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ENERGY SERVICES

Pinewoods Wind Farm – Revised Turbine Dimensions

Environmental Impact Assessment Report / Environmental Impact Statement – Volume 3

Pinewood Wind Limited

Galetech Energy Services
Clondargan, Stradone, Co. Cavan Ireland
Telephone +353 49 555 5050
www.galetechenergy.com

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Pinewoods Wind Farm Substation & Grid Connection

Chapter 1: Introduction

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1.1 Introduction

This Environmental Impact Assessment Report (EIAR) has been prepared by Galetech Energy Services Limited (GES) on behalf of Pinewoods Wind Limited ('the Applicant') to inform the Environmental Impact Assessment (EIA) to be carried out in respect of a Strategic Infrastructure Development (SID) planning application submitted direct to An Bord Pleanála pursuant to Section 182A (Electricity Transmission Lines) of the Planning & Development Act 2000 (as amended) ('the Act').

The proposed development is a 110 kilovolt (kV) 'loop-in/loop-out' electricity substation generally comprising a switchroom, control building and substation compound enclosing 110kV electric plant together with two single circuit strain towers which will connect to the immediately adjacent and permitted 110kV Laois-Kilkenny Grid Reinforcement Project electricity transmission line (An Bord Pleanála Ref: PL11.VA0015). The proposed development is located in south County Laois approximately 17 kilometres (km) south of Portlaoise, 25km north of Kilkenny City, 8km southeast of Abbeyleix and 4km northeast of the village of Ballinakill. The proposed development will be located entirely within the townland of Knockardagur, County Laois.

The proposed development will form part of an adjacent wind farm development, located in both counties Laois and Kilkenny, which has already been granted planning permission by An Bord Pleanála by way of Section 34 of the Act (Refs: PL11.248518 & PL10.248392, the 'Pinewoods Wind Farm'). The permitted Pinewoods Wind Farm comprises 11 no. wind turbines each with a maximum tip height of up to 136.5 metres and all associated site development and ancillary works, including turbine foundations, crane hardstandings, 7.4km of site access tracks, underground electricity and communications cabling, site drainage works, 7 no. site entrances, a permanent meteorological mast with a maximum height of up to 85 metres and temporary upgrade to the R430/L7800 junction. The permitted development is located within the townlands of Knockardagur, Boleybawn, Garrintaggart, Ironmills (Kilrush) and Graiguenahown, Co. Laois; and Crutt, Co. Kilkenny.

The purpose of the proposed development[1] is to facilitate the export of renewable electricity generated by the Pinewoods Wind Farm to the national electricity grid by way of the immediately adjacent and permitted 110kV Laois-Kilkenny Grid Reinforcement Project electricity transmission line. The planning application for the permitted Pinewoods Wind Farm had previously included for a similar 110kV substation at this general location. However, this proposed substation was omitted from the planning permission by An Bord Pleanála by way of condition of consent. The Applicant is therefore now seeking planning permission for the substation, albeit of an amended design and layout, via Section 182A of the Act.

1.1.1 What is Environmental Impact Assessment (EIA)?

EIA is a process required by the European Union (EU) Environmental Impact Assessment Directive 2011/92/EU, as amended by 2014/52/EU, and transposed into Irish law by Part X of the Planning & Development Act 2000 (as amended).

[1] For the purposes of this EIAR, the terms 'proposed development', 'development', 'project', 'proposed development site', 'site', 'substation' and any variation thereof are used interchangeably throughout to describe 'the project' for the purposes of the EIA Directive and encompass and refer to the proposed substation and its associated ancillary infrastructure as described in **Chapter 3** of this EIAR.

EIA is carried out by the relevant competent authority, in this case An Bord Pleanála, to ensure that projects where the likelihood of significant effects on the environment cannot be excluded are subject to a comprehensive and independent examination, analysis and evaluation of their likely significant effects; including the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects; of both their construction and operational phases, prior to being granted planning permission.

EIA is fully integrated into the SID planning application process and helps to ensure that decisions to grant or refuse planning permission for proposed developments are made in the full knowledge of their likely significant effects on the environment, including through consultation with the public concerned.

1.1.2 What is Environmental Impact Assessment Report (EIAR)?

An EIAR is a written statement prepared by the developer (in this case, the Applicant) of the likely significant effects, if any, which the proposed development, if carried out, will have on the environment. The EIAR consists of a systematic analysis of the proposed development, including its construction and operational phases, in relation to the existing environment. It is an iterative process carried out throughout the full lifecycle of the project design and consenting process so as to allow for preventative and ameliorative action, as necessary, at a point in time when changes can still be made to the project that anticipate, avoid and mitigate any likely significant effects foreseen.

The EIAR is the principal document that informs the EIA process and provides integral information which An Bord Pleanála can use; amongst other considerations, including, where appropriate, its own supplementary assessments; in independently undertaking EIA and informing its decision to grant (including subject to conditions and/or modifications) or to refuse planning permission, and/or to seek further information from the Applicant.

The EIAR can also be used by third parties, including members of the public concerned, as part of the public participation process, to evaluate the proposed development and its likely significant environmental effects, and to make submissions to the SID planning application process.

1.2 SID Status

SID is development which is of strategic national or regional importance where a planning application must be made directly to An Bord Pleanála in the first instance, and not to the local Planning Authority as would be the normal course.

Electricity transmission infrastructure, as defined in Section 182A of the Act, may be SID. Therefore, prior to submitting a SID planning application, a proposed development must firstly be the subject of pre-application consultations with An Bord Pleanála pursuant to Section 182E to determine whether it constitutes SID, or not.

The planning application for the permitted Pinewoods Wind Farm had originally included for a similar 110kV 'loop-in/loop-out' substation at this general location. However, prior to granting planning permission for the wind farm, An Bord Pleanála wrote to the Applicant pursuant to Section 131 of the Act advising that, in its consideration, the substation element ought to be subject to pre-application consultations as to whether it came within the definition of SID.

The Applicant duly entered into pre-application consultations and a meeting was held on 13 June 2019 (Ref: ABP-303194-18). An Bord Pleanála subsequently determined that, in accordance with the report of its Inspector, the proposed substation would form a new interconnecting 'loop-in/loop-out' 'node' on the national electricity transmission network, incorporating high voltage electricity infrastructure of 110 kV or more, and therefore falls within the scope of Section 182A of the Act.

Accordingly, for this procedural reason the proposed substation was omitted from the planning permission for the Pinewoods Wind Farm by way of condition of consent (Condition No.4) and instead the Applicant was directed to make an application for permission for the substation directly to An Bord Pleanála by way of Section 182A. A copy of this determination is provided at **Annex 1.1 (Volume II)**.

1.3 Screening

The first stage of the EIA process involves deciding whether an EIA needs to be undertaken or not. This ensures that EIA is only undertaken for projects where the likelihood of significant effects on the environment cannot be excluded.

1.3.1 EIA Classes & Thresholds

Schedule 5 of the Planning & Development Regulations 2001 (as amended) specifies the classes of development which, where they comprise a certain class of development or exceed certain thresholds, must be subject to formal EIA. Where an EIA is mandatory, an EIAR is required to be submitted with a planning application.

The proposed development is not, of itself, a class of development listed within Schedule 5 as requiring EIA and, accordingly, there is no statutory requirement for the proposed development to be accompanied by an EIAR. The proposed development also does not qualify as a change or extension to a development already authorised (i.e. Pinewoods Wind Farm) pursuant to Schedule 5, Part 2, Class 13 of the Regulations as it does not engage any of the thresholds relating to installations for the harnessing of wind power for energy production (wind farms) i.e. number of turbines or megawatt output.

The purpose of EIA categories and thresholds is to generally distinguish between those projects where significant effects on the environment are unlikely and those that may be likely to have significant effects. Given that the proposed development is not a category of development that is mandatorily required to be subject to EIA, it can be generally concluded, on this basis, that it would be unlikely to have any significant effects on the environment.

1.3.2 Case-by-Case Screening

Notwithstanding the above, a screening assessment carried out pursuant to the Regulations may, having regard to the precautionary principle, determine on a case-by-case basis that EIA is required where the likelihood of significant effects on the environment cannot be excluded, including by reference to any likely significant in-combination effects with permitted and proposed projects and plans.

A 110kV substation, generally on the site of the proposed development, was previously included in the planning application and Environmental Impact Statement (EIS)[2] for the permitted Pinewoods Wind Farm (submitted in 2016).

[2] The planning application for the permitted Pinewoods Wind Farm was submitted prior to the formal transposition of EIA Directive 2014/52/EU. Prior to the transposition of that Directive, an EIAR was formerly known as an

Although, An Bord Pleanála determined that the Pinewoods Wind Farm, on its own or in-combination with other permitted or proposed developments in the vicinity would have no likelihood of significant direct, indirect, secondary or cumulative effects on the environment, and granted planning permission, it specifically excluded permission for the substation by way of condition of consent. This was for entirely procedural reasons as described in **Section 1.2** above.

Accordingly, the proposed development has been determined to be SID and forms part of an overall development that was formerly subject to EIA. It further connects into the permitted 110kV Laois-Kilkenny Grid Reinforcement Project electricity transmission line which is also a SID planning permission and formerly subject to EIA. As described in **Section 1.2** above, it has been determined that the proposed development will form a new 'node' on the national electricity transmission network, connecting the permitted Pinewoods Wind Farm to the national electricity grid. For these reasons, and in order to allow An Bord Pleanála to undertake a complete in-combination EIA of the proposed development, the Applicant has submitted an EIAR with the planning application, which includes up-to-date relevant environmental information with due cognisance to the current policy context.

This EIAR therefore assesses the likelihood of significant effects on the environment of the proposed development in combination with, *inter alia*, the permitted Pinewoods Wind Farm and the 110kV Laois-Kilkenny Grid Reinforcement Project electricity transmission line. This approach further accords with a judgement of the High Court *(O'Grianna & Ors. v. An Bord Pleanála [2014] IEHC 632)* which determined that a wind farm development, to which the EIA Directive applies, and its connection to the national grid are considered a single indivisible project for the purpose of the EIA Directive and should be subject to a complete, cumulative EIA. Pre-application consultations with An Bord Pleanála, as described in **Section 1.10** below, have also confirmed that an EIAR should be submitted with this SID planning application.

1.4 Content

In order to be relevant, complete and legally compliant, the content of this EIAR includes all of the information required by EIA Directive 2011/92/EU, as amended by 2014/52/EU, and national legislation as appropriate and necessary to the specific characteristics of the proposed development, and includes:-

(a) A description of the project comprising information on the site, design, size and other relevant features of the project;
(b) A description of the likely significant effects of the project on the environment;
(c) A description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;
(d) A description of the reasonable alternatives studied by the developer (the Applicant), which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;
(e) A non-technical summary of the information referred to in points (a) to (d); and,

Environmental Impact Statement (EIS). Accordingly, the acronym 'EIAR/EIS' is used henceforth in this EIAR to refer to the Pinewoods Wind Farm EIS.

(f) Any additional information specified in Annex IV of the EIA Directive relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.

1.5 Format

The EIAR is presented as 3 no. volumes, which are interrelated and should be read in conjunction with each other, as follows:-

- **Volume I** comprises the main EIAR text and follows a 'grouped format' structure where each environmental factor is assessed and presented as a separate chapter. The EIA Directive prescribes the range of environmental factors which should be used to organise descriptions of the environment and likely significant environmental effects. These have been supplemented with additional environmental factors owing to the characteristics of the project under assessments, as follows:-
  - Chapter 1: Introduction;
  - Chapter 2: Assessment of Project Alternatives;
  - Chapter 3: Description of the Proposed Development;
  - Chapter 4: Population & Human Health;
  - Chapter 5: Biodiversity;
  - Chapter 6: Land & Soils;
  - Chapter 7: Water;
  - Chapter 8: Air Quality & Climate;
  - Chapter 9: Landscape;
  - Chapter 10: Cultural Heritage;
  - Chapter 11: Noise & Vibration;
  - Chapter 12: Shadow Flicker;
  - Chapter 13: Material Assets; and
  - Chapter 14: Interactions of the Foregoing.
- **Volume II** comprises a range of annexes, including technical data and reports, which informed the impact assessment provided in **Volume I** so as to ensure the EIAR is transparently supported by verifiable evidence.
- **Volume III** comprises the EIAR/EIS prepared in respect of the permitted Pinewoods Wind Farm. This EIAR/EIS has been provided to ensure that An Bord Pleanála has before it, and easily to hand for the purposes of cross-referencing, all necessary and relevant environmental assessments related to the entire project to allow for a complete and comprehensive cumulative assessment of the likely significant effects on the environment, including in-combination effects.

A Non-Technical Summary of the EIAR is also provided as a separate standalone volume in order to facilitate the wider public concerned in their involvement in the statutory consultation process during the EIA and planning application determination stage.

1.6 Structure

In order to provide for a consistent approach and to communicate clear, concise, unambiguous information, each chapter of this EIAR is systematically organised so as to follow a similar basic structure, as follows:-

- **The existing environment:** A description of the context, character, significance

and sensitivity of the receiving (baseline) environment using standard descriptive methods, in order to predict the likely significant effects of the proposed development;

- **The likely significant impacts of the proposed development:** The aspects of the construction, existence and operation of the proposed development that are likely to affect the existing environment including, as appropriate, predicted, potential, residual, 'do nothing' and 'worst case' effects. The likely significance of any effects is determined with reference to magnitude, intensity, integrity, duration and probability; and
- **The measures to mitigate and monitor adverse effects:** The range of methods which are proposed for mitigation by avoidance, reduction and remedy of any likely significant effects (including unplanned events) together with ongoing monitoring of the efficacy of mitigation measures.

This structure, which clearly separates data (descriptions of the receiving environment and of the project) from impact predictions (likely significant effects and mitigation measures), is designed to ensure that replicable impact assessments, based on rigorous scientific information and verifiable evidence, is carried out using recognised methods that are presented and documented in a fully legible, transparent and objective manner.

This methodological structure is designed to reduce any possible subjective information and bias in order to facilitate An Bord Pleanála in their independent EIA of the proposed development.

1.7 Guidance

A range of general statutory and non-statutory guidance documents were consulted in undertaking and preparing this EIAR, including *inter alia*:-

- Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2017);
- Draft Advice Notes for preparing Environmental Impact Statements (Project Type 33) (EPA, 2015);
- Wind Energy Development Guidelines for Planning Authorities (DoEHLG, 2006);
- Review of the Wind Energy Development Guidelines – Preferred Draft Approach (DHPLG, 2017);
- Draft Wind Energy Development Guidelines for Planning Authorities (DHPLG, 2019)
- Best Practise Guidelines for the Irish Wind Energy Industry (IWEA, 2012);
- Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018)
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission; 2013);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (DHPLG, 2018;
- Guidelines for Environmental Impact Assessment of Electricity Transmission Projects (Eirgrid, various); and
- Electricity Transmission Studies Evidence-Based Environmental Studies (Eirgrid, various).

