hw planning

Planning and Environmental Statement

Ballyglass Grid Connection – Proposed 110kV Substation and Grid Connection at Ballyglass, Ardnacrusha, Co. Clare.

Client: Reeve Wave Ltd.

July 2026

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Introduction

1.1 Introduction

This Planning and Environmental Statement has been prepared by HW Planning on behalf of Reeve Wave Ltd. It accompanies an application to An Coimisiún Pleanála for the development of a proposed 110kV AIS electricity substation and associated grid connection to the existing Ardnacrusha 110kV substation at Ballyglass, Blackwater, Castlebank, Lakyle, Mountcatherine, Oakfield, Parkroe, Reanabrone, Rosmadda West and Ruanard (townlands), Ardnacrusha, County Clare.

1.2 Application Context

The purpose of the proposed substation and grid connection is to transport the electricity generated at the Ballyglass Solar Array Phase 1 (Clare County Council Reference P22-591 and An Coimisiún Pleanála (formerly An Bord Pleanála) Reference ABP-316043-23) and Phase 2 (Clare County Council Reference P24-60485 and An Coimisiún Pleanála Reference PL-500253-CE-25) to the national grid via a grid connection to the existing Ardnacrusha 110kV substation. The solar array phases are located in the townlands of Ballyglass, Coolderry, Dromintobin North, Dromintobin South, Reanabrone, Oakfield, Knockbrack Lower, Knockbrack Upper, Monaskeha and Ruanard, Ardnacrusha, County Clare. The applicant in both cases was Reeve Wave Ltd.

Early in the project development phase, it was identified that the proposed 110kV substation and grid connection may constitute 'strategic infrastructure development' having regard to the provisions of the Planning and Development (Strategic Infrastructure) Act 2006 and established case precedent on such matters. The Act provides that applications for permission/approval for specified private and public strategic infrastructure developments be made directly to An Coimisiún Pleanála. The applicant entered into pre-application consultations with An Bord Pleanála (now An Coimisiún Pleanála) on the 8th June 2022. An Coimisiún Pleanála confirmed their opinion that the proposed development meets the definition of 'strategic infrastructure development' as defined in the legislation by means of a formal notice dated 22nd July 2024 (Reference ABP-313767-22). The subject application is made pursuant to this determination.

Given the dual consent process associated with the separate planning applications submitted to Clare County Council for the solar array and the subject application submitted to An Coimisiún Pleanála under Section 182A, the assessments presented within this application consider the proposed development in isolation. However, each technical assessment also includes a cumulative impact assessment that considers the combined effects of the proposed development together with the permitted and proposed Ballyglass solar arrays. In terms of definition, the use of the term 'solar farm project' across these reports means the project singular comprising the solar panels and support infrastructure, the substation and grid connection elements, and all associated enabling

works. This Planning and Environmental Statement is prepared with a focus on the proposed substation and grid connection application made to An Coimisiún Pleanála.

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Site and Development Context

2.1 Subject Site

The subject site (c. 13.5 hectares) comprises agricultural lands, sections of the public road network and private lands in the townlands of Ballyglass, Blackwater, Castlebank, Lakyle, Mountcatherine, Oakfield, Parkroe, Reanabrone, Rosmadda West and Ruanard, Ardnacrusha, County Clare. The proposed substation is located on a greenfield site in the townlands of Oakfield and Ruanard. The grid connection route extends c. 5.6 km from the substation site to the existing Ardnacrusha 110kV substation. The site is located approximately 1 kilometre northeast of Ardnacrusha and approximately 2.8 kilometres northeast of the northern environs of Limerick City. The surrounding area includes a varied mix of land uses including agriculture, roads infrastructure, residential and employment, as well as existing renewable energy generation. Ardnacrusha is home to the Ardnacrusha Hydroelectric Power Station, Ireland's largest river hydroelectric scheme, which has been operational since 1929 and is operated on a purpose-built headrace connected to the River Shannon.

The application site will be accessed via a new entrance from the L70382 to the west. The substation site is wholly contained within the parcels that form part of the proposed Ballyglass Solar Array Phase 2 (Clare County Council Reference P24-60485 / An Coimisiún Pleanála Reference PL-500253-CE-25) and is located within 300 metres of the permitted Phase 1. The following map illustrates the subject site in the context of the solar array phases.

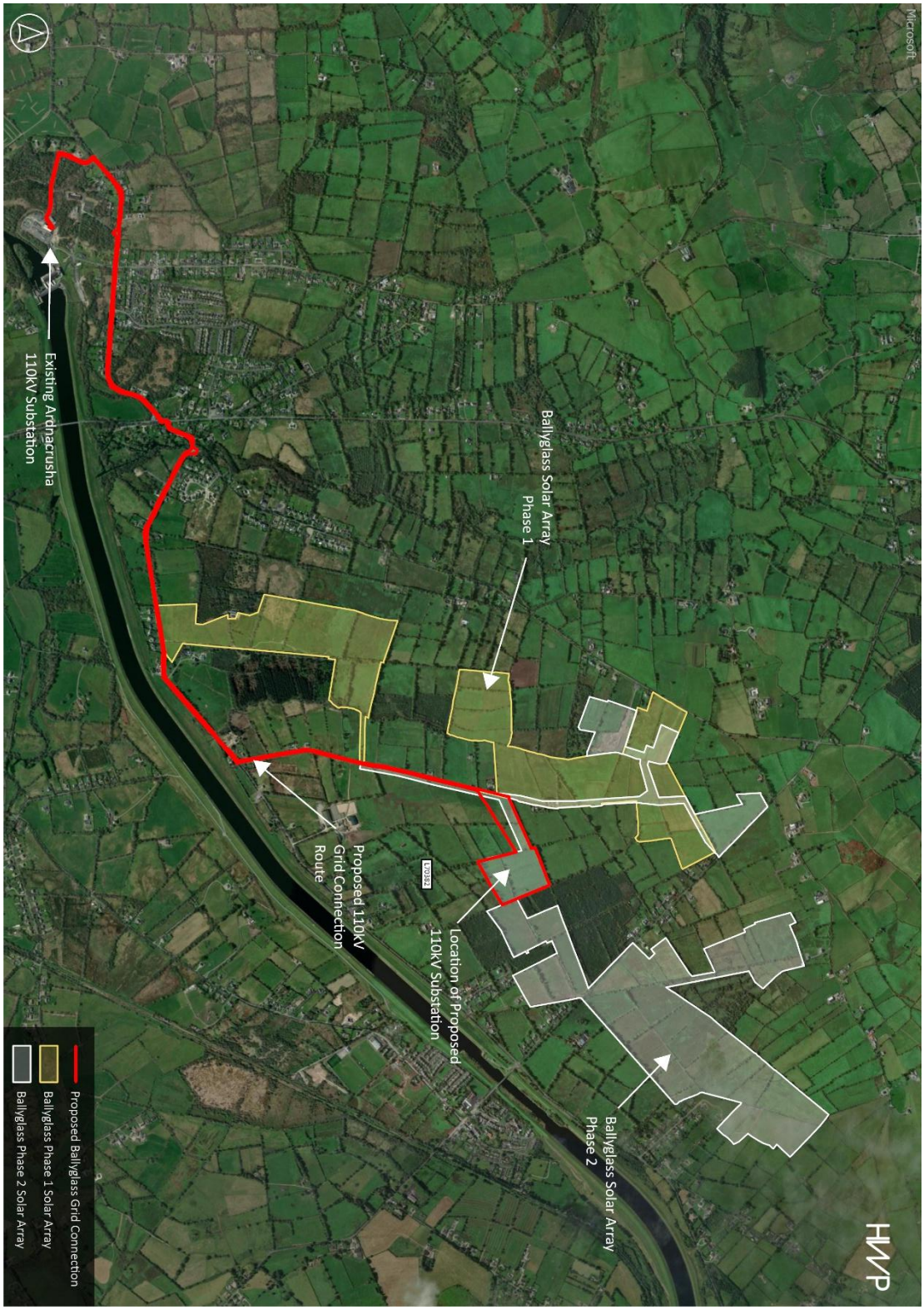


Figure 1 Site context

2.2 Proposed Development

A 110 kilovolt (kV) Air-Insulated Switchgear (AIS) electrical substation, including 2 no. single-storey control buildings with staff welfare facilities, underground wastewater storage tank, all associated electrical plant, cabling, equipment and apparatus, and security fencing, within a substation compound with a total footprint of approximately 0.8 ha; 5.6 kilometre (km) 110kV underground cabling route, with 4.75km following the public road corridor and 0.85km along new proposed access track across agricultural grassland and private access tracks (including joint bays, communication and earth sheath link chambers and all ancillary works along the route); 1 no. temporary construction compound (including offices and staff welfare facilities); temporary construction and operational access from a new entrance from the L70382; Spoil management, landscaping and earthworks; Site drainage; All ancillary works and apparatus.

The development subject to this application forms part of grid connection and access arrangements which will facilitate the connection of the permitted Ballyglass Solar Array Phase 1 (Clare County Council Reference P22-591 and An Coimisiún Pleanála Reference ABP-316043-23) and Phase 2 (Clare County Council Reference P24-60485 and An Coimisiún Pleanála Reference PL-500253-CE-25) to the national grid.

This application is accompanied by a Natura Impact Statement (NIS).

The proposed development works can be summarised as follows:

- Construction of new 110kV substation;
- Underground 110kV underground cable grid connection to the existing Ardnacrusha 110kV substation, including associated joint bays, communication chambers and earth sheath link chambers;
- Temporary construction compound;
- Provision of vehicular construction and operational entrance and access track from the L70382.
- Site drainage;
- Spoil management, landscaping and earthworks

2.2.1 Site Access

The site will be accessed for both the construction and operational phases by means of a new entrance from the L70382. The entrance will be suitably splayed and has been subject to sight line and autotrack analysis, with the latter including modelling of abnormal load delivery for the transformer. Operational sightlines will be maintained by trimming back hedgerows with all necessary land within ownership.

A 4.5 metre wide compacted access track will extend from the entrance to the substation compound, approximately 330m in length. The access track material will be made of porous aggregate material to support percolation to ground. The autotrack analysis has demonstrated that delivery of the substation transformer can be safely accommodated.

2.2.2 Substation

The 110kV substation involves two separate compounds namely (i) the 110kV compound which will be in the ownership of ESB Network and (ii) the IPP compound which will be in the ownership of the

customer. Please refer to the enclosed drawings by Reeve Wave Limited for site configuration and design layout. The main construction elements will include two substation buildings of concrete block construct with tiled roof, which will accommodate staff welfare facilities for the operational phase, High Voltage (HV) electrical equipment and associated infrastructure including palisade fences and concrete post and rail fences. The installation of HV electrical equipment will include a Transformer (TRAFO) with associated equipment along with:

- Cable Sealing End (CSE);
- Surge Arrestor (SA);
- Earth Disconnect (DA, DB, DL, DT);
- Current /Voltage Transformer (CT/VT);
- House Transformer (HoT);
- Circuit Breaker (CB);
- Lightning Masts (LM);
- Diesel Generator;
- Harmonic filters if required by EirGrid;
- Capacitor Bank if required by EirGrid;
- Underground cable trench for the grid connection to the existing Ardnacrusha 110kV substation comprising of 3 no. power ducts, 2 no. telecom ducts and 1 no. earth continuity ducts.

The substation compound has a total area of approx. 0.8ha. Earthworks will be undertaken so the compound is level, with a finish compound level of 44m OD.

2.2.3 Connection to National Grid

In order to connect to the transmission network, it is proposed to connect the proposed 110kV substation to the existing 110kV Ardnacrusha substation by means of a 110kV underground grid connection which is approximately 5.6 km in length. The cable ducts will be installed in an excavated trench, typically to a depth of 1.30m. The cable will run west from the proposed substation through private lands for 0.33km to where it will join the local road network via the L70382. The cable will run south along the L70382 for approximately 1.3km to where it meets the R463. The cable will then run westward for circa 1.95km to where it will join the L3056. It will then travel west and south for approximately 1.45km along the L3056 until it leaves the public road corridor and enters private track. The cable continues along this track for 0.57 km before connecting with the existing Ardnacrusha substation. The exact connection point within the existing Ardnacrusha 110kV substation compound will be determined by ESB and EirGrid requirements.

Joint bays are required at approximately 750 metre intervals along the underground cable route to facilitate the jointing of cable lengths and comprise pre-cast concrete chambers (typically c. 2.5m x 6m x 2.05m) installed below finished ground level. Communication chambers and earth sheath link chambers will also be provided at each joint bay and approximately every second joint bay respectively, in accordance with ESB Networks and EirGrid requirements. All joint bays, communication chambers and earth sheath link chambers will be backfilled to finished ground level upon completion of cable installation, with no above-ground manifestation in the completed development.

All works will be carried out in accordance with international best practice and full compliance with health and safety requirements.

The underground cable route will involve five watercourse crossings. The crossing of the Blackwater River will be undertaken by means of Horizontal Directional Drilling (HDD) beneath the watercourse. The crossings of the Oakfield and West Roo watercourses will be undertaken by means of flatbed crossing methodology. All watercourse crossings will be carried out in accordance with Inland Fisheries Ireland guidelines. There is no requirement for instream works at any proposed crossing.

The construction phase of the proposed development is anticipated to take approximately 9 to 12 months to complete over an 18-month period, with construction anticipated to commence in Q3 2027 subject to the granting of planning permission. Construction activities will be carried out during normal daytime working hours of 07:00 to 19:00 hours Monday to Saturday. To ensure that optimal use is made of good weather periods or at critical periods within the programme, it may on occasion be necessary to work outside of these hours; any such out-of-hours working will be agreed in advance with Clare County Council.

Where vegetation removal is required (e.g. segments of hedgerow), this will be undertaken outside of the bird breeding season, which runs from 1st March to 31st August inclusive, in order to minimise the potential for impacts on nesting birds. Construction may commence in the September to February period so that construction activities are ongoing by the time the next bird breeding season comes around, with works continuing through that breeding season subject to the vegetation-removal restriction above.

2.2.4 Temporary Construction Compound

As outlined in the submitted site layout plans, it is proposed to provide a temporary construction compound west of the proposed substation, accessed from the entrance from the L70382. The temporary compound will include the following facilities at a minimum:

- Adequate canteen space to allow for all workers during the peak period;
- Office space with lighting, heating and internet facilities;
- Toilets and adequate welfare facilities for construction staff in accordance with the relevant statutory Health & Welfare guidelines;
- Parking space for both light and heavy vehicles;
- Designated skips and temporary storage areas.

2.2.5 Surface Water Drainage and Water Services

Surface water drainage proposals for the development have been developed to mimic the natural drainage patterns of the site and thereby be in accordance with the best management practices of Sustainable Drainage Systems (SuDS) including those set out in the SuDS Manual (C753) published by CIRIA in 2015. Specifically, this includes the following:

- The proposed access track to the substation compound will be permeable allowing rainwater to infiltrate through the stone structure to the subsoil below;
- The compound construction is formed with permeable stone thus mimicking a soakaway scenario. ESB compound stone is single sized for the first 150mm for safety purposes. It then changes to a graded 6F2 material;

- The area to be drained includes the roofs and the bunded plinths. These equate to 786.5m^2 which is relatively minor in comparison to the overall compound area;
- Assuming even the most basic of infiltration rates down through the permeable compound stone, it is clear that the existing greenfield situation will be easily maintained;
- The surface water generated in the hardstanding and bunded areas will discharge to soakaways via a Class 1 Full Retention Oil Separator.
- In relation to wastewater, a 5m^3 foul holding tank is proposed as part of the operational development. These tanks are normally used in ESB substations. It will be emptied periodically, with the capacity in excess of modelled holding requirements.

The control buildings will include staff welfare facilities for the operational phase of the Proposed Development. Toilet facilities will be installed with a low-flush cistern and low-flow wash basin. Due to the specific nature of the proposed 110kV onsite substation, there will be a very small water requirement for occasional toilet flushing and hand washing, and therefore a potable water source is not required. It is proposed to either harvest rainwater from the roofs of the buildings or, alternatively, install a groundwater well adjacent to the proposed 110kV onsite substation in accordance with the Institute of Geologists Ireland, Guide for Drilling Wells for Private Water Supplies (IGI, 2007). The well will be flush to the ground and covered with a standard manhole. A pump house is not required as an in-well pump will direct water to a water tank within the roof space of the control building. Bottled water will be supplied for drinking, if required. Section 3 of the submitted Construction and Environmental Management Plan includes a detailed summary of surface water, waste water and water supply requirements for the proposed development.

2.2.6 Site Reprofiling

The subject site is relatively flat in nature but analysis of topographic data confirms that cutting and filling of the existing terrain will be required to establish a level platform for the substation compound. Cutting into the existing terrain and the requirement to relocate soil has been minimised by establishing the compound level to 44 m OD. The excavation area of the substation site is approximately 0.9 ha. It is estimated that approximately 4,600m^3 of soil will need to be removed to form a level substation compound and approximately 650m^3 of soil will need to be removed to build up the access track from competent strata. It is envisaged that the majority of this excavated soil will be reused on site as part of landscaping measures, including the formation of perimeter berms and reinstatement works. Any residual surplus soil that cannot be accommodated on site will be disposed of offsite at an appropriately licensed waste recovery or disposal facility, with the option of an Article 27 by-product declaration to the EPA (under the European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011) pursued where the material meets the relevant criteria. Similarly, the necessary amounts of fill material which must be to ESB Networks specification will be transported onto site, supplemented by suitable material won from the site excavation. This is expected to be 13,650m3.

2.2.7 Site Restoration and Landscaping

This will involve the reinstatement of all other excavated materials and associated landscaping works. It will include the replacement of topsoil in disturbed ground areas such as access tracks and the removal of the construction compound and other temporary work areas. The proposed landscaping is consistent with that proposed under Clare County Council and An Coimisiún Pleanála References P22-591/ ABP-316043-23 and P24-60485 / PL-500253-CE-25.

Within the boundary of the proposed development, the Proposed Ballyglass Solar Array (Phase 2) application includes for the removal of some c. 25 linear meters of existing hedgerow required to facilitate the construction of access track throughout the proposed solar parcels. Notwithstanding the above areas of removal, this will be offset by the planting of new native hedgerow (outside of the SID application boundary) and the bolstering of some c.1,400 linear metres. The removal of hedgerow to facilitate the SID substation is limited to 3 linear metres, where it is proposed to add levelling batter to the access track. Overall, there is an additional c. 175m of proposed bolstered hedgerow, with no further removal or new hedgerow planting required as part of the proposed SID substation development as it is wholly contained within the parcels that form part of the proposed Ballyglass Solar Array.

2.2.8 Other Planned Works

Permitted Phase 1 of Ballyglass Solar Array (Clare County Council Reference P22-591 and An Coimisiún Pleanála Reference ABP-316043-23)

On 21st November 2023, planning permission was granted by An Coimisiún Pleanala for Phase 1 of Ballyglass Solar Array comprising:

A 10-year planning permission for a solar array at Ballyglass, Coolderry, Dromintobin North, Reanabrone, and Oakfield (townlands), Ardnacrusha, Co. Clare. The development will consist of c.265,000 m2 of solar panels on ground mounted frames, 8 no. single storey control cabins with associated electrical transformer units and hardstand areas, 2 no. ring main units, underground cabling within the solar array site and within the L70382 public road to connect solar array field parcels, security fencing, CCTV, access tracks (upgrade of existing and new), upgrades to four existing agricultural field entrances on the R463, L3046 and L70382 and creation of new entrance on L70382, temporary construction compound, landscaping and all associated ancillary apparatus and development works.

Proposed Phase 2 of Ballyglass Solar Array (Clare County Council Reference P24-60485 and An Coimisiún Pleanála Reference PL-500253-CE-25)

Phase 2 of Ballyglass Solar Array was submitted to Clare County Council on the 4th October 2024, comprising:

> *A 10-year planning permission for a solar array at Coolderry, Dromintobin North, Dromintobin South, Knockbrack Lower, Knockbrack Upper, Monaskeha, Oakfield and Ruanard (townlands), Ardnacrusha, County Clare. The development will consist of c. 330,000 m2 of solar panels on ground mounted frames, 13 no. single storey control cabins with associated electrical transformer units and hardstand areas, 2 no. ring main units, underground cabling within the solar array site and within the R471 public road to connect solar array field parcels, security fencing, internal CCTV, access tracks (upgrade of existing and new), upgrade to 1 no. existing agricultural field entrance and creation of 2 no. new entrances on the R471 and 1 no. new entrance on the L70382, 2 no. temporary construction compounds (including site offices and welfare facilities), landscaping and all associated ancillary apparatus and development works.*

The proposed development provides for minor modifications to the solar array permitted under Clare County Council Reference P22/591 / An Coimisiún Pleanála Reference ABP-316043-23. These modifications comprise the omission of 1 no. single storey control cabin and associated

electrical transformer unit, omission of solar panels and access track, and reconfiguration of internal cabling. The solar array will connect to the national grid and will have an operational lifespan of 40 years.

Clare County Council granted conditional permission on the 16th October 2025. First and Third Party appeals were submitted to An Coimisiún Pleanála regarding same, An Coimisiún Pleanála Reference PL-500253-CE-25 refers. This case was due to be decided by 17th June 2026.

2.3 Pre-Planning Discussions

A pre-application consultation process was undertaken with An Coimisiún Pleanála in respect of the proposed substation and grid connection, commencing on the 8th June 2022. Alongside discussions on the strategic infrastructure status of the proposed development (Reference ABP-313767-22), the consultation process was a useful forum for discussion on key matters related to any prospective SID application. Specifically, this included discussion on appropriate assessment, biodiversity, landscape and visual and traffic and access considerations. The feedback obtained from An Coimisiún has directly informed project design direction.

2.4 Site Planning History

A review of the Clare County Council planning enquiry system indicates that the following valid planning applications have been made on/overlap with the subject lands. The most relevant applications relate to the Ballyglass Solar Array phases which the proposed substation and grid connection will support:

Reference: P13-349

Applicant: EirGrid plc

Address: Ballykeelaun, Castlebank, Co. Clare (Ardnacrusha Power Station complex)

Date Received: 16/07/2013

Description: Electricity-related development comprising modifications to the development previously approved under P12-137, at a site adjacent to the existing 110kV station within the Ardnacrusha Power Station complex.

Decision: Granted conditional permission by Clare County Council (decision 30/08/2013; grant issued 30/09/2013). Not appealed.

Reference: P22-591 / ABP-316043-23

Applicant: Reeve Wave Ltd.

Address: Ballyglass, Coolderry, Dromintobin North, Reanabrone, and Oakfield (townlands), Ardnacrusha, Co. Clare

Date Received: 04/07/2022

Description: Phase 1 of Ballyglass Solar Array comprising a 10-year planning permission for a solar array of c. 265,000 m2 of solar panels on ground mounted frames and associated infrastructure.

Decision: Granted by Clare County Council (17/02/2023). Third Party appeal to An Bord Pleanála (now An Coimisiún Pleanála); decision modified and permission granted on 21/11/2023 (ABP-316043-23).

Reference: P23-148 / ABP-317227-23

Applicant: RWE Renewables Ireland Limited

Address: Fahy Beg, Fahy More North, Ballymoloney, Ballyknavin, Ballyquin More, Woodpark, Leitrim, Fahy More South, Ballybrack, Aharinaghmore, Tooreen, Aharinaghbeg, Knockdonagh, Roo East, Blackwater, Rosmadda West, Parkroe, Lackyle, Castlebank and Ardataggle (townlands), Co. Clare

Date Received: 09/03/2023

Description: 10-year permission for a wind farm and underground grid connection to the national grid, consisting of 8 no. wind turbines (blade tip heights of 169m to 176.5m), a permanent meteorological mast, an onsite 38kV electrical substation, underground electrical cabling and all associated site works. Accompanied by an EIAR and NIS.

Decision: Refused by Clare County Council (03/05/2023). First Party appeal to An Coimisiún Pleanála; permission granted with conditions on 06/03/2024 (ABP-317227-23).

Reference: P24-60416 / ACP-323147-25

Applicant: Castlebank Green Energy Limited

Address: Castlebank, Parteen, Ballykeelaun and Drummin (townlands), Ardnacrusha, Co. Clare

Date Received: 30/08/2024

Description: Solar energy development on a total site area of 36.70 ha, comprising PV panels, substations, inverter stations, access tracks, underground cabling, security fencing and CCTV, with a c. 1.2km 38kV underground cable connecting to grid infrastructure at Ardnacrusha Power Station. Accompanied by a NIS.

Decision: Granted conditional permission by Clare County Council (30/06/2025). Third Party appeals to An Coimisiún Pleanála; decision modified and permission granted with revised conditions on 13/01/2026 (ACP-323147-25).

Reference: P24-60485 / PL-500253-CE-25

Applicant: Reeve Wave Ltd.

Date Received: 04/10/2024

Description: Phase 2 of Ballyglass Solar Array comprising a 10-year planning permission for a solar array of c. 330,000 m2 of solar panels on ground mounted frames and associated infrastructure, including minor modifications to the permitted Phase 1.

Decision: Granted conditional permission by Clare County Council (16/10/2025). First and Third Party appeals to An Coimisiún Pleanála; appeal case PL-500253-CE-25 remains under consideration by An Coimisiún Pleanála, with no revised decision date indicated.

03 //

Planning Policy Context

The proposed substation / grid connection forms part of the wider solar farm development, with the collective project supported by a suite of national, regional and local planning policy objectives, which includes but is not limited to the following:

3.1 European Context

3.1.1 European Green Deal and Fit for 55

In its 2018 Communication A Clean Planet for all, the European Commission set out its vision for a climate-neutral EU and explored pathways that would enable the EU to achieve climate neutrality by mid-century in line with the Paris Agreement.

The European Green Deal, published in December 2019, sets out a low emissions growth strategy that aims to transform the EU into a fair and prosperous society, with a modern, resource efficient and competitive economy, where there are no net emissions of greenhouse gases by 2050, where economic growth is decoupled from resource use and where no person and no place is left behind.

The European Green Deal is underpinned by the European Climate Law, enacted in July 2020, which sets into legislation the objective of a climate-neutral EU by 2050 and a commitment to negative emissions thereafter. It also sets a binding intermediate Union target of a reduction of net greenhouse gas emissions (emissions after deduction of removals) by at least 55% by 2030 compared to 1990. In July 2021, the Commission put forward the Fit for 55 package, a wide-ranging set of proposals to revise and update EU climate and energy legislation to ensure that EU policies are in line with the new EU objective established by the Climate Law.

3.1.2 Renewable Energy Directive

In November 2023, a revision of the Renewable Energy Directive (RED III), came into force. RED III increases the EU wide renewable energy target from 32% set under the previous revision of the directive to at least 42.5%, with an ambition to reach 45% by 2030. The Directive also introduces specific targets for Member States in the industry, transport, and building (district heating and cooling) sectors.

RED III extends the presumption that renewable energy projects and associated grid infrastructure are ‘in the overriding public interest’ until such time as "climate neutrality is achieved" and provides a framework for the streamlining of the permit-granting process.

There is an 18-month period to transpose most of the directive's provisions into national law, with a shorter deadline of July 2024 for some of the provisions related to permitting for renewables, in particular Article 16(f) which establishes the legal presumption that the construction and operation of renewable energy development and storage assets are in the "overriding public interest and serving public health and safety when balancing legal interest in individual cases for the purposes of

Article 6(4) and Article 16(1), point (c), of Directive 92/43/EEC [the 'Habitats Directive'], Article 4(7) of Directive 2000/60/EC [the 'Water Framework Directive'] and Article 9(1), point (a), of Directive 2009/147/EC.[the 'Birds Directive']".

3.1.3 REPowerEU Plan

On 18 May 2022, the Commission published the REPowerEU plan, which sets out a series of measures to rapidly reduce EU's dependence on Russian fossil fuels well before 2030 by accelerating the clean energy transition. The REPowerEU plan is based on three pillars: saving energy, producing clean energy and diversifying the EU's energy supplies. As part of its scaling up of renewable energy in power generation, industry, buildings and transport, the Commission proposes to increase the target in the directive to 45% by 2030, thereby increasing the targets set out in the current Renewable Energy Directive This would bring the total renewable energy generation capacities to 1236 GW by 2030, in comparison to 1067 GW by 2030 envisaged under the 2021 proposal. The Plan acknowledges that solar is one of the fastest technologies to roll out. That is why the Commission sets the REPowerEU target of over 320 GW of solar photovoltaic newly installed by 2025 and almost 600 GW by 2030.

3.1.4 EU Solar Strategy

As part of the REPowerEU plan, the Commission adopted an EU solar energy strategy in May 2022. The solar strategy identifies the remaining barriers and challenges in the solar energy sector and outlines initiatives to overcome them and accelerate the deployment of solar technologies. It states the EU solar energy has a significant potential to rapidly become a mainstream part of our power and heat systems and a main lever to achieve the European Green Deal objectives while phasing out our dependence on Russian fossil fuels. Amid the energy crisis, the implementation of the Strategy and these key solar initiatives proposed for the EU and its Member States is of utmost urgency.

Alongside the REPowerEU plan, the Commission also presented a Recommendation on fast permitting for renewable energy projects and a legislative proposal on permitting that will contribute to the further acceleration of solar energy deployment in the EU. It acknowledged that slow and complex permitting processes are a key obstacle to unleashing the renewables revolution and for the competitiveness of the renewable energy industry.

3.1.5 IPCC Climate Change 2023

In March 2023, the UN's Intergovernmental Panel on Climate Change (IPCC) indicated in its 'Climate Change 2023 – Synthesis Report', that it is likely that global warming will exceed 1.5°C during the 21st century, thus making it a significant challenge to limit warming below 2°C. The IPCC state that the world is on a path to exceed the temperature limits of the Paris Agreement. The report states that without urgent actions, climate change increasingly threatens ecosystems, biodiversity, and the livelihoods, health and well-being of current and future generations. In relation to energy systems, the report states that these actions include urgent decarbonisation through renewable energy development such as wind and solar.

3.2 National Context

3.2.1 Climate Action and Low Carbon Development (Amendment) Act 2021

The Climate Action and Low Carbon Development 2015 (as amended) ("the Climate Act") establishes a legislative precedent to reduce Ireland's carbon emissions. The Climate Act legally

binds Ireland to achieve net-zero emissions no later than 2050, and to a 51% reduction in emissions by the end of this decade.

Under Section 15 of the Climate Act, a planning authority, and the Board is obliged to perform its decision-making function (in so far as practicable) in a manner consistent with:

- the most recent approved climate action plan,
- the most recent approved national long term climate action strategy,
- the most recent approved national adaptation framework and approved sectoral adaptation plans,
- the furtherance of the national climate objective, and
- the objective of mitigating greenhouse gas emissions and adapting to the effects of climate change in the State.

The implications of the obligations placed on planning authorities and the Board under Section 15 were recently the subject of a High Court Judgment, *Coolglass Wind Farm Limited v An Bord Pleanála* [2025] IEHC 1. The case highlights the imperative nature of the obligation placed on public bodies to exercise their discretionary powers in "*such a way as to support the outcome favouring climate goals*".

