5 POPULATION AND HUMAN HEALTH

5.1 INTRODUCTION

5.1.1 Background and Objectives

This Chapter of the EIAR assesses the likely significant effects of the Project on population and human health. The Project refers to all elements of the application for the construction, operation and decommissioning of the proposed Garrane Green Energy Project (the Project) (**Chapter 2: Project Description**). Where adverse effects are predicted, the chapter identifies appropriate mitigation strategies. The assessment considers the potential effects during the following phases of the Project:

- Construction of the Project
- Operation and maintenance of Project
- Decommissioning of Project

This chapter of the EIAR is supported by figures provided in **Volume III**. A glossary of common acronyms can be found in **Appendix 1.4** in **Volume IV** of this EIAR.

5.1.2 Statement of Authority

This Population and Human Health Chapter has been prepared jointly by Ms. Sarah Moore, with assistance from Ms. Siobhan Roddy of Jennings O'Donovan & Partners Limited (JOD). The final review was conducted by Managing Director Mr David Kiely. Further details and biographies/CVs of the authors and reviewer of this chapter have been included in **Appendix 1.1 Author Qualifications**.

Mr. David Kiely is Managing Director of JOD and holds a BE in Civil Engineering from University College Dublin and MSc in Environmental Protection from IT Sligo. He is a Fellow of Engineers Ireland, a Chartered Member of the Institution of Civil Engineers (UK). David has over four decades of experience in the preparation of EIARs and EISs for environmental projects including Wind Farms, Solar Farms, Wastewater Projects, and various commercial developments. David has also been involved in the construction of over 60 wind farms since 1997.

Ms. Sarah Moore is an Environmental Scientist in JOD with over 17 years of environmental consultancy experience. She has obtained a MSc in Environmental Engineering from Queens University, Belfast, and a BSc in Environmental Science from University of Limerick. Since joining JOD, Sarah has been involved as a Project Environmental Scientist on a range of renewable energy, wastewater, structures and commercial projects. She has

experience in the preparation of Appropriate Assessments, Ecological Impact Assessments, Environmental Impact Assessments and Geographic Information Systems.

Ms. Siobhan Roddy is a Graduate Environmental Scientist and holds a BSc (Hons) in Environmental Science and Technology from Dublin City University. Siobhan's key capabilities are in report writing, and ArcGIS. She forms part of the Environmental team responsible for preparing the EIAR Chapters and Appropriate Assessments.

5.1.3 Relevant Legislation and Guidance

The Population and Human Health section of this EIAR is carried out in accordance with legislation and guidance contained in **Chapter 1: Introduction, Chapter 4: Planning and Legislative Context** and The Institute of Environmental Management & Assessment (IEMA) Guidelines **'**Determining Significance for Human Health in Environmental Impact Assessment'[1] and 'Effective Scoping of Human Health in Environmental Impact Assessment'[2].

The distance of receptors from the proposed turbines comply with Department of the Environment, Heritage and Local Government Wind Energy Development Guidelines (WEDG) (2006) and DoHPLG, Draft Revised Wind Energy Development Guidelines (2019). The design, construction, operation and decommissioning of the Project including the installation of associated equipment such as switchgear and substations is governed by the Safety, Health and Welfare at Work Act 2005 (as amended) and The Safety, Health and Welfare at Work (General Application) Regulations 2007 to 2023.

The EPA 2015[3] report produced entitled the *'Investigation into the Assessment of Health Impacts within National Environmental Regulation Processes*'. This document outlines how human health impacts are dealt with, throughout the European Union (EU) by environmental regulators with an emphasis on the role at the planning / environment interface was complied with.

European Commission guidance relating to the implementation of the 2014 Directive, in reference to "human health" states "human health" is a very broad factor that would be highly Project dependent. The notion of human health should be considered in the context

[1] IEMA Guide: Determining Significance for Human Health in Environmental Impact Assessment. (2022) https://www.iema.net/media/yljb2nbs/iema-eia-guide-to-determining-significance-for-human-health-nov-2022.pdf
[2] IEMA Guide: Effective Scoping of Human Health in Environmental Impact Assessment. (2022) https://www.iema.net/media/s35fughe/iema-eia-guide-to-effective-scoping-of-human-health-nov-2022.pdf
[3] Golder Associates (2015) *Investigation into the Assessment of Health Impacts within National Environmental Regulation Processes*. Available online at: https://www.epa.ie/publications/research/environment--health/assessment-of-health-impacts-report.php [Accessed: 06/08/2025]

of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation, and decommissioning of a Project in relation to workers on the Project and surrounding population.[4]"

5.1.4 Assessment Structure

In line with the EIA Directive, as amended and current EPA guidelines (2022) the structure of this chapter is as follows:

- Assessment Methodology and Significance Criteria – a description of the methods used in desktop surveys and in the assessment of the significance of effects;
- Baseline Description – a description of the socio-economic profile of the local area of the Project i.e., local electoral areas and of County Limerick and Ireland, and based on a desk-based study using Central Statistics Office (CSO) data;
- Assessment of Potential Effects – including the "Do Nothing" scenario (accounts for likely changes in the baseline due to natural changes and nearby projects) and identifying the ways in which the population and human health of the area could be affected by the Project during the construction, operational and decommissioning stages;
- Mitigation Measures and Residual Effects – a description of measures recommended to avoid, prevent, reduce or, if necessary, offset any potential significant adverse effects and a summary of the significance of any residual effects of the Project after mitigation measures have been implemented;
- Cumulative Effects – identifying the potential for effects of the Project to combine with those from other existing, permitted and/or proposed projects to affect the population and human health. See **Tables 2.1** and **2.2** (20km radius from the Site for large scale developments such as wind farms and 10km radius from Site for other major developments, as is consistent with the EPA "Guidelines on the information to be contained in environmental impact assessment reports" (2022) and best practice.
- Summary of Significant Effects, and
- Statement of Significance – See **Chapter 1: Introduction - Table 1.4: Effect Classification Terminology (EPA Guidelines, 2022)** which highlights the general

[4] Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report, European Commission, 2017 http://ec.europa.eu/environment/eia/eia-support.htm [Accessed: 06/08/2025]

framework for the assessment of significance of effects and **Table 1.5**: **Rating of Significant Environmental Effects (EPA Guidelines, 2022)** which describes how the significance of the potential effects of the Development have been classified by comparing the character of the predicted effect to the sensitivity of the receiving environment.

Section 1.2.2 of the EIA Directive as amended, amalgamates the findings of other assessments as part of the EIA process. Limited interactions with Human Health are possible and consideration has been given to the findings of the following assessments:

- Chapter 9: Soils and Geology
- Chapter 10: Hydrology and Hydrogeology
- Chapter 11: Noise and Vibration
- Chapter 12: Landscape and Visual Assessment
- Chapter 13: Air Quality and Climate
- Chapter 14: Shadow Flicker and EMI
- Chapter 17: Traffic and Transport

Where required, mitigation measures have been proposed to avoid, prevent, reduce or, if necessary, offset any identified significant adverse effects.

5.1.5 Scope of the Assessment

The effect of a development on population and human health includes the following broad areas of investigation:

- Population and Settlement Patterns
- Economic Activity and Tourism
- Employment
- Topography and Land Use
- Health Impacts of Wind Farms
- Property Value / Residential Amenity and
- Natural disaster and Major Accidents.

This assessment considers the following criteria:

- Sensitive receptors in the area
- Existing land use in the area
- General amenities in the area
- Potential effects from water, noise, shadow flicker, air quality and traffic.

- Vulnerability of the project to risk of major accident

5.2 ASSESSMENT METHODOLOGY

Baseline conditions: A desk study was undertaken to describe the baseline conditions of the receiving environment across a range of Population and Human Health factors and are presented in **Section 5.3** of this chapter. Where Central Statistics Office (CSO) data is available, these data are assessed by Study Area; within the locality of the Wind Farm Site and compared with the both the County and National CSO data. These Study Areas are described in **Section 5.3.1** of this chapter. This assessment has been carried out using latest available Central Statistics Office (CSO) data, information and maps from the current Limerick Development Plan 2022-2028; and other relevant studies.

Do Nothing Impact Assessment: This section outlines the impact if the Project were not to go ahead and the likely evolution thereof without the Project as far as natural changes from the baseline scenario.

Assessment of Potential Effects: The potential effects of the Project, are assessed as documented in **Section 5.4**. The potential effects are classified as outlined in **Table 1.5** of the Introduction Chapter (as prescribed in the EPA Guidelines, 2022). Typically, for each impact assessed the quality of the impact, for example, positive or adverse, the significance of the effect, for example, slight or moderate and the duration of the impact, for example, short-term or long-term are assigned. If potentially significant adverse effects are identified, the proposed practical mitigation measures to prevent, reduce, avoid or, if necessary, offset such effects are documented in **Section 5.5.**

Mitigation measures: The mitigation hierarchy approach, as outlined in Chapter 1 of Avoidance, Reduction/ Elimination and Remedy aims to avoid significant impact through embedded mitigation (avoidance), and where avoidance is not possible, through mitigation measures. Remedy, the lowest rung of the mitigation hierarchy is only considered where mitigation measures are not feasible or possible.

Cumulative Assessment: Other developments (other existing, pending and/or permitted developments) within 20km (wind farms) and 10km (other developments) of the Project and along TDR (shown in **Appendix 1.2**), in conjunction with the Project, are assessed to determine the potential cumulative effects on Population and Human Health. Further information can be found in **Chapter 2: Project Description**.

Information regarding human beings and general socio-economic data were sourced from the following websites:

- Central Statistics Office (www.cso.ie);
- Limerick Development Plan 2022-2028;
- The Southern Regional Assembly
- Regional Spatial & Economic Strategy (RSES) 2019-2031 https://www.emra.ie/rses/
- Fáilte Ireland (www.faillteireland.ie);
- National Parks and Wildlife Services (www.npws.ie);
- Sustainable Energy Authority of Ireland (www.seai.ie);
- Limerick County Council (www.limerick.ie);
- The National Planning Framework Ireland 2040 (www.npf.ie)

Consideration was also given to the 2015[5] report produced by the EPA entitled the *'Investigation into the Assessment of Health Impacts within National Environmental Regulation Processes*' that outlines how human health impacts are dealt with, throughout the European Union (EU) by environmental regulators with an emphasis on the role at the planning / environment interface.