The above is a general and non-exhaustive list of EIAR related guidance. Additional guidance documents, specific to each environmental factor, is referenced in each chapter of this EIAR, as relevant.

1.8 EIAR Project Team

The EIA Directive requires that an EIAR must be prepared by a team of competent, qualified experts with an appropriate combination of experience, expertise and knowledge related to the significance, complexity and range of effects that an EIAR needs to assess. Such competence includes an understanding of the legal context of the decision-making process and a variety of technical experts to address different environmental topics, and their interactions, in order to ensure that the information included in the EIAR is complete to a high level of objective quality.

1.8.1 Project Management

GES has been appointed by the Applicant to manage and co-ordinate the management and preparation of this EIAR. GES is an Irish multi-disciplinary renewable energy consultancy that specialises in the project management of planning, environmental and technical engineering services of wind energy developments from project feasibility through to delivery and operation. GES combines the expertise of leading experts in wind farm design, planning and environmental assessment and has extensive experience in managing and coordinating EIAR projects for wind energy and associated electricity grid and substation developments. Some examples of wind energy and ancillary EIAR projects managed by GES are provided in **Table 1.1** below.

Development	Development Description	Status
Carrickallen Wind Farm, Co. Cavan	Wind Farm comprising 10 no. wind turbines and associated ancillary infrastructure.	Operational
Oldmill Wind Farm, Co. Monaghan	Wind Farm comprising 7 no. wind turbines and associated ancillary infrastructure.	Operational
Taghart Wind Farm, Co. Cavan	Wind Farm comprising 7 no. wind turbines and associated ancillary infrastructure.	Permitted
Taghart Wind Farm Grid Connection, Co. Cavan & Co. Meath	Approximately 12km of underground electricity line located predominately within the carriageway of the public road network.	Permitted
Cloghan Wind Farm, Co. Offaly	Wind Farm comprising 9 no. wind turbines and associated ancillary infrastructure.	Permitted
Cloghan Wind Farm Grid Connection, Co. Offaly	Approximately 8km of underground electricity line located predominately within the carriageway of the public road network.	Permitted
Pinewoods Wind Farm, Co. Laois	Wind Farm comprising 11 no. wind turbines and associated ancillary infrastructure	Permitted
Drumlins Park Wind Farm, Co. Monaghan	Wind Farm comprising 8 no. wind turbines and associated ancillary infrastructure	Proposed

Table 1.1: Examples of EIAR wind energy projects managed by GES

1.8.2 Environmental Specialists

The EIAR is also critically dependent on the technical expertise, experience, independence and objectivity of environmental specialists. They characterise the existing environment and evaluate its sensitivity and likely significant effects.

An overview of the specialist experts involved in the preparation of each chapter of this EIAR, together with their relevant qualifications and key environmental factors covered, is provided in **Table 1.2** below. Some specialisms were provided in-house by GES expert staff while in other cases external specialists were appointed as expert consultants in order to undertake individual assessments and prepare specific chapters on environmental topics.

Each appointed specialist is a recognised expert in their field and was selected having regard to their knowledge of relevant environmental legislation; their experience and involvement in EIAR projects for wind energy developments; familiarity with pertinent standards and criteria for the evaluation and classification of significance of effects; the ability to interpret technical documents and to work with project designers to arrive at practical and reliable measures to avoid, mitigate and monitor likely significant effects; and to clearly and comprehensively present their findings in a concise and objective manner. A statement of competence for all of the specialist consultants who contributed to the preparation of this EIAR is provided in each individual chapter of this EIAR, as appropriate.

As part of its project management role, GES undertook overall editorial management of the EIAR to ensure consistency and cross-referencing between different chapters and volumes, and identifying likely interactions between separate environmental factors, together with general project management, briefing and steering of specialist consultants throughout the iterative EIAR and design process.

Ch.	Environmental Topic	Specialist Consultant	Personnel
1	**Introduction**	GES	Gavin Daly *BA Dip (ERM) MIPI* Simon Carleton *BA (Hons) MSc MIPI* Declan Owens *BSc MSc MIPI* Conor Foy *BSc MSc AIEMA*
2	**Assessment of Project Alternatives,** including: • Alternative Grid Connections; and • Alternative Substation Technologies.	GES	
3	**Description of the Proposed Development,** including: • Substation & Grid Connection; • Construction Materials & Aggregates; • Earthworks; and • Drainage & Surface Water Management	GES	
4	**Population & Human Health,** including: • Employment; • Human Health (considered with reference to benchmark standards under other chapters such as noise, landscape, air quality etc.); and • Amenity.	GES	
5	**Biodiversity,** including: • Habitats • Birds • Bats • Non-volant mammals; and • Aquatic ecology.	SLR Consulting	Elaine Dromey Úna Nealon
6	**Land & Soils,** including: • Superficial Geology; • Bedrock Geology; • Geological Heritage & Designated Sites; and	Hydro-Environmental Services	Michael Gill David Broderick

	• Soil Contamination.		
7	**Water,** including: • Local & Regional Hydrology; • Flood Risk; • Hydrogeology; • Ground/Surface physical characteristics; and • Drainage Management.	Hydro-Environmental Services	Michael Gill David Broderick
8	**Air Quality & Climate,** including: • Air Quality; • Climate; • Dust; • Greenhouse gas emissions; and • Contribution of Proposed Development to binding targets.	GES	Gavin Daly Simon Carleton Declan Owens Conor Foy
9	**Landscape,** including • Landscape Character; • Views & Prospects • Landscape Impact; and • Visual Impact.	Macro Works	Richard Barker Rory Curtis
10	**Cultural Heritage,** including • Known archaeological monuments; • Areas of archaeological potential (including unknown archaeology); • Architectural heritage; and • Designations or sensitivities	Dermot Nelis Archaeology	Dermot Nelis
11	**Noise & Vibration,** including • Daytime Noise; • Night time Noise; • Vibration sources; and • Sensitive receptors.	AWN Consulting GES	Mike Simms Cormac McPhillips
12	**Shadow Flicker,** including • Worst Case Effects; • Expected Effects; and • Mitigation Measures.	GES	Cormac McPhillips Gavin Daly Simon Carleton Declan Owens Conor Foy
13	**Material Assets,** including • Transport & Access; • Aviation; • Telecommunications; and • Resources & Utility Infrastructure.	GES	Gavin Daly Simon Carleton Declan Owens Conor Foy
14	**Interaction of the Foregoing**	GES	Gavin Daly Simon Carleton Declan Owens Conor Foy
Non-Technical Summary		GES	Gavin Daly Simon Carleton Declan Owens Conor Foy

Table 1.2: Specialist Consultants involved in the preparation of this EIAR

1.9 Scoping

The scoping process involves identifying the environmental factors that are likely to be significant during EIA and eliminates those that are not. The scoping process is highly interrelated with the consultation process as described in **Section 1.10**. The prior determination of the nature and detail of the information to be contained in the EIAR is one of the most important stages of EIA and may be conducted through a formal or informal process. Scoping helps ensure that the EIAR remains focussed on factors that are environmentally based, likely to occur and may have likely significant and adverse effects.

In undertaking scoping, the statutory obligations as set out in Schedule 6 of the Planning & Development Regulations 2001 (as amended) ('the Regulations') and a range of guidance documents were consulted, including those referenced in **Section 1.7**. A desktop analysis was undertaken of relevant data sources and precedents of EIAs carried out for similar developments, together with other relevant policy documents, such as the Laois County Development Plan 2017–2023 and accompanying Strategic Environmental Assessment (SEA). The scoping process also considered relevant secondary and off-site developments not included within the planning application, including the EIA carried out for the permitted Pinewoods Wind Farm and 110kV Laois-Kilkenny Grid Reinforcement Project electricity transmission line.

1.9.1 Scoping Report

As part of the scoping process, the Applicant initially prepared an 'Outline Scoping Report' to provide a high level overview of the project context; description of the baseline environment; alternatives considered; the proposed development; its likely significant environmental effects; and mitigation and monitoring measures. This report was used in the course of the consultation process, as described in **Section 1.10** below, to allow consultees to inform themselves of the scope and likely significant environmental effects of the project, and to provide comments on the information which should be included in the EIAR, so that a focused and robust EIAR is produced.

1.9.2 Formal Scoping

Section 182E(3) of Act provides for a discretionary provision whereby a prospective applicant during pre-application consultations with An Bord Pleanála may formally request an opinion on the scope and level of detail to be included in the EIAR. In this case, no formal scoping was considered necessary. In the course of pre-application consultations, An Bord Pleanála gave advice to the Applicant on the considerations related to proper planning and sustainable development, and the environment, which may have a bearing on its decision in relation to any subsequent SID planning application. This included advices pertaining to the scope and level of detail to be included in the EIAR, as further described in **Section 1.10** below.

1.9.3 Informal Scoping

Informal scoping was carried out through ongoing iterative dialogue and feedback processes between the EIAR Project Team and the Applicant's project design team, and through the feedback received from the consultation process. Informal scoping was considered the most appropriate means of EIAR scoping in this case, as it was envisaged from the outset that no environmental factors would be scoped out or eliminated from the EIAR. Accordingly, no formal scoping was considered necessary

and all environmental factors, as prescribed in the transposing legislation, have been fully addressed and included in this EIAR, as described in **Section 1.5** above.

As an active process, scoping continued throughout the preparation of the EIAR, including during the impact assessment stage, and the EIAR Project Team maintained a flexible view of the scope throughout by way of open, effective and ongoing communication, and consultation. The project design was dynamically informed and continually reviewed in light of environmental criteria and information emerging during the scoping process, and *vice versa*. This process resulted in the effective anticipation of any likely significant environmental effects and the consequent modification of the proposed development to avoid or reduce effects through redesign and identification of mitigation measures. This process has resulted in the assessment and consideration of a number of Reasonable Alternatives as described in **Chapter 2**.

1.10 Consultations

1.10.1 Pre-Application Consultations

As discussed in **Section 1.2** above, the proposed development was the subject of mandatory pre-application consultations meeting with An Bord Pleanála. As prescribed by legislation, the purpose of the pre-application consultations was twofold. Firstly, to determine whether the proposed development constituted SID; and if so, secondly, to give advice to the Applicant on the procedures involved in making such an application and what considerations, related to proper planning and sustainable development or the environment, in the opinion of An Bord Pleanála, may have a bearing decision in relation to any subsequent SID planning application.

A meeting was held between the Applicant and An Bord Pleanála on 13 June 2019. During this meeting, advice was given to the Applicant on the key environmental factors which would be relevant as part of the EIAR for any subsequent SID planning application. A copy of the meeting record was subsequently furnished to the Applicant (see **Annex 1.2 (Volume II)**) which listed the following pertinent environmental factors to be addressed in the EIAR:-

- Archaeology;
- Visual impact on the surrounding landscape;
- Ecological impacts, including potential impacts on designated sites;
- Watercourses and fisheries;
- Residential amenities;
- Noise;
- Construction traffic routes; and,
- Bats and birds.

Given the passage of time since the submission of the planning application for the Pinewoods Wind Farm in 2016, the Applicant was also advised of the need to ensure that all environmental data is up-to-date and be cognisant of any policy changes which have occurred in the interim and any implications arising from the revised EIA Directive 2014/52/EU. The Applicant was further advised that the EIAR should take into account any likely significant in-combination effects of the proposed development and that a schedule of proposed monitoring and mitigation measures should also be included as a stand-alone appendix document in the EIAR submitted.

A preliminary list of prescribed bodies, which were considered relevant and to be consulted by the Applicant were provided, which were also confirmed in the subsequent formal determination letter (see **Annex 1.1**, **Volume II**). Each of these prescribed bodies were contacted by the Applicant as part of the consultation process for the preparation of this EIAR.

1.10.2 Planning Authority Consultations

As part of the pre-application consultation process, An Bord Pleanála identified Laois County Council, as the relevant planning authority for the proposed development site, and Kilkenny County Council, as the immediately adjacent planning authority, as relevant prescribed bodies for the purposes of EIAR consultation.

Laois County Council

A scoping request was issued to Laois County Council on 20 February 2020 and included the 'Outline Scoping Report' described in **Section 1.9.1** above, in order to provide the Local Authority with sufficient information on the proposed development and its likely significant environmental effects.

A consultation meeting with Laois County Council was held (via telephone) on 30 June 2020. During the meeting, the project was described in detail together with the relevant environmental factors, including, *inter alia*, population & human health (proximity to residential dwellings), biodiversity, transport, flooding, and landscape and visual amenity to be addressed in the EIAR. A written record of the meeting was subsequently provided by the Planning Authority and a copy of same is enclosed at **Annex 1.3 (Volume II)**.

Kilkenny County Council

A scoping request was issued to Kilkenny County Council on 20 February 2020 and included the 'Outline Scoping Report' described in **Section 1.9.1** above, in order to provide the Local Authority with sufficient information on the proposed development and its likely significant environmental effects. Two separate responses were received from Kilkenny County Council relating to the appropriate protection of watercourses and preferred access arrangements.

1.10.3 Stakeholder & Prescribed Body Consultations

A wide range of statutory and non-statutory organisations, including all bodies prescribed in the Planning & Development Regulations 2001 (as amended) and those listed in An Bord Pleanála's pre-application consultation determination, were contacted in writing at early stage in the scoping process to gather their views on the EIAR scope and the likely significant environmental effects of the proposed development. The consultation process involved furnishing each organisation with the 'Outline Scoping Report' described in **Section 1.9.1** above, accompanied by a set of maps and drawings, and requesting written feedback.

Annex 1.4 (Volume II) provides a sample copy of the consultation letter issued to each organisation, while a copy of all responses received is enclosed at **Annex 1.5 (Volume II)**. **Table 1.3**, below, lists all organisations which have been consulted, details whether or not a response was received and provides a summary of the content contained therein. The specific prescribed bodies identified by An Bord Pleanála ad relevant and to be consulted by the Applicant are also identified.

While the consultation undertaken to date has allowed for any identified concerns to be addressed within this EIAR; the statutory consultation process, to be commenced following submission of the SID planning application to An Bord Pleanála, will allow these organisations to make any further comments, as necessary.

1.10.4 Community Consultation & Participation

Non-Statutory Consultation

Community consultation and participation is a key element of each stage of the EIA process and there are specific statutory and non-statutory procedures for public consultation at various stages in the EIA process. While it is not obligatory during the pre-application scoping and preparation of an EIAR, the Applicant has undertaken extensive public consultation throughout the overall development design process. For the most part, this consultation was undertaken as part of the former Pinewoods Wind Farm EIAR/EIS process in 2015/2016 which included a proposal for a 110kV substation on the proposed development site.