Delivering judgement in the case, Mr Justice Humphreys undertook a detailed consideration of the interpretation of Section 15 of the Climate Act and concluded that, when determining a planning application relevant to the achievement of climate plans and objectives under S.15 of the 2015 Act, a planning authority or an Bord Pleanála is required to:

i. Consider if granting permission would contribute to achieving our climate goals, and the Court concluded that in the case of renewable energy projects the answer is invariably yes.

ii. Where the answer to the first question is yes, consider whether granting permission is precluded by a *"mandatory and non-flexible legal requirement that confers no discretion or evaluative judgment on the [board]"*

iii. "If the answer to that is No, the board should then ask if its discretion or evaluative judgment can be exercised in such a way as to support the outcome favouring climate goals."

An appeal against this judgment was dismissed by the Supreme Court in Coolglass Wind Farm Limited v An Bord Pleanála [2026] IESC 5. The Climate Act provides for a 51% reduction in greenhouse gases by 2030 compared to 2018 levels, and puts in place a rigorous governance structure, including a system of carbon budgeting, sectoral emissions ceilings, a national adaptation framework, sectoral adaptation plans, and annually updated Climate Action Plans, to ensure that Ireland achieves its national, EU and international climate commitments in the near- and long-term.

However, in the near term those targets will not be achieved. In May 2025, the Environmental Protection Agency (EPA) published its emissions projections for 2030 which indicated that planned climate policies and measures, if fully implemented, could deliver up to 29 per cent emissions reduction by 2030 compared to 2018. This is insufficient to meet the 51 per cent emissions reduction target in Ireland's Climate Act.

3.2.2 Climate Action Plan 2025

The Department of the Environment, Climate and Communications published the Climate Action Plan 2025 in April 2025 which sets out a roadmap of actions which will ultimately lead us to meeting our national climate objective of pursuing and achieving, by no later than the end of the year 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy. The plan stresses that "renewables-led system is at the core of Ireland's plan to radically reduce emissions in the electricity sector, protect our energy security, and ensure our economic competitiveness. This requires the accelerated and increased deployment of new renewable electricity generation capacity and related infrastructure". It is planned to increase the proportion of renewable electricity to up to 80% by 2030, and a target of 8 GW from solar by 2030. Noting that the programme for large-scale offshore wind deployment is not expected to be to be realised towards end decade, the Climate Action Plan 2025 stresses that deployment rates for onshore renewables will need to increase to match demand growth to ensure we keep electricity emissions within range of the carbon budgets.

3.2.3 Project Ireland 2040 – National Planning Framework

The Government published the National Framework (NPF) in 2018, which was revised in 2025. The plan will guide national, regional and local planning policies and investment decisions for the next two decades. It identifies the transition to a low carbon and climate resilient society as one of the key pillars (shared goals) of the Plan. Section 3.4 of the NPF states that

> *"Harnessing the potential of the region in renewable energy terms in accordance with the capacity allocation targets set out in Chapter 9: Climate Transition and Our Environment, across the technological spectrum from wind and solar, in addition to biomass and wave energy".*

is a key policy priority for the Southern Region.

National Policy Objective 30:

> *"Facilitate the development of the rural economy, in a manner consistent with the national climate objective, through supporting a sustainable and economically efficient agricultural and food sector, together with forestry, fishing and aquaculture, energy and extractive industries, the bio-economy and diversification into alternative on-farm and offfarm activities, while at the same time noting the importance of maintaining and protecting biodiversity and the natural landscape and built heritage which are vital to rural tourism.".*

National Policy Objective 70:

> *"Promote renewable energy use and generation at appropriate locations within the built and natural environment to meet national objectives towards achieving a climate neutral economy by 2050".*

National Policy Objective 71:

> *"Support the development and upgrading of the national electricity grid infrastructure, including supporting the delivery of renewable electricity generating development".*

The NPF also recognises that increases in population and economic growth in areas should be married with a transition to a more sustainable energy market and the achievement of conservation goals.

3.2.4 Programme for Government 2020 – Our Shared Future

The Programme for Government 2020 (PFG) established the strategic goals of the Irish Government. The PFG supports the European Green Deal, which provides a roadmap for Europe to take advantage of the opportunities presented by moving to a low-carbon future. It states that the measures adopted in supporting the European Green Deal will be an important element of the National Economic Plan.

The PFG states that the Government are committed to an average 7% per annum reduction in overall greenhouse gas emissions from 2021 to 2030 (a 51% reduction over the decade) and to achieving net zero emissions by 2050. The implementation of the Climate Action Bill and the establishment of the Climate Action Council will ensure these targets are met with renewable energies seen as a critical component in meeting these ambitious targets.

The PFG calls for a 'Revolution in Renewables' whereby a commitment is made to the rapid decarbonisation of the energy sector. To deliver on the stated target of at least 70% renewable electricity by 2030, the programme states it will:

- Develop a solar energy strategy for rooftop and ground-based photovoltaics to ensure that a greater share of our electricity needs are met through solar power.
- Strengthen the policy framework to incentivise electricity storage and interconnection.

3.2.5 Ireland's Transition to a Low Carbon Energy Future 2015-2030 – White Paper

The Government strategy calls for a radical transformation of Ireland's energy system to meet committed targets and achieve a low carbon energy system by 2050. These commitments included a then EU target to source 20 per cent of its energy needs from renewables such as wind, solar and biomass. Within this, Ireland committed to generating 16 per cent of its overall energy requirements from renewables by 2020 under the EU's plan. At the time of White Paper, about 8 per cent comes from renewables[1].

The strategy includes an objective to "accelerate the development and diversification of renewable energy generation" and increase the country's output of electricity from renewable sources of which we have a plentiful indigenous supply. It is stated that this will be achieved through a number of means including wind, solar PV and ocean energy. Specifically, Section 137 of the White Paper accentuates the role of solar PV as follows:

> *"Solar photovoltaic (PV) technology is rapidly becoming cost competitive for electricity generation, not only compared with other renewables but also compared with conventional forms of generation. The deployment of solar in Ireland has the potential to increase energy security, contribute to our renewable energy targets, and support economic growth and jobs. Solar also brings a number of benefits like relatively quick construction and a range of deployment options".*

3.2.6 Policy Statement on Energy Security in Ireland to 2030

In November 2023, the Government published a Policy Statement on Energy Security in Ireland to 2030 which outlined the key challenges to ensuring security of electricity supply such as having

[1] As identified below, The Climate Action Plan 2021 includes an objective to generate up to 80% from renewables by 2030.

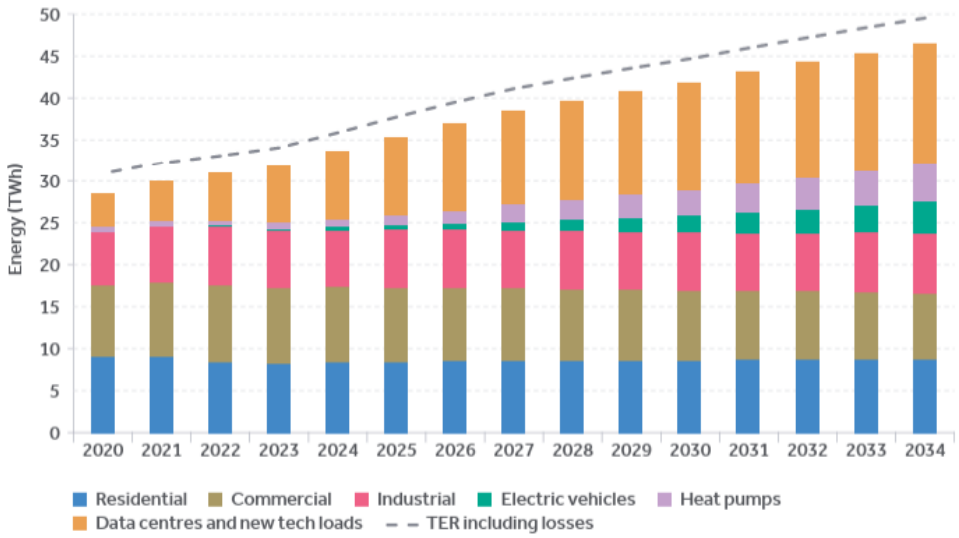
adequate electricity generation capacity, storage, grid infrastructure, interconnection and system services to meet both average and peak demand. It identifies the critical need to maintain security of supply throughout the transition to the target of up-to 80% of electricity consumption from renewable sources. It highlights the need for significant investment in additional flexible conventional electricity generation, electricity grid infrastructure, interconnection and storage in order to ensure security of electricity supply. It states also that the "majority of renewable energy generated by 2030 will be from wind and solar".

3.2.7 EirGrid Generation Capacity Statement 2025 – 2034

EirGrid is leading the secure transition of the electricity grid to a sustainable low-carbon future. Its publication, All-Island Resource Adequacy Assessment, looks at the balance between electricity demand and supply on the island of Ireland for the next 10 years. It is an evolution of the Generation Capacity Statement (GCS) published in previous years.

Throughout the 10-year study horizon, from 2025 to 2034, the demand for electricity is forecast to increase in line with government targets as then set out in CAP 24. The closure of some older conventional fossil fuel burning generators, and the declining performance of other generators on the system mean that this assessment forecasts a challenging outlook for Ireland with capacity deficits identified in some years across the study horizon. The deficits are expected to reduce as new capacity comes forward through the Single Energy Market (SEM) capacity auctions, however the delivery of new capacity (i.e. more renewable electricity) remains challenging.

EirGrids analysis takes into account the targets from CAP 2024, including increased electrification in the heat and transport sectors. The median demand scenario assumes that 100% of the CAP 2024 targets will be met. Over the next ten years, demand is forecasted to grow considerably. In the median scenario, electricity demand is forecasted to increase 45% by 2034 from 2023 levels. The largest growth comes from data centres and new technology loads which will form 31% of all electricity demand by 2030.



Total Electricity Requirement for Ireland sector breakdown

Over the longer term, EirGrid state that it remains crucial that the capacity market delivers new capacity in a timely fashion, and the type and volume of capacity needed to underpin the energy

transition. It is clear that additional renewable, and solar energy in particular, is required to be consented, constructed and operational in a timely manner to support this objective.

3.2.8 Renewable Electricity Support Scheme

The Renewable Electricity Support Scheme (RESS) will provide support subsidies to renewable electricity projects in Ireland. Operated by the Department of Communications, Climate Action and Environment, EirGrid and the CRU, RESS is designed as a series of renewable energy auctions which will take place on a regular basis between 2020 and 2030. Interacting closely with the Climate Action Plan, the Scheme will provide for a renewable electricity ambition of up to 70% by 2030. Auction participants enter their renewable energy projects and competitively bid on the cost of electricity, where the lowest bidder wins the government subsidy. This system predominantly favours large scale developments, as cheaper construction and connection costs ensures that these projects can adopt a more competitive bid strategy.

In March 2023, the Government published a schedule of future RESS auctions shown below, which included a plan for three onshore RESS auctions to be run across 2023 (RESS-3), 2024 (RESS-4) and 2025 (RESS-5). This followed after the RESS-1 and RESS-2 auctions in 2020 and 2022 respectively. The size of these auctions were developed by the Government in order to enable the requisite amount of solar and wind projects to start construction in time for energisation by 2030.

RESS Future Auction Schedule

Auction Type	Indicative Auction Volume (GWh)	Indicative Auction Dates	Indicative Auction Commercial Operation Dates
Offshore RESS 1	10,500-16,000	Q2 2023	2029
Onshore RESS 3	2,000-3,500	Q3 2023	2026
Offshore RESS 2	12,500-18,000	2024-2025	2030
Onshore RESS 4	2,000-5,500	2024	2027
Onshore RESS 5	2,000-5,500	2025	2028

RESS-3 only delivered 934 GWh of successful capacity (less than 50% of the target range) and RESS-4 only delivered 2071 GWh of successful capacity (just over the lower expected volume of 2,000GWh). RESS-5 recently occurred in 2025, and the provisional offers show that a similar trend is likely to prevail. Furthermore, it is commonly known that a large portion of the successful capacity from the RESS-1 and RESS-2 auctions has not connected to the national electricity grid system. The main reasons for this poor capacity delivery are that large numbers of projects cannot secure funding due to high grid connection costs, long connection lead times and projects which are sub-scale for their intended connection method. As a result, the Department of Environment, Climate and Communications have already commenced an EU State Aid engagement process to run further RESS auctions to make up this large shortfall.

3.3 Regional Spatial and Economic Strategy for the Southern Region

The Regional Spatial and Economic Strategy (RSES) provides the framework through which the aspirations of the National Planning Framework will be implemented in the Southern Region. It reaffirms the objective to proactively work towards and achieve a low carbon economy. It includes a commitment to promote change across business, public and residential sectors to achieve reduced Green House Gas (GHG) emissions, improve energy efficiency and increase the use of renewable

energy sources across the key sectors of electricity supply, heating, transport and agriculture. The strategy recognizes that local authorities must demonstrate leadership on related matters:

> *"Leadership is key to transition to renewable energy and the RSES supports the initiative by many local authorities to sign the Covenant of Mayors – a European cooperation movement involving local and regional authorities aimed at increasing energy efficiency and the use of renewable energy".*

RPO 87 Low Carbon Energy Future:

> *"The RSES is committed to the implementation of the Government's policy under Ireland's Transition to a Low Carbon Energy Future 2015-30 and Climate Action Plan 2019. It is an objective to promote change across business, public and residential sectors to achieve reduced GHG emissions in accordance with current and future national targets, improve energy efficiency and increase the use of renewable energy sources across the key sectors of electricity supply, heating, transport and agriculture".*

RPO 89 Building Resilience to Climate Change:

> *"It is an objective to support measures to build resilience to climate change throughout the Region to address impact reduction, adaptive capacity, awareness raising, providing for nature-based solutions and emergency planning".*

RPO 90 Regional Decarbonisation:

> *"It is an objective to develop a Regional Decarbonisation Plan to provide a framework for action on de-carbonisation across all sectors. The Plan shall include existing and future targets for each sector...'*
>
> *Electricity: 'To achieve national and EU targets will require investment in measures to develop alternative renewable energies with greater interconnection to energy resources...".*

RPO 95 Sustainable Renewable Energy Generation:

> *"It is an objective to support implementation of the National Renewable Energy Action Plan (NREAP), and the Offshore Renewable Energy Plan and the implementation of mitigation measures outlined in their respective SEA and AA and leverage the Region as a leader and innovator in sustainable renewable energy generation".*

RPO 97 Power Stations & Renewable Energy:

> *"It is an objective to support the sustainable technology upgrading and conversion of power stations in the Southern Region to use energy efficient and renewable energy sources".*

RPO 98 Regional Renewable Energy Strategy:

> *"It is an objective to support the development of a Regional Renewable Energy Strategy with relevant stakeholders".*

RPO 100 Indigenous Renewable Energy Production and Grid Injection:

"It is an objective to support the integration of indigenous renewable energy production and grid injection".

3.4 Clare County Development Plan 2023-2029 (CDP), as varied

The CDP outlines the vision and overall strategy for the proper planning and sustainable development of the County. Section 1.6 of the plan outlines the key goals and strategic aims for the County during the lifetime of the plan. The CDP recognises the potential of the County to accommodate renewable energy projects with one of the key goals of the plan being:

'A county that is resilient to climate change, plans for and adapts to climate change and flood risk, is the national leader in renewable energy generation, facilitates a low carbon future, supports energy efficiency and conservation and enables the decarbonization of our lifestyles and economy'[2].

CDP Objective CDP 2.1 'Climate Action' states that it is an objective of Clare County Council:

'a) To support the implementation of the National Climate Action Plan 2023 and the National Climate Change Adaptation Framework (and any subsequent versions thereof), and to work with the Regional Climate Action Offices to enable County Clare to transition to a low carbon and climate resilient County;

b) To adopt sustainable planning strategies through integrating land use and transportation and by facilitating mixed use developments as a means of supporting national targets of climate policy mitigation and adaptation objectives, and reducing our carbon footprint and greenhouse gas emissions; and

c) To raise awareness and understanding of the impacts of climate change on both the local economy and communities in the County, and the ways communities can increase their response and grow their resilience to these impacts.'

CDP Objective CDP 2.14 'Transition to a Low Carbon Economy and Society' states it is an objective of the Council:

'a) To facilitate measures which will accelerate the transition to a low carbon economy and a circular economy through mechanisms such as the Climate Action Competitive Fund;

e) To ensure that the development of green industry and technologies incorporates careful consideration of potential environmental impacts at project level including the capacity of the receiving environment and existing infrastructure to serve these new industries;

f) To facilitate the development of energy sources which will achieve low carbon output.'

CDP Objective 8.12 'Renewable Energy Development' states:

[2] Goal 1 of CDP, as varied.

'It is an objective of Clare County Council: to support the implementation of the National Renewable Energy Action Plan (NREAP), the Clare Wind Energy Strategy and the Clare Renewable Energy Strategy to facilitate the development of renewable energy developments in rural areas to meet national objectives towards achieving a low carbon economy by 2050 subject to the requirement of the RES SEA Environmental Report and the mitigation measures arising from the CDP Appropriate Assessment as contained in Volume 10(a).'

Of particular relevance to the proposed development, CDP Objective 11.44 'Energy Security' states it is an objective of the Council:

'To promote and facilitate the sustainable development, maintenance and upgrading of electricity and gas network grid infrastructure, to integrate renewable energy sources, thereby creating a secure and efficient energy supply and storage system for County Clare which is ready to meet increased demand as the regional economy grows.'

CDP Objective 11.45 'Electricity Networks' states it is an objective of the Council:

'a) To facilitate improvements in energy infrastructure and encourage the expansion of the infrastructure within the County;

b) To facilitate future alternative renewable energy developments and associated utility infrastructure throughout the County;'

CDP Objective 11.47 'Renewable Energy' states it is an objective of the Council:

'a) To encourage and to favourably consider proposals for renewable energy developments, including community owned developments, and ancillary facilities in order to meet National, Regional and County renewable energy targets, and to facilitate a reduction in CO2 emissions and the promotion of a low carbon economy;'

The subject lands are located within the 'Western Corridor Working Landscape' area in the CDP. CDP Objective 14.3 'Western Corridor Working Landscape' states that it is an objective of the Council:

'a) To permit development in these areas that will sustain economic activity, and enhance social well-being and quality of life - subject to conformity with all other relevant provisions of the Plan and the availability and protection of resources;

b) To ensure that selection of appropriate sites in the first instance within this landscape, together with consideration of the details of siting and design, are directed towards minimising visual impact;

c) To ensure that particular regard should be had to avoiding intrusions on scenic routes and on ridges or shorelines.'

3.5 Clare Renewable Energy Strategy 2023-2029 (CRES)

The Clare Renewable Energy Strategy outlines the potential for a range of renewable resources, including bioenergy and anaerobic digestion, micro-renewables, combined heat and power, geothermal, solar, hydro, energy storage, onshore and offshore wind, and wave and tidal energy. It acknowledges the significant contribution that they can make to County Clare in terms of energy

security, reduced reliance on traditional fossil fuels, enabling future energy exports and meeting assigned targets. The vision of the strategy is:

> *'A County Clare that is the national leader in renewable energy generation which supports energy efficiency and conservation, and which achieves balanced social and economic development throughout the County and assists in achieving national climate change mitigation targets.'*

Objective RES 3.1 of the CRES states it is an objective of Clare County Council:

> *'To meet the County's energy needs from 100% indigenous renewable energy sources.'*

Chapter 7 of the CRES identifies general parameters for the provision of domestic and large-scale solar projects. Objective RES 7.1 of the CRES 'Increase the penetration of commercial scale solar energy projects' encourages the provision of commercial-scale solar projects on suitable agricultural lands:

> *'A. To increase the penetration of utility scale solar energy development in appropriate locations.*
>
> *C. To favourably consider the development of solar farms on agricultural lands which allow for farm diversification and multipurpose land use.'*

04 //

Assessment of Planning Considerations

4.1 Principle of Development

4.1.1 Energy Context

It is acknowledged that climate change is the greatest challenge facing humanity. The extent of the problem is laid bare in the Intergovernmental Panel on Climate Change Sixth Assessment Report (August 2021) for the United Nations which confirms that to preserve a livable climate, greenhouse gas emissions must be reduced to net zero by 2050. The IPCC report warns that global warming of 2°C will be exceeded during the 21st century. Unless rapid and deep reductions in CO2 and other greenhouse gas emissions occur in the coming decades, achieving the goals of the 2015 Paris Agreement "will be beyond reach". The report calls for decisive action, including the significant upscaling of green energy development to replace the use of fossil fuels.

In April 2022, the IPCC issued a further instalment on the Sixth Assessment Report. This report was again unequivocal that "Climate change is the result of more than a century of unsustainable energy and land use, lifestyles and patterns of consumption and production" and that limiting global warming will require major transitions in the energy sector, involve a substantial reduction in fossil fuel use, widespread electrification, improved energy efficiency, and use of alternative fuels. The proposed development will contribute importantly to this, reducing Ireland's reliance on fossil fuels by supplying a sustainable form of renewable energy.

In Ireland, the Government have made clear the extent of the challenge facing the country and the pronounced need to realise commitments made to the European Union in relation to the reduction of greenhouse gases, via the development of renewable energy sources that reduce carbon emissions. The development and renewal of the energy network in tandem with this is of critical importance as enshrined in current national and regional policy (refer to Section 3 above). The Regional Spatial and Economic Strategy recognises the pronounced need to decarbonise the southern region, and specifically in respect of electricity "to achieve national and EU targets will require investment in measures to develop alternative renewable energies with greater interconnection to energy resources…". Alongside commitments to improve energy efficiency and an increase in the use of renewable energy sources, it is an explicit objective under Regional Policy Objective (RPO) 100 "to support the integration of indigenous renewable energy production and grid injection". The proposed development will deliver directly on this, contributing to the security of energy supply.

The preceding chapter of this statement provides a detailed summary of existing policies which underpin the need for the subject project. If Clare is to achieve the stated vision of the Clare Renewable Energy Strategy to be the national leader in renewable energy generation, then projects such as that proposed must be positively supported.

4.1.2 Clare County Development Plan 2023-2029

The proposed substation and grid connection is integral to the delivery of the Ballyglass Solar Array Phases 1 and 2. Without the subject infrastructure, the renewable electricity generated at the solar arrays cannot be transported to the national grid. The CDP provides direct policy support for the development of grid infrastructure under Objectives CDP 11.44, 11.45 and 11.47, as set out in the preceding chapter.

The transition to a low carbon economy, which includes decarbonisation as one of its key pillars, is a national challenge. The Clare County Development Plan 2023-2029 recognises that the County has considerable capacity to produce energy from renewable and indigenous resources, with recognised potential for Clare to meet its future energy needs from such sources. County Clare has a long-established role in national electricity generation and security of supply, being home to the Ardnacrusha Hydroelectric Power Station and Moneypoint Power Station.

Under permitted reference ABP-316043-23, the An Bord Pleanála (now An Coimisiún Pleanála) inspector confirmed their independent opinion that the principle of developing a solar array was supported at the subject location, noting that the site is located on agricultural lands outside any designated settlement and that the proposal allows for farm diversification and multipurpose land use, as supported by Objective RES 7.1 of the operative development plan. The proposed substation and grid connection is the enabling infrastructure for this permitted generation. These attributes are directly relevant to the policies set out in the County Development Plan as set out below.

Chapter 2 of the Development Plan, 'Climate Change, Energy and Renewable Resources', recognises the need for County Clare to transition to a low carbon and climate resilient County. This is underpinned by Objectives CDP 2.1 and CDP 2.2 of the Plan which include commitments in support of national climate change objectives, including the Government's Climate Action Plan. Objective CDP 2.14 commits the Council to facilitating measures which will accelerate the transition to a low carbon economy, including the development of energy sources which will achieve low carbon output.

4.1.3 Landscape Designation

The subject lands are un-zoned agricultural lands. The site is located within the 'Western Corridor – Ennis to Limerick Working Landscape' area identified in the Clare County Development Plan 2023-2029, defined as all lands within 10km on either side of the N18/M18 save as excluded by Heritage Landscapes. The northern extent of the LVIA study area overlays the 'Settled Landscape' classification, and the LVIA characterises the site and wider study area as a transition between the two. Objective CDP 14.3 permits development in these areas that will sustain economic activity, subject to conformity with the other provisions of the Plan, and requires that site selection, siting and design are directed towards minimising visual impact.

The proposed substation site has been selected to avoid visual prominence. It is wholly contained within the parcels that form part of the proposed Ballyglass Solar Array Phase 2 and is located in a well-screened, low-lying part of the local landscape. The submitted Landscape and Visual Impact Assessment (LVIA) confirms that the site layout avails of existing topography and vegetation to reduce visibility from surrounding roads and receptors. The proposed development therefore accords with the requirements of Objective CDP 14.3.

There are no land use zoning or landscape designations which preclude the development of the proposed substation and grid connection at this location. Existing electricity cables and pylon structures are characteristic features of this rural landscape.

4.2 Landscape and Visual

The design of the proposed substation has been informed by relevant industry standards for the layout and management of such facilities, as well as detailed site analysis, which identified potential constraints and opportunities. This has shaped the final design response in relation to the local landscape and environment.

Macro Works Ltd, a chartered landscape architectural practice, were engaged to carry out a landscape and visual impact assessment (LVIA) of the proposed substation and grid connection, which is submitted in support of this application. The assessment has been prepared in accordance with current EPA guidance and the Landscape Institute's Guidelines for Landscape and Visual Impact Assessment, and the accompanying photomontages follow the Institute's technical guidance on photography and photomontage.

4.2.1 Site Context

Based on a review of the Clare County Development Plan 2023-2029, the subject site is wholly located within Landscape Character Area (LCA) 9 'River Shannon Farmland' and Landscape Character Type (LCT) 24 'River Valley Farmland'. The site and its immediate surroundings are typically flat to low rolling, sloping down from the glacial upland areas to the north towards the River Shannon corridor. The landscape character of the study area is that of a typical productive rural landscape that is not particularly rare or distinctive at a national or regional scale, with associated energy infrastructure and a relatively high degree of intactness of hedgerows and field boundaries. On balance of these factors, the LVIA deems the landscape sensitivity of the study area to be Medium-low.

There are no designated scenic routes within the study area. The nearest scenic designation, Scenic Route 26 (the R466 between Broadford and O'Briensbridge), lies approximately 4 km north of the site, outside the study area. The local and wider landscape character is influenced by an array of anthropogenic land uses including existing electrical infrastructure, major route networks and dispersed residential development. Existing electricity cables and pylon structures are characteristic features of this rural landscape.

4.2.2 Assessment

The LVIA process included a thorough review of the site, surrounding environs within a 3 km radius study area, and statutory documents for sensitive locations. All nearby scenic routes, protected structures, public facilities, walking routes, public roads and cultural, environmental and heritage areas were considered.

Visual impacts were assessed at 4 viewpoint locations, representing various viewing distances, angles and receptor types. The sensitivity of visual receptors at all 4 representative viewpoints was classified as Medium-low, representing relatively typical rural areas. The residual significance of visual effect ranged between 'Slight' and 'Imperceptible', of a Negative to Neutral quality and long-term duration, despite all four viewpoints being contained within the immediate context of the site. The LVIA confirms that the proposed substation and grid connection will not be visible from Viewpoints 1 and 2 on the R471, and is entirely screened from Viewpoint 3 on the L70382, in each case due to landform and vegetation screening. Only at Viewpoint 4 is there potential for a distant view of the upper sections of the proposed substation to the north-east, which the LVIA considers unlikely to draw the eye owing to the slender nature of the steel structures. The residual 'Slight' rating recorded at Viewpoint 1 relates exclusively to the proposed Ballyglass Solar Array Phase 2 viewed in the opposite direction to the proposed substation. This confirms the effectiveness of the site selection process.

For completeness, the LVIA assesses construction stage landscape effects as Moderate-Slight and of a Negative quality, construction stage visual effects in the immediate vicinity of the site as no greater than Moderate, and operational stage landscape effects as no greater than Moderate-slight within approximately 500 metres of the site, reducing to Slight or Imperceptible thereafter. On the significance thresholds applied by the LVIA, none of these effects is significant.

Landscape mitigation is primarily by avoidance, through the siting of the proposed development in a robust rolling rural area availing of a high degree of existing vegetative screening, and through the retention of existing hedgerow boundaries within and around the site. This is supplemented by under-planting and inter-planting in advance of the construction phase, using species of local provenance selected to complement the existing hedgerow mix, to ensure dense and consistent screening in perpetuity. The measures are illustrated on the submitted Landscape Mitigation Plan by Macro Works. Landscape works will be supervised by a suitably qualified landscape architect and maintained through a three-year establishment period from planting.

The completed assessment considers the potential for cumulative impacts arising from the proposed substation and grid connection with the permitted Ballyglass Solar Array Phase 1 and proposed Phase 2, together with other permitted solar developments within the study area, including Drummin Solar (Clare County Council Reference 23/60249) approximately 2.38 km west of the site and a cluster of permitted solar development in the south-eastern quadrant of the study area. The proposed substation is located within the boundary of Phase 2 and within 300 metres of Phase 1, in a heavily screened part of the study area that will be bolstered with additional hedgerow planting as part of the mitigation strategy for the Ballyglass Solar Array Phase 2. Even if partially glimpsed from the surrounding landscape, the proposed substation will only result in a marginal increase in the intensity of electrical infrastructure development within the study area. Overall, the LVIA concludes that the proposed substation and grid connection is not considered to give rise to any significant residual effects.

4.3 Traffic Assessment

4.3.1 Traffic Volumes

This application is supported by a detailed Site Access Report by Civil and Structural Engineering Advisors Ltd. (CSEA). The substation will be an unmanned facility once operational, remotely monitored, with trips confined to periodic maintenance visits by light goods or tractor and trailer type vehicles, together with occasional tanker movements to empty the foul holding tank. The Site Access Report estimates operational and maintenance trips for the wider development at 2 to 4 vehicles per month on average. As such, the operational development will give rise to a significant decrease in both the volume and scale of vehicles accessing the site comparable to existing agri-generated traffic.

Based on the low levels of operational visits, the potential for traffic impacts to occur will be limited to the temporary construction period. The construction of the Ballyglass Solar Arrays Phases 1 and 2 and the proposed substation and grid connection is expected to take c. 18 months, with the substation and grid connection works themselves taking approximately 9 to 12 months within that period. The total assessment of Heavy Goods Vehicle (HGV) trips for the combined Phase 1, Phase 2 and substation/grid connection construction is 6,567 HGV trips. This is equivalent to an average of 16.6 HGV trips per day over the construction period (assuming 5.5 working days per week over a 72-week programme). Estimated farm traffic associated with existing land use at the Phase 2 lands amounts to 436 trips each year, benchmarked against agricultural traffic surveys for solar

developments of a similar scale, which will cease on commencement of construction of the Ballyglass Solar Array and remain absent from the local road network thereafter. Over the lifetime of the project there will be a net reduction of traffic related to the subject site on the local road network.