5.2.1 Evaluation of Potential Effects

Following on from the identification of the baseline environment, the available data is utilised to identify, categorise and assess potential impacts likely to have a significant effect on the population and human health, as a result of the proposed EIA Project.

The statutory criteria (EPA, 2022) for the assessment of impacts require that likely impacts are described with respect to their extent, magnitude, type (i.e. adverse, positive or neutral) probability, duration, frequency, reversibility, and transboundary nature (if applicable). The descriptors used in this chapter are those set out in EPA Guidelines (2022) 'Glossary of Impacts'.

Impacts may be categorised as follows:
Direct: where the existing socio-economic baseline along or in close proximity to the Project is altered, in whole or in part.

Indirect: where the socio-economic baseline beyond the Project is altered by activities related to the construction or operation.

[5] Golder Associates (2015) *Investigation into the Assessment of Health Impacts within National Environmental Regulation Processes*. Available online at: http://www.epa.ie/pubs/reports/research/health/assessmentofhealthimpactsreport.html [Accessed 06/08/2025]

No Impact: where the Project has neither negative nor a positive impact upon the socio-economic baseline.

5.2.1.1 Magnitude

The magnitude of potential impacts has been defined in accordance with the criteria provided in the 2022 EPA publication 'Guidelines on the information to be contained in Environmental Impact Statements' as outlined within **Table 5.1** below.

Table 5.1: Describing the Significance of Effect

Magnitude of Impact	Description
Imperceptible	An effect capable of measurement but without significant consequences
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends
Significant	An effect, which by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment
Very significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment
Profound	An effect which obliterates sensitive characteristics
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities

5.2.1.2 Significance Criteria

The significance of the potential effects of the Project have been classified by taking into account the sensitivity of receptors and the character of the potential effect on them, combined with the likelihood of an impact occurring as defined in **Table 5.2.**

Table 5.2: Determining Significance of the Effect

	Magnitude of Impact				
Importance of Attribute		**Negligible**	**Small**	**Moderate**	**Large**
	Extremely High	Imperceptible	Significant	Profound	Profound
	Very High	Imperceptible	Significant/ Moderate	Profound/ Significant	Profound
	High	Imperceptible	Moderate/ Slight	Significant/ Moderate	Severe/ Significant
	Medium	Imperceptible	Slight	Moderate	Significant
	Low	Imperceptible	Imperceptible	Slight	Slight/ Moderate

5.2.2 Definition of Study Areas

Four geographical Study Areas have been outlined for this assessment. Data from Study Area 1 (District Electoral Divisions which include the townlands in the vicinity of the Project Site) are used to assess local impacts within this chapter, as the Project falls within Study Area 1, it is these areas that will be impacted the most by the construction, operation and decommissioning of the wind energy development. The local Study Area 1 lies within Study Area 2 (County Limerick) and Study Area 3 (The Southern Region Assembly) Study Area 4 (Republic of Ireland) provide national baseline statistical data for this chapter. The four Study Areas are outlined below:

- **Study Area 1: The Project Site and Environs – District Electoral Divisions (DEDs**) **Colmanswell, Tobernea, Rathluirc and Bruree** (90.20km^2). (**Figure 5.1**).
- **Study Area 2**: **Limerick County** (2,755.8km^2).
- **Study Area 3: The Midwest Region: Clare, Limerick and Tipperary** (8,248km^2)
- **Study Area 4: The Republic of Ireland** (70,273km^2).

Study Area 1: The Project area and Environs – District Electoral Divisions (DEDs) (DEDs Colmanswell, Tobernea, Rathluirc and Bruree (90.20km^2).

In order to make conclusions about the population and other statistics in the vicinity of the Development, District Electoral Divisions (DEDs) were analysed.

The entire Project falls under the Municipal District (MD) of Cappamore-Kilmallock and in the Electoral Divisions (ED) of **Colmanswell, Tobernea, Rathluirc and Bruree.**

Colmanswell[6] is separated into the distinct townlands of Ballincolly, Ballyclogh Lower, Ballyclogh Upper, Ballynagoul, Clashgortmore, Creggane, Fort East, Fort Middle, Fort West, Foxhall East, Foxhall West, Garrane, Garryfine, Gortroe and Killacolla.

Bruree[7] is separated into the townlands of Ballinoran, Ballinwillin, Ballyclogh Lower, Ballyclogh Upper, Ballyfookeen, Ballyhinnaught, Ballynoe, Ballyteige Lower, Ballyteige Upper, Bruree, Cappanafaraha, Cooleen, Coolreagh, Dromacummer East,Dromacummer West, East Dromacummer Fortyacres, Garrane, Garroose, Garryfine, Harding Grove, Howardstown North, Howardstown South, Kilbreedy, Knockannacreeva, Knockaunavoddig, Knockfenora, Knockmore, Lackanagrour, Lotteragh Lower, Lotteragh Upper, Lower Ballyclogh Lower Ballyteige Lower Lotteragh Mounteagle, North Howardstown, South Howardstown, Upper Ballyclogh, Upper Ballyteige, Upper Lotteragh and West Dromacummer.

Tobernea[8] is separated into the townlands of Commons, Effin, Garrynancoonagh North, Garrynancoonagh South, Garrynderk North, Garrynderk South, Gortnacrank, Leagane, Mountblakeney, Thomastown, Tobernea, Tobernea East, Tobernea Middle and Tobernea West

Rathluirc[9] is separated into the townlands of Ballydaheen, Ballyhubbo, Ballysallagh, Broghill North, Broghill South, Coarliss, Fortlands, Gortskagh, Kiltoohig, Kippane, Liscullane, Rathgoggan Middle, Rathgoggan North, Rathgoggan South and Rathmorgan.

Study Area 1 is shown in **Figure 5.1:** in Volume III of the EIAR.

Study Area 2: **Limerick County** (2,755.8km^2)

The Project Site, Grid Connection Route (GCR) and sections of the Turbine Delivery Route (TDR) fall within County Limerick. A full description of the GCR and TDR are detailed in **Chapter 2: Project Description.** As all these elements of the Project have the potential to impact upon the population and human health, County Limerick was chosen as a study area to conclude the extent of effects (if any) on the population and human health within the county as a result of the Project.

[6] https://www.townlands.ie/limerick/colmanswell2/ [Accessed 06/08/2025]
[7] https://www.townlands.ie/limerick/bruree1/ [Accessed 06/08/2025]
[8] https://www.townlands.ie/limerick/tobernea/ [Accessed 06/08/2025]
[9] https://www.townlands.ie/cork/rathluirc/ [Accessed 06/08/2025]

Study Area 3: The Midwest Region[10] (8,248km^2)

Study Area 2 falls within Study Area 3: The Midwest Region. The Midwest Region consists of counties Clare, Limerick and Tipperary. The Midwest Region is a Strategic Planning Area of the Southern Regional Assembly.

Study Area 4: The Republic of Ireland (70,273km^2).

Study area 4, Ireland, provides a national baseline of statistical data for this chapter.

5.2.3 Impact Assessment Methodology

Descriptive terminology for impact assessment, and the general framework for the assessment of significance of effects, follows the systematic method of description from the EPA Guidelines (2022), as outlined in **Chapter 1: Introduction, Table 1.4**. The sensitive receptors in this Population and Human Health study are primarily people and where they reside. This is best measured by using habitable dwellings and community areas.

There are 166 sensitive receptors within a 2km radius of the proposed turbines, comprising one-off houses, clusters of houses and farm holdings (**Figure 1.3**). A minimum separation distance between turbines and occupied dwellings of 680m has been achieved. .This complies with the draft 2019 WEDGs which recommend a minimum setback distance of four times the tip height (170m x 4 = 680m) from a proposed turbine. There is one receptor, involved with the Project, within 680m of the Project. Written consent has been obtained in the case where receptors are within 680m of a proposed turbine. All receptors located within 2km of the proposed turbines are shown on **Figure 1.3** of **Chapter: 1 Introduction.**

5.2.4 Consultation

Consultation with relevant organisations was initiated during the initial stage of the EIA process to identify any effects (on population and human health) that could potentially result from the Project. A summary of the consultation responses is presented in **Table 5.3**.

[10] https://www.southernassembly.ie/the-assembly [Accessed: 06/0/8/2025]

Table 5.3: Summary of Consultation response on Population and Human Health

Consultee	Type and Date	Summary of Consultee Response	EIAR sections where comments have been addressed
HSE	07/06/2024	**Public Consultation** All parties affected by the proposed development, including those who may benefit financially from the project, must be fully informed of what the proposal entails especially with regard to potential impacts on surrounding areas. Sensitive receptors and other stakeholders should be identified to ensure all necessary and appropriate mitigation measures are put in place to reduce the likelihood of any complaints about the proposed wind farm development in the future. The Environmental Impact Assessment Report (EIAR) should clearly demonstrate the link between public consultations and how those consultations have influenced the decision-making process in the EIA. To assist with the consultation and planning process it is recommended that the applicant develops a dedicated website for the proposed windfarm development. All correspondence, maps, project updates and documentation including the EIAR should be uploaded to the website. The EIAR should state the period of planning permission sought, the length of time construction is estimated to take and if it is anticipated that the windfarm development will be decommissioned and removed or will continue to operate (following any further planning consent) at the end of this period of planning permission (should permission be granted) **Noise & Vibration** The potential impacts for noise and vibration from the proposed development on all noise sensitive locations must be clearly identified in the EIAR. The EIAR must also consider the appropriateness and effectiveness of all proposed mitigation measures to minimise noise and vibration. A baseline noise monitoring survey should be undertaken both day and night to establish the existing background noise levels. Noise from any existing turbines in the area should not be included as part of the back ground levels. In addition, an assessment of the predicted noise impacts during the construction phase and the operational phase of the proposed windfarm development must be undertaken which details the change in the noise environment resulting from the proposed development. The Draft Revised Wind Energy Development Guidelines were published in December 2019. Whilst these have yet to be adopted, any proposed wind farm development should have consideration of the draft Guidelines.	Public Consultation: Section 1.10.1 of **Chapter 1: Introduction** summarises the public consultation process. Additionally, a report has been included as **Appendix 1.5 Community Engagement Report** detailing all public consultation for the Project. A copy of the EIAR and associated planning documents may be viewed online on the dedicated project SID website (www.garranegreenenergyplanning.ie). Decommissioning Phase: A designated decommissioning plan has been appended to this EIAR as **Appendix 2.1 Construction Environmental Management Plan – Management Plan 6**. Details of decommissioning works are included in this plan, including the fate of turbines and materials. Siting and Location of Turbines: Detailed maps and specifications of turbine locations, heights, and models are included in **Chapter 2: Project Description** and **Volume III: EIAR Figures** and also in the **Planning Drawings**.