Consultations comprised one-to-one discussions between the Applicant and homeowners and local residents whose dwellings are located within 2km of the now-permitted Pinewoods Wind Farm. Local community groups, political representatives and other relevant stakeholders were also consulted regarding the overall development. Two public consultation days were also held which allowed members of the local community to discuss the project directly with representatives on behalf of the Applicant. A Community Consultation & Stakeholder Engagement Report which details the public consultation process undertaken is presented at **Annex 1.6 (Volume II)**. This approach is now recommended as standard per the *Draft Wind Energy Development Guidelines for Planning Authorities 2019*.

In addition, concerns raised by local residents in previous submissions related to the Pinewoods Wind Farm; including visual and landscape effects, loss of local amenity, noise, shadow flicker, health, effects on wildlife, water quality, equine and livestock, road use and widening, and likely effects on property prices and tourism; have all been taken account of in this EIAR as they relate to the proposed development.

Statutory Consultation

Once the SID planning application and EIAR is formally submitted for consideration; the Applicant, An Bord Pleanála and Laois County Council will make arrangements for public access and dissemination of the information contained in the EIAR in accordance with the procedures contained in the transposing legislation and as described in **Section 1.15** below.

1.10.5 Transboundary Consultations

The EIA Directive and transposing legislation requires that, where appropriate, consultations regarding the likelihood of transboundary effects of a project shall be undertaken. Given that the proposed development is not proximate to any international boundary, it was not deemed necessary to consult with any international organisations or authorities nor has An Bord Pleanála requested same during pre-application consultations.

Consultee	Requested in SID Determination	Response Received	Summary of Feedback
An Garda Síochána	-	No	-
An Taisce	Yes	No	-
Bat Conservation Ireland	-	No	-
Birdwatch Ireland	-	No	-
Bord Gáis Energy	-	No	-
Broadcasting Authority of Ireland	-	No	-
BT Communications Ireland	-	No	-
Commission for Communications Regulation	-	No	-
Commission for Regulation of Utilities	Yes	No	-
Department of Agriculture, Food and the Marine	-	Yes	General response relating to felling licenses and associated requirements.
Department of Communications, Climate Action and Environment	Yes	No	-
Department of Culture, Heritage and the Gaeltacht	Yes	No	-
Department of Defence	-	Yes	No observations.
Department of Planning, Housing and Local Government	-	No	-
Department of Transport, Tourism and Sport	-	No	-
Eastern & Midland Regional Authority	-	No	-
Eirgrid	-	No	-
Environmental Protection Agency	-	No	-
ESB Networks	-	No	-

Consultee	Requested in SID Determination	Response Received	Summary of Feedback
Fáilte Ireland	Yes	Yes	Requested to have regard to Fáilte Ireland's Guidelines for the Treatment of Tourism addressed in the EIAR.
Gas Networks Ireland	-	Yes	No Gas Networks Ireland infrastructure in vicinity of proposed development.
Geological Survey of Ireland	-	Yes	No specific comments. Recommend that geo-hazards and groundwater features be considered in the EIAR.
Health and Safety Authority	-	Yes	No observations.
Health Service Executive – Environmental Health Department	Yes	No	-
Iarnród Éireann	-	No	-
Imagine Group	-	No	-
Inland Fisheries Ireland	Yes	No	-
Irish Aviation Authority	-	No	-
Irish Peatland Conservation Council	-	No	-
Irish Raptor Study Group	-	No	-
Irish Water	Yes	Yes	General response requesting appropriate assessment of water environment.
Irish Wildlife Trust	-	No	-
Kilkenny County Council	Yes	Yes	The protection of watercourses should be addressed along with all environmental risks. Roads Design Office request that the L1828 local road is avoided.
Laois County Council	-	No	-

Consultee	Requested in SID Determination	Response Received	Summary of Feedback
Meteor Mobile Communications Ltd (Eir Mobile)	-	Yes	No transmission services will be affected.
Mosaic Net	-	No	-
National Ambulance Service	-	No	-
National Federation of Group Water Schemes	-	No	-
National Parks & Wildlife Service	-	No	-
National Trails Office	-	No	-
Netshare Ireland	-	No	-
Office of Public Works	-	No	-
Open Eir	-	No	-
Ripplecom	-	No	-
2rn (RTE Transmission Network Ltd)	-	Yes	Low risk of any interference.
Sustainable Energy Authority of Ireland	-	Yes	Recommended to contact Laois County Council.
Tetra Ireland Communications Ltd	-	No	-
The Arts Council	-	No	-
The Heritage Council	Yes	No	-
Three (3) Ireland	-	No	-
Towercom	-	No	-
Transport Infrastructure Ireland	Yes	Yes	Recommendation to consider and safeguard future national road schemes, identify and assess haul routes, carry out a Road Safety Audit where applicable and to have regard to Transport Infrastructure Ireland guidelines.

Consultee	Requested in SID Determination	Response Received	Summary of Feedback
Údarás na Gaeltachta	-	No	-
Virgin Media Ireland	-	No	-
Vodafone Ireland Ltd	-	No	-
Waterways Ireland	-	No	-

Table 1.3: Summary of Written Consultations

1.11 Cumulative Impact

This EIAR has considered the likelihood of the proposed development, in its totality including secondary and off-site developments, acting in combination with other existing, permitted and proposed projects and plans in the wider vicinity of the proposed development site, to result in likely effects on the environment which, when combined, may result in effects which are cumulatively significant.

In the first instance, a desktop review of available data sources was undertaken to identify existing developments in the local area. Secondly, the EIA Portal[3] was consulted to assess for the presence of proximate developments which have been subject to EIA. Finally, the online ePlan portals of both Laois County Council[4] and Kilkenny County Council[5] were examined to assess for extant planning permissions which had not yet been commenced. Developments warranting a cumulative impact assessment range from one-off rural dwellings to large-scale quarrying and wind energy developments. **Table 1.4**, below, provides a non-exhaustive list of developments which have been considered in the cumulative impact assessment of this EIAR.

Development	Planning Register Reference	Integrated Pollution Control (IPC) or Industrial Emissions Directive (IED) License	Development Description
One-off Rural Dwellings (Laois & Kilkenny)	Various	N/A	Assorted developments including detached dwellings, bungalows and extensions.
Agricultural Developments (Laois & Kilkenny)	Various	N/A	Assorted developments including livestock housing buildings, silage pits and dairy facilities.
Kilsaran Quarries (Laois)	13/190	N/A	Quarrying and associated operations across a 6.7ha site
Behan Quarries (Laois)	Various	N/A	Quarrying Activities including crushing plants, site offices and wastewater treatment units.
Booth Precast Products (Laois)	20/7	N/A	Quarrying and associated operations across an 8.5ha site
Bord na Móna Powergen Anaerobic Digestion Facility	19/530	N/A	Renewable Gas Facility and associated development on a 17.34ha site
Pinewoods Wind Farm (Laois)	16/260 (An Bord Pleanála Reference	N/A	Construction and operation of an 11 no. turbine wind farm.

[3] http://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1
[4] http://www.eplanning.ie/LaoisCC/searchtypes
[5] http://www.eplanning.ie/KilkennyCC/searchtypes

	PL11.248518)		
Pinewoods Wind Farm (Kilkenny)	17/62 (An Bord Pleanála Reference PL10.248392)	N/A	Construction of approximately 2km of wind farm access track and electrical and communications cabling
Cullenagh Wind Farm (Laois)	13/268 (An Bord Pleanála Reference PL11.242626)	N/A	Construction and operation of an 18 no. turbine wind farm.
Laois-Kilkenny Grid Reinforcement Project (Laois & Kilkenny)	An Bord Pleanála Reference PL11.VA0015	N/A	Electricity Transmission Infrastructure

Table 1.4: Developments addressed in cumulative impact assessment

1.12 Impact Assessment

This EIAR focuses on describing environmental effects that are both likely and significant by reference to the individual environmental factors described in **Section 1.5** and their sensitivities. In order to provide for clarity of method, language and meaning, and to accurately explain the full range of effects, the impact classification and sensitivity terminology described in the *Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2017)* is used in this EIAR to ensure that all likely significant effects are adequately considered and clearly and transparently communicated.

Within this EIAR, a distinction is drawn between 'impacts' and 'effects'. In accordance with the *Guidelines for Ecological Impact Assessment in the UK and Ireland* (CIEEM, 2018), an 'impact' is an action resulting in changes to the environment (for example, the construction activities of a development removing a hedgerow). An 'effect' is the outcome on the environment from an 'impact' (for example, the effects on a dormouse population from loss of a hedgerow). The effect arising from an impact may, or may not be, likely significant[6].

Significance is a concept related to the weight that should be attached to effects when decisions are made. A significant effect is an effect that is sufficiently important to require assessment and reporting so that the competent authority (An Bord Pleanála) is adequately informed of the environmental consequences of permitting a project.

Further specific guidance, legislation and technical standards for describing environmental effects, and pertinent to particular environmental topics, are also described in each individual chapter of this EIAR, as necessary.

Magnitude	Sensitivity of Receptor

[6] As the purpose of this EIAR is to provide a report of the effects, if any, which proposed development would have on the environment, the term 'effects' is used generally throughout this EIAR.

	Very High	High	Medium	Low	Negligible
Very High	Profound	Profound-substantial	Substantial	Moderate	Slight
High	Profound-substantial	Substantial	Substantial - moderate	Moderate-slight	Slight-imperceptible
Medium	Substantial	Substantial - moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

Table 1.5: Impact Significance Matrix

Source: *Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2017)*

* Categories with dark grey shading are considered to equate with 'significant' effects

** The significance matrix provides an indicative framework from which the significance of impact is derived.

1.13 Mitigation & Monitoring Measures

Each chapter of the EIAR includes a description of the measures proposed to avoid, prevent, reduce or offset, as appropriate, any likely significant effects on the environment together with any proposed monitoring measures in respect of both construction and operational phases. Many mitigation measures have already been incorporated into the project design at an early stage, through the iterative scoping and impact assessment processes, to avoid any likely significant environmental effects. Monitoring measures have also been proposed, where appropriate, to demonstrate compliance with, and efficacy of, the mitigation measures proposed.

In order to ensure clarity of the mitigation and monitoring measures proposed, and as requested by An Bord Pleanála during pre-application consultations, all such measures are included in a compendium as a separate annex to this EIAR (see **Annex 1.7, Volume II**).

1.14 Non-Technical Summary

A short, accessible non-technical summary has also been prepared as a separate and self-contained document which can be distributed to the public concerned and who may be likely to be affected by the proposed development. It also contains the details on how members of the public and other organisations can submit any observations they may have to the EIA and SID planning application assessment process.

The non-technical summary is laid out in a similar, but condensed, format to the main EIAR, i.e. describing the project, existing environment, effects and mitigation

and monitoring measures, but presented in a manner that avoids technical language, such that it is easily understandable and accessible to a layperson.

The purpose of the non-technical summary is to transparently facilitate the full public access and participation of of the public concerned in the statutory consultation process following the submission of the SID planning application to An Bord Pleanála.

1.15 Public Access & Participation

Public access and participation is a core feature of the EIA process. Compliance with the Aarhus Convention and the EIA Directive requires that arrangements for public access facilitate the convenient dissemination of the information contained in the EIAR in a timely and fully transparent manner. The core objective is to ensure that the public is made as fully aware as possible, and at the earliest possible stage, of the likely significant environmental effects of the proposed development prior to a decision being made by An Bord Pleanála.

Prior to the submission of the SID planning application, public newspaper notices will be published and site notices erected in accordance with the legislative requirements and any further directions provided by An Bord Pleanála. Full information will also be made available on how the public concerned can access the SID planning application documentation and this EIAR, and involve themselves in the decision-making process, including through making written submissions.

An Bord Pleanála and the Planning Authority (Laois County Council) will also make arrangements for public access and dissemination of this EIAR and other SID planning application documentation in accordance with the procedures contained in the legislation. This will include making all documents available to view and purchase at the offices of An Bord Pleanála (64 Marlborough Street, Dublin 1, D01 V902) and the Planning Authority (Áras an Chontae, JFL Avenue, Portlaoise, Co. Laois, R32 EHP9). URL hyperlinks to all documents will also be available on the website of An Bord Pleanála.

A centralised EIA Portal[7], managed by the Department of Housing, Local Government and Heritage, is a publicly accessible map-based database that provides users with access to all applications for development consent which have been accompanied by an EIAR since 16 May 2017. Following the submission of the planning application to An Bord Pleanála, the public concerned will also be able to access this EIAR via the EIA portal website. The EIAR shall be submitted in a format searchable by electronic means, in so far as practicable.

Finally, the Applicant is also required to provide a dedicated standalone website containing all of the SID planning application documentation and this EIAR. The address of this website (www.pinewoodswindfarmsubstationsid.ie) will be included in the public notices described above.

1.16 Habitats Directive Appropriate Assessment

1.16.1 Appropriate Assessment Screening (Stage 1)

As a separate but interrelated process, screening for the likelihood of any significant effects on European nature conservation sites (Natura 2000) designated under the EU Habitats Directive (92/43/EEC) and Birds Directive (2009/147/EC) was also

[7] EIA Portal

undertaken through the preparation of what is known as an Appropriate Assessment (AA) Screening Report (Stage 1). This is formally a separate assessment process, with discrete reporting requirements, but is obviously highly interrelated with EIAR.

The AA Screening Report assesses whether the preparation and submission of a Natura Impact Statement (NIS) to inform an AA (Stage 2), also to be undertaken by An Bord Pleanála as the competent authority, is required.

The AA Screening Report prepared on behalf of the Applicant concludes that it could not be confirmed that, in the absence of avoidance or reduction (mitigation/protective) measures, designated conservation sites would not be adversely affected by the direct and indirect effects of the proposed development, either individually or in combination with other plans and projects, having regard to their conservation objectives.

As a result, and in accordance with the precautionary principle, it was concluded that the proposed development should proceed to be subject to a Stage 2 AA and that a NIS should be prepared and submitted with the planning application alongside this EIAR.

1.16.2 Natura Impact Statement (Stage 2)

The NIS is presented and submitted as a separate standalone document and accompanies the SID planning application. The NIS includes both the Stage 1 Screening Report and the Stage 2 Assessment

The Biodiversity chapter of this EIAR (**Chapter 5**) does not repeat the detailed assessment included in the NIS but cross refers to the findings of this separate assessment, as necessary. This is as per EPA draft Guidance (2017), "a *biodiversity section of an EIAR, should not repeat the detailed assessment of potential effects on European sites contained in a Natura Impact Statement*" but should "*incorporate their key findings as available and appropriate*".