4.3.2 Site Access/Sightlines

The site will be accessed via a new entrance from the L70382, as shown on the submitted plans. Sightlines have been assessed against the relevant Transport Infrastructure Ireland (TII) junction design standard. The required 70 metre sightlines are available in both directions, subject to trimming back of hedgerows. The road is essentially flat at the entrance. Hedgerows in ownership near the entrance will be maintained, with routine annual maintenance to prevent obstruction by seasonal growth. The entrance has been subject to swept-path analysis, and management measures for any deliveries will follow standard practice for renewable energy projects. These comprise a detailed route plan, risk assessment and transport management plan, to be agreed in full with Clare County Council and prepared in accordance with the European Best Practice Guidelines for Abnormal Road Transports. All remaining construction deliveries will be by standard heavy goods vehicle (HGV).

Equipment and plant will be imported via the Port of Foynes. The delivery route runs via the N69, N21, M20 (Attyflin to Limerick) and N18 national roads, the R645 and R463 regional roads, and the L70382 local road to the site entrance. Swept path analysis of these routes identified no difficulties for the largest construction delivery vehicle. Pavement condition is good along the regional road elements, which have been resurfaced in recent years. Gradients on the local road route are shallow and present no difficulty. The northern section of the L70382 is unbound; a Clause 804 running surface will be laid on the unpaved sections as far as the site entrance.

Section 10 of the Site Access Report sets out focused mitigation to minimise construction phase impacts on existing road users:

- A temporary manual-controlled stop/go system, with layout and sequencing agreed with Clare County Council's Area Engineer's Office in advance of construction;
- Advance warning signage on the approaches to the entrance;
- A delivery booking and scheduling system;
- A pavement condition survey before construction, repeated on completion, with any deterioration attributable to works traffic remedied by the developer; and
- Drainage at the site entrance designed so that no surface water discharges onto the public road.
- Final delivery routes will be agreed with Clare County Council following any grant of permission.

Approximately 4.7 km of the underground grid connection lies within the public road corridor: c. 1.3 km on the L70382, c. 1.95 km on the R463 and c. 1.45 km on the L3056. Trenching will progress at approximately 100 metres per day. Works at any given location are therefore of very short duration, with only short sections of trench open at any one time. Section 2.4.8 of the submitted Construction and Environmental Management Plan sets out the detailed construction methodology. Temporary traffic management for the in-road works will be agreed with the Council's Area Engineer in advance of commencement, covering any single-lane or convoy working on the R463, signage, reinstatement and the necessary road opening consents.

A Traffic and Transport Assessment (TTA) was not prepared for the proposed development; the development generates no material operational trips and construction phase traffic is temporary and short term. The proportionate form of assessment is the engineering appraisal of site access, delivery routes, road geometry, pavement condition and construction traffic management in the submitted Site Access Report prepared by CSEA.

In summary, subject to the temporary traffic management and mitigation described above, the existing road network can adequately cater for the proposed development. The construction phase is short in duration and it has been demonstrated that HGVs can access the site safely. Once operational, the development will reduce vehicular movements to and from the subject lands, which are currently accessed frequently for agricultural purposes.

4.4 Archaeology and Heritage

4.4.1 Archaeology

A detailed Archaeological Impact Assessment of the proposal has been prepared by John Cronin & Associates and is enclosed with this application. The assessment is based on a programme of desktop research and desk-based assessment, a site inspection of the substation lands, a drive-through inspection of the grid connection route, and a review of the geophysical survey undertaken by Target Archaeological Geophysics Ltd. for the Ballyglass Solar Array Phase 2 in 2024, which covered four of the five fields forming part of the substation area. The study included the consideration of the Sites and Monuments Record, the Record of Monuments and Places for County Clare, the Historic Environment Viewer, the Database of Irish Excavation Reports and all available cartographic and documentary sources for the area.

No recorded archaeological sites are located within the proposed development area, meaning that there will be no direct impact on the known archaeological resource. There are no recorded archaeological sites within the 500 metre study area around the substation site, and the grid connection route does not pass through or within 100 metres of any recorded archaeological site, so there will be no indirect impact on the known archaeological resource. Two recorded monuments — an enclosure at Knockbrack Lower (CL053-037----) and a fulacht fia at Coolderry (CL053-036----) — lie between 500 metres and 1 kilometre of the site boundary. A search of the Database of Irish Excavation Reports returned no entries within either study area. There was no indication from the consulted historic maps, aerial photographs or from the geophysical survey of the four surveyed fields of the presence of previously unrecorded archaeological sites. Of the 5.6 km route, c. 4.4 km was depicted as roadway on the first edition Ordnance Survey mapping of 1844, and a further 560 metres lies within the area that later became the compound of Ardnacrusha Power Station, such that the assessment identifies negligible to low potential for the cable trenches to encounter previously undiscovered archaeological features.

Notwithstanding the above, there remains the potential for previously unrecorded archaeological features to be present under the topsoil in the proposed substation area. The assessment recommends the following mitigation measures to practically manage residual risk:

- A programme of archaeological test trenching should be carried out at the proposed substation location in advance of construction, with regard to the site plans and limited to areas that will be disturbed during construction. Should archaeological material be identified, this may require preservation by record (excavation).

- At any areas along the grid connection in which previously undisturbed ground will be disturbed, the work should be monitored by an archaeologist. This may include small areas within the compound of Ardnacrusha Power Station, joint bays and pits for directional drilling at the Blackwater River.

These recommendations are subject to the approval of the National Monuments Service and An Coimisiún Pleanála. The applicant is fully committed to implementing the recommended mitigation measures. All archaeological works will be undertaken by a suitably qualified archaeologist under licence from the National Monuments Service.

Having regard to the above, we respectfully request that a suitably worded condition be applied which will provide for the positive conclusion and resolution of all archaeological considerations in respect of the subject application. This approach will ensure that there will be no significant archaeological impacts and provides the National Monuments Service and An Coimisiún Pleanála with the necessary safeguards to ensure this is the case.

4.4.2 Architectural and Built Heritage

The Archaeological Impact Assessment also addresses the architectural heritage resource. No structures listed in the National Inventory of Architectural Heritage (NIAH) are located within the substation site or within the 500 metre study area around it, and no extant structures are present within the site area. The cartographic review records a building present in 1844 which had been removed by 1893. Analysis of the townland names of Oakfield and Ruanard identifies nothing indicative of archaeological or heritage interest.

The grid connection route engages two Protected Structures. It terminates within the compound of Ardnacrusha Power Station, which is recorded in the NIAH (Reg. No. 20405308) with a national rating and is a Protected Structure in the Clare County Development Plan 2023-2029 (RPS No. 311). The station, constructed between 1925 and 1929, has a significant place in Irish architectural, historical, scientific, social and technical history. As the assessment observes, a grid connection from Ballyglass to Ardnacrusha represents a continuation of the original purpose for which Ardnacrusha Power Station was constructed, and the connection itself will be laid underground within the existing operational compound. The Headrace Canal, constructed as part of the same scheme in the 1920s, lies to the south of the proposed development and will not be affected.

The route also passes in close proximity to Blackwater Bridge, a Protected Structure (RPS No. 650, not recorded in the NIAH). The crossing of the Blackwater (Clare) River is to be undertaken by Horizontal Directional Drilling beneath the watercourse rather than being carried by the bridge, so that no impact on the protected structure will arise. The assessment concludes that, as the cable will be buried, there will be no residual visual impact on either Protected Structure once the cable is in place.

4.5 Water and Drainage Considerations

4.5.1 Flood Risk

All matters relating to potential flood risk and drainage have been investigated in detail as part of the subject proposal, with available resources from the Office of Public Works (OPW) consulted to establish the potential for any impacts.

The subject site is largely located outside of any defined flood risk area having regard to Office of Public Works (OPW) or Clare County Council delineated flood risk mapping. OPW flood event

records were also reviewed for the subject lands. A section of the application boundary traverses a 'River (NIFM) - Low Probability' and 'River (NIFM) – Medium Probability' area, relating to the Blackwater (Clare) watercourse. The proposed development traverses this area by means of Horizontal Directional Drill (HDD), with HDD launch pits located outside of these areas. There is no recorded history of any flood events on the subject lands or the proposed local access routes which will be utilised during the construction phase.

4.5.2 Drainage

Surface water drainage proposals for the proposed development have been developed to mimic the natural drainage patterns of the site and thereby be in accordance with the best management practices of Sustainable Drainage Systems (SuDS). Specifically, this includes the following:

- The proposed access track to the substation compound will be permeable allowing rainwater to infiltrate through the stone structure to the subsoil below. The compound construction is formed with permeable stone thus mimicking a soakaway scenario. ESB compound stone is single sized for the first 150mm for safety purposes. It then changes to a graded 6F2 material.
- The area to be drained includes the roofs and the bunded plinths. These equate to 786.5m^2 and are very modest in themselves and in comparison, to the overall compound area;
- Assuming even the most basic of infiltration rates down through the permeable compound stone, it is clear that existing greenfield run-off rates are easily maintained.

The surface water generated in the hardstanding and bunded areas will discharge to the soakaway via a Class 1 Full Retention Oil Separator. The electrical transformer in the substation is oil filled equipment and, as such, is protected with impermeable bunds. Surface water generated in this bund will be pumped out by an oil sensitive pump ensuring that only non-contaminated water enters the site drainage network.

Details on the proposed locations of surface water drainage infrastructure are provided in the submitted drawings and in Section 3 of the Construction and Environmental Management Plan. In relation to wastewater, a 5m3 foul holding tank is proposed as part of the operational development, which will be emptied periodically.

All storm water management measures will be subject to periodic testing, review and maintenance.

4.6 Ecology

The application is supported by two Ecological Impact Assessments (EcIA): a terrestrial EcIA prepared by Greenleaf Ecology and an aquatic EcIA prepared by Lauren Williams. Together they establish the ecological baseline for the substation site and the grid connection route, evaluate the ecological features present, and assess the effects of construction and operation on habitats and species. Both are informed by desk study, consultation and field survey. This section summarises their findings and the mitigation on which those findings rest; the reports themselves set out the assessment methodology, the survey record and the full schedule of mitigation.

4.6.1 Terrestrial Ecology

The terrestrial EcIA assesses the proposed substation and grid connection alone as well as cumulatively with the wider Ballyglass Solar Array Phase 1 and 2 lands, so that the combined project

is assessed as a whole. The substation site comprises improved agricultural grassland bounded by hedgerows and treelines. The grid connection route runs almost entirely within the existing road network and access tracks, with roadside verges of low botanical value. No Annex I habitat is present, no rare or protected plant species were recorded, and no invasive plant species were recorded within the substation site or along the grid connection route.

Eleven nationally designated sites lie within 10 kilometres of the proposed development. Two are designated for bat roosts: Cloonlara House proposed Natural Heritage Area (pNHA), 0.6 kilometres away and designated for Leisler's bat, and Castleconnell (Domestic Dwelling, Occupied) pNHA, 3.3 kilometres away and supporting a lesser horseshoe bat roost. The EcIA concludes that no significant effects on nationally designated sites will arise in either the construction or the operational phase. European sites are dealt with separately through Appropriate Assessment, addressed below.

Eight bat species were recorded during survey of the wider site, with common pipistrelle accounting for the great majority of activity. Hedgerows and treelines provide the foraging and commuting resource. No potential roost features were recorded within the substation site or along the grid connection route, and no works to trees or structures are proposed. Badger droppings confirm that the wider site forms part of a local foraging territory, but no setts were recorded. No evidence of otter was recorded at the Oakfield 25 and West Roo streams, although the Blackwater (Clare) River provides suitable foraging and commuting habitat at the point of the proposed crossing. No evidence of marsh fritillary was recorded, and the bird species recorded are those common to the surrounding agricultural landscape.

Hedgerow removal to facilitate the proposed development is limited to 3 linear metres, which the EcIA assesses as having a negligible effect on foraging and commuting bats[3]. The matters requiring mitigation are therefore the potential for disturbance to otter at the Blackwater (Clare) crossing and to badger, should either be present when works commence. Both are addressed by pre-construction survey and, where required, working buffers and a derogation licence from the National Parks and Wildlife Service. Vegetation clearance will be carried out outside the bird nesting season, and any construction lighting will be directed and shielded to avoid overspill into retained habitat. The full mitigation schedule is set out in Section 5 of the terrestrial EcIA and is carried into the Construction and Environmental Management Plan.

With that mitigation in place, the terrestrial EcIA identifies no significant residual adverse effects on habitats or species arising from the proposed development, alone or cumulatively with the Ballyglass Solar Array phases or the other projects within its zone of influence. The landscaping and habitat proposals for the collective project are expected to deliver a positive residual effect on hedgerow habitat over the short to medium term.

4.6.2 Aquatic Ecology

The underground cable route involves five watercourse crossings, none of which involves instream works. The crossing of the main channel of the Blackwater (Clare) River (Site BWC1) will be undertaken by means of Horizontal Directional Drilling beneath the watercourse. The Oakfield 25 stream on the R463 (Site OF4) and the two crossings of the West Roo main channel (Sites WR1 and WR2) will be undertaken as flatbed crossings over the existing culverts. The remaining crossing, of a

[3] This 3m hedgerow removal figure is in addition to the 25m hedgerow removal proposed as part of the Ballyglass Solar Array Phase 2 application at this location. For completeness, all hedgerow removal required to facilitate the proposed Ballyglass Substation / Grid Connection development is included again for consideration as part of this application, as is detailed in the Landscape Plan enclosed with this application – drawing no. LD.BLLGLSS_SID by Macro Works refers.

minor drain connected to the West Roo (Site WR3), will comprise a concrete flatbed formation alongside the existing culvert. No watercourse will be directly impacted. The Knockbrack Drain sub-catchment, within which the substation site is located, contains no watercourse crossing. All watercourse crossings will be carried out in accordance with Inland Fisheries Ireland guidelines.

With construction best practice and mitigation measures implemented and monitored in accordance with the Construction and Environmental Management Plan, the Construction Method Statement and Section 5 of the Aquatic EcIA, the residual construction phase effects, whether indirect or cumulative, on the Knockbrack Drain, Oakfield 25 Stream, Blackwater (Clare) River and West Roo stream will be limited to localised, neutral to temporary not significant effects on downstream aquatic receptors. Residual operational phase effects will be neutral: the proposed development has no associated emissions or discharges, so no operational phase effect on water quality arises. The proposed substation and grid connection, alone or in combination with wider projects, will not cause deterioration of Water Framework Directive (WFD) ecological status, nor prevention of attainment of 'good' status in the future, and is therefore compliant with WFD objectives.

The three river waterbodies through which the route passes are the Blackwater (Clare)_020 and North Ballycannan_010 waterbodies, both of Good status, and the Shannon (Lower)_060 waterbody, of Moderate status, within which the substation site lies. The proposed development will not cause deterioration in any of these waterbodies, nor prevent the attainment of good status in the future.

The design of the proposed development has been informed iteratively by aquatic ecological sensitivities. Of particular note, the substation compound has been relocated out of the Oakfield stream catchment, as permitted under Ballyglass Solar Array Phase 1, into the adjacent Knockbrack Drain catchment, which has no connectivity to the sensitive Blackwater (Clare) River or the Oakfield 25 stream. The principal potential source of sediment loss to those watercourses has therefore been moved to a notably less sensitive water catchment, greatly reducing the potential for effects on salmon and lamprey. In scale terms, the 13.5 hectare construction footprint represents approximately 0.12% of the combined area of the three river waterbody catchments through which the development passes.

In accordance with the requirements of the Habitats Directive, the aquatic EcIA and the NIS assess in-combination effects before mitigation is taken into account. On that conservative basis, indirect cumulative effects on salmon and lamprey in the non-designated reaches of the Blackwater (Clare) River, downstream of the Oakfield 25 confluence, could not be ruled out, and mitigation for cumulative effects is accordingly required. With that mitigation in place, the aquatic EcIA concludes that residual cumulative effects will be limited to temporary, localised and slightly negative disturbance during construction, arising from low levels of sediment wash-out in combination with the construction of Phases 1 and 2. Effects on Atlantic salmon productivity in the Blackwater (Clare) River outside the SAC will be temporary and not significant, with no likely significant adverse effect on the conservation objectives for Atlantic salmon of the Lower River Shannon SAC.

Proposed mitigation measures are set out in Section 5 of the aquatic EcIA and Section 6 of the NIS, and is embedded in the Construction and Environmental Management Plan. It provides for the appointment of a suitably qualified Environmental Clerk of Works to oversee implementation throughout the construction phase, with authority to stop works should erosion and sediment controls not be functioning properly. It further provides for water quality monitoring while trenching and drilling are active in proximity to a watercourse, limits on the length of trench open at any one time, restrictions on the storage of fuels and chemicals near watercourses, a prohibition on any

direct discharge of sediment-laden water, the use of an inert biodegradable drilling fluid, and a frack-out contingency plan for the horizontal directional drilling.

A pre-construction survey for invasive alien plant species will be carried out at the substation site, the access track and the temporary construction compound, and an Invasive Alien Plant Species Management Plan will be prepared and implemented should any species be recorded. No invasive plant species were recorded within the proposed substation site or along the grid connection route.

Inland Fisheries Ireland was formally consulted in 2022 on the horizontal directional drilling of the Blackwater (Clare) River and the crossing of the Oakfield 25 stream. The frack-out contingency plan sought in its response has been incorporated into the CEMP. Inland Fisheries Ireland will be contacted in advance of works commencing at each watercourse crossing and provided with the final Construction Method Statement, which will also be provided to the local authority. As a precaution against cumulative effects in combination with construction of the Drummin Solar Farm grid connection, the West Roo crossings at Sites WR1, WR2 and WR3 will be carried out between 1 May and 30 September in any year; that restriction falls away if the Drummin grid connection has been fully constructed and there is no overlap in construction periods.

4.6.1 Green Infrastructure and Biodiversity Development

The collective solar farm project, including the proposed substation and grid connection, provides for the protection, management and enhancement of green infrastructure. Hedgerow removal to facilitate the proposed development is limited to 3 linear metres, additional to the 25 linear metres proposed at this location under the Ballyglass Solar Array Phase 2 application, with no further removal and no new planting required within the application boundary. Across the wider Ballyglass Solar Array Phase 2 lands, the terrestrial EcIA records the removal of approximately 222 linear metres of hedgerow and treeline, against approximately 17,650 linear metres of existing hedgerow and treeline to be retained and enhanced and approximately 385 linear metres of new native hedgerow to be planted, giving a net gain of approximately 163 linear metres. That planting is provided for by the Ballyglass Solar Array Phase 2 application and not by this application. Field margins will be managed in accordance with the BRIDE project techniques, and a Biodiversity Management Plan is appended to the terrestrial EcIA.

4.6.2 Appropriate Assessment / Natura Impact Assessment

An Appropriate Assessment Screening Report prepared by Greenleaf Ecology accompanies this application. Eleven European sites were identified within a 15 kilometre zone of influence. Nine were screened out on the basis that no source-pathway-receptor connection exists between them and the proposed development. The River Shannon and River Fergus Estuaries SPA, although hydrologically connected, was screened out on the basis that any effect on water quality within the SPA would fall below the de minimis threshold. For the Lower River Shannon SAC, the screening report concluded that, in the absence of mitigation and applying the precautionary principle, likely significant effects arising from a deterioration in water quality affecting Qualifying Interest species, and ex-situ disturbance to otter during the Blackwater (Clare) crossing works, could not be excluded. A Stage 2 Appropriate Assessment was therefore required in respect of that site.

A Natura Impact Statement (NIS) prepared by Greenleaf Ecology accordingly accompanies this application, and includes consideration of the proposed development in combination with the Ballyglass Solar Array Phases 1 and 2. The Lower River Shannon SAC (site code 002165) is the only European site for which likely significant effects could not be excluded at screening stage, and is therefore the only site subject to Appropriate Assessment. As recorded in the Aquatic EcIA, the Oakfield 25 stream crossing is 4.7 km upstream of the SAC boundary and the Blackwater (Clare)

HDD crossing is 5.8 km upstream of the SAC boundary; the West Roo crossings are, at nearest, 1.3 km upstream of the confluence with the Ardnacrusha tailrace canal, which flows a further 520 metres to the SAC boundary. The NIS identifies best practice construction and operational design and control measures to ensure that potential pollutant sources are not released from the proposed development to the receiving environment such that there will be no adverse effects on the Qualifying Interests of the SAC.

Subject to the full implementation of the mitigation measures set out in Section 6 of the NIS, the report objectively concludes that the proposed development, alone or in combination with any other plan or project, will not adversely affect the integrity of the Lower River Shannon SAC, and that no reasonable scientific doubt remains as to the absence of such adverse effects.

4.7 EIA Screening

Under the Planning and Development Regulations 2001, current government and EU guidance, An Coimisiún Pleanála must screen the proposed development for Environmental Impact Assessment (EIA) and decide if the planning application for the proposed development does or does not require the preparation of an Environmental Impact Assessment Report (EIAR). This application includes an EIA Screening Statement made in support of the screening process. The proposed development has been screened for EIA having regard to relevant thresholds and it has been objectively concluded that the preparation of an Environmental Impact Assessment Report is not required.

4.8 Noise

A project-specific Noise Impact Assessment for the proposed substation and grid connection has been prepared by Wave Dynamics, which also assesses the noise environment cumulatively with the permitted and proposed Ballyglass Solar Array phases. The assessment was prepared having regard to EPA guidance note NG4 and the Clare County Council Noise Action Plan 2024-2028. It identifies 18 no. noise sensitive locations (NSLs), the nearest 250 metres from the proposed development, and included both attended and unattended background noise monitoring at three locations representative of those NSLs. The findings confirm the following:

- The assessment adopts a daytime construction threshold of 65dB LAeq, with tighter thresholds applying in the evenings, at weekends and at night. Construction calculations show that typical ground works and construction plant are at or below the daytime threshold at all noise sensitive locations, and that no construction noise mitigation is therefore required. Approximately 100 metres of cable trenching will be completed per day, largely within the existing road network. The construction phase effects are deemed short term with no noticeable change on the noise environment in the longer term.
- During operations, the modelled noise levels (free field façade noise levels) at all noise sensitive locations (NSLs) are below the applicable EPA NG4 criteria, including the more onerous 'area of low background noise' criteria which the assessment applies to the four closest noise sensitive locations. Predicted levels comply in the daytime, evening, night-time and cumulative scenarios, and operational levels are predicted to be within 5dB of measured background levels. The noise generating plant, including the proposed substation, is located away from local receptors.

- Operational noise from the underground cabling has been screened out, as no operational noise arises from buried cabling, and no relevant sources of operational vibration have been identified.

Notwithstanding the above, the applicant is committed to ensuring that there is a negligible operational impact at all NSLs and on background noise at these locations, and will undertake additional noise analysis as part of the detailed design process to ensure that this is the case for the final selected equipment. In the event that any noise attenuation is required for some noise sources, these will be incorporated into the final as-built design. This will ensure a negligible impact on background noise. In particular, the applicant will ensure that the selected transformer is specified so as not to emit tonal or impulsive noise characteristics, and would have no objection to a condition to that effect. Construction noise monitoring will be undertaken at periodic sample periods at the boundary with the nearest noise sensitive receptors.

The construction phase of development due to its nature is temporary and therefore any potential noise impacts will be short term. All construction works will be carried out during the day-time period between 07:00 and 19:00 hours Monday to Saturday. No construction activities will occur outside these hours unless agreed in advance with Clare County Council. Potential noise impact will be controlled in accordance with all relevant standards.

4.9 Lighting and CCTV

As detailed in the substation drawings by Reeve Wave Ltd., a number of external lights are proposed for safety purposes in the electrical compound to meet EirGrid requirements. This lighting will be operated manually from the substation building and used infrequently as needed for inspections during periods when natural light is unavailable. The lights will be designed to restrict any potential light scatter.

4.10 Health and Safety

There is no credible evidence to suggest that electricity substations or underground grid connections of the type proposed pose any health and safety concerns. Related matters were discussed, where relevant, as part of community engagement with local residents. There will be no electromagnetic health impacts from the project. Magnetic fields are produced through both natural and man-made means, with electromagnetic fields a by-product of electricity. Exposure to this is an everyday occurrence with typical household electromagnetic field levels summarised in Figure 2 below. The key underlying principle is that the strength of a magnetic field reduces greatly as you move away from its source.

The proposed substation and underground cabling will emit low levels of EMF from the transformer and the cables; however, the levels of EMF emitted are substantially lower than the basic restriction level which is the level at which radiation is potentially harmful to humans. The figure below shows a comparison of AC electric fields from common sources.

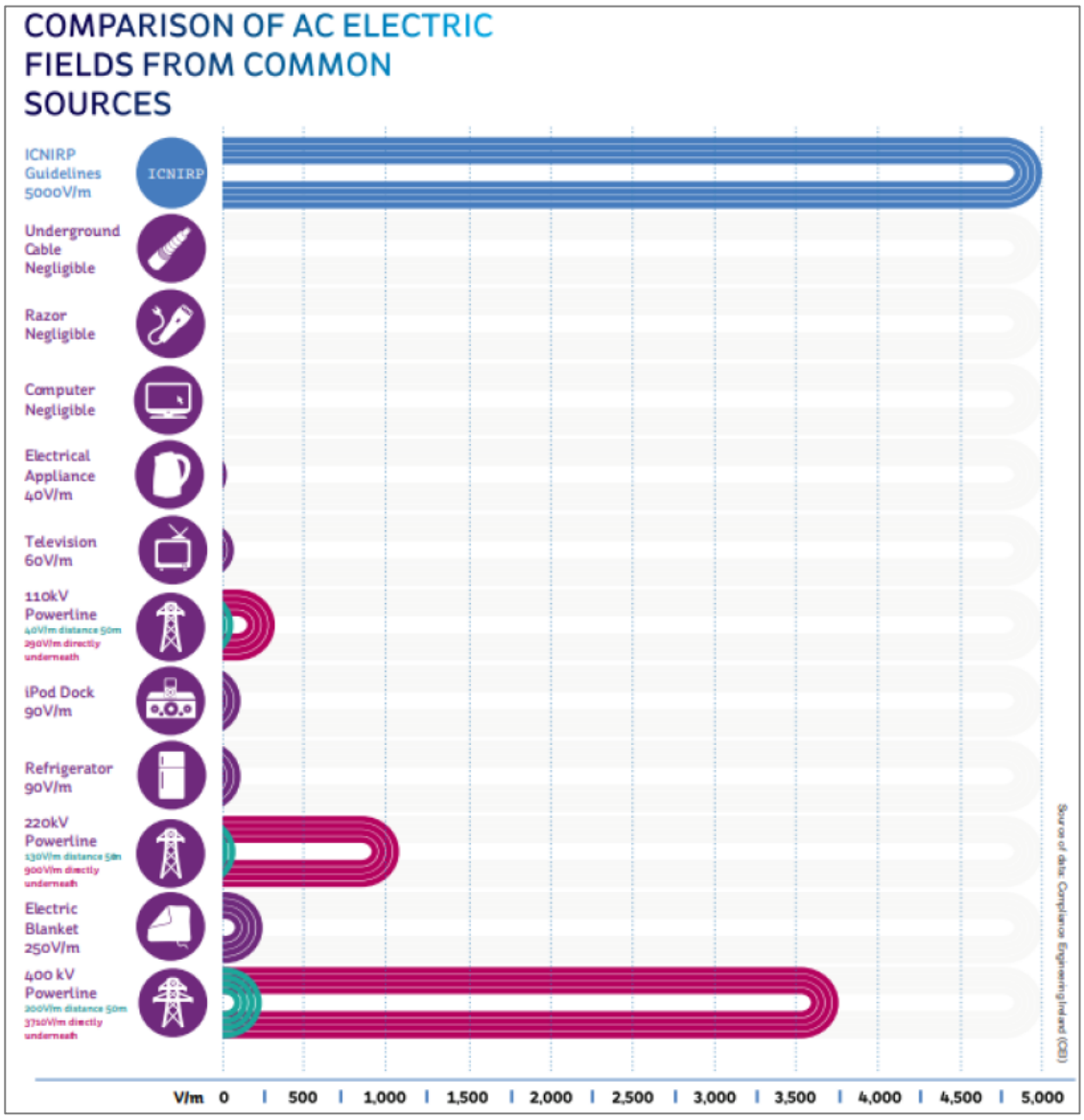


Figure 2 Comparison of AC electric fields from common sources

There are established guidelines for the control of electromagnetic fields:

- International Commission on Non-Ionising Radiation Protection (ICNIRP) Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (up to 300GHz). Health Physics 74 (4): 494-522; 1998
- EU Council Recommendation on the limitation of exposure of the general public to electromagnetic fields (0Hz to 300GHz) 1999/519/EC
- ICNIRP Guidelines for limiting exposure to time varying electric and magnetic fields (1Hz–100kHz) Health Physics 99(6):818-836; 2010
- Directive of the European Parliament and of the Council on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields) 2013/35/EU

Irish government policy is to comply with the 1998 ICNIRP guidelines. Electromagnetic fields are measured using units of microtesla (μT) and the public limit advised by the EU EMF Recommendation and ICNIRP 1998 guidelines is 100 microtesla.

EMF strength decreases with distance relatively quickly. This is illustrated below which shows how exposure to EMF decreases with distance. As shown, when directly on top of a 110 kV cable the magnetic field is 2.32 μT, which is well below the 100 μT public limit. The EMF levels from the proposed development will be considerably lower than the ICNIRP recommendation of 100 μT. As the highest cable voltages at the proposed development are 110kV, the EMF levels will be considerably lower than the ICNIRP recommendation of 100 μT. At the proposed transformer the expected level of EMF is less than 5 μT, which is also considerably lower than the ICNIRP recommendation of 100 μT. The proposed substation and grid connection will in any event be designed, constructed and energised in accordance with ESB Networks and EirGrid standards, which require compliance with the ICNIRP guidelines.