Consultee	Type and Date	Summary of Consultee Response	EIAR sections where comments have been addressed
		Shadow Flicker It is recommended that a shadow flicker assessment is undertaken to identify any dwellings and sensitive receptors which may be impacted by shadow flicker. The assessment must include all proposed mitigation measures. Dwellings should include all occupied properties and any existing or 5 proposed properties for which planning consent has been granted for construction or refurbishment. It is recommended that turbine selection will be based on the most advanced available technology that permits shut down during times when residents are exposed to shadow flicker. As a result, no dwelling should be exposed to shadow flicker. **Air Quality** Due to the nature of the proposed construction works generation of airborne dust has the potential to have significant impacts on sensitive receptors. A Construction Environmental Management Plan (CEMP) should be included in the EIAR which details dust control and mitigation measures. Measures should include: • Sweeping of hard road surfaces • Provision of a water bowser on site, regular spraying of haul roads • Wheel washing facilities at site exit • Restrict speed on site • Provide covers to all delivery trucks to minimise dust generation • Inspect and clean public roads in the vicinity if necessary • Material stockpiling provided with adequate protection from the wind • Dust monitoring at the site boundary • Truck inspection and maintenance plan • Details of a road maintenance agreement between the wind farm operator and the Local Roads Authority to clarify responsibility for the upkeep and repair of access roads during the construction phase of the project **Surface and Ground Water Quality** The proposed development has the potential to have a significant impact on the quality of both surface and ground water. All drinking water sources, both surface and ground water, must be identified. Public and Group Water Scheme sources and supplies should be identified in addition to any private wells supplying potable water to houses in the vicinity of the proposed development. Measures to ensure that all sources and supplies are protected should be described. The Environmental Health Service recommends that a walk over	Noise and Vibration: Assessment of potential noise and vibration impacts on sensitive locations, along with proposed mitigation measures have been included in **Chapter 11: Noise and Vibration**, specifically in **Sections 11.7** and **11.8**. Shadow Flicker: Identification of dwellings affected by shadow flicker and implementation of mitigation strategies are included in **Chapter 14: Shadow Flicker**, and specifically in **Sections 14.2.7** and **14.2.9**. Air Quality: A designated air and climate assessment has been included as **Chapter 13** of the EIAR. Dust generation has also been assessed in **Appendix 2.1: Construction Environmental Management Plan** (**Section 3.5**). Surface and Groundwater Quality: A designated assessment of water and water resources has been included in **Chapter 10: Hydrology and Hydrogeology**. Identification of all drinking water

Consultee	Type and Date	Summary of Consultee Response	EIAR sections where comments have been addressed
		survey of the site is undertaken in addition to a desktop analysis of Geological Survey of Ireland data in order to identify the location of private wells used for drinking water purposes. Any potential significant impacts to drinking water sources should be assessed. Details of bedrock, overburden, vulnerability, groundwater flows, aquifers and catchment areas should be considered when assessing potential impacts and any proposed mitigation measures. Any impacts on surface water as a result of the construction of the underground cables should be identified and addressed in the EIAR. **Cumulative Impacts** All existing or proposed wind farm developments in the vicinity should be clearly identified in the EIAR. The impact on sensitive receptors of the proposed development combined with any other wind farm/renewable energy developments in the vicinity should be considered. The EIAR should include a detailed assessment of any likely significant cumulative impacts of the proposed windfarm development.	sources and measures to protect them has been included in **Sections 10.4**, **10.5 & 10.6.** Cumulative Impacts: Cumulative effects are assessed in all assessment chapters of this EIAR. Please see **Sections 5.5.8, 6.6, 7.8, 8.15.4, 9.4.5, 10.7.4, 11.8.3, 12.4.5, 13.3.8, 14.2.8, 15.6, 16.4.6, 16.5.11, 16.7.7, 16.8.6, 16.9.9 & 17.5** These aspects have been thoroughly addressed in the EIAR and the Project's potential impacts have been comprehensively evaluated.
TII	Letter in Response to Scoping Report received on 28/05/2024	**Material Assets** The proposed development includes for upgrade to the existing entrance on the N20, national road. Although the site access location is not detailed in the EIAR Scoping document, TII's records indicate that the site adjoins the N20 at a location where the national road is subject to a 100kph speed limit regime. It is critical that the developer/applicant be aware that official policy concerning access to national roads seeks to avoid the creation of additional access points from new development or the generation of increased traffic from existing accesses (i.e. non-public road access) to national roads, to which speed limits greater than 50 kph apply. Therefore, there are policy and road safety considerations that would need to be resolved in any subsequent application and available alternative arrangements to the local road network should be utilised and not direct access to the national road, contrary to the provisions of official policy. It is noted with concern that the EIAR Scoping Report does not appear to consider or address this potential policy conflict.	Material Assets and Other Issues and Traffic and Transport: Traffic Addressed in **Chapter 17: Traffic and Transport, Section 17.1.4** and in the **Traffic and Transport Assessment** (**Appendix 17.1)** and the **Traffic Management Plan** in **Appendix 17.2** Landscape and Visual: Visual impacts have been assessed in **Chapter 12: Landscape and Visual.** Visual impacts on Major Routes have been assessed in **Section 12.4.3.7.**

Consultee	Type and Date	Summary of Consultee Response	EIAR sections where comments have been addressed
		Section 2.6 of the DoECLG Guidelines provides that planning authorities may apply a less restrictive approach to the management of access to a national road in 'exceptional circumstances' but only as part of the process of reviewing or varying the relevant development plan. However, the current Limerick City and County Development Plan has not provided any agreed 'exceptional circumstances' cases for development accessing a national road, such as that potentially proposed in this EIAR Scoping referral. With respect to EIAR Scoping issues, the recommendations indicated below provide only general guidance for the preparation of an EIAR, which may affect the national road network. The developer should have regard, inter alia, to the following: TII notes that the subject site adjoins the N20, national road. Access to the road network shall be developed in accordance with official policy and road safety considerations. As outlined above, access directly to a national road outside a reduced 50 – 60kph speed limit location should be avoided in accordance with the provisions of official policy. Alternative arrangements should be identified to ensure adherence to the provisions of official policy. Consultations should be had with the relevant Local Authority/National Roads Design Office, with regard to the locations of existing and future national road schemes, including the National Development Plan (NDP) investment objective M20 Cork – Limerick TII would be specifically concerned as to potential significant impacts the development would have on the national road network (and junctions with national roads) in the proximity of the proposed development, including the potential haul route. **Landscape and Visual** The developer should assess visual impacts from existing national roads. The developer should have regard to any EIAR/EIS and all conditions and/or modifications imposed by An Bord Pleanála regarding road schemes in the area. The developer should, in particular, have regard to any potential cumulative impacts. The developer, in preparing EIAR, should have regard to TII Publications (formerly DMRB and the Manual of Contract Documents for Road Works). The EIAR should have regard to TII's Environmental Assessment and Construction Guidelines, including the Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes (National Road Authority (NRA), 2014).	Noise and Vibration: Assessment of potential noise and vibration impacts on sensitive locations, along with proposed mitigation measures have been included in **Chapter 11: Noise and Vibration**, specifically in **Sections 11.7** and **11.8**.

Consultee	Type and Date	Summary of Consultee Response	EIAR sections where comments have been addressed
		Noise The EIAR should consider the 'European Communities (Environmental Noise) Regulations, 2018, (S.I. no. 549 of 2018)', and, in particular, how the development will affect future action plans by the relevant competent authority. The developer may need to consider the incorporation of noise barriers to reduce noise impacts (see 'Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes (NRA, 2014)'). **Traffic and Transport** It would be important that, where appropriate, subject to meeting the appropriate thresholds and criteria and having regard to best practice, a Traffic and Transport Assessment (TTA) be carried out in accordance with relevant guidelines, noting traffic volumes attending the site and traffic routes to/from the site, with reference to impacts on the national road network and junctions of lower category roads with national roads. In relation to national roads, TII's 'Traffic and Transport Assessment Guidelines' (2014) should be referred to in relation to proposed development with potential impacts on the national road network. The scheme promoter is also advised to have regard to Section 2.2 of TII's TTA Guidelines, which addresses requirements for sub-threshold TTA. Any improvements required to facilitate development should be identified. It will be the responsibility of the developer to pay for the costs of any improvements to national roads to facilitate the private development proposed, as TII will not be responsible for such costs. The designers are asked to consult TII Publications to determine whether a Road Safety Audit is required. In the interests of maintaining the safety and standard of the national road network, the EIAR should identify the methods/techniques proposed for any works traversing/in proximity to the national road network. TII recommends that the applicant/developer should clearly identify haul routes proposed and fully assess the network to be traversed. Where abnormal 'weight' loads are a feature of the development, e.g., turbine or substation components, separate structure approvals/permits and other licences may be required in connection with the proposed haul route. All national road structures on the haul route through all the relevant County Council administrative areas should be checked by the applicant/developer to confirm their capacity to accommodate any abnormal 'weight' load proposed.	

Consultee	Type and Date	Summary of Consultee Response	EIAR sections where comments have been addressed
		In addition, the haul route should be assessed to confirm capacity to accommodate abnormal 'length' loads and any temporary works required are identified. The national road network is managed by a combination of PPP Concessions, Motorway Maintenance and Renewal Contractors (MMaRC) and local road authorities, in association with TII. The applicant/developer should also consult with all PPP Companies, MMaRC Contractors and road authorities over which the haul route traverses, to ascertain any operational requirements, including delivery timetabling, etc., to ensure that the strategic function of the national road network is safeguarded. Where temporary works within any MMaRC Boundary are required to facilitate the transport of turbine components to site, the applicant/developer shall contact thirdpartyworks@tii.ie in advance, as a works specific Deed of Indemnity will be needed by TII before the works can take place. Additionally, any damage caused to the pavement on the existing national road arising from any temporary works due to the turning movement of abnormal loads (e.g., tearing of the surface course, etc.) shall be rectified in accordance with TII Pavement Standards and details in this regard shall be agreed with the road authority prior to the commencement of any development on site. Any Road Safety Audit requirements should be addressed. Any grid connection and cable routing proposals should be developed to safeguard proposed road schemes, as TII will not be responsible for costs associated with future relocation of cable routing where proposals are catered for in an area of a proposed national road scheme. In that regard, consideration should be given to routing options, use of existing crossings, depth of cable laying, etc. In the context of the existing national road network, in accordance with the National Planning Framework National Strategic Outcome No. 2 'Enhanced Regional Accessibility', there is a requirement to maintain the strategic capacity and safety of the network. This requirement is further reflected in the NDP, the National Investment Framework for Transport in Ireland and also the existing Statutory Section 28 'Spatial Planning and National Roads Guidelines for Planning Authorities'.	