1.17 Limitations and Difficulties Encountered in Compiling the EIAR

No general difficulties or limitations, including technical deficiencies or lack of knowledge, were encountered in compiling the information required to be provided in this EIAR. Where specific difficulties or limitations were encountered in relation to specific environmental factors, they are reported in the individual chapters of this EIAR, as appropriate.

1.18 Note on Quotations

It is important to acknowledge that statutory EIAR requirements call for a comprehensive description of the existing environment as well as all likely significant effects. The EIAR therefore contains statements describing the positive and negative aspects of the proposed development. Selective quotation, out of context, may not be representative of the overall findings of the EIAR and, therefore, any quotations should be provided in their proper context.

1.19 Relationship to the Planning Application

For the avoidance of doubt, not all elements of the entire development assessed in this EIAR are the subject of the planning application; and this EIAR should be read in conjunction with the plans and particulars of the applicable planning application.

GALETECH
ENERGY SERVICES

Pinewoods Wind Farm Substation & Grid Connection

Chapter 2: Assessment of Project Alternatives

Pinewood Wind Ltd

Galetech Energy Services
Clondargan, Stradone, Co. Cavan Ireland
Telephone +353 49 555 5050
www.galetechenergy.com

Contents

2.1 Introduction

The presentation and consideration of the various reasonable project alternatives investigated is an important requirement of the EIAR process and the single most effective means of avoiding likely significant effects on the environment. The purpose of this chapter is to document the assessment of the range of alternatives considered in the design process and the main reasons for selecting the development, as proposed.

2.2 Requirements of the EIA Directive

EIA Directive 2014/52/EU requires that an EIAR must include:-

> *'A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of environmental effects'.*

This provision requires an EIAR to present transparent and objective evidence on the range of reasonable alternatives which were examined, analysed and evaluated as part of the iterative EIAR and project design decision-making processes, and which led to the adoption and selection of the final proposed development as described in **Chapter 3.**

The Draft *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2017)* state that it is generally sufficient to provide a broad description of each main alternative, identifying the key issues associated with it, and to demonstrate how environmental considerations were taken into account. A detailed assessment (or 'mini-EIA') of each alternative is not required.

2.3 Alternatives Considered

The consideration of project alternatives is a dynamic process and alternatives may be identified at many levels and stages during the evolution of a project, from strategic site selection through to site layouts, design, technologies and on to mitigation and any monitoring measures. Alternatives that are available for consideration at the earlier stages in the evolution of a project are considered to represent the greatest opportunity for the avoidance of likely significant effects on the environment.

It should be noted that the requirement is to consider 'reasonable' alternatives. In this case, the proposed development is to provide a means to connect the extant permitted Pinewoods Wind Farm to the national electricity grid in order to export renewable electricity generated by the wind farm. Therefore, the consideration of the range of possible alternatives is limited by this circumstance.

Accordingly, the 'Do-Nothing' alternative was not considered a reasonable option. An Bord Pleanála has previously determined that the Pinewoods Wind Farm is in accordance with the proper planning and sustainable development of the area and national policy in respect of the development of sustainable energy sources, and will have no likely significant effect on the environment. As a proven and cost effective technology in the context of Ireland's abundant wind resource, current government policy is strongly supportive of wind energy generation and the Climate Action Plan has set a target of 70% penetration (8.2 gigawatt of onshore wind) by 2030. The latest Environmental Protection Agency (EPA) projections show that only

with full implementation of the Climate Action Plan 2019 can a significant reduction in Ireland's total greenhouse gas emissions be achieved to meet legally binding 2030 EU commitments[1]. As described in **Section 1.2 (Chapter 1)** of this EIAR, the originally proposed grid connection for the Pinewoods Wind Farm was omitted by way of condition of consent (Condition No. 4). In the absence of a means of connecting to the national grid (i.e. the 'Do Nothing' alternative), the permitted wind farm will not be able export the renewable electricity generated and therefore is not considered further in this chapter as a reasonable alternative.

The reasonable alternatives considered in undertaking this EIAR were therefore as follows:-

- Alternative grid connections options;
- Alternative substation locations; and
- Alternative substation design technologies.

Each of these alternatives were considered reasonable and relevant to the proposed development and its specific characteristics, and are assessed in further detail below. This includes an assessment and comparison of likely significant environmental effects, and indicating the main reasons for choosing the development, as proposed.

2.4 Assessment of Alternatives

2.4.1 Alternative Grid Connection Options

The method of connection to the national electricity grid is an integral element of renewable energy developments. In Ireland, the point of connection to the national grid is determined by way of a separate and subsequent statutory process under the auspices of Eirgrid/ESB Networks, as grid network operators.

As part of the permitted Pinewoods Wind Farm EIAR/EIS, 2 no. grid connection alternatives were identified as reasonable and viable options, and the provision of either would facilitate connection of the permitted wind farm to the national electricity grid. These options are described below:-

2.4.1.1 Option G1: Underground Line (UGL) along the public road to an existing substation at Ballyragget, Co. Kilkenny

This grid connection option would involve the excavation of a trench and the laying of electricity cables (within ducting) along the public road, backfilling and reinstatement which will be carried out in accordance with the ESBI guidance *'HV Cables – General Construction Methodology'* (PE424-F7001-R00-001-001).

The underground cables would be of a solid polymeric construction with either aluminium or copper conductors. Cable installation trenching will be by a mechanical digger, with full reinstatement of the top layer to its original wearing course. Cable ducts are laid in a granular bed and backfilled with surround material. This material offers protection to the cables and the contrasting material helps identify location should the need arise later. The depth of the cable trench is approximately 1 metre and the width of the cable trench is 50 centimetres. Following the completion of a ducting section (c. 650m-750m), the electrical cabling is pulled through and joined. The installation of the ducting and cabling would be constructed in agreement with the respective local authorities, including a bond for

[1] http://www.epa.ie/pubs/reports/air/airemissions/ghgprojections2019-2040/2020-EPA-Greenhouse-Gas-Emissions-Projections_final.pdf

reinstatement works. It is estimated that the total construction phase would be 9 – 12 months in duration.

One of the advantages of laying cables under a roadway is that there is typically no permanent effect on the environment additional to that caused by the presence of the roadway. When an underground cable is laid under an existing roadway there is a short-term temporary impact during the construction phase only.

2.4.1.2 Option G2: Connection to the permitted and immediately adjacent 110kV Laois-Kilkenny Grid Reinforcement Project electricity transmission line via a 110kV 'loop-in/loop-out' substation

One of the distinct advantages of this grid connection option, from an environmental impact and technical perspective, is that the permitted 110kV Laois-Kilkenny Grid Reinforcement Project[2] passes immediately adjacent to the permitted Pinewoods Wind Farm. The proximity to the national grid was a key reason for selection of the subject site for the development of a wind farm. The permitted transmission line has also been subject to full EIA and AA. Following detailed discussions with Eirgrid, it has been agreed that the proposed development can break directly into this 110kV line via a substation at the subject site, thereby providing an extremely convenient means to export the renewable electricity generated by the wind farm.

At the time of preparation of the Pinewoods Wind Farm EIAR/EIS (**Volume III**), it was considered that due to the proximity of Option G2 to the wind farm site, this represented the most advantageous alternative from an environmental impact and technical efficiency perspective. This option would result in a reduced likelihood of significant environmental effects, including in respect of *inter alia* land and soil; water; and transport and access. It was for these reasons that this grid connection option was selected as the preferred alternative and assessed throughout the submitted EIAR/EIS (**Volume III**) and included in the plans and particulars submitted with the planning application.

An Bord Pleanála subsequently granted planning permission for the Pinewoods Wind Farm and determined that, on its own or in-combination with other permitted or proposed developments in the vicinity would have no likelihood of significant direct, indirect, secondary or cumulative effects on the environment. However, as described above, permission for the substation was excluded by way of condition of consent for procedural reasons.

2.4.1.3 Assessment of Alternative Grid Connection Options

Following the Board's decision to grant planning permission for the Pinewoods Wind Farm, the Applicant once again carried out a comprehensive *de novo* evaluation of all reasonable grid connection alternatives. This evaluation, which included further discussions with Eirgrid, confirmed that Options G1 and G2, as described above, remain reasonable alternatives of connecting the permitted wind farm to the national grid.

In addition, upon further consideration, it was determined that a further alternative involving the installation of an UGL along the public road network to the permitted Coolnabacky substation also represented a possible option (**Option G3**). The

[2] An Bord Pleanála Reference PL11.VA0015

construction methodologies associated with Option G3 are identical to Option G1, as described above.

Each of the abovementioned grid connection options are illustrated at **Figures 2.1, 2.2** and **2.3** below; and provided at **Annex 2.1 (Volume II)**. A comparative assessment of each option in respect of each environmental factor included in this EIAR is provided in tabular format at **Table 2.1** below.

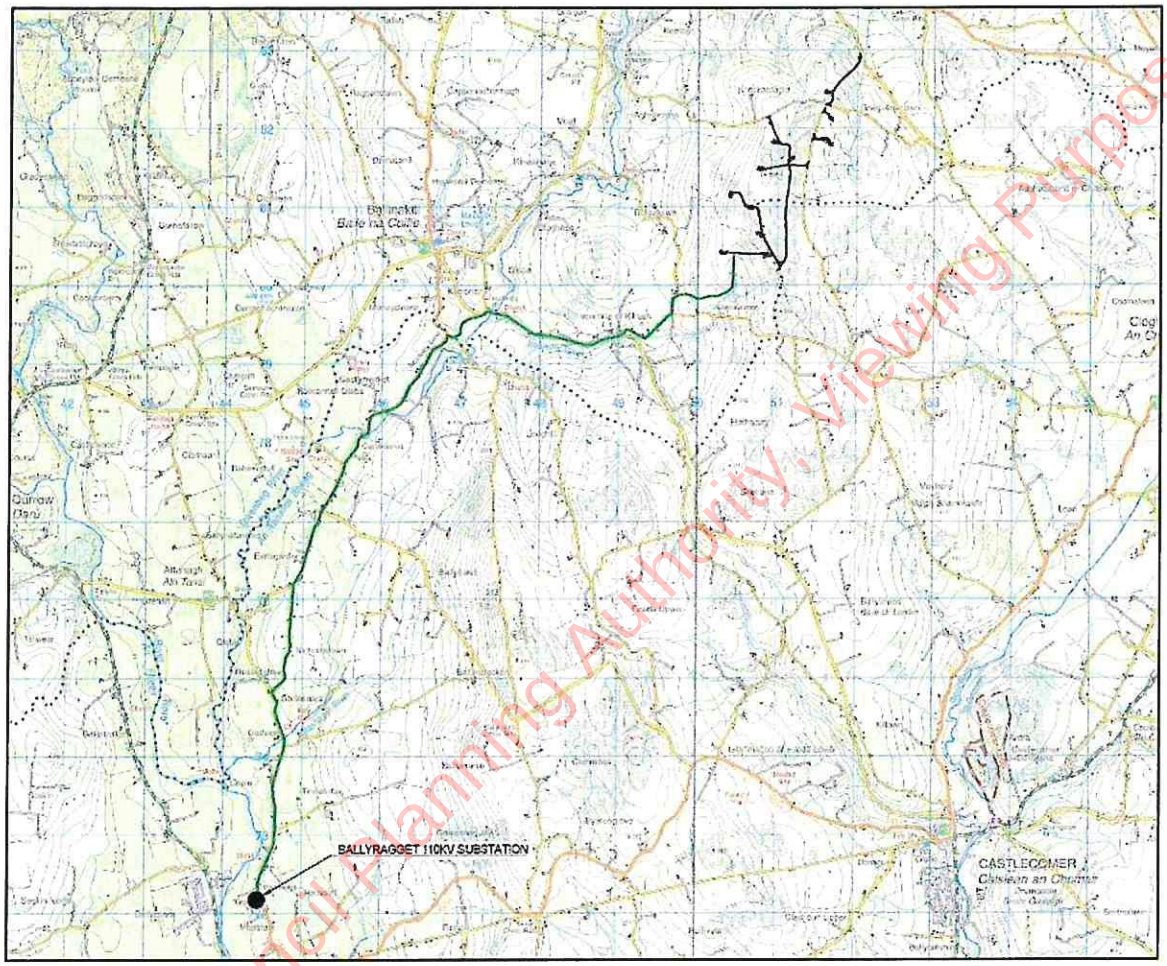

Figure 2.1: Option G1 – UGL Grid Connection to existing Ballyragget substation

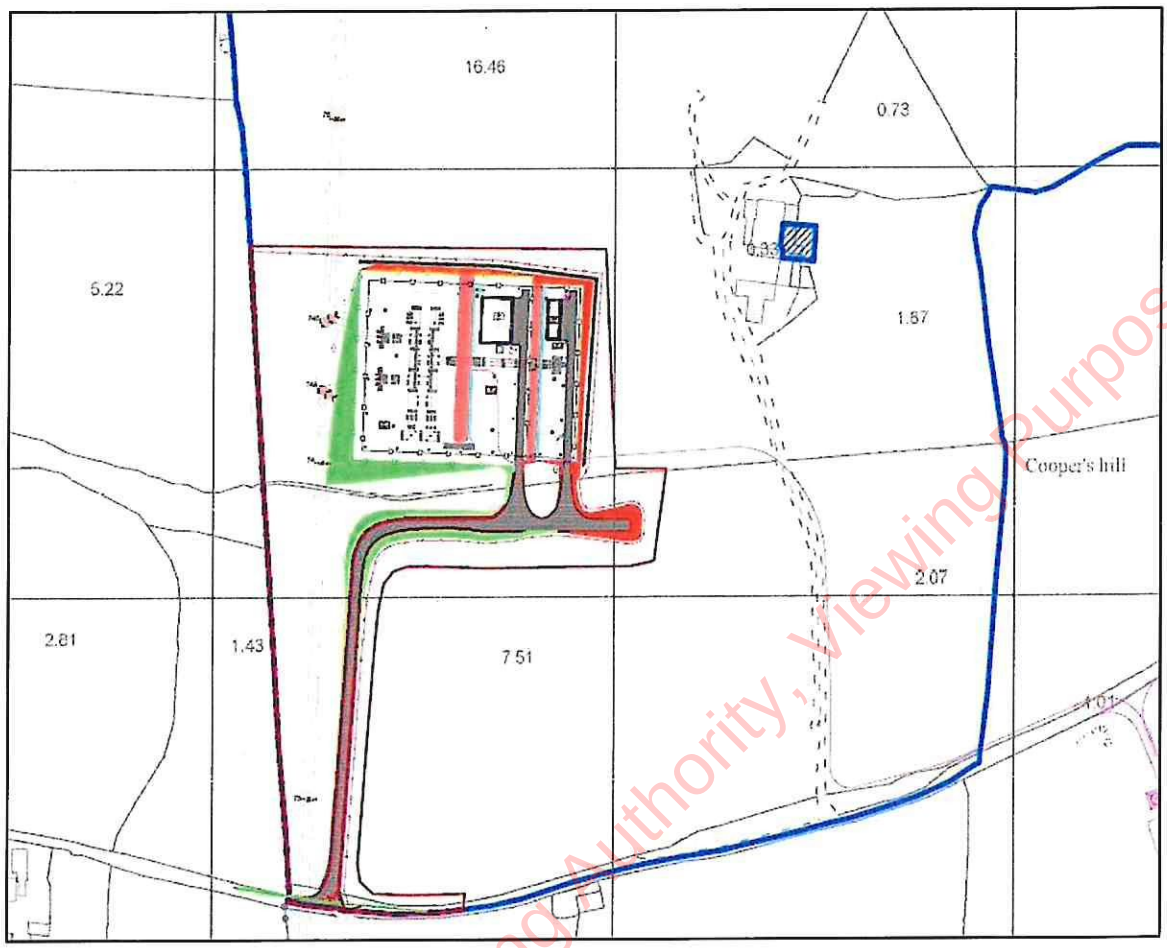

Figure 2.2: Option G2 – 'Loop-in/Loop-out' connection to Laois-Kilkenny Grid Reinforcement Project