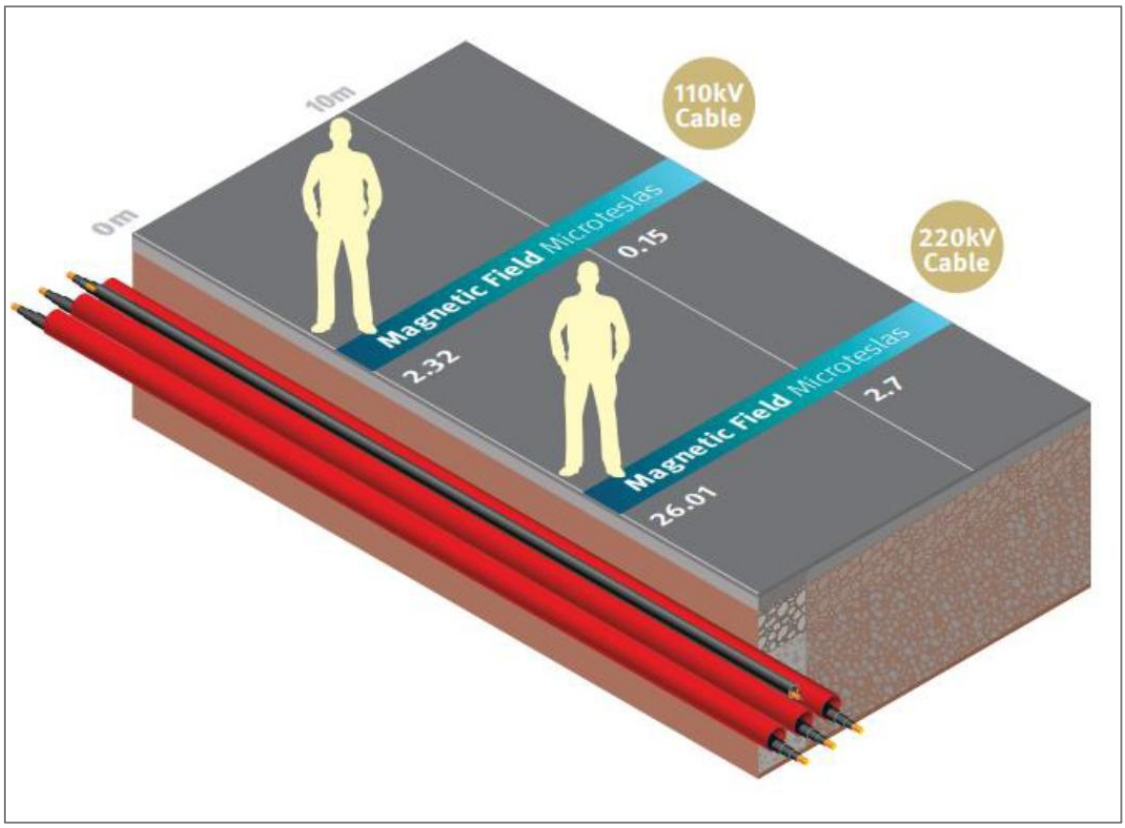


Figure 3 Illustration of decreasing scale of EMF exposure

4.11 Project Implementation

4.11.1 Duration of Planning Permission

A 10-year permission is sought for the proposed development, as advertised in the statutory notices. This is standard implementation period for infrastructure of the subject development's nature. In relation to the operational period, it is requested that no time period be prescribed for this. The solar arrays associated with this 110kV substation and grid connection are expected to have an operational lifetime of up to 40 years. In the event that the solar arrays are decommissioned at the end of this period, it is envisaged that the substation will remain in situ as valuable functioning infrastructure on the national electricity transmission network. As such, and in the event of a grant of

planning permission, it is requested that the operational life of the substation not be time limited by means of an imposed planning condition.

4.11.2 Construction Management

As outlined, it is envisaged that the proposed 110kV substation and grid connection will be constructed alongside the Ballyglass Solar Array. The construction phase is anticipated to take approximately 9 to 12 months to complete over an 18-month period, with construction anticipated to commence in Q3 2027 subject to the granting of planning permission. The process will be governed by strict environmental controls, as well as health and safety procedures. The civil works themselves are non-invasive, reflecting the temporary nature of the works. A Construction and Environmental Management Plan (CEMP) for the substation and grid connection accompanies this application. It sets out a detailed suite of environmental protection measures to be implemented on site during the construction phase. The CEMP identifies all the potential issues which are relevant to the project, such as construction safety; traffic management; environmental risk assessment and management; waste management; and environmental management. The final CEMP will be further developed by the appointed contractor and will include a detailed traffic management plan and risk assessed method statements. The document will be agreed, where relevant, with the Council prior to the commencement of any development.

4.11.3 Operational Maintenance

Once operational, the proposed substation and grid connection, together with the wider collective solar array project, will be run in accordance with a management plan prepared to ensure the development site is maintained in a manner which allows for its optimal technical operation and the meeting of any commitments made during the planning stage of the project. Alongside system performance, this will include routine inspection and monitoring in relation to ongoing planning compliance requirements. This will include implementation of landscape and habitat/biodiversity management plans and monitoring of ecology enhancements installed on the site to ensure their maintenance and improvement. The drainage regime for the substation will be subject to regular inspection and cleaning/clearing as necessary.

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Community Consultation Report

5.1 Introduction

There is no formal obligation under statutory planning provisions to undertake community engagement in advance of lodging a planning application of this nature, however, the applicants have a proactive and strong track record of engaging with local communities.

In advance of submitting the planning application, Reeve Wave Ltd. sought to inform and engage with interested parties in the local community. A community engagement programme was developed to disseminate information on the Ballyglass solar farm project, including the proposed substation and grid connection, and to gain an insight into local issues. This has informed the project design process.

5.2 Consultation Objectives

The main objectives of the programme of consultation was to:

- Encourage people who live locally, to have a say in the development of the proposals;
- Ensure that local people have access to accurate and factual information on all aspects of the proposals which may be of particular interest or concern to them;
- Provide the local community with the opportunity to shape the proposals, ensuring that any pertinent outcomes of community engagement have been reflected in the proposals as far as is possible;
- Ensure people have access to information detailing why the site was identified as suitable for the proposed development;
- Enable Reeve Wave Ltd. to gauge public opinion regarding the proposals.

5.3 Consultation Undertaken

The applicant has been proactive in sharing information on the project with the local community since the earliest phases of the wider Ballyglass solar farm project. A project-specific website was developed in late 2021 to act as a vehicle to provide updates on project development as well as a forum for dealing with queries from the local community. The website has been maintained across the Phase 1, Phase 2 and subject applications and is accessible at ballyglassinfo.com.

As outlined on the website, notification letters, information leaflets and mapping have been issued to the local community at key project milestones. Door-to-door consultation was carried out by the applicant's experienced Community Liaison Officer (CLO), with the majority of the community met during consultation rounds and feedback primarily positive towards the proposals. Several members of the community requested meetings with the CLO and the feedback from these meetings has helped to inform the project design.

The information issued to the local community included summary information on the following:

- Overview of the Ballyglass solar farm project, including the proposed substation and grid connection;
- Energy in Ireland;
- Benefits of solar farms;
- Why this location was chosen;
- What the development will look like;
- Planning application details;
- Client contact details.

5.4 Residential Amenity

The layout of the proposed substation and grid connection has considered proximity to existing residential properties in full. The proposed substation is set back from public roads and residential properties, wholly contained within the parcels that form part of the proposed Ballyglass Solar Array Phase 2. The nearest third party dwelling is located approximately 200 metres to the north-west of the proposed substation compound.

The site is set back from the public road in a well-screened, low-lying location. The design includes focused landscaping measures, including bolstered hedgerow planting, which will provide screening and aid assimilation of the project into the local environment. The effectiveness of this is illustrated in the submitted photomontages which confirm that the proposed substation will have very limited residual visibility, confined to the narrow, upper sections of electrical equipment and lightning poles.



Figure 4 Extract showing outline and photomontage views from VP2 looking southwest towards the substation compound.



Figure 5 Extract showing outline and photomontage views from VP4 looking northeast towards the substation compound.

06 //

Conclusions

6.1 Summary

6.1.1 International and National Policy

Having regard to the commentary set out in this Planning and Environmental Statement, we consider the proposed development to be wholly acceptable in planning terms.

European policy is unequivocal that we are in the midst of climate and energy crises as reflected in the significant scaling up of renewable energy targets in recent years under REPowerEU. In addition to the need for decisive action to address key environmental challenges such as reduction in carbon emissions, there is a pronounced requirement to rapidly reduce the EU's dependence on Russian fossil fuels well before 2030 by accelerating the clean energy transition.

Critically, Ireland is one of the most energy import dependent countries in the EU which carries significant risks in relation to security of energy supply. To reduce its dependency, Ireland must increase the level of energy from renewable energy sources. This is one of the core strategies of the National Planning Framework, the Climate Action Plan and other national climate and energy policies.

Ireland has challenging climate and renewable electricity targets for 2030 including achieving a 51% reduction in overall greenhouse gas emissions by 2030 and to reach net-zero emissions by no later than 2050. Demand for electricity is forecast to increase by between 19% and 50% above existing capacity in the next decade in line with economic forecasts. As EirGrid has warned in its Generation Capacity Statement 2025-2034, there is a continuing risk of electricity generation capacity deficits over the coming decade due to increasing demand. This demand will be largely driven by the connection of large energy users such as data centres, the electrification of heat and transport sectors and the closure of older fossil fuel burning power stations. Ensuring we build renewable, rather than fossil fuel generation capacity to help meet this demand is essential. It is planned to increase the proportion of renewable electricity to up to 80% by 2030, and a target of 8 GW from solar by 2030.

The CRU's Enduring Connection Policy sets the terms and conditions of electricity generators' access to the electricity system and "prioritises, in the first instance, large renewable energy projects" in locations with viable grid connectivity. The proposed 110kV substation and grid connection will deliver a viable grid connection for the permitted Ballyglass Solar Array Phase 1 and proposed Phase 2.

The proposed development responds directly to all aforementioned policies as well as regional and local policy as set out in this report and other supporting reports prepared as part of the planning application. The transition to a low carbon economy, which includes decarbonisation as one its key pillars, is a national challenge. As we transition to a climate neutral future, we must ensure the pathway to decarbonisation is underpinned by affordability and security in how we access and use

energy in our everyday lives. Having a reliable source of energy is vital for consumers to have confidence in the transition.

6.1.2 Environmental Impact

The proposed 110kV substation and underground grid connection has been designed in accordance with best practice industry standards to achieve optimum environmental conditions. It will contribute positively to the achievement of renewable energy targets, delivering the grid connection for the permitted Ballyglass Solar Array Phase 1 and proposed Phase 2. Based on a review of the Clare County Development Plan 2023-2029, there are no land use or policy-based designations which preclude favourable consideration of the proposed substation and grid connection at this location. The prepared Landscape and Visual Impact Assessment has confirmed that the development will not give rise to any significant residual effects. Traffic access during the construction phase will be managed in close consultation with Clare County Council, including agreement of the final delivery routes, the temporary stop/go arrangements and a pre- and post-construction pavement condition survey, and over the lifetime of the project there will be a net reduction of traffic on the local road network. The Natura Impact Statement objectively concludes that, subject to the full implementation of its recommended mitigation measures, the proposal will not adversely affect the integrity of the Lower River Shannon SAC, the only European site subject to Appropriate Assessment. A review of historical records and detailed site investigations have confirmed that there are no issues with respect to flooding and site drainage. The Noise Impact Assessment concludes that the proposal will not give rise to an adverse noise impact at any noise sensitive location in either the construction or the operational phase. Subject to the implementation of the recommended programme of archaeological test trenching and monitoring, to be agreed with the National Monuments Service, no significant residual impact on the archaeological or architectural heritage resource is predicted. The grid connection terminates within the compound of Ardnacrusha Power Station, a Protected Structure of national NIAH rating, and represents a continuation of the original purpose for which that station was constructed.

Overall, we consider that the subject proposal will not detract from the residential or visual amenities in the area or impact on the local environment, and instead, that it will contribute positively to the realisation of policy objectives in full accordance with the proper planning and sustainable development of the area.

07 //

Appendices

Appendix A - Planning and Environmental Report for Ballyglass Solar Array Phase 2, as submitted to Clare County Council.

hw planning

Planning and Environmental Statement

Proposed Solar Array at Coolderry, Dromintobin North, Dromintobin South, Knockbrack Lower, Knockbrack Upper, Monaskeha, Oakfield and Ruanard (townlands), Ardnacrusha, County Clare.

Client: Reeve Wave Ltd

October 2024

Connecting people.

Connecting places.

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01 //

Introduction

1.1 Introduction

This Planning and Environmental Statement has been prepared by HW Planning on behalf of Reeve Wave Ltd. It accompanies a planning application for the development of a proposed solar array at Coolderry, Dromintobin North, Dromintobin South, Knockbrack Lower, Knockbrack Upper, Monaskeha, Oakfield and Ruanard (townlands), Ardnacrusha, County Clare.

The proposed development represents Phase 2 of a previously permitted Ballyglass Solar Array at this general location, Clare County Council Reference 22591 / An Bord Pleanala Reference ABP-316043-23 refers.

1.2 Dual Planning Consent Process

This application made to Clare County Council does not include the substation and grid connection elements of this project which are required to connect the solar array to the national transmission network. The 110 kV substation and associated 110kV underground cabling constitute 'strategic infrastructure' having regard to the provisions of the Planning and Development (Strategic Infrastructure) Act 2006 and established case precedent on such matters. This was confirmed by An Bord Pleanála on the 22nd of July 2024 following pre-application consultation[1]. The Act provides that in such cases, applications for permission/approval for specified private and public strategic infrastructure developments be made directly to An Bord Pleanála (ABP). Notwithstanding this dual consent process, this report considers the full combined development for the purposes of completing a robust assessment of the entire project. A full description of the project as it relates to the application before Clare County Council is outlined in Section 2.3 of this report.

[1] ABP-313767-22 refers.

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Site & Development Context

2.1 Subject Site

The subject site, which is approximately 96 hectares in area is situated within the townlands of Coolderry, Dromintobin North, Dromintobin South, Knockbrack Lower, Knockbrack Upper, Monaskeha, Oakfield and Ruanard. The subject lands are situated approximately 1 kilometres northeast of Ardnacrusha, 2.8 kilometres northeast of the northern environs of Limerick City and approximately 5.5 kilometres northeast of the city centre. The subject site is located within the defined Limerick Shannon Metropolitan Area[2] which is earmarked for future growth. The surrounding area includes a varied mix of land uses including agriculture, roads infrastructure, residential and employment, as well as existing renewable energy generation. In terms of the latter, Ardnacrusha is home of the Ardnacrusha Hydroelectric Power Station which has been operational since 1929. The Ardnacrusha Power Station is Ireland's largest river hydroelectric scheme and is operated on a purpose-built headrace connected to the River Shannon.



Figure 01: Aerial view of Ardnacrusha Hydroelectric power station to the southwest of the subject site.

The proposed development comprises 4 no. distinct field parcels. The R471 dissects the development, with parcels 1, 2 and 3 located to the south of this road and Parcel 4 located to the north. Parcel 1 and 2 abut the permitted Phase 1 of the Ballyglass Solar Array[3], as demonstrated in Figure 02 below. Parcels 2 and 4 are located further east, on either side of the R471. The broader

[2] As defined in the Regional Spatial and Economic Strategy for the Southern Region.
[3] Clare County Council Planning Reference 22/591

landscape is characterised by agricultural fields, comprising small to medium-sized irregularly shaped parcels. Existing development is dispersed throughout the wider area, with small clusters of residential dwellings concentrated along the R471 and within Monaskeha Heights, adjoining Parcel 4 to the east.

Separate to the subject application before Clare County Council, it is envisaged that the proposed solar array will connect to the existing Ardnacrusha 110kV substation by means of a proposed 110kV substation. The connection will take the form of an underground cable connection from the proposed 110kV onsite substation in Parcel 3 which will be subject to a separate planning consenting process[4].

The subject site was selected following a strategic site assessment process which was informed by key governing industry as well as applicable planning criteria. Careful consideration was given to the suitable siting of the proposal relative to substantive planning considerations, as well as access/proximity to the national grid (ESB substations), and the availability of suitable solar resource (light irradiance). The subject site was selected as it is located in an area where these critical components exist, striking an appropriate balance between the requirements of a solar array, and ensuring a low impact to the surrounding environment.

[4] Please refer to Section 2.3 below for further information.

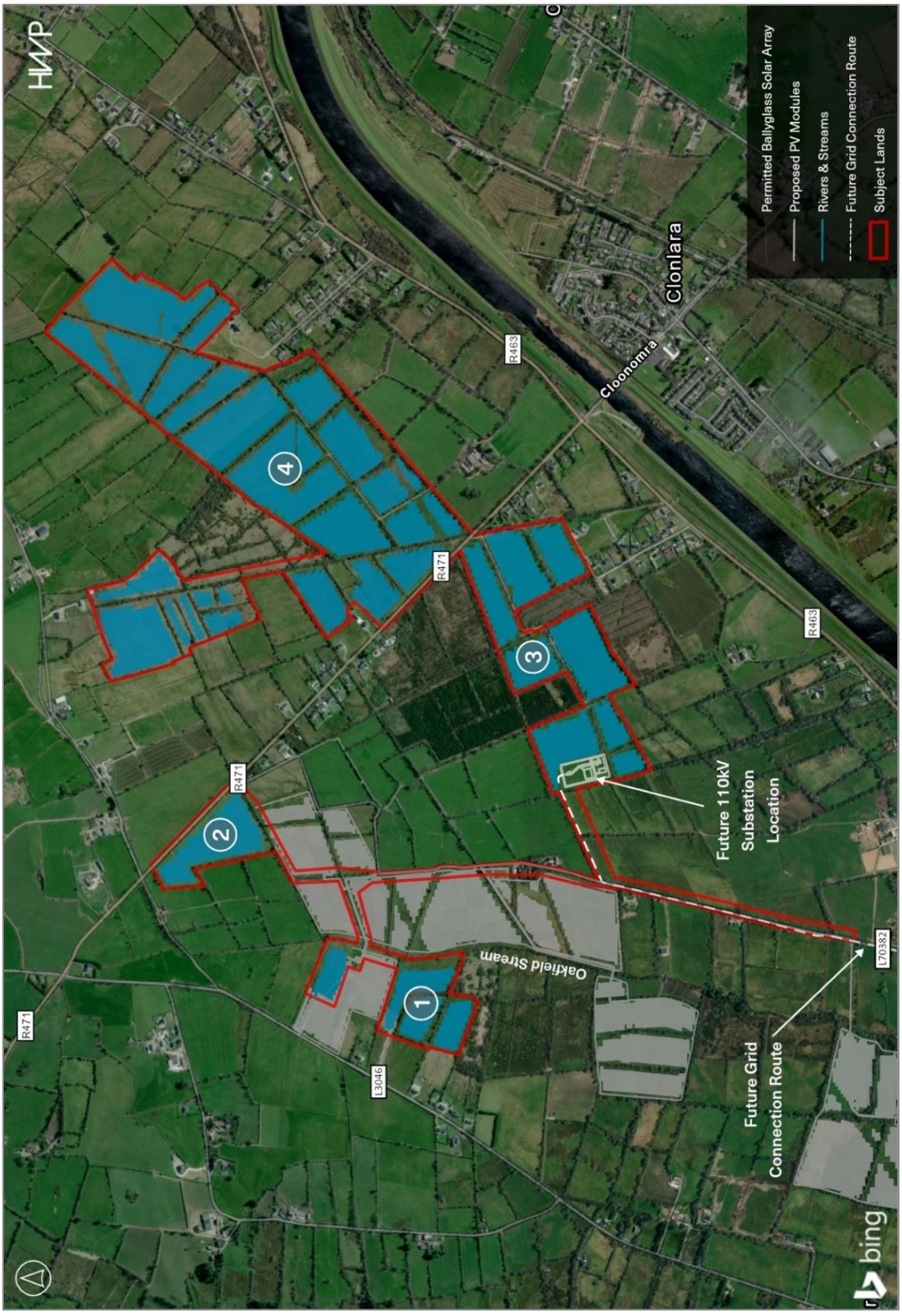


Figure 02: Site Context

2.2 Site Planning History

The recorded planning application history at the subject lands is outlined in table 01 as shown.

Table 01: Planning Application History

Planning Reference	Date Received	Applicant	Description	Decision
P21/796	28/07/2021	Donal Ward	To fill the existing poor quality agricultural land with stone and soil in order to raise the level of the ground, widen existing agricultural entrance, including all ancillary site works	Permission granted on 14/12/2021
P22/591 / An Bord Pleanála Reference ABP-316043-23	04/07/2022	Reeve Wave Ltd.	For a 10 year planning permission for a solar array at Ballyglass, Coolderry, Dromintobin North, Reanabrone, and Oakfield (townlands) Ardnacrusha, Co Clare. The development will consist of c265,000 m2 of solar panels on ground mounted frames, 8 no. single storey control cabins with associated electrical transformer units and hardstand areas, 2 no. ring main units, underground cabling within the solar array site and within the L70382 public road to connect solar array field parcels, security fencing, CCTV, access tracks (upgrade of existing and new), upgrades to four existing agricultural field entrances on the R463, I3046 and L70382 and creation of new entrance on L70382, temporary construction compound, landscaping and all associated ancillary apparatus and development works. The solar array will connect to the national grid and will have an operational lifespan of 35 years. A Natura Impact Statement (NIS) has been prepared in respect of the proposed development and will be submitted to the planning authority with the application	Permission granted with conditions by Clare County Council on 17/02/2023 Permission granted by An Bord Pleanála with Revised Conditions on 21/11/2023

2.3 Proposed Development

Reeve Wave Ltd., intend to apply for a 10-year planning permission for a solar array at Coolderry, Dromintobin North, Dromintobin South, Knockbrack Lower, Knockbrack Upper, Monaskeha, Oakfield and Ruanard (townlands), Ardnacrusha, County Clare.

The development will consist of c. 330,000 m2 of solar panels on ground mounted frames, 13 no. single storey control cabins with associated electrical transformer units and hardstand areas, 2 no. ring main units, underground cabling within the solar array site and within the R471 public road to connect solar array field parcels, security fencing, internal CCTV, access tracks (upgrade of existing and new), upgrade to 1 no. existing agricultural field entrance and creation of 2 no. new entrances on the R471 and 1 no. new entrance on the L70382, 2 no. temporary construction compounds (including site offices and welfare facilities), landscaping and all associated ancillary apparatus and development works.

The proposed development provides for minor modifications to the solar array permitted under Clare County Council Reference P22/591 / An Bord Pleanála Reference ABP-316043-23. These modifications comprise the omission of 1 no. single storey control cabin and associated electrical transformer unit, omission of solar panels and access track, and reconfiguration of internal cabling.

The solar array will connect to the national grid and will have an operational lifespan of 40 years. A Natura Impact Statement (NIS) has been prepared and will be submitted to the Planning Authority with the application.

The civil works for the panels themselves use a simple, ground-mounted system that avoids undue ground disturbance and works with the existing site topography. The PV panels will sit on angled racks comprised of galvanized steel arranged in portrait or landscape configuration depending on the final system deployed. It is envisaged that these will be screw or driven-piled following geotechnical assessment. The panels will be stationary with no movable parts. They will be positioned on the rack at a minimum height of 0.25 m above the ground and rise to a maximum height of up to 3.0 m. The PV panels will be orientated to the south in order to capture maximum solar energy. The panels will be positioned at a tilt angle of between 15 – 25 degrees from the horizontal having regard to natural site topographical and orientation conditions to ensure the best solar absorption.

A total of 13 no. control cabins and associated transformer units are incorporated into the layout. The control cabins, which are 3.5 m in height and 22.2 m2 in area, are manufactured offsite and will be finished in a moss green colour to support integration into the local rural environment. The control cabins contain an inverter to convert direct current generated by the PV panels into alternating current which can be subsequently used by the electricity network. The transformers step up the power received from the solar PV array before onward passage to the future substation for transmission to the national grid. Provision is also made for 2 no. Ring Main Unit cabinets which house switchgear to connect, measure and integrate electricity loads in the distribution network.

The solar array comprises four distinct field clusters. Parcel 1 to the northwest comprises fields accessed from the L3046 to the west. Parcel 2 is located to the southwest of the R471 with frontage onto same. Parcel 3, the southernmost parcel, comprises largely backland fields accessed via the L70382 to the west and R471 to the east. Parcel 4 is the largest land parcel and is located northeast of the R471 with frontage onto same. It is proposed to connect Parcel 1 through 4 by means of an underground cable run within private lands, the L70382 and R471 public roads.

A compacted gravel access track up to 4.5 metres wide will provide internal access to the solar arrays and associated infrastructure. There are approximately 430 m of existing access track across the subject agricultural farm lands, which will be subject to upgrading alongside approximately 4,135 metres of new access tracks.

A perimeter fence up to 2 m in height will be erected to provide security and restrict unauthorised entry. This fence will primarily be stock proof in nature, sympathetic to the agricultural character of the site. Paladin fencing up to 2.4m may be erected in some areas depending on security requirements. The footings for the fence may be either pre-moulded or localized in-situ concrete, to be determined once a contractor is appointed. The installed fencing will incorporate mammal friendly access, with a 300 x 300 mm gap at intervals of 100 m., as per the submitted technical plans.

It is proposed to access the solar array via the L70382 (Parcels 1, 2 and 3) and from the R471 (Parcels 2, 3 and 4). The proposed development will utilise an existing entrance on the R471, which will be subject to upgrade works. 2 no. new entrances are proposed on the R471 and 1 no. new entrance on the L70382 which will be provided for as per the submitted plans. The adjoining hedgerows in ownership in the vicinity of these entrances will be maintained to facilitate appropriate sightlines.

A total of 222 linear metres of hedgerow will be permanently removed throughout the site to facilitate site entrance upgrades, access tracks and cabling works. This will be offset by 385 linear metres of new hedgerow planting (Type 2), as well as the bolstering of 17,650 linear metres where necessary, to fill any gaps in existing hedgerows.

Ecology on the site will be further fostered to deliver significant biodiversity gains to the receiving environment through riparian and hedgerow corridors and wildflower meadows.

Once constructed, the solar array will be an unmanned facility, which is monitored remotely by way of infrared CCTV. There is no requirement for potable water or wastewater treatment facilities as part of the constructed solar array.

It is envisaged that the solar array will contribute directly to a carbon dioxide emission reduction of 19,966 tonnes per annum or the equivalent of approximately 798,640 tonnes of CO2 over the 40 year lifetime of the project.

The proposed Phase 2 of the solar array will have a maximum export capacity of 70 MW.

2.4 Other Development

Substation and Grid Connection

The solar array will connect to the Ardnacrusha 110kV substation by means of a proposed 110kV substation and associated 110kV underground cabling, which will be the subject of a separate planning application directly to An Bord Pleanála. An Bord Pleanála determined under reference ABP-313767-22 that the proposed 110kV substation and 110kV underground cabling constitutes 'strategic infrastructure' as defined under applicable provisions contained within the Planning and Development (Strategic Infrastructure) Act 2006.

Outline proposals for the substation and underground cable connection are enclosed with the subject application for information only. The main construction elements will be two substation buildings of concrete block construct, electrical infrastructure, plinths, bunds, lightning masts, surface water and foul drainage works and lighting. The compound facility will be secured with fencing to full EirGrid specification. Cables connecting the solar array to the proposed 110kV substation will be underground to a depth of approximately 1.2m. Existing site levels will be reprofiled for the purposes of accommodating the substation following detailed pre-commencement site investigations.

The submitted construction and environmental management plan provides summary construction detail related to the 110kV substation and 110kV underground cabling. All works will be undertaken to EirGrid specification and in full compliance with environmental and other mitigation measures contained in the final Construction and Environmental Management Plan.

Permitted Phase 1 of Ballyglass Solar Array

On 21st November 2023, planning permission was granted by An Bord Pleanala for Phase 1 of Ballyglass Solar Array comprising:

> *A 10-year planning permission for a solar array at Ballyglass, Coolderry, Dromintobin North, Reanabrone, and Oakfield (townlands), Ardnacrusha, Co. Clare. The development will consist of c.265,000 m2 of solar panels on ground mounted frames, 8 no. single storey control cabins with associated electrical transformer units and hardstand areas, 2 no. ring main units, underground cabling within the solar array site and within the L70382 public road to connect solar array field parcels, security fencing, CCTV, access tracks (upgrade of existing and new), upgrades to four existing agricultural field entrances on the R463, L3046 and L70382 and creation of new entrance on L70382, temporary construction compound, landscaping and all associated ancillary apparatus and development works.*

2.5 Pre-Planning Discussions

A pre-application planning meeting took place on 10th September 2024. (Reference PPI 24-56). In attendance were members of the project design team and representatives of Clare County Council Planning Department. Amongst the matters discussed were the principle of development and environmental considerations including landscape and visual, traffic and impacts on residential amenities. The feedback received has informed the design approach for the project.

03 //

Planning Policy Context

3.1 European Context

3.1.1 European Green Deal and Fit for 55

In its 2018 Communication A Clean Planet for all, the European Commission set out its vision for a climate-neutral EU and explored pathways that would enable the EU to achieve climate neutrality by mid-century in line with the Paris Agreement.

The European Green Deal, published in December 2019, sets out a low emissions growth strategy that aims to transform the EU into a fair and prosperous society, with a modern, resource efficient and competitive economy, where there are no net emissions of greenhouse gases by 2050, where economic growth is decoupled from resource use and where no person and no place is left behind.

The European Green Deal is underpinned by the European Climate Law, enacted in July 2020, which sets into legislation the objective of a climate-neutral EU by 2050 and a commitment to negative emissions thereafter. It also sets a binding intermediate Union target of a reduction of net greenhouse gas emissions (emissions after deduction of removals) by at least 55% by 2030 compared to 1990.

In July 2021, the Commission put forward the Fit for 55 package, a wide-ranging set of proposals to revise and update EU climate and energy legislation to ensure that EU policies are in line with the new EU objective established by the Climate Law. Additional Fit for 55 proposals were published in December 2021. Tripartite negotiations between representatives of the European Parliament, Council and Commission commenced in Q3 2022 with a view to reaching timely agreement on this ambitious package. This will help to accelerate Europe's decarbonisation and phase out our dependence on Russian gas, oil and coal imports.

3.1.2 Renewable Energy Directive

In December 2018, the recast Renewable Energy Directive 2018/2001/EU entered into force, as part of the clean energy for all Europeans package, aimed at keeping the EU a global leader in renewables and, more broadly, helping the EU to meet its emissions reduction commitments under the Paris Agreement. Building on the 20% target for 2020, the recast Renewable Energy Directive 2018/2001/EU established a new binding renewable energy target for the EU for 2030 of at least 32%, with a clause for a possible upwards revision by 2023.

On 21 July 2021, the Commission proposed a revision of the renewable energy directive in July 2021, as part of the package to deliver on the European Green Deal as detailed above. The proposal raises the ambition of the existing legislation to align it with EU's increased climate ambition and sought to increase the current target to at least 40% renewable energy sources in the EU's overall energy mix by 2030. Less than a year later, following Russia's invasion of Ukraine and the need to accelerate the EU's independence from fossil fuels, the Commission proposed to further increase the target to 45% by 2030, together with measures to accelerate permitting for renewables.

The new legislation was published on 31 October 2023 and entered into force 20 days later. It sets an overall renewable energy target of at least 42.5% binding at EU level by 2030 - but aiming for 45%. This will be key to achieving the EU's objective of climate neutrality by 2050 and to strengthen Europe's security of energy supply. In addition to the new headline target to double the existing share of renewable energy sources, a strong policy framework will facilitate electrification in different sectors, with new increased sector-specific targets for renewables in heating and cooling, transport, industry, buildings and district heating/cooling, but also with a framework promoting electric vehicles and smart recharging. Previously, Ireland had a target for 34.1% renewable energy share in 2030 in order to be able to contribute to the previous EU-wide target of 32%. Ireland will now have to set a revised national contribution in accordance with the new EU-wide target of 42.5%, which is due to be submitted in 2024.