Consultee	Type and Date	Summary of Consultee Response	EIAR sections where comments have been addressed
		The provision of cabling along the national road network represents a number of significant implications for TII and road authorities in the management and maintenance of the strategic national road network and TII is of the opinion that grid connection cable routing should reflect the foregoing provisions of official policy. Consistent with CAP24, for all renewable energy developments requiring grid connection to the national grid, TII recommends that a full assessment of all route alternatives for grid connection takes place, including alternatives to public road, where appropriate. In TII's experience, grid connection accommodated on national roads has the potential, inter alia, to result in technical road safety issues such as differential settlement due to backfilling trenches and can impact on ability and cost of general maintenance, upgrades and safety works to existing national roads. Having regard to the foregoing, in TII's opinion, the grid connection routing, where it is proposed to utilise the road network, must demonstrate that the route proposed represents the 'optimal solution'. In addition, there is a finite road space available to accommodate all utilities in the road network and TII recommends that a co-ordinated approach to grid connection routing in this area is achieved to avoid risk to the effective delivery of renewable energy projects. Other consents or licences may be required from the road authority for any trenching or cabling proposals crossing the national road. TII requests referral of all proposals agreed and licensed between the road authority and the applicant, which affect the national road network. Cable routing should avoid all impacts to existing TII infrastructure such as traffic counters, weather stations, etc. and works required to such infrastructure shall only be undertaken in consultation with and subject to the agreement of TII. Any costs attributable shall be borne by the applicant/developer. The developer should also be aware that separate approvals may be required for works traversing the national road network. Notwithstanding any of the above, the developer should be aware that this list is non-exhaustive, thus site and development specific issues should be addressed in accordance with best practice.	

Consultee	Type and Date	Summary of Consultee Response	EIAR sections where comments have been addressed
Failte Ireland	Letter in Response to Scoping Report received on 04/06/2024	**Air Quality and Climate** Tourism impact upon air quality is dependent on the activity proposed and sensitivity of the location. If the tourism project includes a large increase in transportation services, collection of baseline air emission data is advised. Transportation emissions affect not only air quality, but also greenhouse gases. Changing climatic patterns due to climate change should be factored into this analysis. **Noise and Vibration** A link between tourism and this prescribed environmental factor, beyond the normal development impacts, is rare, however the impact upon tourism of issues of noise and vibration can be significant. Construction adjoining hotels for example should consider the sensitivity of the development and ensure mitigation is in place. **Material Assets; Traffic and Transport** The different transport patterns associated with tourism activities is a key impact of tourism and should be considered especially for tourism projects. These produce temporal and seasonal changes on the norm and specialist consideration and interpretation should be given. Tourism proposals should, where possible, be well served by public transport and should be accessible by modes other than the car. The impact of traffic on tourism assets can be substantial and can vary in severity according to season, the weather, etc. The impact of construction traffic can be a particular concern in tourism sensitive areas in terms of noise pollution and visual impact. The construction programme of developments should work to avoid peak tourism periods in tourism areas and should consider planned or anticipated tourism events and festivals. **Cultural Heritage** Cultural heritage can be a key component of tourism projects and the impact of tourism on the maintenance of cultural heritage should be given the utmost consideration, whether positive or negative. As a tourism attraction, cultural heritage should be strongly considered in non-tourism developments and the impact upon tourism considered as a potential impact. **Major Accident and Natural Disaster** There is a requirement for tourist developments to describe expected significant effects on the environment of the proposed development's vulnerability to major accidents and/or natural disasters relevant to it. Where appropriate measures should be identified to prevent	<u>Air Quality:</u> A designated air and climate assessment has been included as **Chapter 13** of the EIAR. Dust generation has also been assessed in **Appendix 2.1: Construction Environmental Management Plan** (**Section 3.5**). <u>Noise and Vibration:</u> Assessment of potential noise and vibration impacts on sensitive locations, along with proposed mitigation measures have been included in **Chapter 11: Noise and Vibration**, specifically in **Sections 11.7** and **11.8**. <u>Material Assets and Traffic and Transport:</u> Traffic Addressed in **Chapter 17: Traffic and Transport, Section 17.1.4** and in the **Traffic and Transport Assessment (Appendix 17.1)** and the **Traffic Management Plan in Appendix 17.2** <u>Major Accident and Natural Disaster:</u> Natural Disasters and Major Accidents are assessed in **Section 5.3.9** of this chapter.

Consultee	Type and Date	Summary of Consultee Response	EIAR sections where comments have been addressed
		or mitigate the significant adverse effects of such accidents or disasters, including resulting from climate change, on the environment and detail the preparedness for the proposed response.	Cultural Heritage Cultural heritage and tourism are addressed in **Chapter 15: Archaeology and Cultural Heritage**, with an assessment of potential effects in **Section 15.4.**.

5.3 BASELINE DESCRIPTION

5.3.1 Population and Settlement Patterns

Study Area 1: Site and Environs (DEDs Colmanswell, Tobernea, Rathluirc and Bruree (90.20km^2).

According to the 2022 census, there is one defined community settlement with a population greater than 3,970 people within a 10km radius of the Project. The town of Charleville, the nearest urban settlement to the Project, is located 2.5km (closest turbine) south-west of the Site and has a population of 3,970[11] people (CSO). The nearest major centre of population to the Site is Limerick City, County Limerick, which is located 22.9km north of the Project. According to the CSO, there were 102,287 persons living in Limerick City, in 2022.

The area surrounding the Site is largely rural, with a mixture of agricultural grassland, commercial forestry plantations, private roads and public roads and a local Wastewater Treatment Plant is located adjacent to the Project. Isolated residences and farmsteads are also scattered throughout the area. Nearby settlements include the villages of Charleville 2.5km (closest turbine) south-west and Kilmallock 6.0km east.

Over the last five years, Limerick City and County Council have granted planning permission in the Study Area 1 for development including one-off housing, alterations to existing dwelling houses, agricultural buildings and relocation of existing farm entrances. The 2022 Census statistics note 2,578 occupied permanent residences in the Study Area 1.

There are 166 receptors within 2km of the proposed turbines. This includes 3 No. commercial properties, 6 No. derelict houses and 157 No. residential receptors of which 5 No. are involved in the Project. The closest inhabited dwelling not involved in the Project is (H33) located 702m from the nearest turbine (T8). The closest dwelling involved in the Project is H28 located 529m from T3. All receptors located within 2km of the proposed turbines are shown on **Figure 1.3**.

The total population (2022 Census) in the Bruree ED was 1,294, of which males numbered 662 and females were 632, in Colmanswell was 535, of which males numbered 277 and females were 258, in Tobernea was 694, of which males numbered 332 and females were 362 and in Rathluirc was 4,446, of which males numbered 2,179 and females were 2,267.

[11] https://visual.cso.ie/?body=entity/ima/cop/2022&boundary=C04167V04938

Turbine Delivery Route (TDR)

As outlined in section 5.2.2, parts of the TDR fall within Study Area 1 (Colmanswell) namely, the townlands of Ballynagoul, Creggane and Garrane. To assess potential impacts on human beings and human health along the Turbine Delivery Route (TDR), a review of properties and planning applications in the vicinity of the areas which are planned to be the subject of temporary widening works along the TDR was carried out. Full details of the works locations on the TDR between Shannon Foynes Port and the Site are outlined in **Appendix 17.3** of the EIA. Full details of the works locations on the TDR between the Port of Galway are shown in **Appendix 17.4** of the EIA.

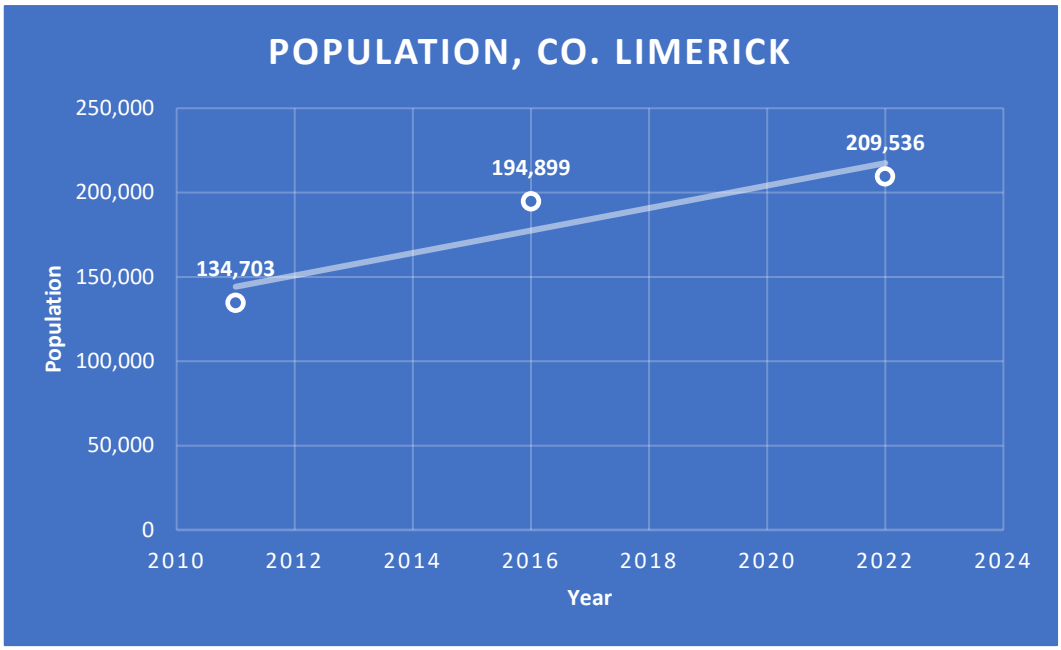
The majority of development along the TDR comprises rural farmstead properties and one-off housing. The land-use along the TDR is comprised mainly of transport infrastructure, and surrounding land use is mainly agriculture with some areas of peat harvesting and forestry.