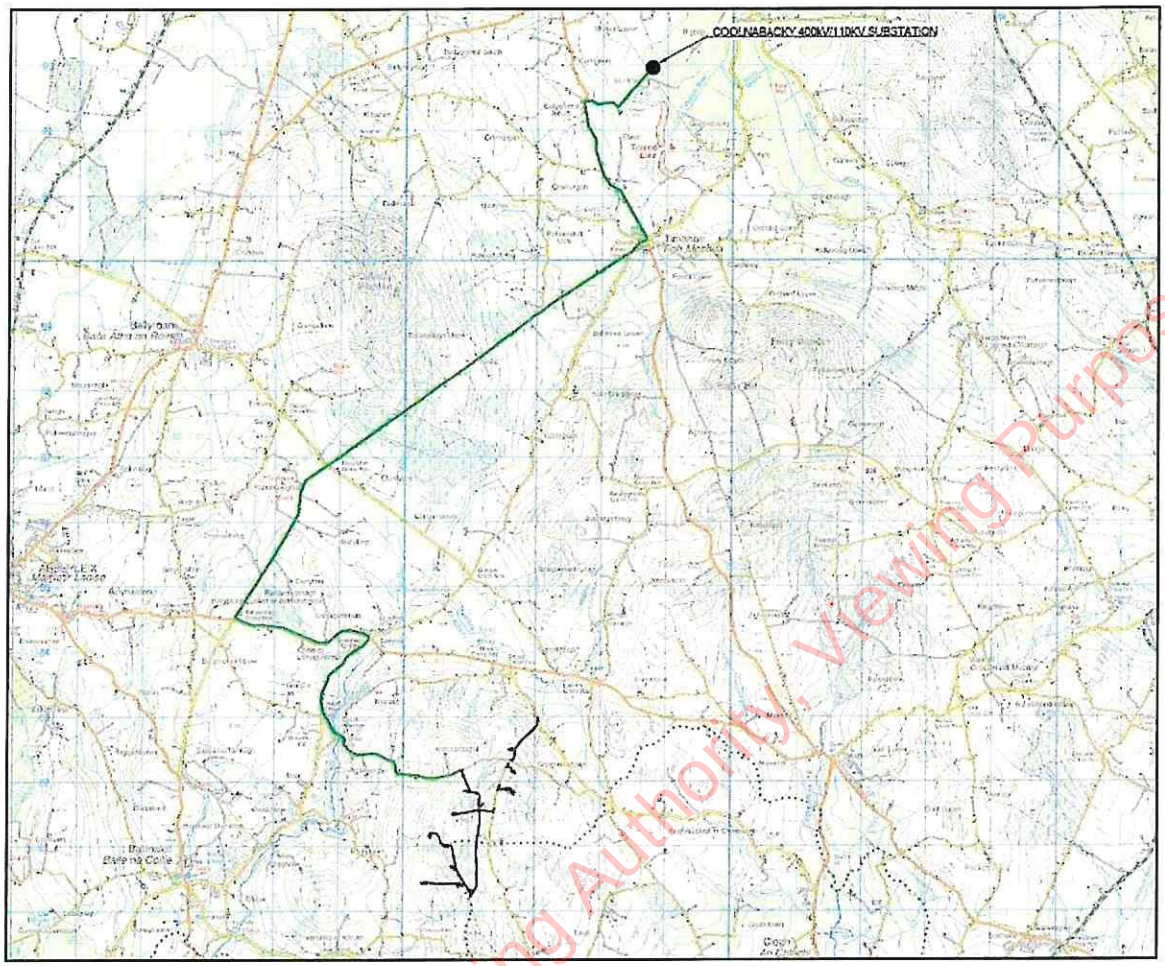

Figure 2.3: Option G3 – UGL Grid Connection to permitted Coolnabacky substation

Location / Factor	Option G1	Option G2	Option G3	Emerging Preferred Option
Population & Human Health	Relatively low density of dwellings along the route. Likelihood of temporary disruption to local communities during construction works.	Low density of dwellings in vicinity of identified location.	Relatively low density of dwellings along the route but the route would travel through the village of Timahoe. Likelihood of temporary disruption to local communities during construction works.	Option G2
Biodiversity	Identified route is generally not sensitive; but would require the crossing of the River Barrow and River Nore SAC on 3 no. occasions albeit within the public road carriageway.	Identified site is generally not sensitive; however, nearby watercourses ultimately discharge downstream to the River Barrow and River Nore downstream.	Identified route is generally not sensitive; but would require the crossing of the River Barrow and River Nore SAC on 3 no. occasions, albeit within the public road carriageway..	Option G2

Land & Soil	No sensitive land uses or soil types. Excavations required over a large linear distance.	No sensitive land uses or soil types. Excavations confined to a local site.	No sensitive land uses with some localised evidence of peat. Excavations required over a large linear distance.	Option G2
Water	Identified route would require the crossing of a number of watercourses which discharge to the River Nore and to European designated sites for nature conservation.	Proposed development does not require the crossing of any watercourses. Nearby watercourses ultimately discharge to the Nore and to European designated sites for nature conservation.	Identified route would require the crossing of a number of watercourses which discharge to the River Barrow and to European designated sites for nature conservation.	Option G2
Air & Climate	No constraints identified. Development would result in a positive overall effect.	No constraints identified. Development would result in a positive overall effect.	No constraints identified. Development would result in a positive overall effect.	Option G1 or Option G2 or Option G3
Landscape	The proposed development would be located underground and, following construction, would have no surface expression.	No protected landscape designations or designated scenic views in the immediate vicinity. Site is remote and substantially screened from public view.	The proposed development would be located underground and, following construction, would have no surface expression.	Option G1 or Option G3
Cultural Heritage	A moderate number of heritage features identified in the vicinity of the route; particularly within 500m.	1 no. heritage feature identified within 500m of the location.	A moderate number of heritage features identified in the vicinity of the route; particularly within 500m.	Option G2
Noise & Vibration	Construction activities would take place in the immediate vicinity of dwellings along the route.	Limited number of dwellings in the immediate vicinity.	Construction activities would take place in the immediate vicinity of dwellings along the route, particularly in the village of Timahoe.	Option G2
Shadow Flicker	Shadow Flicker cannot be generated.	Shadow Flicker cannot be generated.	Shadow Flicker cannot be generated.	N/A
Material Assets (Transport & Access; Telecommunications)	Short-term effects likely on transport & access during construction due to requirement for temporary road closures and diversions.	No significant effects likely on transport; intermittent, but extremely short-term and temporary disruption possible during delivery of materials.	Short-term effects likely on transport & access during construction due to requirement for temporary road closures and diversions.	Option G2

	No significant effects on telecommunications.	No significant effects on telecommunications.	No significant effects on telecommunications.	

Table 2.1: Environmental Assessment of Alternative Grid Connection Options

On the basis of the above assessment, it is concluded that none of the 3 no. identified grid connection options are likely to result in significant effects on the environment. However, given the immediacy of the Laois-Kilkenny Grid Reinforcement Project electricity transmission line to the permitted Pinewoods Wind Farm; the significant technical and other efficiencies associated with this option; and the reduced likelihood of significant effects in respect of land and soil; water; cultural heritage; and material assets (transport and access), it is assessed that Option G2 is once again the preferred means for connecting the Pinewoods Wind Farm to the national electricity grid.

2.4.2 Alternative Substation Locations

Given the fixed location of the permitted Pinewoods Wind Farm vis-à-vis the fixed alignment of the permitted Laois-Kilkenny 110kV Grid Reinforcement Project electricity transmission line, reasonable alternative siting options are limited to minor micro-siting based on alternative design technologies, described below. Accordingly, it was not deemed necessary to evaluate additional alternative sites.

2.4.3 Alternative Substation Design Technologies

Following the determination that Option G2 represents the preferred alternative for connecting the Pinewoods Wind Farm to the national grid, the Applicant undertook an analysis of technological design options, including internal electrical equipment and plant, which could be provided for as part of the proposed substation. Depending on the alternative design technologies deployed there will be minor variations in terms of internal substation layout and footprint. The consideration of alternative design technologies was therefore an important consideration in the context of the generally fixed location for the substation in the context of the specific characteristics and topography of the proposed development site.

It is important to note that the design of such substations must accord with Eirgrid specifications and, as such, the scope for installing alternative electrical apparatus and design technologies is very limited. Moreover, the original substation design submitted with the permitted Pinewoods Wind Farm is no longer an accepted Eirgrid specification and has been superseded.

Within Eirgrid specifications for 110kV substations, there are currently two approved designs (see **Annex 2.2**), as follows:-

2.4.3.1 Option SD1: 'Air-Insulated Switchgear' Substation

Air-Insulated switchgear (AIS) substations are conventional switchgear substations which use air between phase-to-ground and phase-to-phase insulation. Air is the primary medium for insulation within these systems. AIS units have been extensively used in the last few decades. Within AIS substations, electrical equipment is located outdoors and is spaced at a sufficient distance from ground and from other equipment to maintain safe electrical and maintenance clearances.

2.4.3.2 Option SD2: 'Gas-Insulated Switchgear' Substation

Gas-insulated switchgear (GIS) substations comprise standard electrical equipment which includes circuit breakers, current transformers, voltage transformers,

disconnect and ground switches, interconnecting busbars, surge arresters, and connections to the electricity grid. GIS enclosures are typically cast or welded aluminium. GIS enclosures are pressure sealed and designed to remain closed throughout the lifetime of the equipment, which is typically 50 years or more. A GIS substation uses Sulphur Hexafluoride (SF6) at a moderate pressure for phase-to-phase and phase-to-ground insulation. SF6 has 2-3 times greater insulating ability of atmospheric air at the same pressure which results in a more compact overall substation size. The high-voltage conductors, circuit breaker interrupters, switches, current transformers, and voltage transformers are encapsulated in SF6 gas inside grounded metal enclosures.

2.4.3.3 Assessment of Alternative Substation Design Options

A comprehensive technical and environmental evaluation of Options SD1 and SD2 was undertaken by the Applicant to determine which option represented the most suitable and appropriate alternative for the proposed development. It was concluded that both options were feasible from a technical standpoint and that neither option was likely to result in significant environmental effects.

GIS substations are, on occasion, developed as part of renewable energy developments and have a slightly smaller footprint. AIS substations are, however, generally considered to be the most appropriate technology for renewable energy projects. The provision of an AIS substation allows for greater flexibility in terms of any future development which Eirgrid may decide to undertake. As Eirgrid have indicated that the proposed development will form a 'node' on the national electricity network to which other projects may seek to connect, it is possible that future expansion of the proposed development site may occur.

Therefore, given that both options were technically feasible and that neither option was evaluated as likely to result in significant environmental effects, it was considered that the development of an AIS substation (Option SD1) was preferable due to the greater flexibility afforded by this design. The increased range of options for future development afforded by an AIS substation was considered to outweigh any minor reduction in environmental effects (e.g. slightly reduced level of groundworks etc) which would arise from the development of a GIS substation.

2.5 Conclusion

This chapter has provided a description of the reasonable alternatives, which are relevant to the proposed project and its specific characteristics, and which have been assessed, evaluated and analysed. The consideration of various alternatives was a recursive process and integral to the iterative and dynamic EIAR and project design process. The objective of this process was to avoid any likely significant effects on the environment through the selection of a means of connection to the national electricity grid for the permitted Pinewoods Wind Farm which avoids inherent environmental sensitivities, in favour of a proposed development which has fewer constraints.

Alternative Grid Connection Options, Alternative Substation Locations and Alternative Substation Design Technologies have all been discussed and analysed. An indication of the main reasons for selecting the preferred option, including a comparison of likely significant environmental effects is provided.

The final proposed development evaluated in this EIAR and described in **Chapter 3** is therefore based on grid connection Option G2 and substation design Option SD2

which has been assessed to achieve the best balance between the avoidance of any likely significant environmental effects and achievement of the objectives of the project.

GALETECH
ENERGY SERVICES

Pinewoods Wind Farm Substation & Grid Connection

Chapter 3: Description of the Proposed Development

Pinewood Wind Ltd

Galetech Energy Services
Clondargan, Stradone, Co. Cavan Ireland
Telephone +353 49 555 5050
www.galetechenergy.com

Contents

3.1 Introduction

The purpose of this chapter is to provide a description of the proposed development in sufficient detail, which, when taken together with the descriptions of the existing environment provided in this EIAR, will allow an independent reader to understand the significant environmental effects likely to arise from the proposed development.

The description considers the location of the proposed development together with its main physical characteristics including design, size, scale and land-use requirements of all relevant phases of the existence of the project from its construction through to operation and decommissioning. The proposed development described in this chapter was arrived at following the consideration of various reasonable alternatives described in **Chapter 2**.

This chapter should also be read in conjunction with the technical plans and drawings submitted with the planning application and photomontages provided in **Annex 9.2** of this EIAR. Further descriptions of specific elements of the proposed development and the existing baseline environment are also provided in individual chapters of this EIAR as they relate to particular environmental factors including, for example, in combination with other proposed developments; the nature and quantity of materials and natural resources used; and the possible production of residues, waste, pollution, noise and nuisances etc.

The description of the proposed development also addresses other off-site/secondary developments which occur as a direct result of the proposed development, including the immediately adjacent permitted Pinewoods Wind Farm and Laois-Kilkenny 110kV Grid Reinforcement Project electricity transmission line, together with haul routes for the importation of aggregates, materials and electrical equipment to facilitate construction of the proposed development.