3.1.3 REPowerEU Plan

On 18 May 2022, the Commission published the REPowerEU plan, which sets out a series of measures to rapidly reduce EU's dependence on Russian fossil fuels well before 2030 by accelerating the clean energy transition. The REPowerEU plan is based on three pillars: saving energy, producing clean energy and diversifying the EU's energy supplies. As part of its scaling up of renewable energy in power generation, industry, buildings and transport, the Commission proposes to increase the target in the directive to 45% by 2030, thereby increasing the targets set out in the current Renewable Energy Directive This would bring the total renewable energy generation capacities to 1236 GW by 2030, in comparison to 1067 GW by 2030 envisaged under the 2021 proposal. The Plan acknowledges that solar is one of the fastest technologies to roll out. That is why the Commission sets the REPowerEU target of over 320 GW of solar photovoltaic newly installed by 2025 and almost 600 GW by 2030.

3.1.4 EU Solar Strategy

As part of the REPowerEU plan, the Commission adopted an EU solar energy strategy in May 2022. The solar strategy identifies the remaining barriers and challenges in the solar energy sector and outlines initiatives to overcome them and accelerate the deployment of solar technologies. It states the EU solar energy has a significant potential to rapidly become a mainstream part of our power and heat systems and a main lever to achieve the European Green Deal objectives while phasing out our dependence on Russian fossil fuels. Amid the energy crisis, the implementation of the Strategy and these key solar initiatives proposed for the EU and its Member States is of utmost urgency.

Alongside the REPowerEU plan, the Commission also presented a Recommendation on fast permitting for renewable energy projects and a legislative proposal on permitting that will contribute to the further acceleration of solar energy deployment in the EU. It acknowledged that slow and complex permitting processes are a key obstacle to unleashing the renewables revolution and for the competitiveness of the renewable energy industry.

3.2 National Context

3.2.1 Climate Action and Low Carbon Development (Amendment) Act 2021

Ireland's Climate Action and Low Carbon Development (Amendment) Act 2021, (the Climate Act), commenced on 7 September 2021. The Climate Act places on a statutory basis "the National Climate Objective"; that "the State shall, so as to reduce the extent of further global warming, pursue

and achieve, by no later than the end of the year 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy". The Climate Act also provides for a 51% reduction in greenhouse gases by 2030 compared to 2018 levels, and puts in place a rigorous governance structure, including a system of carbon budgeting, sectoral emissions ceilings, a national adaptation framework, sectoral adaptation plans, and annually updated Climate Action Plans, to ensure that Ireland achieves its national, EU and international climate commitments in the near- and long-term. Reaching climate neutrality will mean that Ireland will have no further negative impacts on the climate system by mid-century. This represents an extremely ambitious target for Ireland to meet over the next three decades, but one which is in line with the scale and severity of climate breakdown facing the international community and which underscores Ireland's commitment to showing leadership on climate action.

3.2.2 Climate Action Plan 2024

The Department of the Environment, Climate and Communications published the Climate Action Plan 2024 in December 2023 which sets out a major programme of change. Decarbonising electricity is at the centre of the Climate Action Plan strategy as this will also aid in the decarbonisation of other sectors such as transport, heating and industry. The share of electricity from renewable energy increased from 7.2% to 38.6% between 2005 and 2022. Demand for electricity is forecast to increase by between 19% and 50% above existing capacity in the next decade in line with economic forecasts. Ensuring we build renewable, rather than fossil fuel generation capacity to help meet electricity demand is essential. It makes economic sense and also facilitates decarbonising our heating and transport through electrification. It is planned to increase the proportion of renewable electricity to up to 80% by 2030, and a target of 8 GW from solar by 2030. Noting that the programme for large-scale offshore wind deployment is not expected to be realised towards end decade, the Climate Action Plan 2024 stresses that deployment rates for onshore renewables will need to increase to match demand growth to ensure we keep electricity emissions within range of the carbon budgets.

3.2.3 Project Ireland 2040 – National Planning Framework

The Government published the National Framework (NPF) in 2018. The plan will guide national, regional and local planning policies and investment decisions for the next two decades. It identifies the transition to a low carbon and climate resilient society as one of the key pillars (shared goals) of the Plan. Section 3.4 of the NPF states that

> *"harnessing the potential of the region in renewable energy terms across the technological spectrum from wind and solar to biomass and wave energy"*

is a key policy priority for the Eastern and Midland Region.

National Policy Objective 23:

> *"Facilitate the development of the rural economy through supporting a sustainable and economically efficient agricultural and food sector, together with forestry, fishing and aquaculture, energy and extractive industries, the bio-economy and diversification into alternative on-farm and off-farm activities, while at the same time noting the importance of maintaining and protecting the natural landscape and built heritage which are vital to rural tourism".*

National Policy Objective 55:

"Promote renewable energy use and generation at appropriate locations within the built and natural environment to meet national objectives towards achieving a low carbon economy by 2050".

Within this, solar energy is identified as one of four areas of renewable energy potential, alongside wind, biomass and wave energy.

The NPF also recognises that increases in population and economic growth in areas should be married with a transition to a more sustainable energy market and the achievement of conservation goals.

3.2.4 Programme for Government 2020 – Our Shared Future

The Programme for Government 2020 (PFG) establishes the strategic goals of the Irish Government over the next 5 years. The PFG supports the European Green Deal, which provides a roadmap for Europe to take advantage of the opportunities presented by moving to a low-carbon future. It states that the measures adopted in supporting the European Green Deal will be an important element of the National Economic Plan.

The PFG states that the Government are committed to an average 7% per annum reduction in overall greenhouse gas emissions from 2021 to 2030 (a 51% reduction over the decade) and to achieving net zero emissions by 2050. The implementation of the Climate Action Bill and the establishment of the Climate Action Council will ensure these targets are met with renewable energies seen as a critical component in meeting these ambitious targets.

The PFG calls for a 'Revolution in Renewables' whereby a commitment is made to the rapid decarbonisation of the energy sector. To deliver on the stated target of at least 70% renewable electricity by 2030, the programme states it will:

- Develop a solar energy strategy for rooftop and ground-based photovoltaics to ensure that a greater share of our electricity needs are met through solar power.
- Strengthen the policy framework to incentivise electricity storage and interconnection.

3.2.5 Ireland's Transition to a Low Carbon Energy Future 2015-2030 – White Paper

The Government strategy calls for a radical transformation of Ireland's energy system to meet committed targets and achieve a low carbon energy system by 2050. These commitments included a then EU target to source 20 per cent of its energy needs from renewables such as wind, solar and biomass. Within this, Ireland committed to generating 16 per cent of its overall energy requirements from renewables by 2020 under the EU's plan. At the time of White Paper, about 8 per cent comes from renewables[5].

The strategy includes an objective to "accelerate the development and diversification of renewable energy generation" and increase the country's output of electricity from renewable sources of which we have a plentiful indigenous supply. It is stated that this will be achieved through a number of

[5] As identified below, The Climate Action Plan 2024 includes an objective to generate up to 80% from renewables by 2030.

means including wind, solar PV and ocean energy. Specifically, Section 137 of the White Paper accentuates the role of solar PV as follows:

> *"Solar photovoltaic (PV) technology is rapidly becoming cost competitive for electricity generation, not only compared with other renewables but also compared with conventional forms of generation. The deployment of solar in Ireland has the potential to increase energy security, contribute to our renewable energy targets, and support economic growth and jobs. Solar also brings a number of benefits like relatively quick construction and a range of deployment options".*

3.2.6 Policy Statement on Security of Energy Supply

In November 2021, the Government published a Policy Statement on Security of Electricity Supply which outlined the key challenges to ensuring security of electricity supply such as having adequate electricity generation capacity, storage, grid infrastructure, interconnection and system services to meet both average and peak demand. It identifies the critical need to maintain security of supply throughout the transition to the target of up-to 80% of electricity consumption from renewable sources. It highlights the need for significant investment in additional flexible conventional electricity generation, electricity grid infrastructure, interconnection and storage in order to ensure security of electricity supply. It states also that the "majority of renewable energy generated by 2030 will be from wind and solar".

3.2.7 EirGrid Generation Capacity Statement 2023-2032

The Generation Capacity Statement (GCS) is a way for EirGrid to signal future needs and requirements to the all-island energy market, as well as to policy makers and regulators who may have to react.

The GCS is an annual report from EirGrid. Following a methodology set out by the energy regulator the Commission for the Regulation of Utilities (CRU) in Ireland, the GCS examines the balance between electricity demand and supply in Ireland for the following 10 years The ten-year outlook reflects the time required by the wider energy eco-system to build the necessary infrastructure that can address identified problems.

The GCS is a significant source of information for the Single Electricity Market (SEM) Capacity Auctions, which are run annually to meet electricity capacity needs for a specified year, typically four years later. These are known as "T-4" auctions and the most recent one was run in 2023 to source capacity for September 2026 to September 2027. For Ireland, since 2016, EirGrid has warned via the GCS of an increasing tightness between supply and demand. There is no question that the current outlook, based on the best information available, is serious. It is likely that in the coming years we will experience system alerts and will need to work proactively to mitigate the risk of more serious impacts.

This year's (2024) GCS predicts a challenging outlook for Ireland with capacity deficits identified during the 10 years to 2032. The deficits will increase up to 2025 due to the deteriorating availability of power plants, resulting in their unavailability ahead of intended retirement dates as well as increasing electricity demand. In later years, the deficits are expected to reduce as new capacity comes forward through the SEM capacity auctions.

EirGrid's analysis for Ireland shows that further new electricity generation will be required to secure the transition to high levels of renewable electricity over the coming decades. A balanced portfolio of new capacity is required which is crucial to ensuring Ireland meets its carbon budgets between now

and 2030 for the electricity sector, which positions the electricity sector to achieve the zero net carbon target by 2050. Furthermore, by 2030 there will be significant new additional load from the heat and transport sectors as they are electrified, in line with government targets set out in the Climate Action Plan 2023.

Policy and regulation actions are required to manage the shortfalls highlighted by the GCS, through combination of short-term measures and longer-term market based enduring solutions. To address the challenge, in 2021, the Commission for the Regulation of Utilities (CRU), incorporating some of the recommendations of EirGrid and in conjunction with the Department of Environment, Climate and Communications (DECC), developed a programme of work and actions. This programme continues to progress actions that will be delivered over the coming years. The CRU programme outlined:

- The delivery, through the all-island capacity auctions, of over 2,000 MW of enduring flexible gas-fired generation capacity, which is renewable gas ready, by 2030.
- Procurement of 650 MW of temporary emergency generation capacity to remain available until the necessary replacement capacity has been secured. This capacity only be called upon in the event of a shortfall in capacity and where alerts on the system are likely.
- Extending the operation, on a temporary basis, of older generators to delay the loss of up to 1,200MW of capacity, to allow time for the enduring measures to be implemented. This included Moneypoint operating on coal/HFO until 2025 and Tarbert, which has since been decommissioned, operating on HFO until end 2023.
- Actions to enhance the responsiveness of Demand Side Units and develop additional demand side capacity.

These temporary measures, if there are all fully implemented in time, help bring the adequacy position back to the standard set by the CRU. There are many risks associated with the deliverability of these measures and the CRU, DECC and EirGrid are all working closely to manage these. Notwithstanding, it is clear that the technologies required to meet the CRUs requirements for energy security rely on continued and increased use of fossil fuels. Whilst necessary, this is clearly inconsistent with Irelands objectives to shift away from fossil fuels and achieve our 2030 and 2050 climate targets.

3.3 Regional Context

3.3.1 Regional Spatial and Economic Strategy for the Southern Region

The Regional Spatial and Economic Strategy (RSES) provides the framework through which the aspirations of the National Planning Framework will be implemented in the Southern Region. It reaffirms the objective to proactively work towards and achieve a low carbon economy. It includes a commitment to promote change across business, public and residential sectors to achieve reduced Green House Gas (GHG) emissions, improve energy efficiency and increase the use of renewable energy sources across the key sectors of electricity supply, heating, transport and agriculture. The strategy recognizes that local authorities must demonstrate leadership on related matters:

> *'Leadership is key to transition to renewable energy and the RSES supports the initiative by many local authorities to sign the Covenant of Mayors – a*

European cooperation movement involving local and regional authorities aimed at increasing energy efficiency and the use of renewable energy'.

RPO 87 Low Carbon Energy Future:

'The RSES is committed to the implementation of the Government's policy under Ireland's Transition to a Low Carbon Energy Future 2015-30 and Climate Action Plan 2019. It is an objective to promote change across business, public and residential sectors to achieve reduced GHG emissions in accordance with current and future national targets, improve energy efficiency and increase the use of renewable energy sources across the key sectors of electricity supply, heating, transport and agriculture'.

RPO 89 Sustainable Renewable Energy Generation:

'It is an objective to support measures to build resilience to climate change throughout the Region to address impact reduction, adaptive capacity, awareness raising, providing for nature-based solutions and emergency planning'

RPO 90 Regional Decarbonisation:

'It is an objective to develop a Regional Decarbonisation Plan to provide a framework for action on de-carbonisation across all sectors. The Plan shall include existing and future targets for each sector...'

Electricity: 'To achieve national and EU targets will require investment in measures to develop alternative renewable energies with greater interconnection to energy resources...'

RPO 95 Sustainable Renewable Energy Generation:

'It is an objective to support implementation of the National Renewable Energy Action Plan (NREAP), and the Offshore Renewable Energy Plan and the implementation of mitigation measures outlined in their respective SEA and AA and leverage the Region as a leader and innovator in sustainable renewable energy generation.'

RPO 97 Power Stations & Renewable Energy:

'It is an objective to support the sustainable technology upgrading and conversion of power stations in the Southern Region to use energy efficient and renewable energy sources'.

RPO 98 Regional Renewable Energy Strategy:

'It is an objective to support the development of a Regional Renewable Energy Strategy with relevant stakeholders'.

RPO 100 Indigenous Renewable Energy Production and Grid Injection:

'It is an objective to support the integration of indigenous renewable energy production and grid injection'

3.4 Clare County Development Plan 2023-2029 (CDP)

The CDP outlines the vision and overall strategy for the proper planning and sustainable development of the County. Section 1.6 of the plan outlines the key goals and strategic aims for the County during the lifetime of the plan. The CDP outlines the vision and key objectives for the County up to 2029. The CDP recognises the potential of the County to accommodate renewable energy projects with one of the key goals of the plan being.

> *'A county that is resilient to climate change, plans for and adapts to climate change and flood risk, is the national leader in renewable energy generation, facilitates a low carbon future, supports energy efficiency and conservation and enables the decarbonization of our lifestyles and economy'*

Regarding the delivery of solar energy in the County, CDP Objective 2.18, states it will be an objective of Clare County Council to.

> *'a) To facilitate and support the development of solar farms in appropriate locations throughout the County including on agricultural lands and brownfield sites subject to normal planning considerations; and*
>
> *b) To encourage the use of solar thermal or solar PV installations as part of the design and planning process for new developments and refurbishments.'*

Separately CDP Objective 8.12, 'Renewable Energy Development' states.

> *'It is an objective of Clare County Council: to support the implementation of the National Renewable Energy Action Plan (NREAP), the Clare Wind Energy Strategy and the Clare Renewable Energy Strategy to facilitate the development of renewable energy developments in rural areas to meet national objectives towards achieving a low carbon economy by 2050 subject to the requirement of the RES SEA Environmental Report and the mitigation measures arising from the CDP Appropriate Assessment as contained in Volume 10(a).'*

CDP Objective CDP 2.1 'Climate Action', states that it is an objective of Clare County Council:

> *'a) To support the implementation of the National Climate Action Plan 2023 and the National Climate Change Adaptation Framework (and any subsequent versions thereof), and to work with the Regional Climate Action Offices to enable County Clare to transition to a low carbon and climate resilient County;*
>
> *b) To adopt sustainable planning strategies through integrating land use and transportation and by facilitating mixed use developments as a means of supporting national targets of climate policy mitigation and adaptation objectives, and reducing our carbon footprint and greenhouse gas emissions; and*
>
> *c) To raise awareness and understanding of the impacts of climate change on both the local economy and communities in the County, and the ways communities can increase their response and grow their resilience to these impacts.'*

CDP Objective CDP 2.2, 'Climate Change Mitigation, Adaptation and Resilience' states it is an objective of the Council:

'a) To support the implementation of the Clare Climate Change Adaptation Strategy 2019-2024 (and any subsequent versions);

b) To promote measures that build resilience to climate change to address impact reduction, adaptive capacity, awareness raising, providing for nature-based solutions and emergency planning;

c) To raise awareness of issues relating to climate change and climate change adaptation during the lifetime of this Plan;

d) To liaise, collaborate and work in partnership with the relevant Government approved sectors in relation to initiatives and activities across the County;

f) To facilitate and support the relevant stakeholders and enterprises in the progression of advancements in climate adaptation solutions and renewable energy generation and technologies.'

CDP Objective CDP 2.14, Transition to a Low Carbon Economy and Society states it is an objective of the Council

'a) To facilitate measures which will accelerate the transition to a low carbon economy and a circular economy through mechanisms such as the Climate Action Competitive Fund;

b) To support the development of enterprises that create and employ green technologies and to promote County Clare as a Low Carbon County as a means of attracting inward investment to the County and to the wider Southern Region;

e) To ensure that the development of green industry and technologies incorporates careful consideration of potential environmental impacts at project level including the capacity of the receiving environment and existing infrastructure to serve these new industries.

f) To facilitate the development of energy sources which will achieve low carbon output.

i) To require the submission of an Energy Efficiency and Climate Change Adaptation Design Statements for large scale commercial and residential applications;

j) To promote climate change issues across business, public and residential sectors and to target measures and support initiatives to achieve reduced greenhouse gas emissions in accordance with current and future national targets, improve energy efficiency and increase the use of renewable energy sources across the key sectors of electricity supply, heating, transport and agriculture;'

CDP Objective 2.18 Solar Energy

'It is an objective of Clare County Council:

a) To facilitate and support the development of solar farms in appropriate locations throughout the county including on agricultural lands and brownfield sites subject to normal planning considerations;'

CDP Objective 11.44 Energy Security

'To promote and facilitate the sustainable development, maintenance and upgrading of electricity and gas network grid infrastructure, to integrate renewable energy sources, thereby creating a secure and efficient energy supply and storage system for County Clare which is ready to meet increased demand as the regional economy grows.'

CDP Objective 11.45 Electricity Networks

'a) To facilitate improvements in energy infrastructure and encourage the expansion of the infrastructure within the County;

b) To facilitate future alternative renewable energy developments and associated utility infrastructure throughout the County;'

CDP Objective 11.47 Renewable Energy

'a) To encourage and to favourably consider proposals for renewable energy developments, including community owned developments, and ancillary facilities in order to meet National, Regional and County renewable energy targets, and to facilitate a reduction in CO2 emissions and the promotion of a low carbon economy;'

The subject lands are located within the 'Western Corridor Working Landscape' area in the CDP. CDP Objective 14.3 Western Corridor Working Landscape states that it is an objective of the Council:

'a) To permit development in these areas that will sustain economic activity, and enhance social well-being and quality of life - subject to conformity with all other relevant provisions of the Plan and the availability and protection of resources;

b) To ensure that selection of appropriate sites in the first instance within this landscape, together with consideration of the details of siting and design, are directed towards minimising visual impact;

c) To ensure that particular regard should be had to avoiding intrusions on scenic routes and on ridges or shorelines. Developments in these areas will be required to demonstrate:

i. That the site has been selected to avoid visual prominence

ii. That site layouts avail of existing topography and vegetation to reduce visibility from scenic routes, walking trails, public amenities and roads

iii. That design of buildings and structures reduces visual impact through careful choice of form, finishes and colours and that any site works seek to reduce the visual impact of the development.'

3.5 Clare Renewable Energy Strategy 2023-2029 (CRES)

The Clare Renewable Energy Strategy outlines the potential for a range of renewable resources, including bioenergy and anaerobic digestions, micro-renewables, combined heat and power, geothermal, solar, hydro, energy storage, onshore and offshore, wave and tidal energy. It acknowledges the significant contribution that they can make to County Clare in terms of energy security, reduced reliance on traditional fossil fuels, enabling future energy exports and meeting assigned targets. The vision of the strategy is:

> *'A County Clare that is the national leader in renewable energy generation which supports energy efficiency and conservation, and which achieves balanced social and economic development throughout the County and assists in achieving national climate change mitigation targets.'*

Objective RES 3.1 of the CRES states it is an objective of Clare County Council:

> *'To meet the County's energy needs from 100 % indigenous renewable energy sources.*

Chapter 7 of the CRES identifies general parameters for the provision of domestic and large-scale solar projects. Objective RES 7.1 of the CRES '*Increase the penetration of commercial scale solar energy projects'* encourages the provision of commercial-scale solar projects on suitable agricultural lands;

> *'A. To increase the penetration of utility scale solar energy development in appropriate locations.*
>
> *C. To favourably consider the development of solar farms on agricultural lands which allow for farm diversification and multipurpose land use.'*

04 //

Assessment of Key Issues

4.1 Energy Context and Principle of Development

It is acknowledged that climate change is the greatest challenge facing humanity. The extent of the problem is laid bare in the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (August 2021) for the United Nations which confirms that to preserve a liveable climate, greenhouse gas emissions must be reduced to net zero by 2050. The IPCC report warns that global warming of 2°C will be exceeded during the 21st century. Unless rapid and deep reductions in CO2 and other greenhouse gas emissions occur in the coming decades, achieving the goals of the 2015 Paris Agreement "will be beyond reach". The report calls for decisive action, including the significant upscaling of green energy development to replace the use of fossil fuels.

In April 2022, the IPCC issued a further instalment on the Sixth Assessment Report. This report was again unequivocal that "Climate change is the result of more than a century of unsustainable energy and land use, lifestyles and patterns of consumption and production" and that limiting global warming will require major transitions in the energy sector, involve a substantial reduction in fossil fuel use, widespread electrification, improved energy efficiency, and use of alternative fuels. The proposed development will contribute importantly to this, reducing Ireland's reliance on fossil fuels by supplying a sustainable form of renewable energy.

The Irish Government have made clear the extent of the challenge facing the country and the pronounced need to realise commitments made to the European Union in relation to the reduction of greenhouse gases, via the development of renewable energy sources that reduce carbon emissions. The development and renewal of the energy network in tandem with this is of critical importance as enshrined in current national and regional policy (refer to Section 3 above). The Regional Spatial and Economic Strategy recognises the pronounced need to decarbonise the southern region, and specifically in respect of electricity *"to achieve national and EU targets will require investment in measures to develop alternative renewable energies with greater interconnection to energy resources..."*. Alongside commitments to improve energy efficiency and an increase in the use of renewable energy sources, it is an explicit objective under Regional Policy Objective (RPO) 100 *"to support the integration of indigenous renewable energy production and grid injection"*. The proposed development will deliver directly on this, contributing to the security of energy supply.

The Clare County Development Plan 2023-2029 recognises that the County has considerable capacity to produce energy from renewable and indigenous resources, with recognised potential for

Clare to meet all its future energy needs from such sources by 2030[6]. The Renewable Energy Strategy emphases that this target can only be met if, inter alia:

> *Biomass energy crops are planted in significant areas throughout County Clare; Waste streams, especially organic waste, are utilised for energy generation;The County Clare Wind Energy Strategy targets are realised; Solar energy development is progressed and supported in the period up to 2030; and Marine energy development is progressed and supported in the period up to 2030.*

The preceding chapter of this statement provides a detailed summary of existing and emerging policies which underpin the need for the subject project. If Clare is to achieve its stated goal to become a national leader for renewable energy generation, projects such as that proposed must be positively supported. National policy acknowledges the potential of solar to contribute towards energy security, contribute to meeting renewable energy targets and support the provision of economic growth and jobs. Simply put, this means that renewable energy needs to be provided close to centres of population and employment. In this case, the subject site is located within the defined Limerick Shannon Metropolitan Area which is earmarked for significant population growth. The proposed solar array will therefore act as a positive enabler of economic development locally, while supporting sustainable residential growth in the metropolitan area consistent with national objectives. Being close to local demand, energy produced from the site will be used efficiently in the local area without transmission loses.

Under permitted reference ABP-316043-23, the An Bord Pleanala inspector confirmed their independent opinion that the principle of developing a solar array was supported at the subject location:

> *"The site is located on agricultural lands that are outside any designated settlement and the proposal will allow for farm diversification and multipurpose land use, as supported by objective RES7.1 of the operative development plan...".*
>
> *"I have reviewed the guidance that exists within the operative development plan, alongside government policy, and I am satisfied that the proposed development is suitably located and is acceptable in principle...".*

4.2 Landscape and Visual

The design of the proposal has been informed by relevant industry standards for the layout and management of such facilities, as well as detailed site analysis, which identified potential constraints and opportunities. This has shaped the final design response in relation to the local landscape and environment.

Macro Works Ltd, a chartered landscape architectural practice, were engaged to carry out a landscape and visual impact assessment (LVIA) of the proposed development, which is submitted in support of this application. The assessment incorporates best practice methodologies prescribed in the Environmental Protection Agency (EPA) publication 'Guidelines on the Information to be contained in Environmental Impact Statements (2015) and the accompanying Advice Notes on

[6] Policy RES 3.1 establishes an objective for Clare to meet the County's energy needs from 100% indigenous renewable energy sources.

Current Practice in the Preparation of Environmental Impact Statements (2015), and Landscape Institute and the Institute of Environmental Management and Assessment publication entitled Guidelines for Landscape and Visual Impact Assessment (2013).

4.2.1 Site Context

The western and southern sections of the subject phase 2 solar array lands are located within the 'Western Corridor Working Landscape' areas identified in the Clare County Development Plan. Working landscapes are descripted as "intensively settled and developed areas within settled landscapes...". It comprises of a low rolling lowland landscape, sloping towards the Shannon River and associated Headrace Canal which feeds the Ardnacrusha hydro-power plant. It is an area typified by pasture agriculture with a high frequency of existing treelined hedgerows. The northern / eastern extent of the site, including the larger parcel to the north of the R471 across Knockbrack, is located within the 'Settled Landscape' classification. These are defined to "comprise of a network of farmland, villages and towns that make up the majority of the County. These landscapes are where the majority of the population live and work. They provide opportunities for enterprise, leisure and personal fulfilment".



Figure 03: Extract from CDP Landscape Designations Map (Left) and Extract from Renewable Energy Strategy illustrating Solar Opportunity Areas (Right)

As illustrated also in Figure 03, and as per Chapter 7 of the Clare Renewable Energy Strategy 2023-2029, the subject lands are located in a solar opportunity area where a low level of 'cumulative constraints' exist for such development. The suitability of the subject lands, specifically in the context of landscape visibility, is reflected in the Zone of Theoretical Visibility (ZTV) mapping contained in the submitted LVIA. The existing Digital Surface Model (DSM) ZTV map illustrates that in the majority of cases, less than 20% of the proposed Ballyglass Solar Array Phase 2 will be visible even prior to mitigation planting. The LVIA assesses the visual impact of the subject proposal in combination with the permitted Ballyglass Solar Array Phase 1 and concludes that there will be no notable cumulative visual impacts generated by the two developments. Cumulative views of both phases of the Ballyglass Solar Array within the wider area will be limited to fleeting sequential views along the surrounding local and regional road network.

The robust nature of the local landscape and suitability to accommodate development of the subject nature was noted specifically by An Bord Pleanála under ABP-316043-23:

in my view the established landscape is capable of absorbing this change, given the flat topography to the south, the gentle rolling nature to the north, the extensive hedgerows and their augmentation with further planting, the separation distances from roads and residential dwellings, and the generally low rise nature of the panels to approx. 3m in height. I consider that the setting, which is a working rural landscape would, following mitigation, have a low visual impact and any residual views remaining would be intermittent and of a low impact. Having regard to the mitigation measures proposed, I am satisfied that the proposed development would not adversely impact on the landscape and visual amenities of the area including those from adjoining properties".

4.2.2 Assessment

The LVIA process included a thorough review of the site, surrounding environs within a 5 km radius, and statutory documents for sensitive locations. All nearby scenic routes, protected structures, public facilities, walking routes, public roads and cultural, environmental and heritage areas were considered. This resulted in the selection of 13 no. viewpoint locations for detailed assessment, representing a variety of distances, angles and viewing contexts.

The LVIA predicts that of the viewpoints assessed 12 no. will have an impact of no greater than 'Slight-Imperceptible' at operational stage, with the remaining 1 no. view predicted to have a 'Slight' impact in the post-mitigation scenario[7]. The findings, which firmly place most all views at the lower end of the impact assessment spectrum, support initial baseline assessments that the solar array is substantially screened locally and that proposed mitigation screen planting will be very effective in supplementing this.

At operational stage, there will be few extensive or open views towards the solar array, particularly after mitigation has become established. Where views exist, these will be heavily screened or filtered by vegetation, or alternatively, fleeting open views through gateways.

Cumulative Assessment

The LVIA includes a detailed assessment of the proposed Phase 2 lands with the permitted Phase 1 of the solar array. The previously assessed and accepted low level of visual impact arising from permitted Phase 1 lands means the immediate imminent baseline is not sensitive in principle to additional development. Whilst the proposed development will increase the intensity of solar array development within the surrounding landscape, its location adjacent to a consented solar array will optimise ancillary infrastructure such as access tracks and electrical infrastructure. In terms of visual impacts, the most important point to make is that the proposed development will result in a residual visual impact no greater than 'Slight'. As such, the potential for the proposed development to be viewed in combination with the consented Phase 1 is extremely limited, as reflected in the cumulative assessment photomontages.

The LVIA also considers interactions with other permitted solar array and wider cumulative projects in the area. Owing to the relatively flat nature of the landscape between the proposed and consented developments, where all other solar array developments are located along lands that incline away from the River Shannon toward the uplands to the north, combined with the high degree of intervening vegetation within the intervening landscape, area and the relatively low-height of the

[7] VP8

solar panels there will be minimal opportunities to afford visibility of the proposed and consented developments.

While the subject application does not include the proposed 110kV substation, the LVIA has considered the potential for visual impacts from the proposed development and this infrastructure through a review of relevant viewpoints. The assessment confirms that the proposed substation will be located in a heavily screened part of the study area that will be bolstered with additional native hedgerow planting as part of the mitigation strategy for the proposed development. Even if partially glimpsed from the surrounding landscape, the proposed substation will only result in a marginal increase in the intensity of electrical infrastructure development within the study area. Thus, it is not considered that the proposed substation will generate any notable cumulative landscape and visual effects.

Based on the landscape and visual impact judgements provided throughout this LVIA, the proposed development is not considered to give rise to any significant residual impacts. Instead, landscape and visual impacts are not considered to exceed 'Moderate-slight' significance, even in the immediate context of the site.