The TDR via Foynes passes five defined settlements, (Croom, Patrickswell, Limerick City, Askeaton and Foynes) and the TDR via Galway Port passes (Galway City and suburbs, Gort, Ennis, Shannon, Limerick City and Croom). However, all proposed TDR works associated with the Project are located outside of defined settlement areas. The active construction areas for the road works along the Turbine Delivery Route will involve localised surface-level earthworks (removal of soil and unconsolidated rock) and will be temporary in nature as detailed in **Chapter 17: Traffic and Transport**.

Study Area 2 Limerick County (2,756km^2)

The total population in the 2022 CSO for County Limerick was 209,536 of which males numbered 104,452 and females were 105,084. There has been an 8.0% increase in the population since 2016 as shown in **Graph 5.1** below. The population density is 76 persons per square kilometre (km^2) in 2022. The total number of households was 76,472 in 2022, compared to 71,022 in 2016[13] . The average size of households has decreased slightly since 2011 and 2016 with an average of 2.73 and 2.75 respectively, with an average of 2.70 people per household in 2022.

[13] https://www.cso.ie/en/releasesandpublications/ep/p-tah/tenureandhouseholdsinireland2016-2019/demography/ - [Accessed 06/08/2025]



Graph 5.1: **Total Population trend for County Limerick in recent National Census years.**

County Limerick is the tenth largest county in Ireland with a land mass of 2,756km^2. There are a number of small towns, and large and small villages geographically spread throughout the County. In total, there are 90 settlements within the county, and they provide essential services for the local communities and the rural hinterlands. The different settlement tiers perform differing roles with the result that no area in the county is significantly peripheral or isolated. This provides a reasonable platform upon which to build an integrated local economic and community plan and strong sustainable communities. The Local Economic and Community Plan 2024-2028[14] (LECP) as set out in the County Limerick Development Plan sets out the objectives and actions needed to promote and support the economic development and the local and community development of County Limerick. The LECP is compiled by local community development committees of which there is one in each local authority area, established under the Local Government Reform Act 2014 (as amended).

The towns of Newcastle West (7,209), Annacotty (3,398), Castleconnell (2,488) and the town of Abbeyfeale (2,206) are the most populated within the county[16]. Newcastle West, is the County Town of County Limerick. It is an important residential, service and commercial centre providing significant levels of employment. According to the 2022 Census there are 3,355[17] people residing in the Newcastle West settlement area who are classed as being '*At Work*'.

[14] The Local Economic and Community Plan 2024-2028 – [Accessed 06/08/2025]
[16] https://visual.cso.ie/?body=entity/ima/cop/2022&boundary=C04160V04929 – [Accessed 06/08/2025]
[17] CSO (2022) https://visual.cso.ie/?body=entity/ima/cop/2022&boundary=C04160V04929&guid=f4bad9b8-d885-4be1-a8d7-a1fbb9699cd9 - [Accessed 06/08//2025]

Study Area 3: Midwest Region (as part of the Southern Region Assembly)

The Regional Spatial and Economic Strategy (RSES) for the Southern Regional Assembly 2040[18] outlines the assembly's aim of reversing of town/village and rural population decline, by encouraging new roles and functions for buildings, streets and sites. The National Planning Framework (NPF)[19] projects a population growth for the southern region of between 340,000 to 380,000, during this period, with an additional 225,000 people in employment.

RSES notes that the population living in '*aggregate rural area'* (i.e. persons living in the open countryside or in settlements of less than 1,500) are home to almost 49.15% of this region's population, and as such represent a sizeable cohort of the population. Population growth needs to be matched by the delivery of critical enabling infrastructure and services, thus ensuring that these places grow as successful significant employment centres and service locations not only for the urban areas themselves but, importantly, for their extensive hinterlands that include smaller towns, villages and rural areas. The RSES outlines the importance of the energy sector being a regional driver of the rural economy (White Paper-Irelands transition to a Low Carbon Energy Future 2015-2030). The RSES outlines a key objective relating to supporting enterprise and employment in rural areas, as set out in the Department of Heritage, Regional, Rural and Gaeltacht Affairs Action plan for Rural Development [20], which includes the support of sectoral growth through roll out of initiatives to develop the renewable energy sector in rural Ireland.

Study Area 4: Ireland

Ireland has experienced rapid population growth in recent years with an improved standard of living and infrastructure growth resulting in a net inflow of population. The country has seen a population increased by 8% since 2016 from 4,761,865 to 5,149,139 as per the 2022 census[21]. The Irish population is at its highest figure since 1841, and it is the first time the population has been recorded over 5 million since 1851[14].The National Planning Framework (NPF)[22] (2018) has set out its intention to facilitate a significant growth in Ireland's population by 2040. Full achievement of the targets set out in the 'Project Ireland 2040

[18] Southern Regional Assembly, *'Regional Spatial & Economic strategy 2020-2040 (RSES)'*. Available at: http://www.southernassembly.ie/regional-planning/rses - [Accessed 06/08/2025]
[19] The Department of Housing Planning and Local Government, on behalf of the Government, 'Project Ireland 2040 - The National Planning Framework' published February 2018. Available at: https://npf.ie/project-ireland-2040-national-planning-framework/ [Accessed 06/08/2025]
[20] Department of Heritage, Regional, Rural and Gaeltacht Affairs 'Action Plan for Rural Development' Available at: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://assets.gov.ie/static/documents/realising-our-rural-potential-action-plan-for-rural-development.pdf
[21] Central Statistics Office (CSO), 'Census 2022 Reports'. Available at: https://www.cso.ie/en/statistics/population/censusofpopulation2022/censusofpopulation2022-summaryresults/ - [Accessed 06/08/2025]
[22] The Department of Housing Planning and Local Government, on behalf of the Government, 'Project Ireland 2040 - The National Planning Framework' published February 2018. Available at: https://npf.ie/project-ireland-2040-national-planning-framework/ - [Accessed 06/08/2025]

National Planning Framework'[23] would accommodate around 1.1 million additional people residing in Ireland by 2040.

5.3.2 Economic Activity

5.3.2.1 Primary sectors

Study Area 1: Study Area 1 Site and Environs (District Electoral Divisions) Bruree, Tobernea, Colmanswell and Rathluirc (90.20km^2).

The main sectors in this Study Area are trades, agriculture, administrative and secretarial occupations, elementary occupations and professional services.

Study Area 2: Limerick County

The economy of County Limerick is broadly based and diverse with strengths in the areas of professional services, commerce and trade and manufacturing industries. In 2022, the manufacturing sector employed the highest number of workers in County Limerick, with over 12,500 people working in the industry. Human health and social work activities were the next largest, with just over 11,500 workers followed by wholesale and retail trade with more than 10,500 workers.[24]

5.3.3 Employment

5.3.3.1 Primary sectors

Study Area 2: Limerick County

According to the CSO 2022 there were 90,600 persons over 15 years of age at work in Limerick County, an increase of 13,500 people (+17%) between 2016 and 2022. Nationally, there was an increase of over 16% of people over 15 years of age at work.[25]

The leading employment sector in County Limerick is the manufacturing sector, which accounted for the largest number of workers in the county at more than 12,500. Human health and social work activities was the next largest, with just over 11,500 workers followed by wholesale and retail trade with more than 10,500 workers. **Table 5.4** sets out employment status in Limerick County in 2022.

[23] The Department of Housing Planning and Local Government, on behalf of the Government, 'Project Ireland 2040 - The National Planning Framework' published February 2018. Available at: https://npf.ie/project-ireland-2040-national-planning-framework/ - [Accessed 06/08/2025]
[24] https://www.cso.ie/en/csolatestnews/pressreleases/2023pressreleases/pressstatementcensus2022resultsprofile7-employmentoccupationsandcommutinglimerick/ [Accessed 06/08/2025]
[25] CSO, Census 2022 Summary Results Limerick Available at: https://www.cso.ie/en/csolatestnews/pressreleases/2023pressreleases/pressstatementcensus2022resultsprofile7-employmentoccupationsandcommutinglimerick/#:~:text=More%20than%2090%2C600%20people%20at,the%20main%20results%20for%20Limerick.Accessed online 06/08/2025]

Table 5.4: Limerick County Labour Force Status (2022)

Principal Economic Status	No. Persons
At work	90,623
Looking for first regular job	1,351
Short term unemployed	2,801
Long term unemployed	4,410
Student	20,759
Looking after home/family	10,971
Retired	28,513
Unable to work due to permanent sickness or disability	9,808
Other	826
Total	**170,062**

5.3.4 Land Use and Topography

Land use and Topography is assessed in this section for the Electoral Division Area (Study Area 1), as this land in this area will be most affected due to the Project. There will minimal or no long-term impact on land use from the TDR and GCR work, therefore study area 2 and 3 will not be assessed in this section.

5.3.4.1 Study Area 1 Site and Environs (District Electoral Divisions) Bruree, Tobernea, Colmanswell and Rathluirc (90.20km^2).

County Limerick is located in the Southern Region Assembly and is bordered by counties Clare, Kerry, Cork and Tipperary. Due to the expanse and variety of the County Limerick landscape there are 10 landscape character types (LCT's) across the County. According to the Landscape Character Assessment (LCA) for County Limerick, the Project is contained within the 'Agricultural Lowlands' Landscape Character Area. The 'LCA 01 Agricultural Lowlands' are described as:

"the largest of the Landscape Character Areas in Limerick and comprises almost the entire central plain. This landscape is a farming landscape and is defined by a series of regular field boundaries, often allowed to grow to maturity. This well-developed hedgerow system is one of its main characteristics. In terms of topography, the landscape is generally rather flat with some locally prominent hills and ridges. The pastoral nature of the landscape is reinforced by the presence of farmyards."

According to the Limerick County Development Plan 2022 – 2028' regarding wind energy development, the 'Agricultural Lowland' Character Area Specific Objective d) 'Encourages the regular arrangement of turbines with equal spacing in proposed wind farm developments which take field boundaries into account', while also being classified as an area 'Preferred' for wind energy development.

"Landscape values were derived for each landscape character area by consideration of environmental and cultural benefits e.g. aesthetics, ecological, historical, socio-economic, religious, mythological etc. The values were given a score ranging from low, medium, high to outstanding."