The proposed development will be commissioned as a single construction phase with the Pinewoods Wind Farm and the construction period is likely to last for approximately 15-18 months. The description of the proposed construction phase includes land-use requirements; proposed site construction works; off-site/secondary developments; description of materials, plant and equipment used to facilitate construction together with a description of likely emissions; waste and traffic etc.

3.2 Project Duration

A ten-year planning permission is being sought for this proposed development. That is, planning permission would remain valid for ten years following the final grant of permission by the Board. The Wind Energy Development Guidelines for Planning Authorities 2006 state that *"Planning Authorities may grant permission for a duration longer than 5 years if it is considered appropriate, for example, to ensure that the permission does not expire before a grid connection is granted. It is, however, the responsibility of the applicants in the first instance to request such longer durations in appropriate circumstances"*. A ten-year planning permission is considered appropriate for a development of this nature to ensure all other required licenses and consents are in place and to ensure that the Laois-Kilkenny Grid Reinforcement Project electricity transmission line, to which it is proposed to connect the proposed development, is at an advanced stage of construction/commissioning.

The proposed substation has been determined by An Bord Pleanála to be SID (see **Section 1.2 (Volume I)**) and will, once operational, become a 'node' on the national electricity network and will be largely operated and maintained by Eirgrid as part of

the national electricity network. As a result, the proposed substation does not have a specified operational period and is highly likely that it will continue to be operated following the decommissioning of the Pinewoods Wind Farm (i.e. after its 25-year operational period) and, therefore, decommissioning of the electricity substation is not proposed. Therefore, we request that An Bord Pleanála does not impose a condition of consent on the proposed development specifying a time limited operational duration.

3.3 Site Location & Context

The proposed development site is located c. 1.2km north of the county boundary between County Laois and County Kilkenny in the townland of Knockardagur, County Laois; approximately 17km south-west of Portlaoise and 25km north of Kilkenny City, and approximately centred at Irish Transverse Mercator (ITM) Grid Reference 650427, 682395.

The nearest towns are Abbeyleix, approximately 8km north-west, and Castlecomer, approximately 8km south-east. The village of Ballinakill is c.4km south-west of the subject site. There are also a number of smaller nucleated and crossroad settlements throughout the wider environs of the subject site together with numerous dispersed 'one-off' dwellings and farmsteads outside of any identified settlements. The general location of the proposed development site, in a regional context, is illustrated in **Figure 3.1**.

The topography in the wider environs of the subject site is dominated by the upland area known as the Castlecomer Plateau, characterised by undulating hills and steep escarpments at its fringes. Dissecting the lowlands on either side of the plateau are the rivers Barrow and Nore, which lie to the east and west respectively. The lowlands are a mixture of pasture and tillage with fields typically bordered by mature broadleaf tree lines and hedgerows. Agricultural land-uses extend into the upland areas in the form of more marginal grazing with scrubby hedgerow field boundaries.

Extensive commercial conifer plantations emerge on higher slopes and throughout the Castlecomer Plateau. There are also occasional small patches of woodland associated with demesne landscapes within lowlands as well as narrow strips of riparian vegetation at the margins of streams and rivers. A number of quarries are also present in the wider area.

The proposed development site was selected for a number of reasons including its proximity to both the permitted Pinewoods Wind Farm (which it will serve) and the permitted Laois-Kilkenny Grid Reinforcement Project electricity transmission line. The location of the subject site vis-à-vis the fixed location of both of these permitted projects, makes it the most suitable location for the proposed development.

The proposed development site is also located in a relatively remote and benefits from good separation distances to residential dwellings, with just 5 no. dwellings within 500m; the nearest of which is c. 100m east. The site also avoids sensitive habitats and the landscape is assessed to have the ability to assimilate a development of the type proposed.

The proposed development site is located within a single agricultural landholding comprising agricultural grassland/pasture with mature hedgerows, and occasional trees, at the boundaries.

The topography of the site is sloping with elevations ranging from approximately 225m above ordnance datum (AOD) to the west of the site and approximately 245m AOD to the east. The sloping nature of the proposed development site necessitates a requirement for a bespoke 'split-level' design which is further described at **Section 3.4.1** below.

The proposed development site is drained by the Knockardagur stream, immediately south of the footprint of the proposed substation. Based on field assessments undertaken (see **Chapters 5** and **7**) the stream is generally dry and is assessed as only likely to contain flow following periods of intense or prolonged rainfall. Due to the sloping nature of the proposed development site, all surface water runoff flows towards the Knockardagur stream either directly to the stream or via agricultural drains which then discharge to the stream.

The proposed development site is accessed via a local-tertiary road, the L77951, which generally experiences extremely low volumes of vehicular movements.

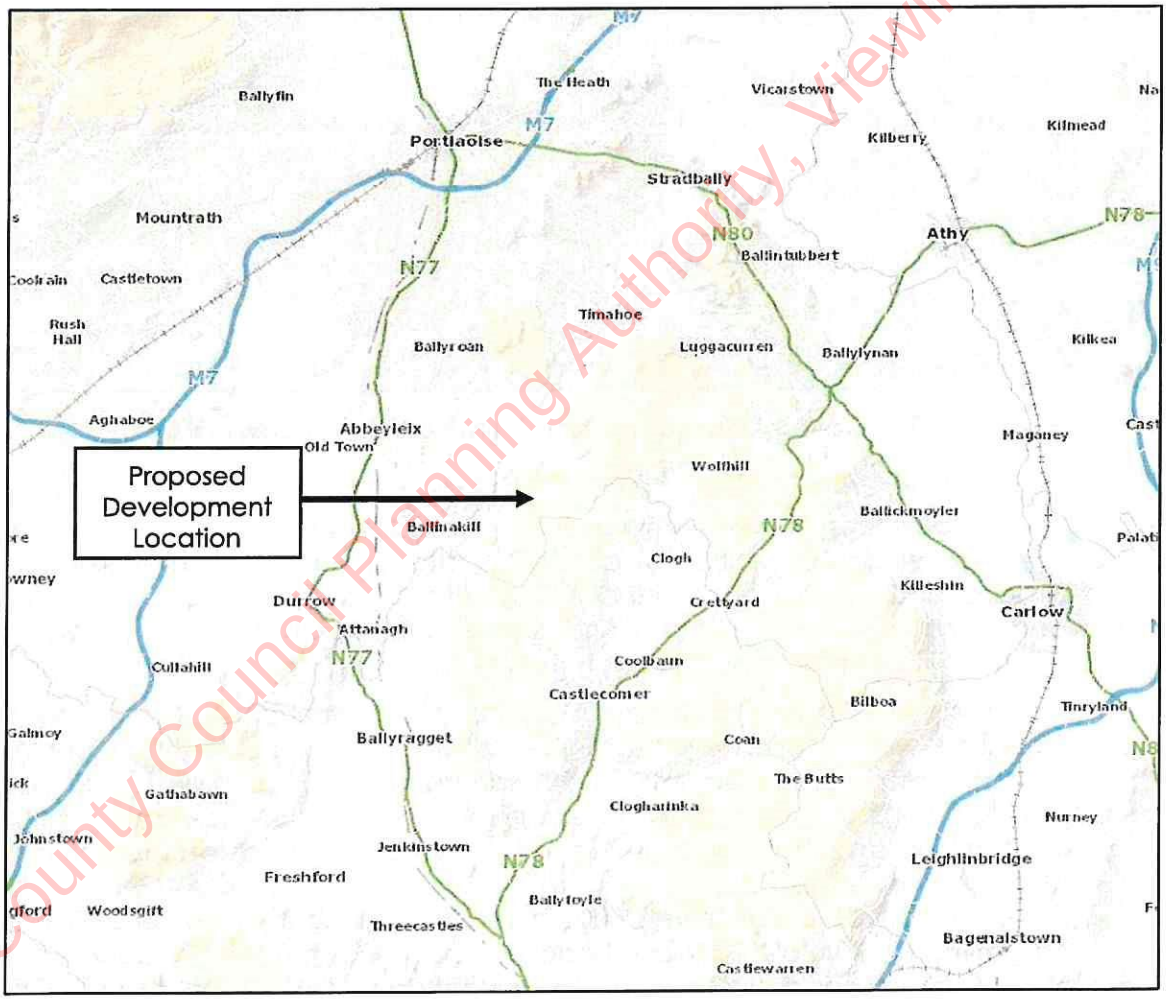

Figure 3.1: Proposed Development Location

Plate 3.1: General View across the Proposed Development Site

3.4 Description of the Proposed Development

The proposed development will comprise a 110kV electricity substation, including all associated development works to accommodate its construction, operation, maintenance and the export of electrical power generated by the permitted Pinewoods Wind Farm to the national grid via the immediately adjacent permitted Laois-Kilkenny Grid Reinforcement Project. This will include:-

- A 110 kilovolt (kV) 'loop-in/loop-out' Air-Insulated Switchgear (AIS) electrical substation with a 'split level' design, including 2 no. single-storey control buildings (with a Gross Floor Area of 589 square metres), 1 no. transformer bay, 2 no. line bays and all associated electrical equipment, services and lighting within an up to 2.95 metre high fenced compound (with a total footprint of 13,100 square metres);
- 2 no. lattice-type strain towers with a maximum height of up to 21m and approximately 70m of 110kV overhead electricity lines to facilitate connection of the proposed substation to the permitted 110kV Laois-Kilkenny Grid Reinforcement Project electricity transmission line (An Bord Pleanála Reference PL11.VA0015);
- Approximately 0.65km of on-site access track with associated site entrance from local public road (L77951); and

- All associated and ancillary site development, excavation, construction, landscaping and reinstatement works, including provision of site drainage infrastructure and surface water protection measures.

The site of the proposed development has a total area of c. 5.5 hectares. The proposed development will facilitate the export of renewable electricity generated at the permitted 'Pinewoods Wind Farm' (An Bord Pleanála Reference PL11.248518/Laois County Council Planning Register Reference 16/260 & An Bord Pleanála Reference PL10.248392/Kilkenny County Council Planning Register Reference 17/62) to the national electricity grid.

The layout of the overall proposed development is illustrated at **Figure 3.2**, below, and replicated at **Annex 3.1 (Volume II)**.

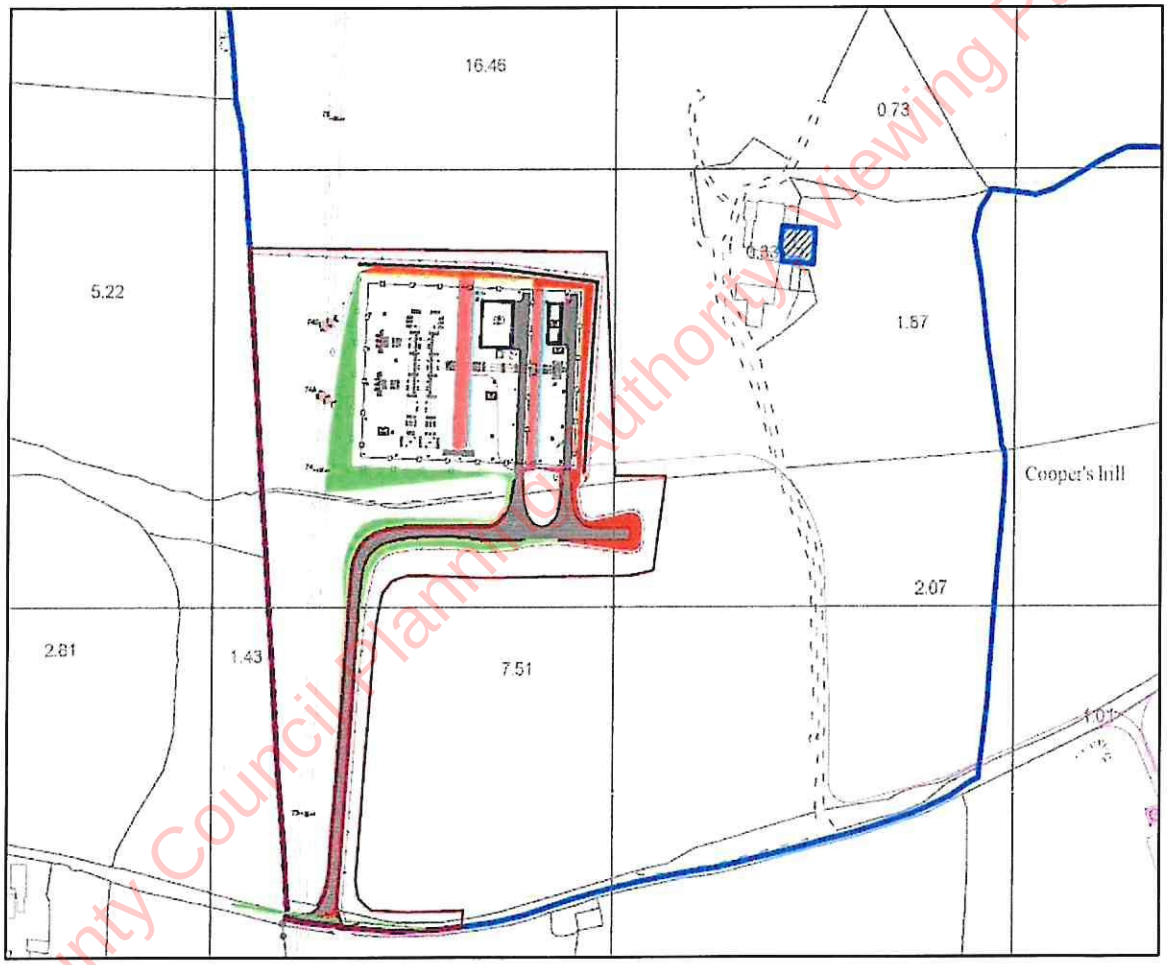

Figure 3.2: Proposed Development Layout

Each element of the proposed development is discussed in turn below and all relevant technical plans, drawings and other particulars are included in the accompanying planning application plans and particulars.

3.4.1 Substation

As set out at **Chapter 2**; following consultations with Eirgrid and a comprehensive assessment of available alternative substation design technologies, it has been determined that the proposed development will comprise a 110kV 'loop-in/loop-

out' air-insulated switchroom (AIS). The footprint of the substation (overall compound area) will measure approximately 13,100m² and will be surrounded by a palisade fence, with associated gates, of up to 2.95m in height for safety and security reasons. The proposed substation will contain 2 no. control buildings and all necessary electrical equipment and apparatus to facilitate the export of electricity to the national grid. Ancillary infrastructure located within the footprint of the compound will include light posts and lightning masts.

At the location of the proposed substation, the Laois-Kilkenny Grid Reinforcement Project electricity transmission line will be broken and will be connected to the substation via approximately 70m of 110kV overhead line (OHL) suspended from 2 no. lattice-type strain towers. Once constructed, electricity being transmitted along the Laois-Kilkenny Grid Reinforcement Project electricity transmission line will be diverted through the proposed substation, allowing electricity generated by the Pinewoods Wind Farm to be exported to the national grid, before returning to the Laois-Kilkenny Grid Reinforcement Project; hence the 'loop-in/loop-out' nature of the proposed substation.

