 1.4.

Table 1.4 Categories of Significance of Visual Effects

Significance Category	Description of Effect
Major Beneficial Effect	<p>The project would:</p> <ul style="list-style-type: none"> • Cause a very noticeable improvement in the existing view. • Open up a new view of local landscape dominate the future view. • Greatly enhance the character (including quality and value) of the landscape in this view. • Enable the restoration of characteristic features and elements lost as a result of changes from inappropriate management or development. • Enable a sense of place to be created or greatly enhanced.
Moderate Beneficial Effect	<p>The project would:</p> <ul style="list-style-type: none"> • Cause a noticeable improvement in the existing view. • Enhance the character (including quality and value) of the landscape. • Enable the restoration of characteristic features and elements partially lost or diminished as a result of changes from inappropriate management or development. • Enable a sense of place to be restored.
Minor Beneficial Effect	<p>The project would:</p> <ul style="list-style-type: none"> • Cause a barely perceptible improvement in the existing view. This will typically occur where the viewer is at some distance from the development and the development newly appears in the view, but not as a point of principal focus. It will also occur where the development is closely located to the viewpoint but is seen at an acute angle and at the extremity of the overall view. • Complement the character (including quality and value) of the landscape in this view. • Maintain or enhance characteristic features and elements. • Enable some sense of place to be restored.
None	<ul style="list-style-type: none"> • No change resulting from the development
Negligible Effect (applies to both, adverse and beneficial)	<p>The project would:</p> <ul style="list-style-type: none"> • Not result in a discernible deterioration in the existing view. • Maintain the character (including quality and value) of the landscape. • Blend in with characteristic features and elements. • Enable a sense of place to be retained.
Minor Adverse Effect	<p>The project would:</p> <ul style="list-style-type: none"> • Cause a barely perceptible deterioration in the existing view. This will typically occur where the viewer is at some distance from the development and the development newly appears in the view, but not as a point of principal focus. • It will also occur where the development is closely located to the viewpoint but is seen at an acute angle and at the extremity of the overall view. • Not quite fit the character (including quality and value) of the landscape in this view. • Be at variance with characteristic features and elements. • Deduct from a sense of place.
Moderate Adverse Effect	<p>The project would:</p> <ul style="list-style-type: none"> • Cause a noticeable deterioration in the existing view. • Conflict with the character (including quality and value) of the landscape in this view. • Have an adverse impact on characteristic features or elements. • Diminish a sense of place.
Major Adverse Effect	<p>The project would:</p> <ul style="list-style-type: none"> • Cause a very noticeable deterioration in the existing view. • Obstruct an existing view of local landscape and the development will dominate the future view. • Be at complete variance with the character (including quality and value) of the landscape in this view. • Degrade or diminish the integrity of a range of characteristic features and elements. • Damage a sense of place or cause a sense of place to be lost. • Cause the integrity of characteristic features and elements to be lost

2. Desktop Survey

This phase of the study primarily involved the use of Google Earth and aerial photography with the proposed substation site and properties located within approximately 1.5km of the development. OSI contour mapping at

1:50,000 were also used in the identification of visual impacts of the proposed development from individual properties within the study area. Desktop sources included:

- Google Earth Aerial Photography Season
- Google Earth Street View Photography
- Intervening Property Boundary: Wall, Hedgerow, Trees, Fence
- Nature of View: Direct (D), Filtered (F), Oblique (O), Screened (S)
- Magnitude of change at operation phase
- Impact at operation phase.

The assessment of each property commenced with an examination of Google Earth aerial photography, OSI Discover Mapping (Scale 1:50,000) covering the vicinity around the properties and wider landscape between the property and proposed development. Vegetation, topography and ancillary buildings were focused on, as these elements were found to provide considerable screening at the initial benchmark survey stage. Once the proposed substation site was identified in relation to each property, notes taken during the site survey were used to assess the local environment around the property along with the assessment of views in the direction of the development from the property. Assumptions made from the examination of Google Earth aerial photography in terms of vegetation, topography and neighbouring buildings were investigated and worst-case scenario assumptions were made in relation to building type, and heights of intervening topography, vegetation and other existing buildings (i.e., no screening, upper views from properties).

A combined total of ten individual properties were assessed, which lie within up to approximately 1.5km radius of the site. The assessment of individual private properties is based on houses identified on aerial photography and during site surveys. Where it has not been possible to access physically or visually a particular property or properties, a worst-case assessment is assumed (e.g. ground floor windows in the direction of the line, no screening vegetation). These ten properties were considered as six property clusters (refer to Table 2.1) and were highlighted for review and verification assessment onsite.



Figure 2.1 Indicative Site Location with Highlighted Surrounding Properties

Table 2.1 Properties Clusters Considered within Study Area

Map No	Summary of Properties	Approx. Distance from Site	Impact	Reason
1.	Cluster of 3 properties located along Cul de Sac to the south	Approximately 1.4km	No Impact	Fully screen due to topography
2.	Cluster of 2 properties located along Cul de Sac to the south	Approximately 1km	No Impact	Fully screen due to topography
3.	Single dwelling west	Approximately 1.2km	No Impact	Due to distance, topography and intervening vegetation
4.	Single dwelling northeast	Approximately 900m	Minor	Taller elements may be visible above intervening vegetation
5.	Cluster of 2 properties located along Cul de Sac to the northeast	Approximately 1km	Negligible	Due to distance, topography and intervening vegetation
6.	Single dwelling east	Approximately 1.2km	No Impact	Due to distance, topography and intervening vegetation

2.1 Final Assessment

The preliminary conclusions of the desktop assessment and identified properties recorded during the onsite review and verification were brought together. Considering the high susceptibility and sensitivity of the receptors, the residual visual impact ratings of 'magnitude of change' and 'significance of visual impacts (or effects)' have been concluded. Impacts at the operational phase have been assigned to properties based on a combination of the following:

- Existing intervening vegetation between the property and the Proposed Development.
- Proximity and orientation of property windows in relation to the Proposed Development.
- Predicted visibility from the property of the Proposed Development.

3. Visual Impact Summary

A total of 10 properties were assessed within the study area of the Proposed Development.

Table 3.1 Visual Impact Summary

Impact Rating	Number of properties
Negligible/Low	0
None	7
Negligible Effect	2
Minor Adverse Effect	1
Moderate Adverse Effect	0
Major Adverse Effect	0
Total	10

Table 3.2 Summary of Impact

Impact Significance	Number of properties
Significant	0
Not Significant	10
Total	10

In conclusion, the assessment has been undertaken based on views from the public road near these residential receptors and looking out from within the Application Site. Thus, further variations may occur as experienced within the grounds or property of each receptor.

Of the ten receptors assessed only one individual receptor within 1.5km of the site (1km study area and properties lying within approximately 500m beyond the study area) will have a potential limited view of the Proposed Development, therefore a total of one out of ten properties or 10% will experience a minor adverse visual impact that is, according to the definitions used in this report. This will typically occur where the development obstructs an existing view of local landscape, that is, the development will not be prominent or dominate the future view due to its distance to the receptor (0.9km) and the nature of views experienced by the receptor.

The majority of properties will experience no visual impact or negligible visual impact, that is, where a development causes no or a barely perceptible deterioration in existing views or will not be a point of principal focus.

The changes resulting from the Proposed Development while noticeable, will not alter the character of the existing view.