Landscape Sensitivity

"The sensitivity of a landscape to development and therefore to change will vary according to its character and to the importance which is attached to any combination of landscape values. The sensitivity of the character areas was derived by consideration of designations such as Special Areas of Conservation & Special Protection Areas, Natural Heritage Areas, National Parks, by information such as tourist maps, guidebooks, brochures and by evaluation of indicators such as uniqueness, popularity, distinctiveness and quality of the elements of the area."

The Site is currently used mainly for agricultural livestock grazing. The Site is situated on relatively low and level ground, at elevations ranging between 55m to 70m AOD. The highest point of the Site is located toward the south-eastern portion of the Site with an elevation of 70m AOD. It is noted that no part of the Project area is within a site with a nature conservation designation.

Turbine Delivery Route (TDR)

To assess potential impacts on population and human health along the Turbine Delivery Route within Study Area 1, a review of landscape values and sensitivity in the vicinity of the areas which will be subject to temporary works along the Turbine Delivery Route was carried out. According to the Landscape Character Assessment for County Limerick (LCA, 2022 - 2028), the TDR works will be located within two designated landscape character types:

- Agricultural Lowlands,
- Shannon Integrated Coastal Zone Management (ICZM)

The temporary road works along the Turbine Delivery Route will involve only minor surface-level earth works. At intervals where the paved road surface narrows to less than 2.5 metres

width, temporary road surfacing will be applied, in the form of compacted gravel Clause 804 stone, inside the road verge to safely facilitate turbine component deliveries. This will be a temporary feature and road verge will be reinstated following completion of turbine component deliveries to the Site. The proposed Turbine Delivery Route works associated with the Project will not have any long-term adverse effects on the landscape or landscape value.

5.3.5 Tourism

Tourism is one of Ireland's most important economic sectors and is a significant source of full time and seasonal employment. County Limerick has a wide range of tourist attractions. Tourism information for Electoral Division Area (Study Area 1) and County (Study Area 2 and 3) are presented in this section, as these areas will potentially be most impacted by the Project.

5.3.5.1 Tourist Attractions

Study Area 1: Study Area 1 Site and Environs (District Electoral Divisions) Bruree, Tobernea, Colmanswell and Rathluirc (90.20km^2).

There are a number of tourist attractions within a 15km radius of the Project.

The most notable occur in the wider periphery of the Study Area, such as Lough Gur located c.15km north-east of the nearest turbine. Lough Gur is one of Ireland's foremost archaeological complexes and is popular for visitors, hosting a castle, visitors centre, cemetery, bird watch, series of ring forts as well as numerous other archaeological features. Adare Manor Golf Course and luxury resort is located in the wider north-west at approximately 18km from the Site. Adare Manor hosts a golf course (which is the host of the 2027 Ryder Cup), a luxury hotel, spa and numerous other amenities on the periphery of the heritage settlement of Adare.

Several notable recreational features are also located within the Study Area including the Kilmallock Cycle Hub which hosts a series of four routes of varying lengths are distributed alongside the quiet country roads. Kilmallock is considered to be the largest cycling hub in Ireland. Route 3 comes within c. 3km to the north-east of the Site and Route 1 of the cycle route comes within 4.3km to the south-east.

Within 9km to the south-east of the Site is the nearest point of the Ballyhoura Way (National Waymarked Trail). Multiple walking and mountain bike trails are dispersed across the Ballyhoura Mountains which wind through existing wind turbines and take deliberate advantage of the expansive views afforded from these elevated trails.

Other tourism, heritage and recreation features of local/ regional importance include:

- Kilmallock hosts several historic landmarks within 6km to the east including; 13th century Dominican Abbey, SS. Peter & Paul Catholic Church, Castlecourt and a museum.
- Charleville Golf Course (c. 6km south-west of site)
- Bruree Mill (2.6km north-east)
- Effin GAA Club (c. 5.7km south-east)
- Kilmallock GAA Club (c. 6km)

Study Area 2: Limerick County

The tourism industry is critical to the economy of County Limerick. The County is one of the leading tourist counties in Ireland and attracts significant domestic and foreign investments annually. Many areas that are important to the tourist industry of County Limerick owe their attraction to their abundance of tourism resources, including natural and cultural attractions, especially within Limerick City itself, vibrant towns and villages and contrasting landscapes, all of which are easily accessible to both national and international visitors[27]. For example, King John's Castle, which is a key tourist attraction which looms over the River Shannon is located 30.0km north of the Site. It features Limerick's showpiece castle, with its vast curtain walls and towers, was built on the orders of King John of England between 1200 and 1212. The massive twin gate towers still stand to their full height. There are a number of objectives and preferred development options outlined in the Limerick CDP (2022 - 2028) which seek to promote tourism in the county. The CDP (2022 - 2028) states; *"Tourism is a proven economic driver, playing a significant role in the overall development of Limerick. The sector is uniquely positioned to contribute strongly to job creation and reversing unemployment in communities throughout Limerick."*. The Local Authority's objective is to grow the tourism sector within the county as shown within the CDP, through policy objectives and goals such as Development Plan Objective ECON 045: *Support strong growth in the tourism sector in Limerick ensuring the economic and societal benefits of tourism are effectively distributed throughout the County, through connections between complementary sites and attractions, by encouraging visitors to move around the County and to enable them to do so with ease".*

[27] Limerick County Council, '*The Limerick Development Plan 2022-2028'*. Available at: https://www.limerick.ie/sites/default/files/media/documents/2023-05/Limerick-Development-Plan-Volume-1-Written-Statement-including-Variation-No-1.pdf/ - [Accessed 06/08/2025]

5.3.5.2 Tourism: Numbers and Revenue

Study Area 2: Limerick County

The Mid-West Region includes the Counties of Clare, Limerick and Tipperary. The region has a wealth of natural, cultural and heritage assets of national importance and is a significant tourist destination. Ireland's Mid-West Region benefits annually from an influx of foreign and domestic visitors with this market proving particularly important for the region's tourism and hospitality sectors. Prior to the Covid-19 pandemic, the region benefited from approximately 1.4 million overseas visitors each year, and over 900,000 domestic tourists, which when combined contributed over €600m annually to the regional economy[28]. In 2023, a total of 433,000 domestic and 287,000 oversea tourists visited Limerick, generating a revenue of € 78 and € 224 million respectively.

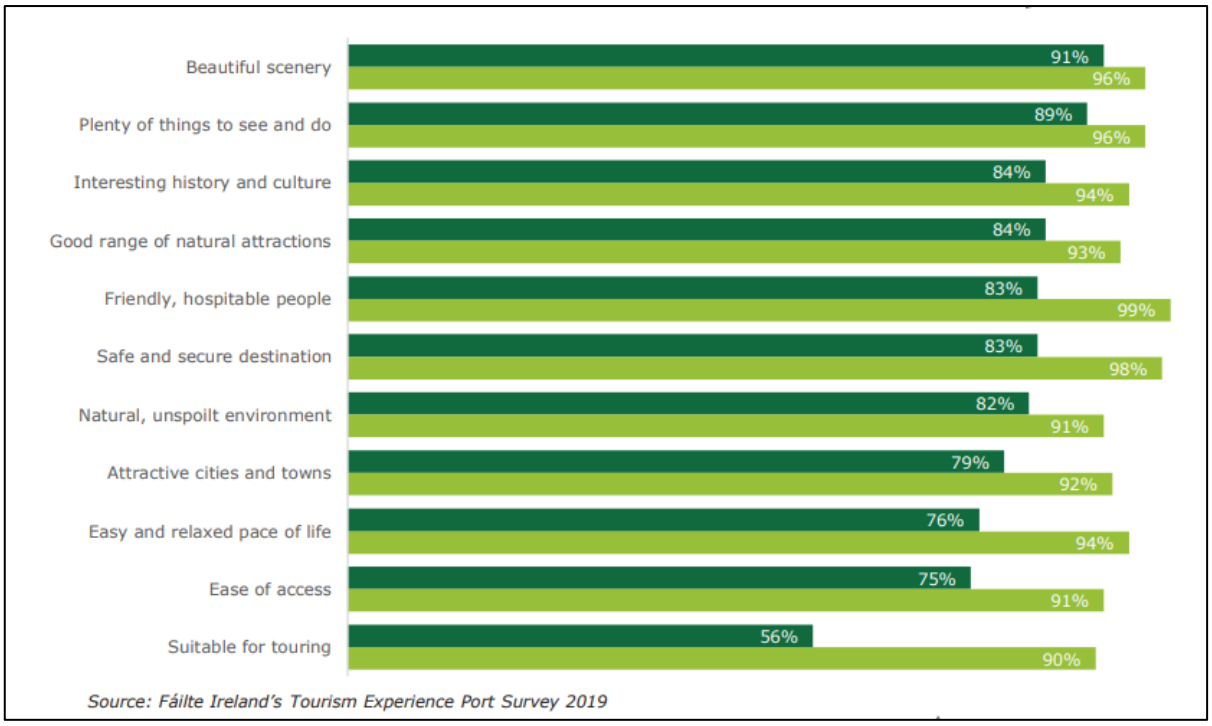
County Limerick is home to a number of nationally renowned visitor attractions including; the Ballyhoura Way, Adare Cottage, Lough Gur, The Hunt Museum, Limerick Greenway, Foynes Flying Boat and Maritime Museum and the Limerick Whiskey Experience. .

5.3.5.3 Visitors Attitudes to Windfarms

The first wind farm in Ireland was completed in 1992 at Bellacorrick, Co. Mayo and since then wind farms have elicited a range of reactions from Irish people (Fáilte Ireland, 2012). In 2002, Sustainable Energy Ireland (SEI) - now the Sustainable Energy Authority of Ireland (SEAI) - commissioned a survey aimed at identifying public attitudes to renewable energy, including wind energy in Ireland[29]. The 2002 survey found that, in general, Irish people are positively disposed towards the development of wind farms. However, the survey also indicated that people will not accept wind farms everywhere and that special care should be taken so that wind farm development be cognisant to contextual landscape characteristics.

Ireland's scenery has been a cornerstone of international tourism marketing campaigns for decades. The future sustainability of Ireland's tourism industry is therefore inextricably linked to the maintenance of the character and scenic qualities of the Irish landscape. **Graph 5.2** from Fáilte Ireland shows the importance of visual amenity to tourists visiting from overseas.