The layout of the proposed substation is illustrated at **Annex 3.2 (Volume II)**. It is important to note that this layout has been designed fully in accordance with current Eirgrid specifications; however, the Applicant may be instructed by Eirgrid to immaterially alter the precise siting of control buildings and/or electrical equipment within the overall substation. Any such immaterial alterations or deviations have been fully assessed and provided for within this EIAR.

The substation compound will be surfaced with free-draining crushed stone such that rainwater can percolate to ground. The boundaries of the proposed substation will be landscaped with native species to reduce any visual effects on the landscape. Further details of landscaping proposals are provided at **Chapter 9**.

The proposed substation will be connected to the Pinewoods Wind Farm via underground electrical cabling permitted pursuant to An Bord Pleanála Reference PL11.248518.

Due to the sloping nature of the proposed development site (see **Section 3.3** above) and in order to minimise the volume of material to be excavated to provide the substation footing (see **Section 3.4.5** below); the design of the proposed development has incorporated a split-level approach to ensure an optimum cut and fill balance, and to reduce impacts during construction, similar to that illustrated at **Figure 3.3**.

There will be a requirement to modify and redistribute subsoil material around the site to facilitate the achievement of the required levels for the buildings, structures and electrical substation equipment. In addition to reducing the volume of excavated material, the split-level design assists, from a visual perspective, in ensuring that the proposed development can set into the landscape thus fully exploiting the screening effects of the surrounding topography and of the mature vegetation which surrounds the proposed substation.

A typical 110kV AIS substation is illustrated at **Figure 3.3**.

Figure 3.3: Example of a 110kV AIS Substation with split-level design

3.4.1.1 Control Buildings

The proposed substation will contain 2 no. control buildings; one of which, the Independent Power Provider (IPP) building, will be operated and maintained by the Applicant while the Transmission System Operator (TSO) building will be operated and maintained by Eirgrid.

The IPP building will measure approximately 21.4m x 6.5m (total footprint of c. 139m²) and will have an overall height of 5.25m from finished floor level (FFL). The building shall be constructed of blockwork and will be finished in sand and cement render, slate roof covering and steel doors. The IPP building will house switchgear and associated equipment such as incoming and outgoing circuit breakers, earth fault, protection devices, metering equipment, computers and servers while also providing welfare facilities for wind farm staff and maintenance personnel. The building will not require a dedicated water source due to infrequent use and the low volumes that will be required (toilet facilities and hand washing). Accordingly, the building design will incorporate a rainwater harvesting system. Wastewater arising will be stored in a sealed foul holding-tank and will be tankered off-site as required by a local licensed waste collector. Potable water will, as required, be delivered to site by an approved local provider. Water supply and waste water management proposals of this nature are common practice for developments of this type located in remote/rural areas with infrequent usage.

The TSO building will measure approximately 25m x 18m (overall footprint of c. 450m) and will have an overall height of approximately 8.55m (from FFL). This building shall also be constructed of blockwork and will be finished in sand and cement render,

slate roof covering and steel doors. The TSO building will contain a control room to allow operatives monitor and manage the operation of the electrical apparatus and will also include storage and welfare facilities. Similar to the IPP building, a rainwater harvesting system will be implemented and wastewater will be removed from site by a local licensed waste collector.

Layout and elevation drawings of both the IPP and TSO buildings are provided at **Annex 3.3 (Volume II)**. The precise internal layout of both buildings may be subject to further immaterial alterations to reflect any future revisions to Eirgrid specifications. As set out above, any immaterial deviations from the precise layout and elevations illustrated at **Annex 3.3** are fully provided for within this EIAR.

3.4.2 Electrical Apparatus

Electrical equipment; including, but not limited to busbars, line bays and a transformer bay; will be located outside the control buildings (within the palisade fence) and will increase the low voltage of the electricity generated by the adjacent Pinewoods Wind Farm to high-voltage 110kV before being transmitted to the national grid. Electrical equipment may also include underground cabling, as necessary, located within the substation compound.

The positioning of electrical equipment within the substation compound is provided on the accompanying planning application drawing and accords with current Eirgrid specifications. Immaterial deviations to the precise siting of this internal equipment may be necessary at the time of construction in line with any future revisions to Eirgrid specifications. To reiterate, any such deviations are fully provided for and assessed within this EIAR.

3.4.3 Overhead Line & Associated Strain Towers

The purpose of the proposed OHL and strain towers has been discussed at **Section 3.4.1** above. The strain towers will be a lattice-type tower and will be located immediately beneath the Laois-Kilkenny Grid Reinforcement Project from where the proposed OHL will transmit electricity through the proposed substation before returning it to the Laois-Kilkenny Grid Reinforcement Project via approximately 70m of 110kV overhead electricity line. The towers will have a permanent above-ground footprint of c. 70m², with concrete foundations below ground, and will have a maximum height of up to 21m. However, it should again be noted that the precise specifications of the proposed OHL and strain tower may be immaterially altered to ensure compliance with future revisions with Eirgrid specifications.

3.4.4 Site Entrance & Access Tracks

Access to the proposed substation will be provided by 1 no. new site entrance from the L77951 local public road. The proposed site entrance will not be required to accommodate any abnormal loads but has been designed to ensure ease of access and egress for standard HGVs which will deliver construction materials and electrical apparatus to the site. The site entrance will be constructed in accordance with the requirements of the Local Authority, particularly regarding the provision of appropriate site visibility splays to ensure traffic safety.

Following the completion of construction, the site entrance will be appropriately fenced off and gated to prevent unauthorised access. The reinstatement of the site entrance will also incorporate the replanting of hedgerows with native species.

Hedgerows will be appropriately sited to allow for future growth while ensuring, at all times, that visibility splays are maintained during the operational phase.

A total of approximately 0.65km (including c. 0.2km located within the substation compound area) of on-site access tracks will be required for construction purposes and for site access during the operational phase. The access tracks shall be similar to normal agricultural tracks but with a slightly wider typical running width of approximately 5m.

Access tracks will be unsealed and constructed of crushed stone material to allow for permeability. Initial site investigations (trial pitting) have indicated the presence of suitable material which can be reused in the construction of the access tracks and substation compound. Should excess aggregate material be encountered, it is proposed to utilise this material in the construction of areas of hardstanding at the Pinewoods Wind Farm. However, additional aggregate material will also be imported to the proposed development site from local quarries (see **Chapter 13**) to ensure compliance with all necessary Eirgrid specifications.

Additional excavated strips will be required, where necessary, alongside the access track to accommodate drainage.

Some cut/fill in the construction of the access track will be necessary to ensure that horizontal and vertical alignments are suitable to accommodate HGV loads and drainage infrastructure. Where excess material arises from the construction phase, it will be utilised in the construction of trackside berms.

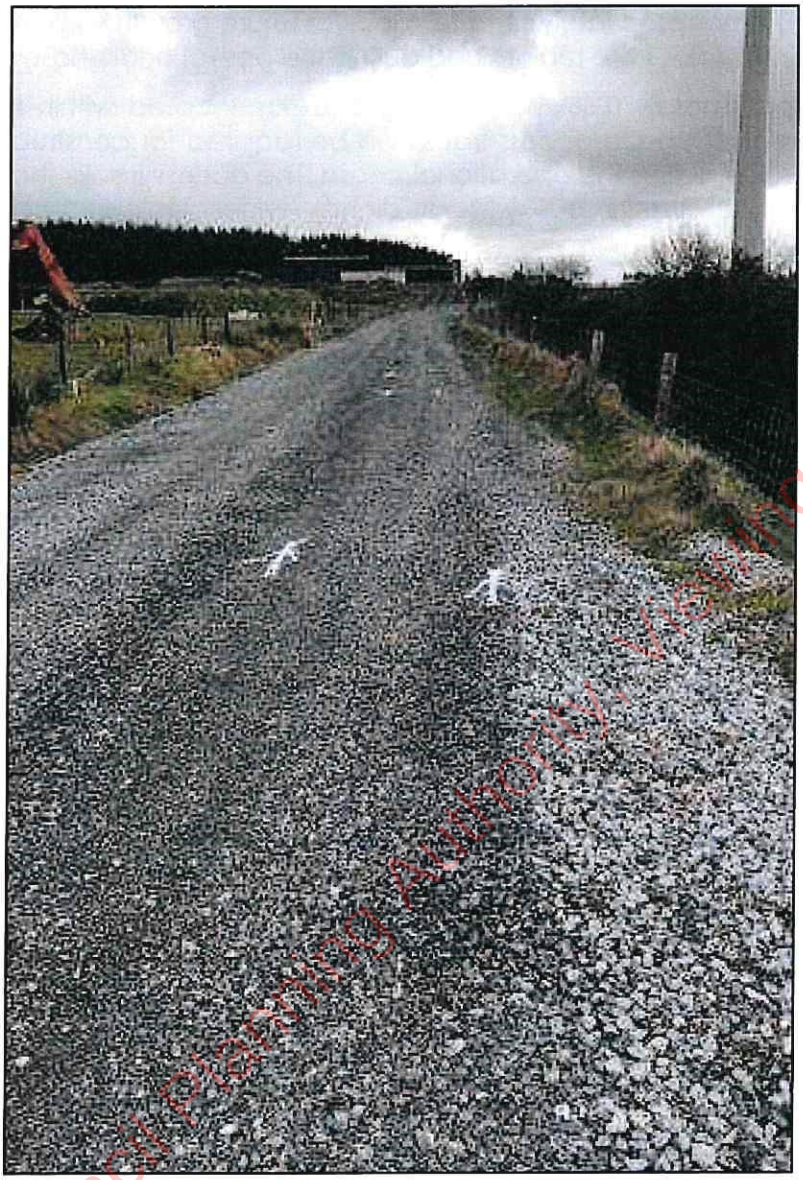

Figure 3.4: Typical Access Track

3.4.5 Earthworks

The site investigations undertaken indicate that sub-surface material generally comprises gravelly silt at upper levels with bedrock (generally comprising shale) being encountered at depths ranging from 1.3m to 6.6m. While a dedicated borrow pit will not be developed, it is proposed that suitable material encountered during construction will be used in the formation of the access track and the substation compound footing. Given the composition of sub-surface material, no blasting of any rock will be required. It should be noted that the material present is not suitable for use as capping materials for the substation compound and this material will be imported to site (see **Chapter 13**).

Due to the sloping nature of the proposed development site, the substation design has incorporated a 'split level' design to substantially reduce the level of excavations which would have been necessary to provide for a single level

compound. However, and notwithstanding the split level design, approximately 62,000m³ of topsoil, subsoil and rock material will be excavated to provide a platform for the proposed substation and to allow for construction of the proposed access track. A cut/fill approach will be implemented to re-use, insofar as possible, material generated through excavations as fill. It is estimated that approximately 21,750m³ will be re-used as fill in the construction of the substation footing and access track; while c. 7,000m³ of topsoil material will be used in the reinstatement and landscaping of the proposed development site following the completion of construction activities.

A Spoil Management Plan will be prepared prior to the commencement of construction at the site and will be agreed with the Planning Authority. The Spoil Management Plan will also cover the storage and restoration of all material excavated during the construction phase.

The use of topsoil and subsoil for reinstatement will be possible through the following methods:-

- Saving the top layer of the soil excavated for landscaping uses over any backfilled areas; and
- Placing the excavated soil along trackside berms and along the boundaries of the proposed substation.

It is estimated that c. 33,250m³ of excess material (topsoil, subsoil and rock material) will arise which cannot be re-used or accommodated within the proposed development site. Where excess material comprises suitable aggregates (estimated to be c. 5,900m³), it is proposed to transport this material to the Pinewoods Wind Farm for use in the construction of access tracks and areas of hardstanding. The use of such material in the construction of the Pinewoods Wind Farm is a significant opportunity to utilise locally won material, of similar or identical geological composition, and to reduce the volume of construction traffic on the wider road network and associated vehicular emissions.

Where excess material comprises topsoil or subsoil, it is proposed, where appropriate to do so, to re-use this material for reinstatement and landscaping purposes within the Pinewoods Wind Farm site for the purposes of:-

- Resurfacing of hardstanding areas;
- Reinstatement of site entrances; and
- Trackside berms and landscaping.

Appropriate locations for the deposition of this material will be carefully selected in accordance with **Section 2.3.5** and **2.3.6** of the preliminary Construction Environmental Management Plan (CEMP) enclosed at **Annex 3.4 (Volume II)**; in consultation with the on-site Ecological Clerk of Works (ECoW) and Environmental Manager (EM); ensuring that, at all times, water quality/siltation measures are fully implemented in advance and that the receiving site is suitable from a ground stability perspective. Spoil will be transported to these locations where it will be placed in accordance with best-practice methods to ensure the long-term stability of the stored material.

In the event that spoil cannot be reused either within the proposed development site or within the permitted Pinewoods Wind Farm, this material will be disposed of in an environmentally sensitive manner by a licensed waste contractor in consultation with the Planning Authority.

The excavation of material to provide the requisite substation platform will result in the creation of cut faces on the northern and eastern boundaries on the substation footprint. Given the results of the site investigations undertaken to date and the presence of rock, it is possible that these will be retained as exposed rock faces and natural vegetation will, through time, colonise the faces. Due to the presence of rock, it is unlikely that retaining structures will be required, however, should same be deemed necessary by the Geotechnical Clerk of Works (GCoW); slope retention measures including gabion baskets, soil nailing or rock anchoring may be installed. For the purposes of this EIAR and as presented at **Annex 9.2**, it is assumed that a bare rock face will be retained throughout the operational phase.

3.4.6 Micro-siting

The immaterial micro-siting of the proposed substation; including control buildings and electrical equipment, access tracks and other elements of the proposed development; following further post-consent site investigations and geotechnical analyses, also forms part of the proposed development.

It is proposed that infrastructure may be micro-sited within the planning application boundary subject to compliance with the mitigation measures included in this EIAR. These immaterial micro-siting deviations have been incorporated, and fully assessed, throughout this EIAR, and will have no material effect on the substantive conclusions of this EIAR.

3.5 Off-Site & Secondary Developments

3.5.1 Aggregates Sources & Construction Materials Haul Route

Where construction materials and aggregates cannot be sourced on-site from construction excavations, they will be obtained from local quarries/suppliers. Only fully licensed quarries which have been subject to EIA and have appropriate planning permission for the volumes of material to be extracted will be used. These aggregates are slated for extraction in the normal course of the relevant quarry's business and therefore will have no additional likely significant environmental effects above and beyond those normally entailed in the operation of the quarry.