4.3 Glint and Glare

Solar panels, by their nature, are designed to absorb rather than reflect light for the purposes of capturing solar energy and converting it into electricity. They are constructed with high transmission low-iron glass, with a lower transmission and reflective ratio compared to common glass. Compared to other artificial, and in some cases, natural surfaces, the reflection from solar PV modules is almost negligible. It is scientifically proven that similar levels of reflectance emanate from wet road surfaces or plastic mulch/biodegradable film in agricultural landscapes. Higher levels of reflectance emanate from greenhouses and aluminium shed roofs in an Irish rural context, with these and polytunnel structures very common place across Co. Clare. More generally, the comfort with the non-reflectivity of solar PV technology is best encapsulated by the significant increase in solar PV installation at major European airports, which includes Zurich, Munich, Salzburg, London Gatwick and Belfast International, among others.

A Glint and Glare Assessment prepared by Macro Works accompanies this application which outlines potential impacts on road, residential and aviation receptors in the area.

4.3.1 Road Receptors

A total of 228 no. road-based receptors were examined. Analysis taking account of the existing screening inherent across the study area (using a digital surface model-DSM) and on-site verification of the analysis results, determined that 14 of the road Receptor Points will actually have the potential to be materially affected by glint and glare, reducing to 4 Receptor Points when proposed mitigation planting is considered. A review of the particulars of these points having regard to possible duration of impact, orientation of travel (relative to the solar array) and field of view confirms there will not be any significant hazard or nuisance impact generated from the proposal.

4.3.2 Dwelling Receptors

The glint and glare report also models potential impacts on individual residential dwellings in the local area. A total of 140 dwellings were examined, with DSM modelling and onsite verification of analysis results confirming that 5 no. dwellings have some potential to incur glint and glare effects

post landscape mitigation establishment. In all cases, the magnitude of potential impacts identified at these properties will range between negligible, very low or low, meaning there will be no material impact on local properties.

As noted in the report, all reflectance periods provided are theoretical by default and represent a worst-case scenario in that they assume that the sun is always shining and at full intensity. In the Irish context, the reflectance frequency/duration figures provided are likely to be at least double the reality, according to Met Eireann data.

4.3.3 Aviation Receptors

The application site is located approximately 22km east of Shannon Airport While it is located outside the IAA and DAA protocol 10 km and 15 km radius study areas that might require testing for glint and glare impacts, a full analysis of potential impacts on the airport has been undertaken.

Using the Federal Aviation Administration (FAA) approved Solar Glare Hazard Analysis Tool (SGHAT) software, no impacts have been identified in relation to airport runways.

A viewshed analysis was carried out for the Air Traffic Control Tower at Shannon Airport (1-ATCT) to identify what portions of the proposed development are theoretically visible. This was undertaken with the aid of a digital terrain model (DTM) to produce a Zone of Theoretical Visibility (ZTV) map (Figure 1.12 refers). The result of this analysis shows that, in a bare-earth analysis where no intervening visual obstructions, such as vegetation or buildings are included, there is no potential for inter-visibility between the ATCT and the proposed areas of PV panels – indicated in yellow on Figure 1.12. As there is no potential for intervisibility between the proposed solar array and the ATCT at Shannon Airport, there can be no glint and glare effects Shannon Airports ATCT.

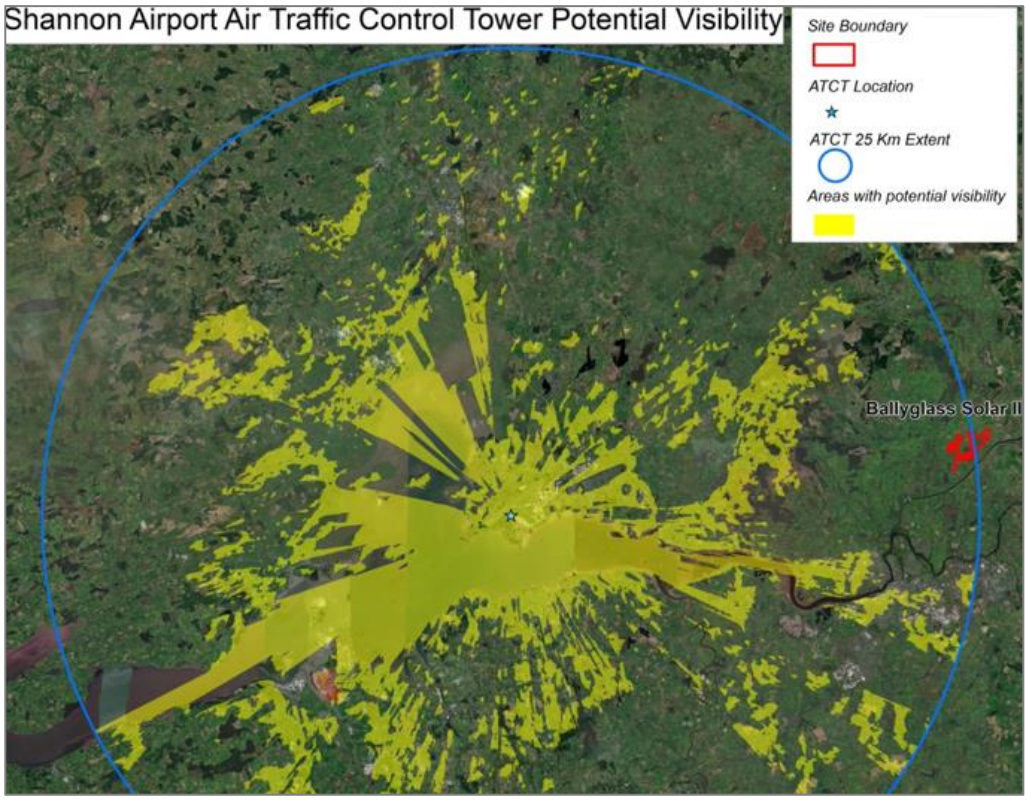


Figure 04: Zone of Theoretical Visibility (ZTV) map showing the areas within the site that are potentially visible (yellow pattern) from the air traffic control tower (1-ATCT) in Shannon Airport.

4.4 Ecology

4.4.1 Ecological Impact Assessment

An Ecological Impact Assessment (EcIA) was prepared by Greenleaf Ecology. The EcIA provides an overview of ecology within the proposed development site, as well as identifying, quantifying and evaluating the potential effects arising from the construction and operation of the development on habitats, species and ecosystems in the surrounding area. The subject site contains a number of ecological habitats including Depositing Lowland Rivers (FW2), Drainage ditches (FW4), Hedgerows (WL1) and Treelines (WL2).

A combination of desktop research and on-site ecological surveys confirmed the following:

- There are no records of protected species of vascular plants or bryophytes from the footprint of the proposed site and no rare or protected species of flora were recorded during the site survey.
- Some Giant Hogweed is present within field boundaries in Parcel 3. An Invasive Alien Species (IAS) Management Plan will be put in place to manage same.
- A dedicated survey for Marsh Fritillary was conducted within Parcel 4 on 13th September 2024. No evidence of Marsh Fritillary was recorded at the proposed site.
- No evidence of roosting/resting of bats was recorded during site surveys. Suitable roosting habitat for bats at the site is limited to mature trees within the field boundaries of the site. The proposed development will not have an adverse impact on roosting bats. The site's landscaping plan will enhance and increase hedgerow and treeline networks at the site, providing greater foraging and commuting habitats for bats.
- No badger setts were recorded within the proposed site during the site survey and the site field boundaries. Badger droppings were recorded in Parcel 1, Parcel 3 and Parcel 4, indicating that the proposed site forms part of the foraging territory of the local badger population. Mammal movement through the site will continue to be provided as part of security fence design.

The proposed development will not result in permanent impacts on semi-natural habitats and the proposed landscaping plan includes new hedgerow planting and hedgerow and riparian enhancement which will serve to further develop overall habitat and species diversity on the site. The development footprint will be largely confined to the open agricultural fields, which are considered to be of lower local ecological value. No significant effects on designated sites, habitats, flora or fauna have been identified as a result of the proposed development.

4.4.2 Appropriate Assessment / Natura Impact Statement

A Natura Impact Statement (NIS) prepared by Greenleaf Ecology accompanies this application. The proposed development site has a hydrological connection with the Lower River Shannon SAC via drainage discharges and watercourses. The Stage 1 Appropriate Assessment Screening found that it could not be excluded, on the basis of objective scientific information that the proposed works, individually or in combination with other plans or projects, would have a significant effect on a Natura 2000 site. Therefore, a NIS was required to ascertain whether the proposed works would have an adverse effect on the integrity of the Natura 2000 site in question. This has considered the relevant qualifying interests indicated as having a potential impact-receptor pathway and identified best practice measures to ensure that potential pollutant sources are not released from the

proposed development to the receiving environment such that there will be no risk of adverse effects on these qualifying interests.

The report objectively concludes that the proposed development will not adversely affect the integrity of the Lower River Shannon SAC in view of the site conservation objectives and that the conservation status of the qualifying interests and special conservation interests will not be compromised by the proposed development directly, indirectly or cumulatively.

4.5 Archaeology and Heritage

A detailed Archaeological Assessment of the proposal has been prepared by John Cronin & Associates and is enclosed with this application. The assessment included a study of the archaeological and historical background of the proposed development site and the surrounding environs. This included information from the Record of Monuments and Places of County Clare, the topographical files within the National Museum and all available cartographic and documentary sources for the area. A field inspection was also conducted with the aim of identifying any previously unrecorded features of archaeological or historical interest. The findings identified no recorded sites of archaeological importance within the site.

A geophysical survey of all available portions of the proposed solar array was undertaken by Target Archaeological Geophysics Ltd. in June 2024. Nothing of archaeological significance was noted from the results of the survey that would require avoidance at the design stage of the development. It is recommended that prior to development works taking place, a programme of archaeological test trenching be undertaken at the site, under licence by the National Monuments Service.

Overall, a preventative approach has been taken in relation to the design and construction management of the project. This includes minimising the amount of ground disturbance caused by the construction process (and by extension any possible impact on sub-surface remains) and the monitoring of focused groundworks to access tracks, entrance, cables, substations and the boundary fence by a suitably qualified archaeologist, under licence to negate any potential for impacts on archaeological or cultural heritage assets during the construction phase.

4.6 Traffic

4.6.1 Operational Traffic

The design of the project has considered transport impacts arising from both the construction and operational phases. Construction and operational access will be via the R463 and subsequently, the R471 and L70382 roads. This application is supported by a detailed Site Access and Drainage Report by CSEA Engineering Advisors. The solar array will be an unmanned facility once operational, with trips confined to maintenance staff accessing the site by light goods vans. These movements will be limited to 1-2 trips per month on average. As such, the operational development is expected to give rise to a decrease in both the volume and scale of vehicles accessing the site comparable to existing agri-generated traffic.

4.6.2 Construction Traffic

Based on the low levels of operational visits, the potential for traffic impacts to occur will be limited to the temporary construction period. The proposed development will be constructed alongside the permitted phase 1 and future substation. The traffic impacts for the phase 1 and the substation were presented and assessed as part of Clare County Council Reference 22591 / An Bord Pleanala Reference ABP-316043-23. The volume of vehicular movements for these elements is c.13 trips per

day. As set out in Section 4.1 of the submitted Site Access and Drainage Report, the proposed development will result in additional HGV trips in the order of 1,386 trips, an equivalent average of 3.5 no. additional HGV trips per day over the construction period. Combined with the permitted phase 1 and future substation / grid connection, this equates to an average of 16.6 HGV trips per day for the temporary duration of construction period[8].

Alongside the standard HGV deliveries, it is envisaged that one abnormal delivery load will be needed to transport the substation transformer to site. It should be noted again that planning permission is not being sought at this time from Clare County Council for the substation. The exact specification for the transformer in question is subject to finalisation but it is expected that it will require a specialised flat-bed tractor and trailer combination appropriately sized to the transformer model. Special delivery measures will be put in place for this delivery consistent with now standard abnormal load convoys for wind farm projects. This will include a detailed route plan, risk assessment and transport management plan to be agreed in full with Clare County Council. This will be prepared in accordance with the European Best Practice Guidelines for Abnormal Road Transports.

4.6.3 Site Access/Sightlines

The proposed delivery route for the PV panels and construction materials is detailed in Section 5 of the Site Access and Drainage Report. Selection has been informed by a detailed route review process conducted in relation to key assessment criteria for projects of this nature, including the carriageway widths, sightlines, road surface conditions, and existing and proposed traffic volumes. The pavement was found to be in good condition along the length of the proposed delivery routes. Resurfacing works to the existing paved length of the L70382 are permitted under Clare County Council Reference 22591 / An Bord Pleanala Reference ABP-316043-23[9]. This will greatly improve the existing 'do-nothing' scenario at this location.

As detailed in the report, it is proposed to access the site via 4 site entrances. Swept Path Analyses has been completed on all proposed site entrances, the design of which has been tested and meet requirements for articulated vehicle access. A detailed appraisal of the sight lines at all entrances has also been undertaken which confirms appropriate visibility standards are achievable on the regional and local roads. The adjoining hedgerows in ownership in the vicinity of entrances will be maintained to facilitate appropriate sightlines as part of the operational management of the solar array.

4.7 Water and Drainage

All matters relating to potential flood risk and drainage have been investigated in detail as part of the subject proposal, with available resources from the Office of Public Works (OPW) consulted to establish the potential for any impacts. This application is supported by consideration of onsite drainage[10] for the solar array.

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[8] 72 week construction period.

[9] The permitted works include resurfacing works to the existing paved length of the L70382. Upgrading of the unpaved areas of the L70382 to Site Entrance 4 (of permitted Phase 1) to a clause 804 track is also permitted.

[10] Refer to Traffic Access and Drainage Report by CSEA Engineering Advisors.

4.7.1 Flood Risk

The subject lands are not situated within or proximate to any areas of flood risk as identified by the OPW. As illustrated below, there is some fluvial flood risk associated with the Blackwater river to the west and the headrace to the south, neither of which is attendant to the subject lands.

OPW Hazard Mapping records were also interrogated for the site. They confirm that there are no recorded flood events on the subject lands or level of identified flood hazard. This position was also corroborated with the landowners. It follows that there is no issue with respect to flood risk on this site.



Figure 05: Extract from OPW Flood Maps with Subject Proposal Boundary Superimposed, www.floodinfo.ie

4.7.2 Drainage

Subject to appropriate design specifications, the installation of solar PV arrays will not give rise to increased surface water runoff (volumes or rates) in an agricultural setting. This position is supported by both academic and industry testing of pre and post-panelled ground conditions. A paper on the hydrologic response of solar arrays published in the Journal of Hydrologic Engineering confirmed that "solar parks themselves did not have a significant effect on runoff volumes, peaks or times to peak". This research advocates the establishment and maintenance of grass underneath erected panels promoting kinetic friction and the avoidance of bare-ground in adjacent spacer sections (areas between array rows). It also confirmed that rainwater which falls on angled panels infiltrates through natural processes.

Having regard to this, the drainage strategy for the site includes the follows:

- Generous separation distances have been incorporated between the array rows to avoid blanket coverage of the site and the maintenance of normal green-field ground conditions, with substantial buffer strips established in a number of areas;
- The installation frames and panels themselves will be pitched at an angle of between 15-25 degrees to a maximum of 3 metres off the ground to the north and a minimum of 0.25 metres off the ground to the south. This provides two-fold benefits, namely mitigating

against any potential for increased rates of rainwater runoff from the panels (compared with more pronounced angles with a greater dripline to the ground surface) and the creation of natural conditions which allow seeded grass beneath panels to flourish and be maintained;

- A programme of grass reseeding and active management will be advanced alongside landscaping proposals to preserve peak water runoff rates at optimal natural levels. It should be noted that once operational, the proposal will allow for sheep grazing on the site further eradicating the need for storm-water management interventions;
- Surface water will continue to be accommodated by the existing original drainage and infiltration pattern on the site via the network of perimeter drains. There is adequate capacity in the existing drainage regime. Any overgrown drains will be cleaned and cleared of excess vegetation and subject to regular inspection and maintenance to aid performance;
- Surface water will be prevented from running onto the public road by provision of drainage and soakaways at the entrances to the proposed solar array. These measures are detailed in the Site Access and Drainage Report. All storm water management measures will be subject to periodic testing, review and maintenance;
- As outlined in the CEMP, best practice guidelines and environmental controls will be implemented as part of project design to protect all water features during the construction phase. The final detail will be agreed with the Council as part of the preparation of the pre-commencement construction management plan.

4.8 Environmental Impact Assessment Screening

The requirement for Environmental Impact Assessment (EIA) has its origins in Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment. This Directive has been amended three times and was codified by Directive 2011/92/EU in 2011. Directive 2011/92/EU was then subsequently amended by Directive 2014/52/EU in 2014.

It is well established through significant case-law precedent that solar arrays are not a project type falling within the categories of projects requiring EIA identified in Part 1 or Part 2 of the Planning and Development Regulations 2001, as amended. As such, EIA and indeed EIA Screening, do not apply to solar arrays unless there is another project component which does fall within Part 1 or Part of the aforementioned Regulations. Circular Letter EUIPR 03/2020 issued by the Department of Housing, Planning and Local Government confirms this interpretation with direct reference to some high court judgements.

An Environmental Impact Assessment (EIA) screening has been prepared having regard to the recently published ministerial circular EUIPR 01/2023 and requirements under S.I. 383 related to 'Projects for the restructuring of rural landholdings'. The proposed development has been screened for EIA in consideration of the relevant thresholds and it has been objectively concluded that the preparation of an Environmental Impact Assessment Report is not required.

4.9 Noise

The application is accompanied by a Noise Impact Assessment Report by Wave Dynamics which has been prepared having regard to Statutory Instrument No. 549/2018 of the European Noise

Regulations; BS 8233:2014; World Health Organisation noise guidelines, and the EPA guidance note for noise: NG4 Guidelines. The noise impact assessment included attended noise measurements on the proposed development lands. This included measurements of background noise at the noise sensitive locations.

The noise generating plant associated with the solar array project are the inverters, transformers, and the proposed substation. As illustrated on the site layout plans, this plant is located centrally, away from local receptors. This is reflected in the findings of the noise assessment with the modelled noise levels (free field façade noise levels) are well below the recommended EPA/WHO/BS8233 guidelines of 55dB during day-time and 45dB at night-time.

The construction phase of development due to its nature is temporary and therefore any potential noise impacts will be short term. All construction works will be carried out during the day-time period between the hours of 7.00am to 7.00pm Monday to Saturday. No construction activities will occur outside these hours unless agreed in writing 24 hours prior by Clare County Council. Potential noise impact will be controlled in accordance with all relevant British Standards Codes of practices such as: BS 5228-1: 1997 "Noise Control on Construction and Open Sites -Part 1"; BS 5228:2009 and AI:2014 "Code of practice for noise and vibration control on construction and open sites". The applicant is happy to accept a condition limiting construction phase noise to 70dB as per BS5228.

4.10 Lighting and CCTV

There are no formal lighting requirements for the proposal. Solar panels are designed with the express purpose of absorbing light during the day and they do not operate at night-time.

The CCTV will incorporate infra-red technology which is invisible to the human eye but visible to the camera. The purpose of the CCTV is to monitor the valuable solar array infrastructure itself. It will be orientated towards this infrastructure rather than any third-party lands.

4.11 Project Implementation

4.11.1 Duration of Permission

The applicants have applied for a 10-year planning permission, as per the development description for the project. In their Planning Considerations advisory guidance, the Irish Solar Energy Association, advise generally that 10-year planning permissions should be sought for projects of this nature, having regard to commercial and technical considerations beyond the control of solar array developers. On receipt of any grant of permission for the subject project, the applicant intends to mobilise on the implementation of the permission as soon as possible, however, it may take a period longer than 5-years for project implementation to be completed. A 10-year permission is requested based on the following:

- As outlined in the planning application, it is envisaged that the application will connect to the grid by means of a new substation and underground cable connection to the existing Ardnacrusha 110kV substation. This application will be subject to Strategic Infrastructure Development provisions, the timelines for which are variable but may add 12-24 months to the overall planning process, which will sit independent of any permission for the generation element (solar array) of the project.
- Post any grant of permission, the Applicant will require a grid connection offer to connect the proposed development to the grid. The solar array permission itself is one of the key milestones that needs to be achieved to apply for the grid connection offer. The Enduring

Connection Policy (ECP) process for grid connection applications is the current pathway for electricity generators, storage and other system services technology projects to connect to the electricity system. The future design of the ECP process is currently under review by the CRU at the time of writing of this report (ref. CRU/2023163). Up to 2024, the ECP process encompassed a batch application window which opened for one month per year and allowed projects with full planning permission to apply for a grid connection offer. Whist the current timing of future ECP processes is to be confirmed it is reasonable to assume that a grid connection offer might issue between 12-18 months from the grant of permission for the solar array.

- The Renewable Electricity Support Scheme (RESS) will provide support subsidies to renewable electricity projects in Ireland. Operated by the Department of Communications, Climate Action and Environment, EirGrid and the CRU, RESS is designed as a series of renewable energy auctions which will take place on a regular basis between 2020 and 2030. There is a requirement for a large number of projects to still come through the RESS process in order to achieve our renewable and climate 2030 targets. In order to apply to participate in a RESS auction, a project must have a grid connection offer and thus it is sequential to the ECP process as described above. The issue of a RESS subsidy, if applicable, might reasonably take up to 12 months from the acceptance of a grid connection offer.
- Following on from the ECP and where relevant the RESS processes, it will be necessary to confirm the appointment of various Contractors responsible for the construction of the proposed development and a procurement process undertaken to source all necessary equipment and materials. The solar array, substation and grid connection then needs to be constructed. This process may take up to 24 months and is subject to market conditions.
- Further to the above, 10-year permissions have been routinely applied to renewable energy projects. This recognises recent precedent on such matters, which includes the granting of 10-year permissions for solar arrays in County Clare, such as the permitted Phase 1 of Ballyglass Solar Array.

Having regard to industry requirements and precedent on such matters, it is considered reasonable that a 10-year permission should be afforded here.

4.11.2 Operational Solar Array

The applicants have requested a 40-year operational period for the solar. In the last 5-years there has been a pronounced shift from 25 year to 40 year operational periods having regard to significant technological advances with the lifespan of warrantied panel modules reaching 40+ years. It should be noted that investment decisions are made over 40 years for projects of this nature. To ensure certainty in approach, it is important at the planning stage that operational and maintenance budgets and programming reflect this. This a key driver for the requested operational period for the project, which will ensure certainty of a continuous supply of sustainable green energy at this location over this horizon. There is recent precedent in respect of planning permissions for 40-year operational periods, as shown in Table 03.

Table 03: Granted Solar Farms with 40-year Operational Period

County Council	Reference	Grant Date	Applicant	Description
Waterford	ABP-317188	24/04/2024	BNRGN Mothel Limited	A Solar Farm on a total site area of 141 hectares (ha), consisting of photovoltaic panels on ground mounted steel frames with associated cabling and ducting; 28 no. single storey inverter stations; perimeter fencing; permeable gravel access track; 49 no. onsite pole mounted CCTV cameras; 4 no. new site accesses; 4 no. security gates; 3 no. temporary construction compound/material storage area; 3 no. temporary construction stage wheelwash systems (with overhead settlement tank); 6 no. temporary storage containers and all associated ancillary development services and works
Meath	24/60134	19/04/2024	Harmony Solar Milltown Limited	The development will consist of: A 10-year permission for the development of a solar farm on a site of 35.81 hectares consisting of the following: 211,320 sqm of solar photovoltaic panels on ground mounted steel frames; 6 hardstanding locations for electrical skids; new internal access tracks; underground power and communications cables and ducts ; a new access from the L6835 public road; access gates; landscaping and biodiversity enhancement measures; boundary fencing and all associated ancillary development, site works and services. The solar farm will be operational for 40 years. Installation of underground electrical cabling and associated infrastructure within the public road corridor along the L6835 public road for approximately 10 metres to connect into the permitted underground cabling associated with the permitted 'Milltown Solar Farm (Meath County Council Reg. Ref. 21396 & An Bord Pleanála Case Number: PL17.311460) which is located to the north of the site within the townland of Milltown. A Natura Impact Statement (NIS) has been prepared in respect of the

				proposed development and will be submitted to the planning authority with the application
Kildare	23/567	28/11/2023	Delamain Solar Farm Ltd	10 Year Planning Permission for a solar farm with a total area of circa 246 hectares in the townlands of Brannockstown, Brownstown, Carnalway, Coghlanstown West, Corbally, Delamain, Dunnstown, Gaganstown, Greenhills, Harristown, Hillsborough, Moorhill and Rochestown in County Kildare. The solar farm will consist of solar photovoltaic panels with a surface area of 1,130,000m2 on ground mounted frames, 40 no. single storey electrical inverter/transformer stations, 4 no. single storey spare parts containers, 19 no. Ring Main Units, 9 no. weather stations underground electrical ducting and cabling within the development site, private lands and within the L6063, L2032, L6071, R448, L6072, R412, L6074, L6047 and R413 public roads to connect solar farm field parcels, security fencing, CCTV, access tracks, 5 no. stream and drain deck crossings, temporary construction compounds, landscaping and all associated ancillary development and drainage works. Construction and operational access will be via entrances from the R412, R413, L6044, L6047 and L6063. The solar farm will have a maximum export capacity of circa 210 megawatts. The operational lifespan of the solar farm will be 40 years and planning permission is requested for this duration. Part of the proposed development is situated within the demesne land of Harristown House which contains Protected Structures, but no works are proposed to these Protected Structures but no works are proposed to these Protected Structures. Revised by significant Further Information consisting of revised site layout plans to reduce panelled areas in Parcels 1 and 2, relocation of meteorological mast in

				Parcel 1 and all associated landscaping and ancillary works
Wexford	20231025	28/11/2023	Delamain Solar Farm Ltd	A 10 year planning permission for a solar farm with a total area of circa 55 hectares in the townlands of Ballylough, Coolbaun, Crory, Lodgewood, Scarawalsh and Tincurry. The solar farm will consist of solar panels on ground mounted frames, 9 no. single storey electrical inverter/transformer stations, 5 no. single storey energy storage modules, 2 no. single storey spare parts containers, 2 no. ring main units, 2 no. weather stations, underground electrical ducting and cabling within the development site, private lands and within the L5130 public road to connect solar farm field parcels, security fencing, CCTV, access tracks, 5 no. stream and drain deck crossings as well as 6 no. cabling open trench undercrossings and 2 no. horizontal directional drills, temporary construction compounds, landscaping, netting adjacent GAA playing fields and all associated ancillary development and drainage works. Construction and operational access will be via. 5 no. entrances from R772 and L5130 (3 no. of which were permitted under Wexford County Council Planning Reference 20221309). The operational lifespan of the solar farm will be 40 years and planning permission is requested for this duration. A Natura Impact Statement (NIS) has been prepared and will be submitted to the Planning Authority with the application.
Kerry	22372	22/11/2023	Lodgewood Solar Farm Limited	10 year planning permission for a 100% carbon negative renewable energy solar PV installation consisting of 2MW of ground mounted solar panels an improved entrance and all associated works. The purpose of the installation will be to feed 100% green energy to the national grid. The solar installation will have an operating life of c. 40 years.

4.11.3 Construction Management

As detailed in the enclosed Construction & Environmental Management Plan (CEMP), the envisaged construction period for the proposed development is 72 no. weeks, inclusive of the planned 110kV substation and grid connection element. This process will be governed by strict environmental controls, as well as health and safety procedures. The civil works themselves are non-invasive, reflecting the temporary nature of the proposed development. sets out a detailed suite of environmental protection measures to be implemented on site during the construction phase. The CEMP identifies potential issues which are relevant to the project, such as construction safety; traffic management; environmental risk assessment and management; waste management; and environmental management and outlines how these will be addressed. To ensure compliance, environmental audits will be carried out as an integral part of the construction phase of the project. The final CEMP will be further developed by the appointed contractor and will include a detailed traffic management plan and risk assessed method statements. The document will be agreed, where relevant, with the Council prior to the commencement of any development.

4.11.4 Operational Maintenance

Once operational, the solar array will be run in accordance with a management plan prepared to ensure the development site is maintained in a manner which allows for its optimal technical operation and the meeting of any commitments made during the planning stage of the project. Alongside system performance, this will include routine inspection and monitoring in relation to ongoing planning compliance requirements. The drainage regime on the site will be subject to regular inspection and cleaning/clearing as necessary. It is currently envisaged that sheep grazing will be the principal means of managing grass growth levels on the site which improves fertility of the soil under panels, while retaining the lands in productive agricultural use. This is consistent with best practice measures contained within the UK BRE Planning Guidelines for the development of ground mounted solar PV systems.

4.11.5 Decommissioning and Site Reinstatement

The proposed development is considered to be temporary in nature, with an operational lifetime of 40 years. Compared to other power generation technologies, solar arrays can be easily and economically decommissioned and removed from the site allowing for its full reinstatement to its original condition. The project consists of numerous recyclable materials, including glass, aluminium and silicon, which will be dismantled and recycled. Decommissioning of the site is estimated to take between 2-4 months in order to return the site for reuse as either pasture or arable land. It will commence with removing the solar panels, followed by the mounting frames, then removal of the pile driven steel supports. This will be followed by the removal of the buried electrical cables, inverters, and pad foundations, of which there will be very few. CCTV systems, fencing and access tracks will then be removed to leave a clear field. The field will then be prepared for return to the landowner for agricultural use. The constructed access tracks may be retained if desired by the relevant landowner, otherwise they shall be removed.

4.12 Community Considerations

4.12.1 Community Engagement

The applicant has been proactive in sharing information on the project with the local community. Having regard to the Covid-19 pandemic, a decision was taken in late 2021 to develop a project

specific website to act as a vehicle to provide updates on project development as well as a forum for dealing with queries from the local community.

This website was maintained for the Phase 2 application and is accessible via the following url: www.ballyglassinfo.com



Figure 06: Extract from project website

As outlined on the website, a notification letter, a solar information leaflet and a map highlighting the Phase 2 lands was issued to the local community. This round of consultation was carried out via door-to-door letter drops by the CLO in June 2024, the majority of the community were met during this consultation and the feedback was primarily positive towards the proposal. This information was uploaded to the project website to inform the wider community. Several members of the community requested meetings with the CLO and the feedback from these meetings has helped to finalise the layout for the proposed development. The clear intent of this approach was to generate an increased awareness of the project within the local area and encourage engagement.

4.12.2 Residential Amenity

The subject proposal has been designed with the intention of protecting the amenities of adjacent neighbours. The layout has evolved as a direct output of some community discussions and the feedback of the project design team. The layout includes focused design measures including buffer zones / setbacks to residential adjoining properties and provision of new intervening hedgerow planting. For instance, following community consultation, several solar panel tables were removed and additional screening was provided for within fields adjoining residential properties in Parcel 4.

There are other examples of this, where the design has incorporated additional setbacks, landscaped areas and bolstered planting to mitigate against any potential impact on adjoining residential amenities, as illustrated in the figure below.