[28] Regional Enterprise Plan to 2024 Mid-West, https://enterprise.gov.ie/en/publications/publication-files/mid-west-regional-enterprise-plan-to-2024.pdf, [accessed 25/06/24]
[29] Sustainable Energy Ireland (2003), Attitudes towards the Development of Wind Farms in Ireland, Dublin



Graph 5.2: Importance and rating of destination issues among overseas holidaymakers (%) from Fáilte Ireland[30]

Fáilte Ireland, in association with the Northern Ireland Tourist Board (NITB), decided in 2007 to survey both domestic and overseas holidaymakers to Ireland to determine their attitudes to wind farms. The survey drew on many aspects of the original SEI survey in particular, the landscape types that were used to elicit a reaction from respondents. The purpose of the survey was to assess whether or not the development of wind farms would impact on the visitors' enjoyment of Irish scenery.

In 2012, this research was updated by Millward Browne Landsdowne on behalf of Fáilte Ireland to determine if there was any change in visitor attitudes during this period.

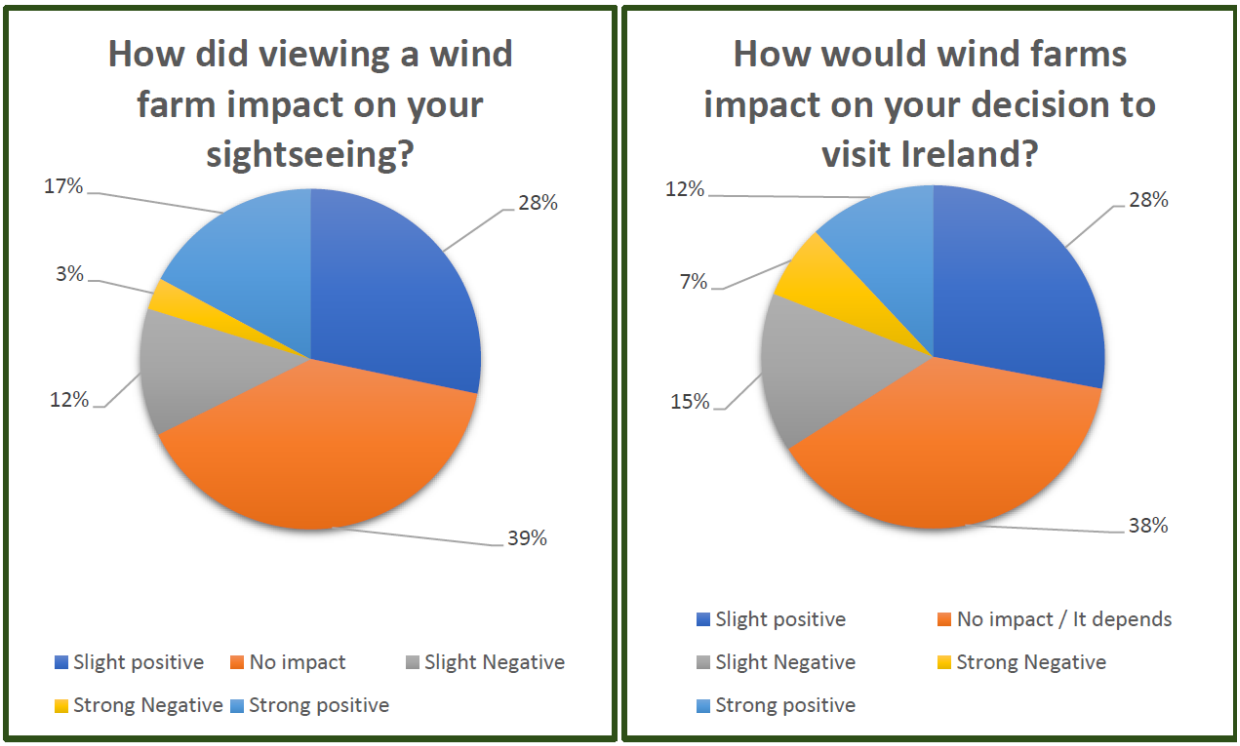
The 2012 research indicated that 47% of visitors felt an increased positive impact on landscape from wind farms, compared to 32% in 2007. Negative responses also increased, showing 30% in 2012 against 17% in 2007. However, 49% of visitors felt that wind farms had no impact on the landscape in 2007 in comparison to 23% in 2012. It was notable that those interviewed who did not see a wind farm during their trip held more negative perceptions and opinions on wind farms than those that did.

[30] Fáilte Ireland (2021) Key Tourism Facts 2019 https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/3_Research_Insights/4_Visitor_Insights/KeyTourismFacts_2019.pdf?ext=.pdf [Accessed 06/08/2025]

Despite the fact that there has been an increase in the number of visitors who have seen at least one wind farm on their holiday, there was also a slight increase (from 45% in 2007 to 48%) in the number of visitors who felt that this had no impact on their sight-seeing experience. Importantly, and as has been seen in the previous research, the type of landscape in which a wind farm is sited can have a significant impact on attitudes.

Visitors were again asked to rate the beauty of five different yet typical Irish landscapes: coastal, mountain, farmland, bogland and urban industrial land, and then rate the scenic beauty of each landscape and the potential impact of siting a wind farm in each landscape. The results indicated that each potential wind farm and site must be assessed on its own merits, due to the scenic value placed on certain landscapes by the visitor and their preferred scale/ number of wind turbines within a wind farm. Looking across all landscapes, wind farms are seen to have an enhancing effect on the landscapes seen as less beautiful, particularly urban/ industrial and bogland. Coastal areas (91%) followed by mountain moorland (83%) and fertile farmland (81%) continue to be rated as the most scenic, and resistance is greatest to wind farms in these areas. There was a greater relative negativity expressed about potential wind farms on coastal landscapes (40%), followed by fertile farmland (37%) and mountain moorland (35%). Less than one in four were negatively disposed to the construction on bogland (24%) or urban industrial land (21%). Most visitors also still favour large turbines (47%) over small turbines (28%), and in smaller numbers, with the option of five turbines proving the most popular, followed by two clusters of ten and finally wind farms of 25 turbines.

Seven out of ten (or 71%) visitors claim that potentially greater numbers of wind farms in Ireland over the next few years would have either no impact or a positive impact on their likelihood to visit Ireland (**Graph 5.3**). Of those who feel that the potentially greater number of wind farms would impact positively on future visits, the key driver is support for renewable energy, followed by potential decreased carbon emissions. Given the scenario where more wind farms will necessarily be built in Ireland in the future, the most widely held view is that this will not impact their likelihood to visit the area again, with a slightly greater majority saying that this would have a positive rather than a adverse effect.



Graph 5.3: Visitors Attitudes on the Environment – Wind Farms. Source: Fáilte Ireland (2008)

Fáilte Ireland carried out research on overseas holidaymakers' attitudes to Ireland in 2018. It noted holiday makers choice is based largely on *beautiful scenery* (93%), followed closely by *plenty to do and see* (91%) and *friendly people* and *natural attractions* (88%).

Wind Farms & Tourism Trends

In 2021, BiGGAR Economics published research findings, on research carried out in Scotland on 44 wind farms and tourism trends[31]. This research also re-examined 28 wind farms constructed between 2009 and 2015 that had been analysed in a previous study by BiGGAR Economics published in 2017, finding that the localities in which they were based had outperformed Scotland and their local authority areas in the majority of cases. This research has analysed trends in tourism employment in the localities of the 44 wind farms developed in recent years, providing a substantial evidence base. The study found no relationship between tourism employment and wind farm development, at the level of the Scottish economy, across local authority areas nor in the locality of wind farm sites.

[31] BiGGAR 2021, Wind Farms & Tourism Trends in Scotland: Evidence from 44 Wind Farms, Available at: https://biggareconomics.co.uk/wp-content/uploads/2021/11/BiGGAR-Economics-Wind-Farms-and-Tourism-2021.pdf [Accessed 06/08/2025]

5.3.6 Public Perception of Wind Energy

SEAI National Survey 2022

Several studies to assess the public perception and visitor perception of wind farms have been carried out over the last 2 decades. The most recent of these studies, was carried out in 2022, by Sustainable Energy Authority of Ireland (SEAI). In-person doorstep interviews were conducted across all of rural Ireland, encompassing 1,764 households. This included 1,116 households within 5km of a new commercial wind or solar project site, of which 219 households are located within 1km of a project site[34]. The results indicated very positive views and strong support for wind farms in Ireland. In summary:

- 67% of respondents hold positive or very positive views towards wind energy
- 73% of respondents who live <1km of a Renewable Electricity Support Scheme 1 (RESS1) wind project hold positive or very positive attitudes towards wind energy
- 59% of respondents feel Ireland has too few wind farms
- 65% of respondents <1km from a RESS1 wind project feel Ireland has too few wind farms
- Few respondents feel Ireland has too many wind farms, regardless of how close they live to a new wind farm

IWEA Interactions Opinion Poll on Wind Energy

Interactions Research have conducted omnibus research commissioned by Wind Energy Ireland (WEI), formerly the Irish Wind Energy Association (IWEA), in October 2017, November 2018, November 2019 and again in November 2020 with the objective to *"measure & track perceptions and attitudes around wind energy amongst Irish adults."*

The most recent survey, conducted online in November 2020 and published in January 2021[35] sampled a representative sample of 1,004 Irish adults nationwide, together with a supplementary booster sample of 203 rural dwellers. The key findings from the survey included:

- 82 per cent in favour of wind energy with 50 per cent strongly in favour
- Opposition to wind energy at 4 per cent
- Majority in rural Ireland – 52 per cent – would support a wind farm in their area while opposition is at 15 per cent.
- The top five reasons for supporting wind energy were identified as:
    - Good energy source

[34]SEAI, 2023 Irish national survey of households near new commercial wind and solar farms, Available at: https://www.seai.ie/publications/SEAI-RESS-National-Survey.pdf [Accessed 06/08/2025]

[35] https://windenergyireland.com/images/files/2032-wei-version-2020-for-media.pdf [Accessed: 06/08/2025].

- Good for the environment
- Creates jobs.
- No reason to be against wind energy.
- Cheaper energy.

As a result of the ongoing research, trends in the attitudes of windfarms over the past four years can be assessed. The survey showed that the trend in attitude amongst the nationally representative sample is increasingly positive. Despite very consistent overall satisfaction, some movement can be seen over time within the rural sample from being 'strongly in Favour' towards 'tending to favour' wind power.