Detailed consideration has been given to a number of construction material sources and haul route options to the site as part of the EIAR process (see **Chapter 13**). Candidate quarries, which may be selected to supply materials following a competitive tendering process, are identified at **Annex 13.1** (**Volume II**) and the likely haul routes to the proposed development site indicated. Further details of the construction materials haul route and traffic volumes are provided in **Chapter 13**.

While the final selection of a precise construction material haul route to the site will be dependent on the chosen material supplier(s), all suppliers will be instructed to utilise the extensive national and regional road networks in counties Laois, Kilkenny and Carlow (as relevant) and to avoid local roads insofar as possible. Regardless of the supplier ultimately selected, all construction deliveries will be required to access the site via a specific route from the R430. From the R430, deliveries will follow the L7800, private access tracks associated with the Pinewoods Wind Farm between the L7800 and the L78001, the L78001, private wind farm access tracks between the L78001 to the L77951, and the L77951 before accessing the proposed substation via a dedicated site entrance and access track.

In accordance with a scoping consultation response received from the Roads Design Office of Kilkenny County Council, the L1828 will not be used for the transportation of materials to the site and all suppliers will be prohibited from utilising this road.

3.6 Construction Phase

The construction phase is predicted to last for approximately 15-18 months from commencement of detailed site investigations through to the commissioning of the substation and ending with progressive site reinstatement and landscaping. Construction activities will be completed concurrently with the permitted Pinewoods Wind Farm.

The construction phase of the development will comprise a 6 no. day week with normal working hours from 08:00 to 20:00 Monday to Friday and 08:00 to 18:00 on Saturdays. It may be necessary to undertake occasional works outside of these hours to avail of favourable weather conditions or in the event of any emergency. Where construction activities are necessary outside of the normal working hours, local residents and the Planning Authority will receive prior notification.

No construction works are envisaged during the operational phase. Works during this phase will typically involve the routine maintenance and servicing of the electrical equipment and the site, as necessary

Further details of the construction phase and specific mitigation measures to be implemented are provided in each chapter of this EIAR as they relate to each environmental topic.

3.6.1 Construction Method

The construction method will consist of the following general sequence:-

- Initial surface water protection measures, including the provision of silt fencing along the western boundary of the proposed development site and up-gradient of the Knockardagur stream. It should be noted that construction activities will not commence until siltation/water quality protection measures are installed to the satisfaction of the ECoW and EM;
- The construction of the site entrance, ensuring that requisite traffic visibility splays are provided;
- Progressive installation of surface water protection measures and construction of on-site access track and permanent drainage infrastructure;
- Site preparatory and groundworks associated with the substation compound footprint including control building and strain tower foundations;
- Construction of the control buildings;
- Construction of bases or plinths for electrical apparatus;
- Installation of internal and external electrical apparatus in control buildings and within compound area;
- Erection of strain towers;
- Erection of palisade fencing around substation;
- Commissioning and testing of electrical apparatus;
- Stringing of the 110kV OHL and connection to the Laois-Kilkenny Grid Reinforcement Project;
- Final commissioning of all electrical equipment and apparatus;
- Progressive site reinstatement, restoration and landscaping including the installation of stockproof fencing and erection of gates.

A preliminary Construction & Environmental Management Plan (CEMP) was prepared in respect of the entire Pinewoods Wind Farm as part of its planning application and is enclosed at **Annex 3.4 (Volume II)**. The methods and measures set out in the CEMP, regarding construction activities, will be implemented as relevant to the subject proposed development. A detailed CEMP, addressing the overall development (i.e. permitted wind farm and proposed development) will also be prepared in advance of all construction activities and will incorporate all mitigation measures proposed in this EIAR and will incorporate targeted Construction Method Statements (CMSs) prepared by the appointed Contractor in respect of each element of the proposed development. The preparation, application and documentation of this CEMP will enable all parties – including contractors, designers and competent authorities – to learn from the systematic implementation and assessment of best practice, particularly through the recording of summary information on performance outcomes.

The construction phase will be supervised by a range of environmental and engineering specialist personnel including, but not limited to, a Project Supervisor for the Construction Stage (PSCS), ECoW and Archaeological Clerk of Works (ACoW) and GCoW who will liaise closely with the appointed Contractor's on-site EM to monitor and to ensure that all applicable measures are implemented. The detailed CEMP, which will incorporate further technical information following the undertaking of post-consent detailed design, will be submitted to the Planning Authority for approval prior to any works commencing on the proposed development site. The CEMP shall also provide additional details of intended construction practices including:-

- A detailed Traffic Management Plan for the timing and routing of construction traffic to and from the construction site and associated directional signage, to include, in particular, proposals to facilitate and manage the delivery of loads and alternative arrangements to be put in place for pedestrians and vehicles during the course of site development works;
- Implementation stage details of the proposed construction methods (i.e. CMSs);
- Specific measures to prevent the spillage or deposit of clay, rubble or other debris on the public road network;
- Details of appropriate measures for construction stage noise, dust and vibration, and any monitoring of such levels;
- Storage and containment of all construction related fuel and oil within specially constructed bunds to ensure that fuel spillages are fully contained. All such bunds shall be roofed to exclude rainwater;
- Appropriate provision for re-fuelling of vehicles;
- Off-site disposal of construction/demolition waste and construction-stage details regarding the management of spoil:
- Final drainage design specifications to ensure that surface water run-off is controlled such that no silt or other pollutants enter watercourses in full compliance with the measures outlined in this EIAR; and
- Further details of the intended hours of construction.

The CEMP will also take full cognisance of and incorporate the measures outlined within any specific environmental management plans proposed as part of this EIAR and will also incorporate any specific requirements set out in conditions of consent, subject to a grant of planning permission.

3.6.2 Site Entrance & Access Track

The site entrance and on-site access track will generally be constructed as follows:-

- Construction phase drainage and surface water protection measures will be installed;
- Existing hedgerow will be removed to accommodate the site entrance and provide sufficient visibility splays;
- Topsoil and subsoil will be removed, side cast and stored in separate mounds in appropriate areas adjacent to the site entrance and access track;
- All drains will be appropriately culverted to ensure that flowpaths are maintained and to avoid effects on the existing drainage regime;
- Crushed stone will be laid on a geo-textile mat (where required) and compacted in layers to an appropriate depth; and
- The access tracks will be largely retained during the operational phase to facilitate access for maintenance personnel; however, any section of track which is not required will be reinstated by removing aggregates, replacing with excavated spoil and reseeding.

3.6.3 Temporary Construction Compound

A dedicated temporary construction compound is not required for the proposed development. Construction materials, fuels and chemicals will be stored; and waste management facilities, site offices, parking facilities and welfare facilities provided; at the Pinewoods Wind Farm temporary construction compound; however, following the completion of groundworks associated with the substation, certain non-polluting construction materials and electrical apparatus may be stored at the proposed development site prior to use/installation.

3.6.4 Construction Drainage Management & Disposal

The proposed development site is located in the catchment of the specified Freshwater Pearl Mussel populations as set out in First Schedule of the European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009 (S.I No. 296/2009). Sedimentation poses the biggest threat to the Freshwater Pearl Mussel which is a qualifying interest of the downstream River Barrow and River Nore SAC (Site Code: 002162). All surface water runoff shall be strictly controlled such that no silt or other pollutants enter water courses and that no artificially elevated levels of downstream siltation or plumes of silt arise when substratum is disturbed in accordance with the Fourth Schedule of the Regulations.

Construction works will be carried out in accordance with the 'Land & Soil' and 'Water' assessments and mitigation measures included in this EIAR in order to prevent any likely significant effects on nearby watercourses by debris, silt and hydrocarbons (see **Chapters 6** & **7**). These measures have also been implemented in the Natura Impact Statement (NIS) which accompanies the planning application.

Sources for likely significant effects on the hydrological environment during construction include increased volumes of surface water runoff; the generation of silt laden surface water runoff from excavations and the temporary storage of stockpiled materials; likelihood of surface water and groundwater contamination due to the leakage of oils/fuel from site vehicles; spillage during refuelling operations; and leakage from chemical, waste and fuel storage areas.

Specific mitigation measures are presented in the relevant chapters of this EIAR in relation to each of these issues. The precise implementation and siting of these measures will be determined, subject to planning permission being granted, following the post-consent detailed design process and will be included within the CEMP to be agreed with the Planning Authority prior to the commencement of construction.

During the construction phase, temporary stockpiles of excavated materials will be stored appropriately in designated areas of the site, within the catchment of the surface water drainage measures, in order to guarantee that no silt/sediment laden waters or deleterious matter enters surrounding surface water features. All surface water runoff from stockpiles, excavations or from dewatering operations will be passed through an appropriate attenuation train, including silt fences (also known as silt curtains), silt traps (also known as silt/settlement/stilling ponds) and settlement lagoons[1]. Other surface water protection measures which may be implemented, as appropriate, include silt bags and siltbusters.

The installation these surface water runoff measures will avoid any discharge of silt or sediment laden waters directly to any surface water features prior to being fully treated. At the point of discharge, buffered outfalls (or level spreaders) will be installed to ensure that erosion or scouring does not occur. Further details of the proposed surface water protection measures are enclosed at **Chapter 7** and within the outline Surface Water Management Plan (SWMP) enclosed at **Annex 3.5 (Volume II)**.

The outline SWMP, which will be further developed prior to commencement of development to incorporate any further immaterial design alterations and/or in response to any applicable conditions of consent, referred to above has been prepared in accordance with the overall surface water management measures contained within the SWMP prepared for the permitted Pinewoods Wind Farm (see **Volume II**, **Annex 3.4**, **Appendix B**). The Pinewoods Wind Farm SWMP sets out the overarching surface water management framework which will be implemented across the entire development, including the proposed development. The measures set out in the outline SWMP for the proposed development mirror those of the wind farm SWMP (which were assessed to be appropriate by An Bord Pleanála in respect of that development at this general location) but have been adapted to address the specific characteristics of the proposed development site. The outline SWMP has been prepared to provide consistent water protection measures to ensure that no deleterious matter is discharged, from either the permitted wind farm site or proposed development site, to the hydrological environment.

3.6.5 Chemical Storage and Refuelling

Storage areas for oils, chemicals and fuels will comprise bunded areas of sufficient capacity within the Pinewoods Wind Farm temporary construction compound. Bunds will have a watertight roof structure and will be supplied by a licensed manufacturer to enable adequate safe storage for the quantities of material required. An adequate supply of spill kits will be readily available in order to clean up any minor spillages should they occur. A hydrocarbon interceptor will be installed within the surface water drainage system during the construction phase to trap any

[1] Please note that the titles of surface water protection infrastructure are used interchangeably within this EIAR and accompanying documentation.

hydrocarbons that may be present. A 50m buffer will be observed around all surface water features and no fuel/chemicals shall be handled or stored within this zone.

From the construction compound, fuel will be transported to the works area by a 4x4 in a double skinned bowser with drip trays under a strict protocol and carried out by suitably trained personnel. The bowser/4x4 will be fully stocked with spill kits and absorbent material, with delivery personnel being fully trained to deal with any accidental spills. The bowser will be bunded appropriately for its carrying capacity.

3.6.6 Construction Waste Management

Waste will be generated during the construction phase and the main items of anticipated construction waste are as follows:-

- Hardcore, stone, gravel, concrete, plaster, topsoil, subsoil, timber, concrete blocks and miscellaneous building materials;
- Waste from chemical portaloo toilets;
- Plastics; and
- Oils and chemicals.

Waste disposal measures proposed include:-

- On-site segregation of all waste materials into appropriate categories including, for example, topsoil, bedrock, concrete, bricks, tiles, oils /diesels, metals, dry recyclables e.g. cardboard, plastic, timber;
- All waste materials will be stored in skips or other suitable and sealed receptacles in a designated area of the construction compound;
- Wherever possible, left over materials (e.g. timber off-cuts) shall be re-used on-site;
- Uncontaminated excavated material (rock, topsoil, subsoil, etc.) will be re-used on-site in preference to importation of clean inert fill;
- Based on site investigations, rock is likely to be encountered during excavations and will be utilised during construction;
- All waste leaving the site will be transported by approved and licensed contractors and taken to suitably licensed facilities and will be recycled, recovered or reused, where possible; and
- All waste leaving the site will be recorded in accordance with legal requirements and copies of relevant documentation maintained.

3.6.7 Construction Employment

It is estimated that approximately 100 no. people will be employed during the 15-18 month construction phase. The actual number of personnel present at a given time will depend on the activities being undertaken and will vary throughout the course of the construction programme. Employment will be the responsibility of the construction contractor but it is likely that the workforce will include labour from the local area.

3.6.8 Construction Traffic

Vehicular traffic required for the construction phase is likely to include:-

- Articulated trucks (HGVs) to bring initial equipment onto site and later to bring electrical equipment and apparatus;
- Tipper trucks and excavation plant involved in site development and groundworks; and

- Miscellaneous vehicles and handling equipment, including vehicles associated with construction workforce.

Likely effects from construction traffic could include temporarily increased local traffic levels and traffic noise. Construction traffic on the local road network will be managed in accordance with a Traffic Management Plan and the requirements of the Local Authority. This may include the installation of temporary road signage and traffic lights, as appropriate. Noise arising from construction traffic will be localised, temporary and of a short term duration.

Traffic mitigation measures will be implemented during the construction phase, as follows:-

- Signage at the proposed site entrance giving access information;
- Temporary traffic restrictions kept to minimum duration and extent;
- Diversions put in place to facilitate continued use of roads, in the unlikely event that restrictions are required;
- Strictly enforced speed limits; and
- Provision of a designated person to manage access arrangements and act as a point of contact to the public.

3.7 Operational Phase

During the operational phase, other than routine maintenance and monitoring, there will be no other activities associated with the proposed development. On average, the site will be visited once/twice a week by a light commercial vehicle for maintenance purposes. In exceptional circumstances there may be a requirement to replace an electrical component which may require more substantive works on site; however, large scale construction works would not be required.

Waste will be generated during the operational phase including, for example, cooling oils, lubricating oils and packaging from spare parts or equipment. All waste will be removed from site and reused, recycled or disposed of in accordance with best-practice and all regulations in a licensed facility.

Further details on the operational phase and specific mitigation measures are provided in each chapter of this EIAR as they relate to each environmental topic.

3.8 Decommissioning Phase

While the primary function of the proposed electricity substation is to facilitate the connection of the Pinewoods Wind Farm to the national electricity grid; the proposed substation will, once operational, be largely operated and maintained by Eirgrid as a node on the national electricity network. As a result, it is highly likely that the proposed substation will continue to operate following the decommissioning of the Pinewoods Wind Farm (i.e. after its 25-year operational period) and, therefore, decommissioning of the electricity substation is not proposed.

We wish to reiterate our request that An Bord Pleanála does not impose a condition of consent on the proposed development specifying a time limited operational duration.