Figure 07: Sample offsets to residential dwellings and additional screening measures within Parcel's 3 and 4.

The nature of views of the site from the surrounding areas has been set out in the submitted LVIA and supporting photomontages. In general, the identified visual effects on residences have been mitigated by the retention of existing site vegetation and the proposals for new hedgerow and tree planting on site as set out in the solar array landscape plan. The low-lying nature of the proposed development means that the general topographical patterns remain intact. The pattern of hedgerow vegetation is retained and a solar array is compatible with the general agricultural character of the landscape. The key identified visual effects on residential areas are set out below:

- Short term and temporary visibility of construction machinery from residences along the R463, R471 and L70382 during the construction period.
- Potential short-term moderate visibility of the northern part of solar array (where not screened by garden vegetation) from the R471 abutting the northern boundary of Parcel 2, with visibility reducing to imperceptible as mitigation planting matures.
- Potential short-term veiled views of the solar array from the end of the cul-de-sac associated with Monaskeha Heights. The residential receptors at this location are afforded only intermittent views of the proposal prior to any mitigation planting being established, given the level existing vegetation at this location.
- Potential short-term short distance views of panels from residential receptors on the R471 between parcels 3 and 4. With the addition of the proposed mitigation, the site will be screened from the road corridor at this location. The degree of enclosure through vegetation is consistent with much of the surrounding road corridor and will not appear out of place.

4.12.3 Health and Safety

There is no credible evidence to suggest that solar arrays pose any health and safety concerns. There will be no electromagnetic health impacts from the project. Magnetic fields are produced

through both natural and man-made means, with electromagnetic fields a by-product of electricity. Exposure to this is an everyday occurrence with typical household electromagnetic field levels summarised below. The key underlying principle is that the strength of a magnetic field reduces greatly as you move away from its source.

Solar arrays can emit low levels Electric Magnetic Fields (EMF) from transformers and underground cabling; however, the levels of EMF emitted are substantially lower than the basic restriction level which is the level at which radiation is potentially harmful to humans. The figure below shows a comparison of AC electric fields from common sources[11].

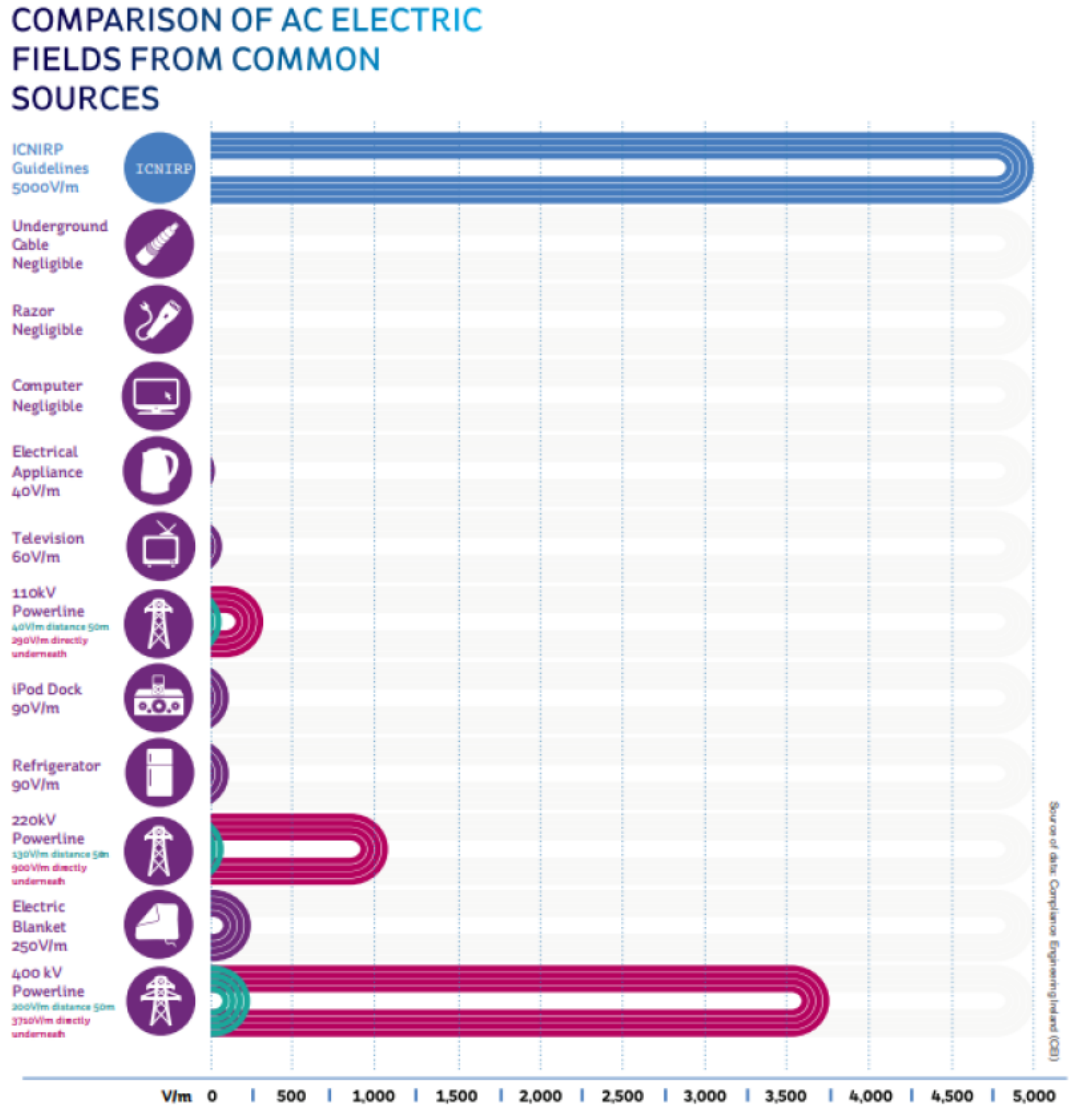


Figure 08: Comparison of AC electric fields from common sources

There are established guidelines for the control of electromagnetic fields:

[11] The ESB document titled "EMF & You" has been appended to this report for further information in relation to EMF and the electricity network in Ireland.

- International Commission on Non-Ionising Radiation Protection (ICNIRP) Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (up to 300GHz). Health Physics 74 (4): 494-522; 1998
- EU Council Recommendation on the limitation of exposure of the general public to electromagnetic fields (0Hz to 300GHz) 1999/519/EC
- ICNIRP Guidelines for limiting exposure to time varying electric and magnetic fields (1Hz–100kHz) Health Physics 99(6):818-836; 2010
- Directive of the European Parliament and of the Council on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields) 2013/35/EU
- Irish government policy is to comply with the 1998 ICNIRP guidelines. Electromagnetic fields are measured using units of microtesla (μT) and the public limit advised by the EU EMF Recommendation and ICNIRP 1998 guidelines is 100 microtesla.

EMF strength decreases with distance relatively quickly. This is illustrated below which shows how exposure to EMF decreases with distance. As shown, when directly on top of a 110 kV cable the magnetic field is 2.32 μT, and 26.01 μT when standing directly over a 220 kV cable, both of which are well below the 100 μT public limit. As the highest cable voltages at the proposed development are 33kV, the EMF levels will be considerably lower than the ICNIRP recommendation of 100 μT. At the inverter/transformer the expected level of EMF is less than 30 μT, which is also considerably lower than the ICNIRP recommendation of 100 μT. The nearest third party residence to a solar panel is over 40 metres away and any EMF signal from the solar array will be negligible.

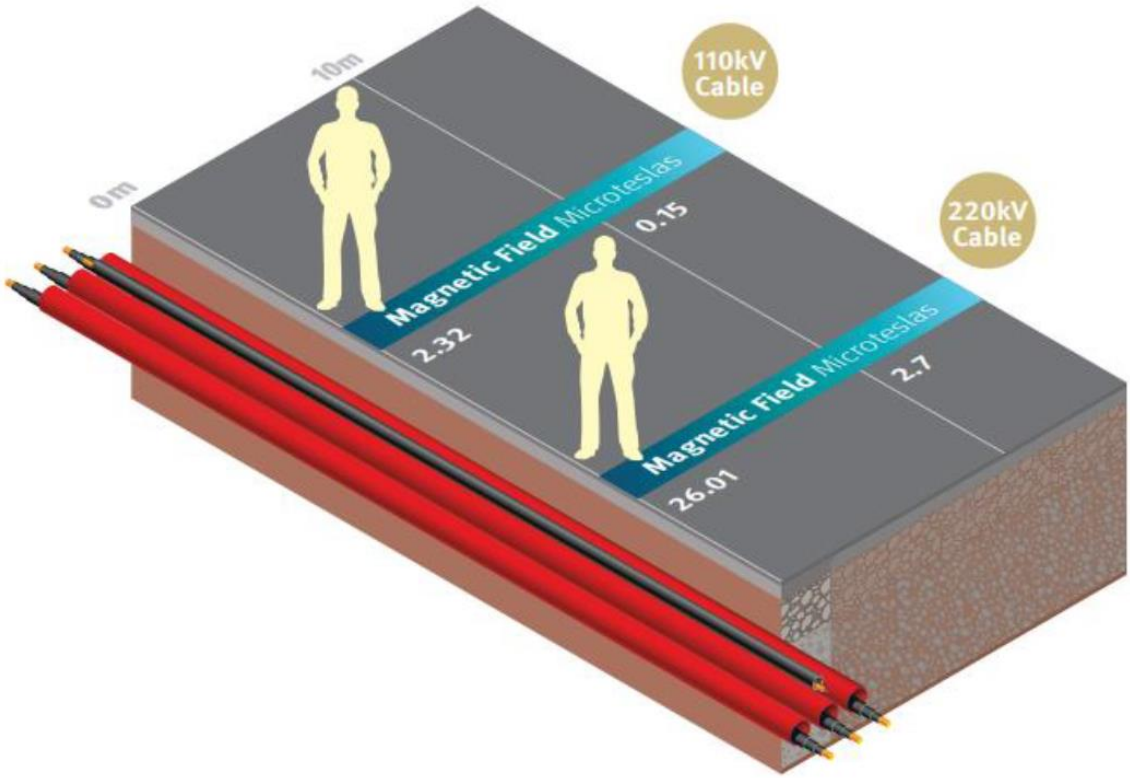


Figure 09: Illustration of decreasing scale of EMF exposure

Elsewhere, An Bord Pleanála precedent demonstrates that fire risk is not deemed to be a significant issue in the assessment of solar array development. We note the comments contained within the Inspectors report for a solar array development at Knockglass and Kilberrihert, Coachford, Co. Cork, whereby it was stated "there are no reasons to believe that there are fire risks associated with the proposed solar panels". This opinion is repeated within the inspectors report for a solar development in Coolroe, Tintern, Co. Wexford whereby the inspector states:

> *"there is no information available to suggest that a fire at the subject site would be a significant risk. The proposed arrays are comprised largely of glass and metal, and as such could not reasonably be considered as potential fuel for a fire, in my opinion."*

Scientific research in relation to power frequency of electromagnetic fields (EMFs) associated with renewable energy developments has confirmed that EMFs are highest in inverter/transformer units, but these are not excessive in nature, with US studies outlining that associated levels are below 0.2 mG at a distance of 50 metres. The subject proposal provides for a minimum separation distance of c. 134 m between the nearest inverter and third-party property boundary in Parcel 4 which renders this a non-issue. Notwithstanding this, recent international research from the World Health Organisation and Scientific Committee on Emerging and Newly Identified Health Risks confirms that there is no evidence to prove that EMFs can cause any adverse health effects.

Typical Magnetic Field Near Common Household Appliances	EMF Levels at 15 cm (6 inches) away (mG)	EMF Levels at 60 cm (2 ft) away (mG)
Electric Shavers	4-600	0.4-10
Hair Dryer	1-700	0.1-10
Can Opener	500-1500	3-30
Electric Range	20-200	0.2-9
Microwave	100-300	1-30
Television	10-80	0.1-8

An Bord Pleanála precedent demonstrates that fire risk is not deemed to be a significant issue in the assessment of solar array development. We note the comments contained within the inspector's report for a solar array development at Knockglass and Kilberrihert, Coachford, Co. Cork, whereby it was stated "*there are no reasons to believe that there are fire risks associated with the proposed*

solar panels". This opinion is repeated within the inspectors report for a solar development in Coolroe, Tintern, Co. Wexford whereby the inspector states:

> *"there is no information available to suggest that a fire at the subject site would be a significant risk. The proposed arrays are comprised largely of glass and metal, and as such could not reasonably be considered as potential fuel for a fire, in my opinion."*

The collective issue of potential health and safety issues arising from solar array developments was explored in detail as part of the Oral Hearing held for the Coolroe solar development. The Wexford County Council Planning Official who dealt with the file gave evidence that he engaged a number of local planning authorities in England to scope the extent of planning issues, including health and safety considerations. He advised that the potential for related issues was limited. In dealing with the file, the inspector's report corroborated this view:

> *"The planning officer discounts the issue of impacts on public health on the basis of UK documentation available. I concur with this position".*

4.12.4 Communications

Both international academic and industry practitioner research confirms that Electromagnetic interference (EMI) from solar PV installations are very low risk, with appropriate siting of proposals and use of certified equipment rendering the potential for impacts on radio/television and mobile phone networks as negligible.

Within the European Union, all technical devices, including inverters for PV systems must comply with the requirements of the EMC Directive 89/336/EEC in terms of electromagnetic properties. As such, these components are certified to industrial standards where interference-free stability is a pre-condition for television, radio and mobile receptors.

Alongside the use of certified equipment and best-practice electrical design measures, the incorporation of suitable setback distances from communications equipment itself is recognised to negate residual potential for EMI. In April 2015, the National Laboratory of the U.S. Department of Energy (NREL) published a white paper on the deployment of solar PV near naval airfields and its potential for electromagnetic interference on communications infrastructure. It confirmed that emissions are typically low strength from such developments with "little to no EMI impact on communications or telemetry (transmission) equipment". In the UK, solar arrays have been permitted immediately adjacent to mobile phone base stations/antennae without any quantifiable impacts on commercial operations. An independent assessment of Sudbrook Solar Farm, Severn Estuary, Monmouthshire, included a recommendation that a 15 m separation distance be maintained between the solar array and an onsite mobile base station, with no further mitigation required. In the case of the subject proposal, the site boundary is c.1.6 km from the nearest telecommunications mast to the southwest at Ardnacrusha Power Station[12]. Based on technical tests, the proposal will not give rise to any impacts on telecommunications infrastructure.

[12] www.comreg.ie mapping viewer

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Conclusions

5.1 Summary

Having regard to that set out above, we consider the proposed development to be wholly acceptable in planning terms. There is a pronounced need for decisive action nationally to address key environmental challenges such as reduction in carbon emissions, as enshrined in national, regional and local policy. Solar arrays represent a positive form of agricultural diversification in local communities. As a temporary use in the landscape, they are typically inert, with a negligible environmental impact. The subject site has been carefully selected on the basis of key technical, planning, as well as environmental considerations and is deemed suitable for the intended use, as verified by the grant of planning permission granted by Clare County Council and An Bord Pleanala for Phase 1 of the Ballyglass Solar array. The site, with its south facing aspect and absence of constraining factors, make it ideal for a solar PV array.

The proposed solar array has been designed in accordance with best practice industry standards, incorporating innovative industry technologies to achieve optimum environmental conditions. The significant levels of existing local vegetation and natural contours means the site is well screened. The prepared landscape and visual impact assessment has confirmed that that the solar array, either alone or in-combination with permitted Phase 1, will not give rise to any significant impacts having regard to the considered nature of project design and prevailing landscape character. Traffic access during the construction phase will be managed in close consultation with the Area Engineer's Office and local residents. The Ecological Impact Assessment and Appropriate Assessment / Natura Impact Statement reports objectively conclude that the proposal will not result in any significant effects in relation to designated Natura 2000 sites, rather the proposal will result in significant biodiversity gains to the receiving environment. Elsewhere, a review of historical records and site investigations have confirmed that there are no issues with respect to flooding and site drainage. It has been objectively determined that the proposal will not have any adverse impacts with respect to glint/glare and noise, and a precautionary approach has been exercised in the design with generous buffers to existing residences in the local area. It has been demonstrated that the project will not have an adverse impact on archaeological heritage and a programme of testing will be completed prior to commencement of development in full consultation with the Department of Housing, Local Government and Heritage.

Overall, we consider that the subject proposal will not detract from the residential or visual amenities in the area or impact on the local environment, and instead, that it would contribute positively to the realisation of policy objectives in full accordance with the proper planning and sustainable development of the area.

06 //

Appendix A – “EMF & You”

Energy for generations

EMF & YOU

Information about Electric & Magnetic Fields and the electricity network in Ireland

April 2017

ABOUT ESB

ESB was established in 1927, as a corporate body in the Republic of Ireland under the Electricity (Supply) Act of 1927. Since then, ESB has been providing energy for those life moments, big and small, profound and everyday where electricity influences people's lives for the better. As a strong, diversified, vertically integrated utility, ESB operates right across the electricity market: from generation, through transmission and distribution to supply of customers.

ESB is fully committed to protecting the health and safety of employees, contractors, customers and the public. Safety is a core company value of ESB and this value guides the approach to safety across all business activities. Arising from concerns about possible adverse health effects resulting from exposure to electric and magnetic fields (EMF) from electrical equipment, such as power lines and appliances, ESB has set out its policy in relation to this topic in this booklet.



WELCOME

ESB understands that some people may have concerns about the potential side effects of frequent EMF exposure on health. Over the last 35 years, there has been considerable public debate surrounding EMF and this has generated many questions.

The main interest of people in this country has centred around the fields produced by ESB overhead power transmission lines, but questions have also been asked about the fields produced by other electrical sources such as household electrical appliances, distribution lines and substations. In accordance with our desire to deal in an open manner with this issue we are providing you with information on this subject, covering key questions such as:

- What are EMFs?
- What studies have been carried out so far?
- Are there risks to human health?
- What is the national and international guidance on EMF exposure?
- Do power lines affect animals?
- Should people take any special precautions against EMF?

The quality of your living and working environment, along with the welfare of livestock and farm crops is of the utmost importance to us at all times. All of ESB Networks plant and equipment complies with the European Recommendation (1999/519/EC) on the limitation of exposure of the general public to electromagnetic fields (0Hz to 300 GHz). Despite over 35 years of intensive research into power frequency EMFs, the international overriding scientific consensus is that EMFs, as generated from power lines, do not cause any adverse long term health effects.

We hope you find this booklet useful and informative and that it provides the answers to the questions currently being asked on this issue, which first became an area of Irish public concern in the 1980s. To explain any technical terms used in the following pages, a glossary has been included on page 32. Please contact ESB for more information or visit our website at www.esb.ie

Pat O'Doherty, Chief Executive



WHAT ARE ELECTROMAGNETIC FIELDS?

Electromagnetic Fields have been recognised since electricity was discovered and have been the subject of thousands of scientific studies across the globe.

Our knowledge and understanding of EMF has grown significantly in recent years.

Electric and Magnetic Fields occur both naturally and from man-made sources.

All electricity, both natural and man-made, produces two types of fields: electric fields and magnetic fields. EMF are produced by natural phenomena which have been a constant part of the environment throughout human evolution. For instance, the Earth has a natural electric field and a magnetic field.

The most common source of man-made EMF that we encounter is electricity.

The man-made sources include all electrical systems including house wiring, electrical appliances and overhead and underground power lines. In Ireland the voltage in homes is 230V. Electricity in Ireland is transmitted at voltages of up to 400,000V (400kV).

The Electric Field

The electric field depends on voltage. The higher the voltage, the stronger the electric field. You can imagine it as being like pressure in a water pipe. A 400kV power line produces a higher electric field than a 110kV power line. The magnitude of an electric field is expressed in volts or kilovolts (thousands of volts) per metre. This is written as V/m or kV/m.

Electric fields are strongest closest to a power line and their level reduces quickly with distance. Electric fields are blocked by buildings, trees etc.

Therefore, inside a typical house the dominant sources of electric fields are typical household appliances such as microwave ovens, hair-dryers and electric blankets.

There are no external electric fields associated with underground cables. This is because the electric field produced is contained within the cable.

The Magnetic Field

The magnetic field is produced by moving electric charges and so the strength of the magnetic field varies directly with the current flows in lines or cables. As a result, the magnetic field can vary at different times during the day. You can imagine this as being like the flow rate of water in a water pipe. Magnetic fields are measured in units of microtesla (μT). Unlike electric fields, magnetic fields are not blocked by buildings, trees etc. Like electric fields, magnetic fields are highest closest to an electricity line or cable and their level reduces quickly with distance from the line or cable.

Appliances that use a lot of power, such as electric heaters or cookers, generate higher levels of magnetic fields than lower powered appliances.

Q Why does a fluorescent light glow under a high voltage powe line?

There is a well-known phenomenon whereby a fluorescent light will glow dimly if placed below a high-voltage power line. This effect is caused by the electric field. The electric field causes a tiny current (measured in millionths of an ampere) to flow through the mercury vapour inside the tube which casts a weak glow. The moment you move the fluorescent light away from the line, the electric field weakens and the light goes out. This phenomenon has no impact on people or other organisms.



WHAT IS THE ELECTROMAGNETIC SPECTRUM?

Electromagnetic energy travels in waves. These waves span a broad range of frequencies from static frequency (fields that do not change direction with time) at one end of the spectrum, to very high frequency (fields that change billions of times per second) at the other end of the spectrum.

The electromagnetic spectrum shown in Figure A identifies the various types of electromagnetic energy based on their frequency. The earth's magnetic field is largely constant and therefore is described as a static field. Its frequency is very low or zero. The earth's static magnetic field (which acts like a giant bar magnet) causes a compass to align north-south.

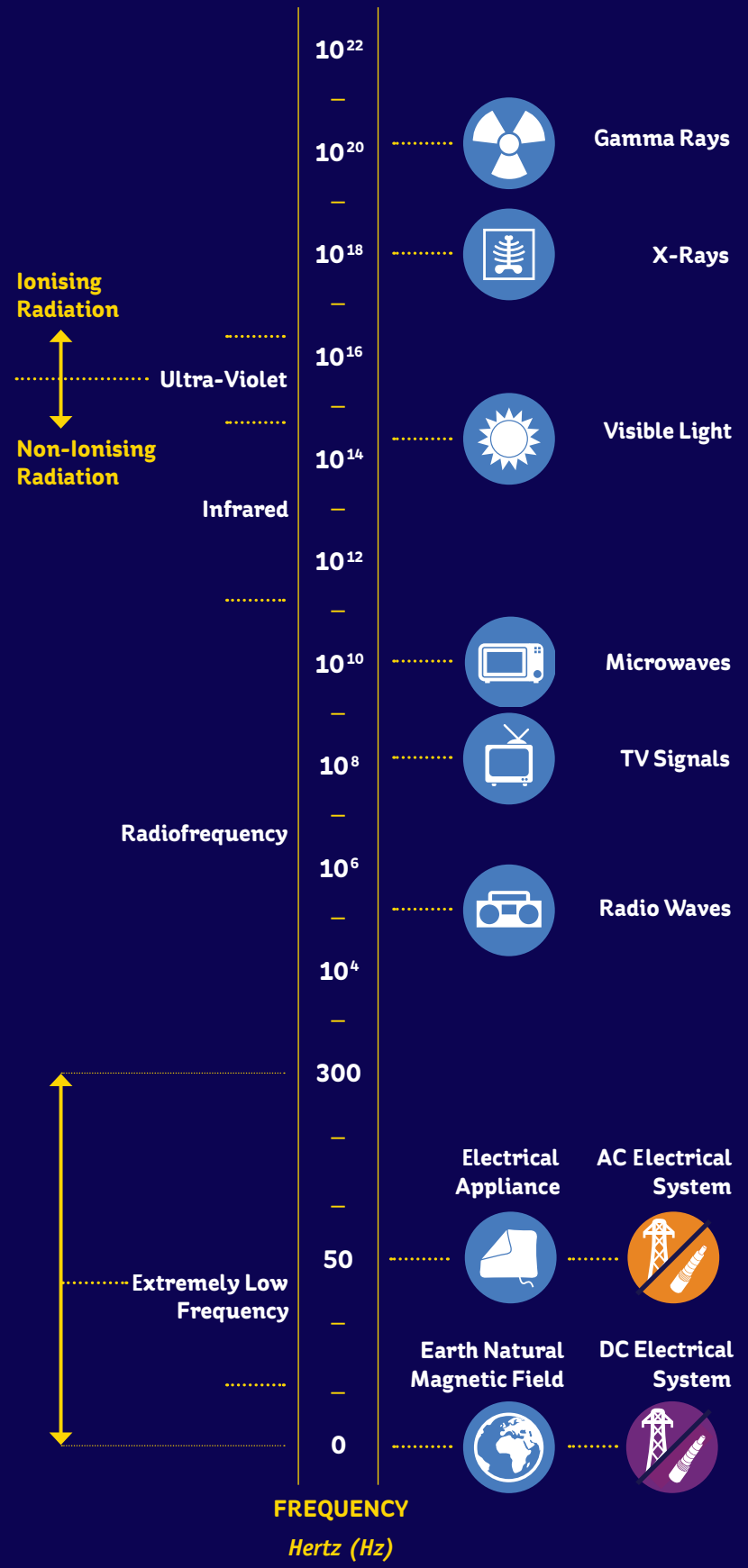
Most man-made sources of electric and magnetic fields fluctuate in direction and intensity. They are called time-varying or alternating current fields (AC). Time-varying or AC fields come from anything that runs on electricity, from electrical installations to household appliances.

Their frequency is expressed in Hertz (Hz). Hertz is the rate at which the field alternates back and forth per second. The electric power system operates at 50Hz in Ireland and Europe and 60Hz in some other places such as North America and thus is a source of EMF at these frequencies. Such frequencies are in the extremely low frequency (ELF) range, 0-300Hz. The ELF EMF from all electrical equipment are time-varying fields with a dominant frequency of 50Hz in Ireland/Europe.

The strength of the EMF or field depends on how close you are to the equipment. Hence the EMF a person can experience from a household appliance can be similar or higher than that from transmission lines because you can be much closer to the household appliance than an overhead transmission line, which is usually several metres or more away from you.

THE ELECTROMAGNETIC SPECTRUM

FIGURE A



ARE EMFs ASSOCIATED WITH ELECTRICITY THE SAME AS RADIATION?

No. The fields resulting from electricity are fundamentally different from x-ray and gamma ray radiation.

Whilst these are all forms of electromagnetic energy there are important fundamental differences.

The term radiation is usually used to refer to ionising energy. Ionising means that, if the radiation is sufficiently strong, it can break bonds in molecules and therefore damage biological molecules including the DNA of cells. Only the high-frequency portion of the electromagnetic spectrum is ionising. This includes, x-rays, gamma rays and ultraviolet light.

The energy in visible light, radio frequency and fields in the static and 50Hz ranges, including electricity, are all classified as non-ionising.

It is very important to realise that 50Hz fields, i.e. electricity, are non-ionising. They have insufficient energy to ionise molecules. Examples of non-ionising energy include EMF from the earth and electric power sources, radio waves and TV waves, microwaves, and most frequencies of visible light. *See figure A, page 9.*



WHAT SCIENTIFIC STUDIES ON THE HEALTH IMPACT OF EMF HAVE BEEN CARRIED OUT?

Since 1979 many scientific studies have been carried out on the possible effects of EMF on people.

To determine if something is harmful to health, scientists evaluate the results from three different types of studies.

1. Epidemiological Studies

Epidemiology is the study of patterns of disease in populations. It searches for statistical links or associations between exposures, such as EMF, and disease in human populations. Epidemiological studies are usually observational, meaning that researchers investigate, but do not try to change, what happens as people go about their daily lives. As a result, epidemiological studies are susceptible to certain kinds of errors that lead an exposure and a disease to be associated even when one does not cause the other. For example, the positive association between number of doctors per capita and mortality rates arises not because doctors increase mortality, but rather because of social and economic factors such as industrialisation and job opportunities. Likewise, just because persons with a certain health condition live near electric power sources does not mean that the fields from these power sources caused the condition. Other environmental and behavioural causes would have to be ruled out, as would the possibility that some people moved to the area after already developing the health condition.

2. Experimental Studies – People and Animals

These studies involve exposing people or animals to EMF in controlled laboratory conditions and looking for biological changes. For practical reasons, human experimental studies of EMF are usually short-term. Experimental studies generally study effects of short-term exposures.

3. Experimental Studies – Cells and Tissues

These studies involve exposing isolated tissues and cells to EMF in controlled laboratory conditions to investigate potential mechanisms of interaction.

TWO TYPES OF TECHNOLOGY

Transmission systems worldwide are typically constructed as overhead lines and in some cases underground cables are used.

Two types of technology can be used to transmit electricity. Both AC and DC power lines produce electric and magnetic fields. AC lines produce AC electric and magnetic fields and DC lines produce static electric and magnetic fields. ESB Networks transmission and distribution networks are AC systems.

When electricity transmission cables are placed underground, the metallic shielding of the cables block the electric field from the cables above the ground, but this shielding does not block the magnetic field from the cables.

ALTERNATING MAGNETIC FIELDS



STATIC MAGNETIC FIELDS

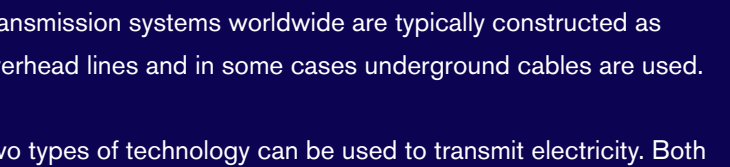


Figure B. Schematic comparison of AC and DC current flow and the resulting magnetic fields.

THE EFFECT OF DISTANCE ON MAGNETIC FIELDS

Both AC and DC technologies produce magnetic fields and both decrease with distance as you move away from the line or cable. See graph below:

AC LINES AND CABLES

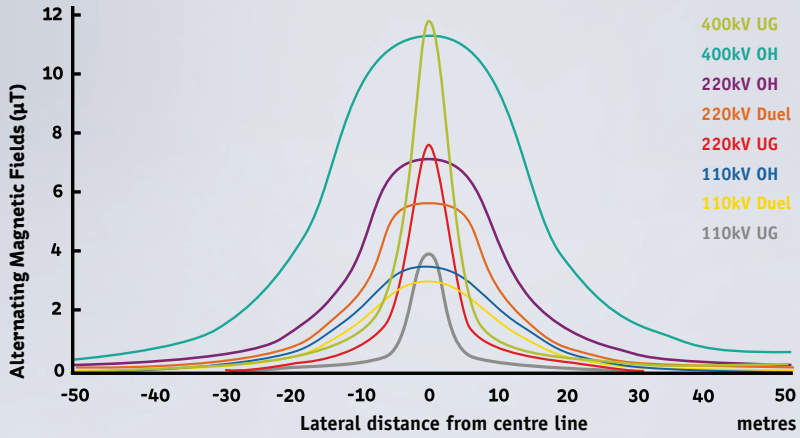


Figure C Illustrates the magnetic field from overhead AC lines operating in Ireland. The field strength decreases with distance. The fields from these AC lines are far below the 1998 ICNIRP Guidelines for exposure to AC magnetic fields (100µT). In 2010 ICNIRP updated its ELF-EMF guidelines, which included the recommendation for a 200µT reference level for exposure for the general public, but these have not yet been adopted by the European Union.





WHAT DO HEALTH AND SCIENTIFIC AGENCIES SAY ABOUT RESEARCH ON AC MAGNETIC FIELDS AND HEALTH?

National and international health and scientific agencies have reviewed more than 35 years of research including thousands of studies.

None of these agencies has concluded that exposure to ELF-EMF from power lines or other electrical sources is a cause of any long-term adverse effects on human, plant, or animal health.
Agencies have recognised a statistical association between estimated higher long-term exposures to magnetic fields and childhood leukaemia in some epidemiological studies. However they have not been able to rule out the contribution of chance, selection bias and other factors to explain this association with reasonable confidence. Neither long-term studies of animals, nor studies of cellular mechanisms, have confirmed a biological basis for such an association. This explains why no health agency has concluded that there is a causal relationship between magnetic fields and health effects.

SCENIHR is the European Union's Scientific Committee on Emerging and Newly Identified Health Risks. The committee provides opinions on emerging or newly-identified health and environmental risks.

On 4 February 2014, SCENIHR published its "Preliminary opinion on Potential health effects of exposure to electromagnetic fields (EMF)". This is an update to its 2009 opinion.

The committee reported that new epidemiology studies do not shed light on a previously reported association with childhood leukaemia. Shortcomings in these studies, and a lack of experimental support from animal studies or cellular evidence prevent a causal interpretation of this statistical association.

Several recent epidemiology studies examined residential proximity to power lines and childhood leukaemia risk, but overall provided no new evidence for an association. In the largest study to date, Bunch et al. (2014) provided an extension and update to the 2005 study in the United Kingdom by Draper et al.

The authors extended the study period by 13 years (1962-2008), included lower voltage lines (132kV) in addition to 275/400kV lines, and included Scotland in addition to England and Wales in their analyses. Bunch et al. (2014) included over 53,000 childhood cancer cases and over 66,000 healthy control children and reported no overall association with residential proximity to 132kV, 275kV, and 400kV power lines for leukaemia or any other cancer among children.

The statistical association with distance that was reported in the earlier Draper et al. (2005) study was not apparent in this extended analysis.

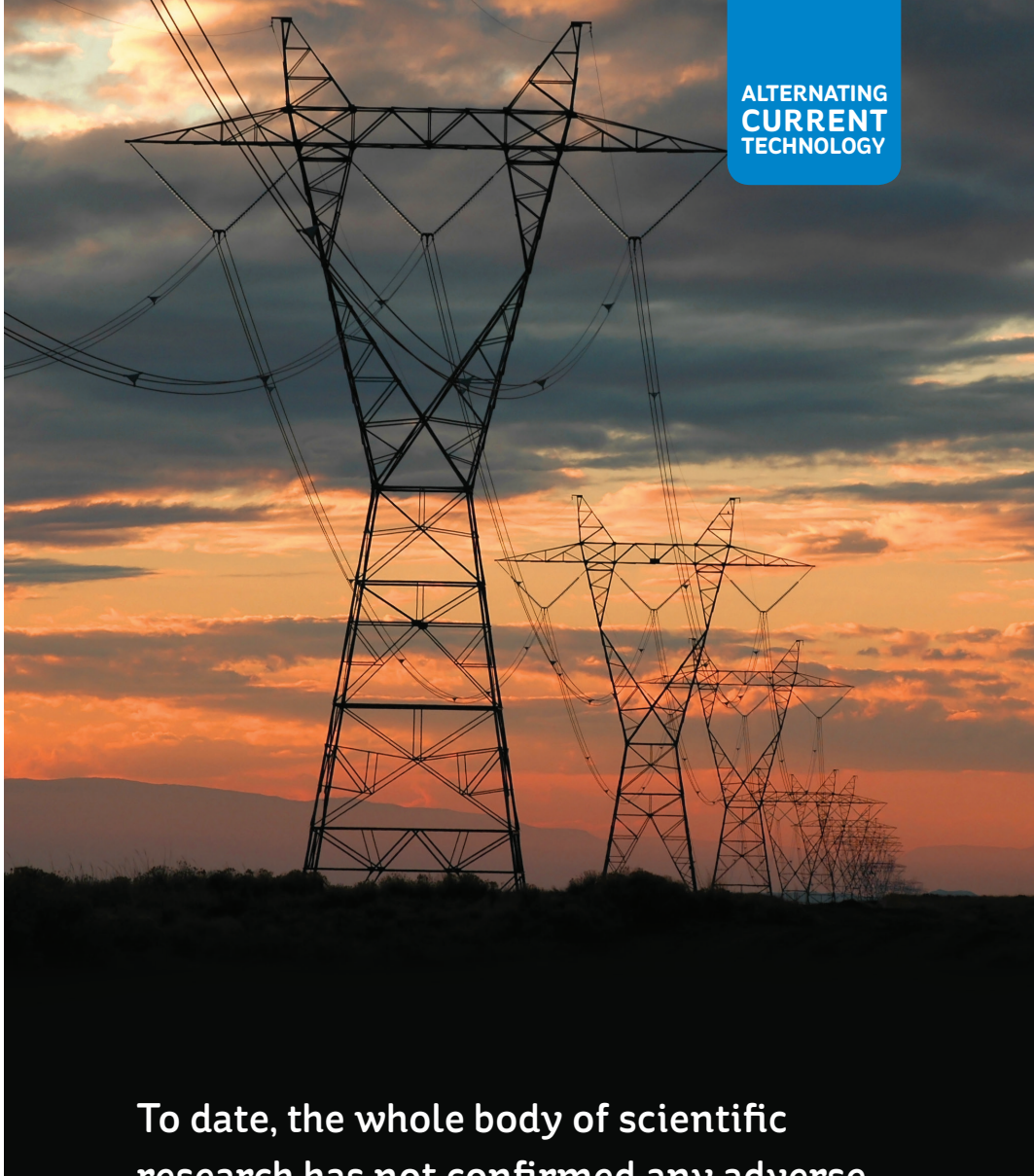
No health agency has concluded that exposure to EMF from power lines and other electrical sources is a cause of any long-term adverse effects on human, plant, or animal health.

In 2007, the World Health Organisation updated the International Agency for Research on Cancer (IARC) report with the publication of its comprehensive review of ELF-EMF health research.[1]

The conclusions of the World Health Organisation report can be summarised as follows:

- The research does not establish that exposure to EMF of the nature associated with power lines causes or contributes to any disease or illness.
- There are no substantive health issues related to electric fields at levels generally encountered by members of the public.
- While epidemiology studies have reported a weak statistical association between childhood leukaemia and long-term exposures to magnetic fields greater than 0.3-0.4μT, this association is not supported by the laboratory studies and has not been considered a causal relationship.
- The animal studies as a whole do not show adverse effects, including cancer, among animals exposed to high levels of magnetic fields.
- The laboratory studies on cells and tissues have not confirmed any explanation as to how weak magnetic fields could cause disease.
- Because the epidemiology studies have limitations and the experimental studies provide little or no support for an association with cancer or mechanisms to cause cancer, the World Health Organisation did not conclude that magnetic fields cause childhood leukaemia. Thus, considering all of the research together, the reviewers for the World Health Organisation did not conclude that magnetic fields cause any long-term, adverse health effects.
- The view of the World Health Organisation on ELF-EMF and health issues provided on its website is "based on a recent in-depth review of scientific literature, [we conclude] that current evidence does not confirm the existence of any health consequences from exposure to low level electromagnetic fields".[2]

[1] http://www.who.int/peh-emf/publications/elf_ehc/en/index.html
[2] http://www.who.int/peh-emf/about/whatisemf/en/index.html



To date, the whole body of scientific research has not confirmed any adverse effect to human health from EMF.

Independent international health and scientific agencies are continuing to review and monitor the possibility of health effects from exposure to EMF. They are doing this not because they have identified a problem but to ensure that even the smallest possibility of a health risk has not been overlooked, given that everyone in the developed world is exposed to EMF.

The findings of these agencies carry considerable weight, as they reflect the judgements of groups of multiple scientists rather than the views of individuals.

The World Health Organisation stated that the scope of any actions we may take to reduce EMF exposure, either personally or as a society, should be proportional to the strength of the science. The actions to reduce exposure should be very low in cost and should not compromise the health, social and economic benefits of electricity to our society.

WHAT IS THE VIEW OF THE IRISH GOVERNMENT?

In March 2007, Ireland's Department of Communications, Marine and Natural Resources (DCMNR) assembled a panel of independent scientists to review EMF and radio frequency research. The conclusions are summarised in the document entitled "Health Effects of Electromagnetic Fields". The conclusions of this report were consistent with those of The International Agency for Research on Cancer (IARC), the World Health Organisation and other national and international agencies. In relation to EMF, the report states:

'No adverse health effects have been established below the limits suggested by international guidelines.'

In 1988 and 1992, The Department of Energy (Dr T. McManus) published comprehensive assessments of scientific research on electromagnetic fields. In summary of the views of the national and international organisations who have produced reports and addressed the issue, Dr. McManus concludes 'Without exception these reports and the position taken by the organisations concerned do not see enough evidence to be able to indict electromagnetic fields as a hazard to health'.

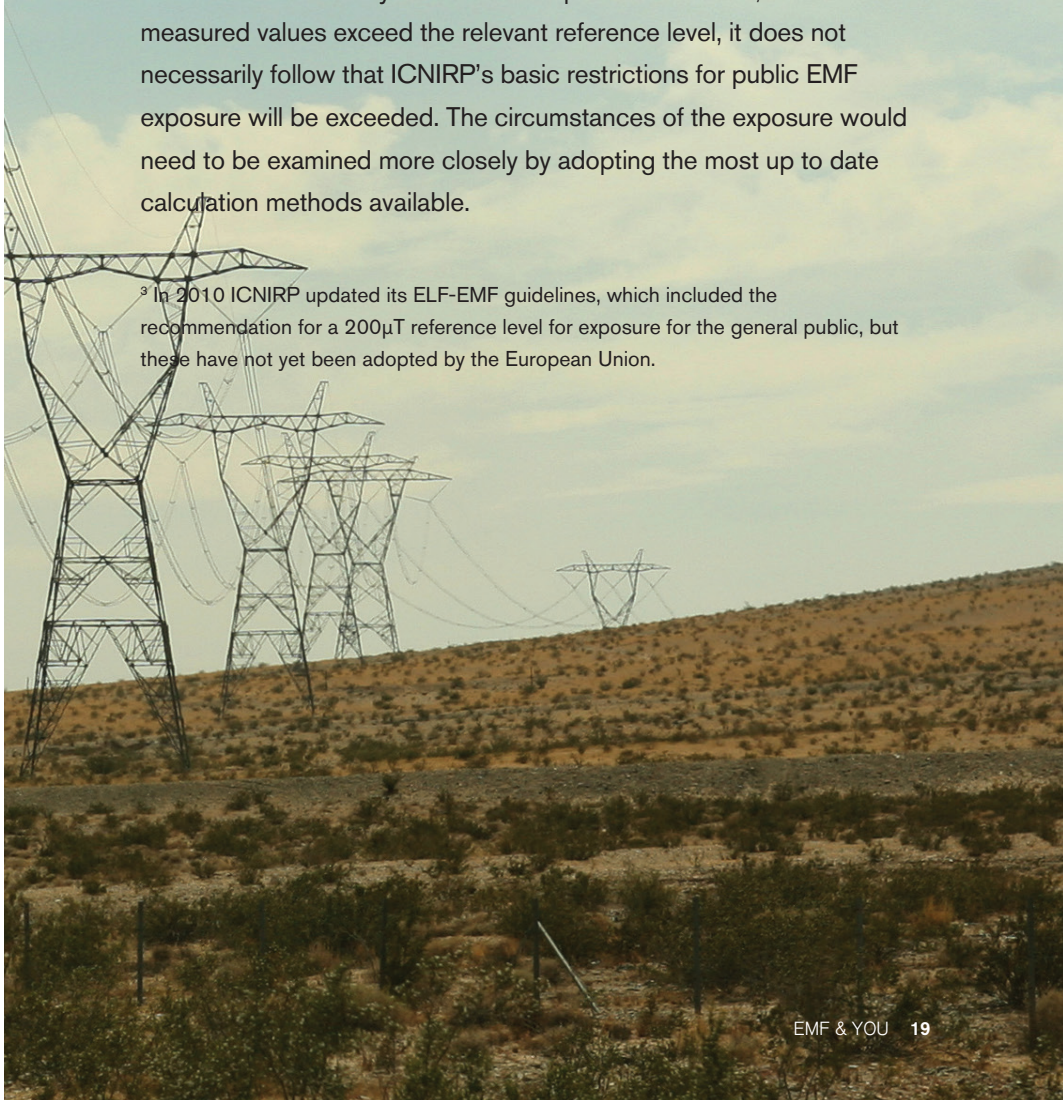
In 2011, Professor Denis O'Sullivan, Chief Scientific Advisor to the Irish Government published an updated review entitled 'A Review of Recent Investigations into the Possible Health Effects of Exposure to Electromagnetic Fields (EMF) from Power Lines'. In relation to possible long term health effects Professor O'Sullivan concludes that 'the lack of positive findings in controlled experiments or in studies on animals further weakens the belief that this association is in fact, a real one. Furthermore, there is no known biological explanation for the effect. It is simply not possible for the level of energies associated with power lines to cause cancer'.

WHAT IS THE VIEW OF THE EUROPEAN UNION?

In 1999, the Council of the European Union adopted a recommendation in relation to public and occupational exposure to EMF. This recommendation applies the exposure guidelines advocated in 1998 by the ICNIRP, to locations where people spend significant time.

The 1998 ICNIRP guidelines specify limits on exposure to EMF, which are called 'basic restrictions'. To make sure that these basic restriction limits are not exceeded, conservative measurable 'reference levels' for both electric and magnetic field exposure are provided. For the general public these reference levels at 50Hz are 5kV/M and 100μT.[3] If the EMF exposure level is less than the reference level, compliance with the basic restriction is assured. However, if exposure exceeds the reference level, the circumstances of the exposure need to be examined more closely to confirm compliance. However, even if the measured values exceed the relevant reference level, it does not necessarily follow that ICNIRP's basic restrictions for public EMF exposure will be exceeded. The circumstances of the exposure would need to be examined more closely by adopting the most up to date calculation methods available.

[3] In 2010 ICNIRP updated its ELF-EMF guidelines, which included the recommendation for a 200μT reference level for exposure for the general public, but these have not yet been adopted by the European Union.





ARE THERE ANY PRECAUTIONS THAT NEED TO BE TAKEN?

A 2007 Government report stated that, while there is limited scientific evidence of an association between ELF-EMF and childhood leukemia, considerable research carried out in laboratories does not support this possibility.

Nevertheless, the report recommended that the evidence should not be discounted and suggested no-cost, or lowcost, precautionary measures to lower people's exposure to ELF fields.

As a precautionary measure, it recommended that future power lines and power installations should be sited away from heavily populated areas. The report also noted that lowering international guideline limits as a precautionary measure is not recommended by the World Health Organisation.

These precautionary goals are achieved by routing transmission lines as far from existing residences as is reasonably possible, optimising the phasing of adjacent lines, and incorporating stakeholder input during the consultation process carried out in the development of new electricity infrastructure.

Source: Report from Expert Group on the Health Effects of Electromagnetic Fields for Department of Communications, Marine and Natural Resources, 2007.

DO POWER LINES AFFECT ANIMALS?

As with human health, some have expressed concern about the potential effects of EMF from high-voltage transmission lines on animal health, welfare, behaviour and productivity.
The potential effects from EMF on both economically important domesticated animal species and wildlife have been investigated since the 1970s. This has led to a good understanding of the potential means by which EMF could affect organisms in the vicinity of power lines.
Overall, the research does not show that EMF have adverse effects on the health, behaviour or productivity of animals, including livestock.

The substantial body of research on wild and domestic animals is informative for all large mammals and does not indicate any risk. Thus, there is no scientific basis in the research literature to conclude that the presence of a transmission line would create conditions that would impair the health of animals or would precipitate abnormal behaviour.
Studies on dairy cows, for example, failed to find any consistent variation in fertility, hormone levels, milk fat content or dry matter intake beyond what would be expected due to normal variation even when exposed to ELF-EMF far stronger than would occur from the Irish transmission system.
Other research on sheep has examined the effect of ELF-EMF on weight gain, wool production, behaviour, onset of puberty and immune function. None of the studies showed consistent or replicated evidence of adverse effects.

Crops, Plants and Trees

As scientific literature has accumulated, both from laboratory and field studies, on the potential effect of EMF from transmission lines on plants, including agricultural crops and trees, and forest and woodland vegetation, no adverse effects on plants have been reported from electric and magnetic field exposures at levels comparable to those near high-voltage transmission lines.



WHERE CAN I FIND MORE INFORMATION ON EMFS?

The following sources are recommended should you require more detailed information on EMFs.

- The World Health ORGANISATION – International EMF Project(2007)
  www.who.int/mediacentre/factsheets/fs322/en/index.html

- The European Health Risk Assessment Netw ork on Electromagnetic Fields Exposure (2010)
  http://efhran.polimi.it/docs/EFHRAN_D2_final.pdf

- Health Protection Agency
  www.hpa.org.uk/Topics/Radiation/UnderstandingRadiation/UnderstandingRadiationTopics/ElectromagneticFields/ElectricAndMagneticFields/HealthEffectsOfElectricAndMagneticFields/

- Department of Communications, Climate Action & Environment
  www.dccae.gov.ie

- European Commission
  http://ec.europa.eu/enterprise/sectors/electrical/documents/lvd/electromagnetic-fields/

- International Agency for Research on Cancer
  www.iarc.fr/en

- International Commission on Non-ionising Radiation Protection
  www.icnirp.de

- Scientific Committee of the European Commissions
  http://ec.europa.eu/health/scientific_committees/consultations/public_consultations/scenihr_consultation_19_en.htm

WHAT IS ESB'S POSITION AND COMMITMENT?

ESB's position on EMF and health is based on the authoritative conclusions and recommendations of established national and international health and scientific agencies which have reviewed the body of scientific research.

These agencies have consistently concluded that the research does not indicate that EMF cause any adverse health effects at the levels encountered in our everyday environment and that compliance with the existing ICNIRP standards provides sufficient public health protection.

ESB recognises that some individuals are concerned about issues regarding EMF and health. ESB is committed to addressing these concerns. By continuing to closely monitor engineering and scientific research in this area and provide information to the general public and to ESB staff on this issue.

ESB's policy in relation to this issue is as follows:

i. ESB shall apply all legal requirements relating to EMF in Ireland, Northern Ireland, UK and in other jurisdictions where local legislation does not set as high a standard.
ii. ESB shall design and operate generation, transmission and distribution networks and telecommunications infrastructure in compliance with legislation and with due regard to the latest recommendations and guidance of leading international experts and independent bodies on EMF.
iii. ESB shall closely monitor and support engineering / scientific research on EMF.
iv. ESB shall comply with the requirements of 1999/519/EC regarding the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz).
v. ESB shall provide information for the public on its website about the hazards and risks associated with EMF arising out of ESB equipment and/or premises.

AC ELECTRIC FIELDS

Graph 1. The graphic shows some examples of different sources of electric fields and how they compare to typical electric fields associated with overhead electricity lines that make up part of the electricity grid in Ireland.

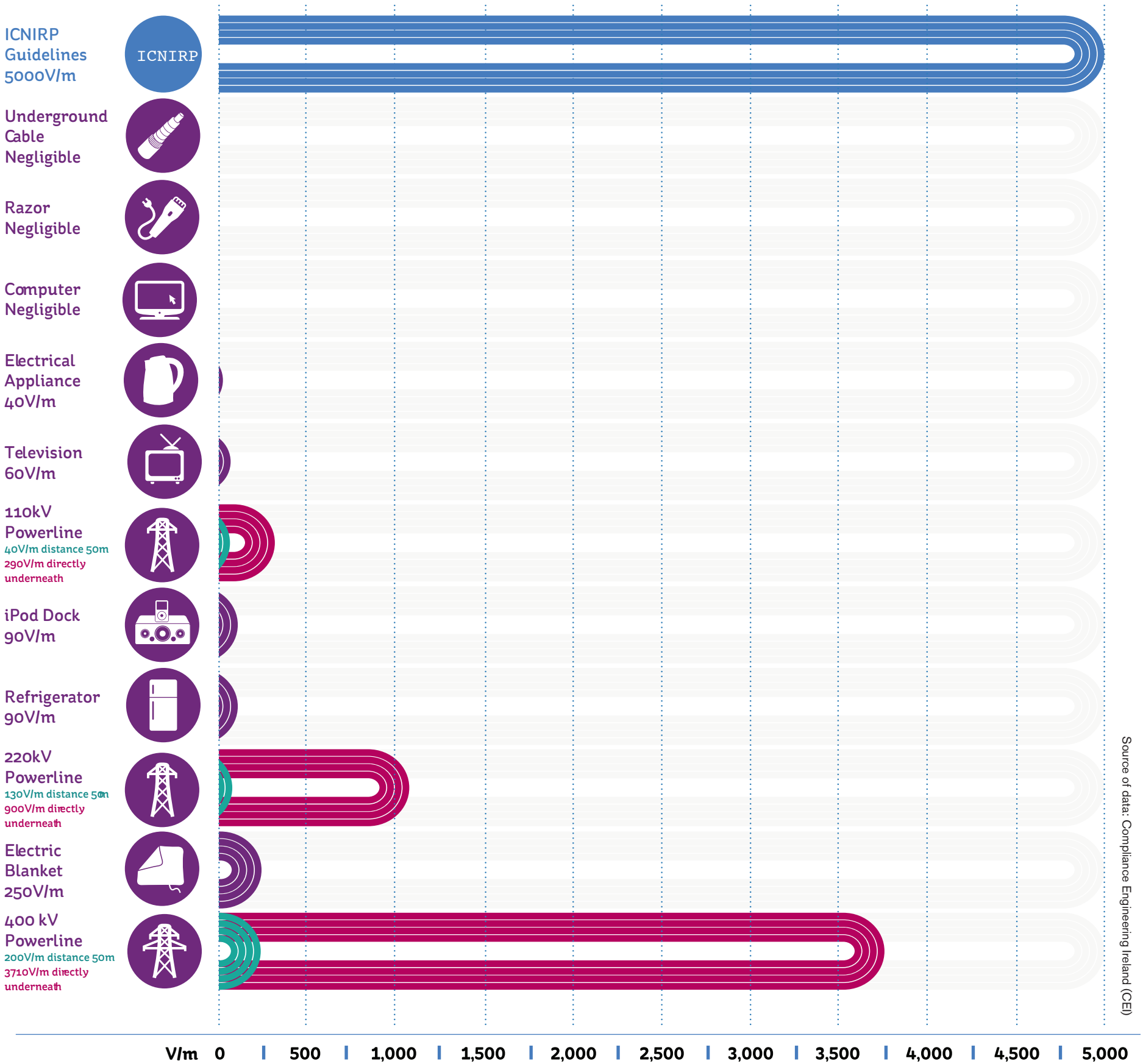
The graph also references the ICNIRP guidelines for exposure to electric fields set to ensure public health and safety.

The International Commission on Non-Ionising Radiation Protection (ICNIRP) was established in 1992.

This independent scientific commission was established to advance non-ionising radiation protection for the benefit of people and the environment. It provides science-based guidance and recommendations including independent international guidelines and recommended limits of exposure. ICNIRP is formally recognised by the World Health Organisation and the European Union as the non-governmental standard setting body for EMF.

This provides an indication of approximate fields from lines and appliances.

COMPARISON OF AC ELECTRIC FIELDS FROM COMMON SOURCES



5kV/m is a reference value, 9.2KV/m is maximum allowable electric field as per the ICNIRP recommendations (using the Dimbylow calculations).

AC MAGNETIC FIELDS

Graph 2. The graphic opposite shows some examples of different sources of magnetic fields and how magnetic field levels from these sources compare to typical magnetic field levels from electricity lines or cables that make up part of the electricity grid in Ireland.

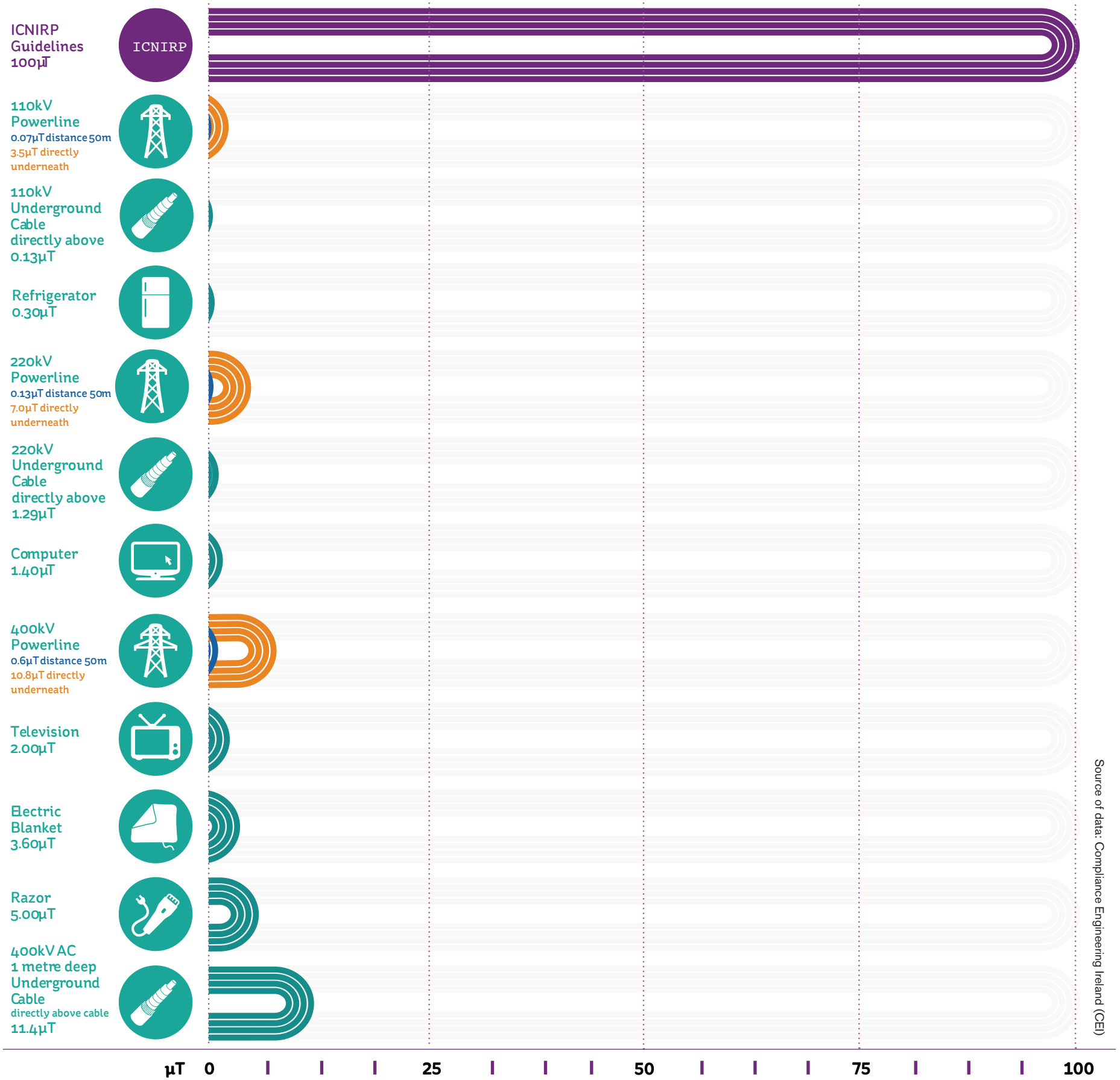
The graph also references the ICNIRP guidelines for exposure to magnetic fields set to ensure public health and safety.

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COMPARISON OF DIFFERENT SOURCES OF AC MAGNETIC FIELDS (μT)



Source of data: Compliance Engineering Ireland (CEI)

GLOSSARY

AC (ALTERN ATING CURRENT)

Electricity that changes direction at regular intervals is described as AC electricity. AC is the form in which electricity is delivered to our homes and businesses. This is the type of electricity used mainly on the Irish transmission system and in every other system in the world.

CARCINOGENIC

Any substance or agent, including ionising radiation, that causes cancer.

CONDUCTOR

An object or material that can carry electricity, like the power cables used in an overhead line.

CURRENT

The movement of an electrical charge similar to the rate of fluid flow in a pipeline.

DC (DIRECT CURRENT)

Electricity that flows in one direction only, like the battery in your car.

ELECTRIC FIELD

An electric field is created by the difference in electric potential (voltage) between the conductors in power cables. The strength of an electric field is expressed in units of volts per meter (V/m). Higher voltage sources produce higher electric fields.

ELECTROMAGNETIC FIELD

The term electromagnetic field is frequently used to refer to electromagnetic energy across a wide frequency spectrum ranging from the earth's natural fields to cosmic radiation.
Sometimes it refers to frequencies above about 100 kHz where electric and magnetic fields are coupled and radiate away from sources.

ELF (EXTREMELY LOW FREQUENCY)

Frequencies found at the end of the electromagnetic spectrum that contain very little energy and cannot directly break molecules apart, ie., non-ionising. 50Hz electric power operates at ELF levels.

FREQUENCY

AC Electricity is transmitted in waves. The number of times the wave repeats itself in a second is the frequency and is measured in Hertz. On the Irish transmission system, AC electricity is transmitted at 50Hz.

INDUCED CURRENT

A flow of electric current in an object created by the proximity to an AC power source.

IONISING RADIATI ON

Radiation, such as X-rays, which has sufficient energy to break molecular chemical and electrical bonds.

MAGNETIC FIELD

Created by the movement of electric charges. Magnetic fields surround magnetic materials and electric currents. In magnetic materials and permanent magnets, the field is created by the coordinated spins of electrons and nuclei within iron atoms. The magnitude of the magnetic field is expressed as magnetic flux density, also referred to as magnetic field strength. Measured in Tesla (for large fields) or μT (for small fields).

MOLECULE

The smallest particle of a substance that retains the properties of that substance.

NON-IONISING RADIATION

Electromagnetic fields at frequencies that do not have enough energy to disrupt atoms or molecules.

RADIATION

Any of a variety of forms of energy propagated through space.

VOLTAGE

Voltage is the difference in electric potential between any two conductors of a circuit. It is the electric 'pressure' that exists between two points and is capable of producing the flow of current through an electrical conductor. Voltage in a power line is comparable to pressure on a pipeline.



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Accreditations
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