Public acceptance of new renewable electricity survey 2021

A study was carried out to survey Irish public opinion, specifically in relation to wind farms and their associated grid connections[36]. The study found that over 75% of the people surveyed are positively disposed to wind turbines but just 36% are willing to accept the development of wind farms within 5km of their homes. The findings of these results are encouraging from a tourism perspective as many tourists who visit Limerick are from the domestic market which accounted for 433,000 visits in 2023[37]. Per the findings of the referenced study, over three quarters of participants are positively disposed to windfarms in Ireland. Interpreted on a broader level the results of the study would appear to suggest the development of windfarm infrastructure in County Limerick is unlikely to have a significant impact from a tourism related perspective.

The study results indicate there are regional variations in preferences. The results showed, the highest share of outright opposition to wind farms is in the Midlands, at 21% of respondents, and the lowest is in the Border region at 9%. The opposition to new transmission lines is highest at 44% in the South-West and lowest in the West at 18%. In respect to Garrane Green Energy Project, the grid connection is to be an underground ducting Grid Connection from the on-site 110kV Substation to the lattice end masts (as shown on **Drawing No. 3337-SUIR-SS-DR-C-2411**) with a 'loop in' Grid Connection to the existing 110kV OHL between Charleville substation and Killonan substation.

[36] Public acceptance of renewable electricity generation and transmission network developments: Insights from Ireland, Manuel Tong, Koecklin,GenaroLongoria, Desta Z.FitiwiabJoseph, F.DeCarolisc, JohnCurtis , Energy Policy, Volume 151, April 2021, 112185
[37] Failte Ireland, Limerick Key Tourism Facts 2023 chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/Research/Key%20Tourism%20Facts%20and%20Figures%202023/FI_Key-Tourism-Facts-2023_Limerick.pdf?ext=.pdf [Accessed: 06/08//2025].

5.3.7 Human Health

Common concerns around wind farms in terms of human health are generally associated with issues such as electromagnetic interference, shadow flicker and noise. These topics are considered in this EIAR in addition to air quality and water contamination in **Chapter 10: Hydrology and Hydrogeology, Chapter 11: Noise and Vibration, Chapter 13: Air Quality and Climate** and **Chapter 14: Shadow Flicker.**

5.3.7.1 General Health of Population

Human health of communities can vary greatly owing to a number of factors including susceptibility to disease, location, income inequality, access to health care etc. The Department of Health routinely publishes a review of Irish public health indicators derived from several areas, including demographics, population health, hospital and primary care, employment and expenditure. In 2021 it published "*Health in Ireland – Key Trends 2021*" which indicates a generally positive picture of decreasing mortality rates set against high self-perceived health over the past decade. According to this report, Ireland has the highest self-perceived health status in the EU area, with 83.9% of people rating their health as good or very good[39].

In Limerick City, the health status of the population is worse compared with the average situation in the state, and the more rural County Limerick. In the city, 81.4% rate their health as very good or good compared with 88.1% in the County while 13.8% rate their health as fair, bad or very bad in the city compared with 9.2% in the County. The poorer health status of people in the city is linked to social deprivation and an ageing population structure[40].As stated by the CSO, 'In 2022, 80% of people in Limerick stated that their health was good or very good compared with 86% in 2016. Nationally, 83% of people stated that their health was good/very good'[41].

5.3.7.2 Electromagnetic Interference

Electromagnetic fields ("*EMF*") are invisible lines of force that surround electrical equipment, power cords, wires that carry electricity and outdoor power lines. Electric and magnetic fields can occur together or separately and are a function of voltage and current. When an electrical appliance is plugged into the wall, an electric field is present (there is voltage but

[39] The Department of Health (2021) – "*Health in Ireland: Key Trends 2021"* Available at: https://www.gov.ie/en/publication/350b7-health-in-ireland-key-trends-2021/
[40] https://mypoint.limerick.ie/en/consultation/local-economic-and-community-plan-limerick-city-and-county-2023-2028/chapter/26-health-well-being Accessed 06/08/2025]
[41] https://www.cso.ie/en/csolatestnews/pressreleases/2023pressreleases/pressstatementcensusofpopulation2022-summaryresultslimerick/#:~:text=2022%20and%202016.-,Health,compared%20to%2087%25%20in%202016. [Accessed Online 06/08/2025]

no current); when that appliance is turned on, electric and magnetic fields are present (there is both voltage and current). Both electric and magnetic fields decrease with distance. Electric fields are also dissipated by objects such as building materials. On a daily basis, people are exposed to extremely low frequency ("*ELF*")) electric and magnetic fields (EMF) as a result of using electricity.

National and international health and scientific agencies have reviewed more than 35 years of research including thousands of studies. None of these agencies has concluded that exposure to ELF-EMF from power lines or other electrical sources is a cause of any long-term adverse effects on human, plant, or animal health. The International Commission on Non-Ionising Radiation Protection (ICNIRP) Guidelines give a limit of 100μT for sources of AC magnetic fields. This compares to 0.13μT for 110kV underground cable when directly above it, 1.29μT for 220kV underground cable when directly above it and 11.4μT for 400kV AC underground cable that is one metre deep and measured directly above it. The ESB published an information booklet in 2017 called "*EMF & You*" which provides information about Electric & Magnetic Fields and the electricity network in Ireland[42].

This indicates that any baseline EMF in the receiving environment from existing cable and electrical infrastructure is minimal.

In 2014 a scientific study was undertaken in Canada[43], measuring electromagnetic fields around wind farms and their impact on human health. This study concluded the following: *"There is nothing unique to wind farms with respect to EMF exposure; in fact, magnetic field levels in the vicinity of wind turbines were lower than those produced by many common household electrical devices and were well below any existing regulatory guidelines with respect to human health"*.

5.3.7.3 Shadow Flicker

Shadow Flicker is the effect caused by the sun shining behind the rotating blades of a turbine relative to a nearby sensitive receptor which causes a momentary shadow on a window of that sensitive receptor. **Chapter 14** provides the full assessment of shadow flicker of the Project for this EIAR.

[42] EMF & You, ESB, 2017 - https://esb.ie/docs/default-source/default-document-library/emf-public-information_booklet_v9.pdf?sfvrsn=0, [Accessed 06/08/2025]
[43] Lindsay C McCallum, *et al*. (2014) *Measuring electromagnetic fields (EMF) around wind turbines in Canada: is there a human health concern?*

5.3.7.4 Noise

Baseline noise monitoring was undertaken at three locations between 20th February and 19th March 2023. The Lidar system which monitored wind speed and direction recorded continuously for the same 10-minute intervals. Noise data was recorded for a representative range of wind speeds during the period.

A number of predictions were prepared for the layout of the proposed 9 turbine wind farm. Based on the initial layout, potential noise-sensitive receptors (which included occupied and un-occupied properties) were identified from maps. Receptor locations were verified through aerial mapping, Eircode searches and specific site visits.

Chapter 11 provides an assessment of noise in relation to the Project.

5.3.7.5 Air Quality

The Irish Environmental Protection Agency (EPA, 2022)[44], EU and World Health Organisation (WHO, 2014) reports estimate that poor air quality accounted for premature deaths of approximately 600,000 people in Europe in 2012, with 1,200 Irish deaths attributable to fine particulate matter ($PM_{2.5}$) and 30 Irish deaths attributable to exposure to ozone (O_3)[45] [46]. These emissions, along with others including nitrogen oxides (NO_x) and sulphur oxides (SO_x) are produced during the burning of fossil fuels for energy generation, transport or home heating. There are no such emissions associated with the operation of wind turbines.

Some level of traffic disruption to the public during the construction and decommissioning phases of the Project is likely. Transport generally accounts for a significant portion of pollutants in the atmosphere.

Chapter 13 provides an assessment of air quality in relation to the Project.

5.3.7.6 Water Quality

Contaminants such as sediments arising from the Project have the potential to cause negative ecological effects. Mitigation proposals set out in **Chapter 10: Hydrology and Hydrogeology** will prevent and reduce risk of contamination of waterbodies. The drainage design and surface water network are considered in terms of assimilative capacity, that is

[44] Air Quality in Ireland, EPA 2022.
[45] *www.euro.who.int/en/health-topics/environment-and-health/air-quality/news/news/2014/03/almost-600-000-deaths-due-to-air-pollution-in-europe- new-who-global-report,* [Accessed 06/08/2025]
[46] Irelands Environment 2016 – An Assessment', EPA, 2016, [Accessed 06/08/2025]

to dilute contaminants in receiving waterbodies as a '*last line of defence'*. Any contaminants will be treated when water is abstracted for drinking water purposes. This is further detailed in the Construction Environmental Management Plan (**Appendix 2.1**).

Consultation with the Geological Society of Ireland (GSI) well database indicates there is one mapped well namely, a borehole within the indicative Redline Boundary. Governing industry guidelines stipulate a buffer zone of 250m is required of from boreholes used for drinking water abstraction.

Chapter 10 provides a hydrological assessment for the Project, including the proposed mitigation measures to prevent potential effects on water quality (see also **Appendix 2.1**).

5.3.7.7 Traffic

It is proposed that the turbine nacelles, tower sections and hubs will be landed in Foynes Port, Co. Limerick. Turbine blades will be delivered via either Foynes Port, Co. Limerick or Galway Port. From Foynes, components will be transported to the Site via the N69, N18, M20 and N20 to the upgraded site entrance. From Galway, blades will be transported to the Site via the R339, R336, N6, M6, M18, N18, M20 and N20 to the upgraded site entrance.

Chapter 17 provides an assessment of traffic in relation to the Project.

5.3.7.8 Health Impact Studies

There are anecdotal reports of negative health effects on people who live near wind farms, however, there are no peer reviewed scientific research to support these views. Several peer reviewed scientific research publications are outlined below.

The National Health and Medical Research Council (NHMRC), Australia's leading medical research body, have concluded that there is no reliable or consistent evidence that wind farms directly cause human health problems as part of their Systematic Review of the Human Health Effects of Wind Farms published in December 2013. The review was commissioned to determine whether there is a direct association between exposure to wind farms and negative effects on human health or whether the association is casual, by chance or bias.

Objectors to wind farms often refer to 'Wind Turbine Syndrome' as a condition that can be caused by living in close proximity to wind farms. The symptoms allegedly include sleep deprivation, anxiety, nausea and vertigo. It has been rejected by the wind industry and is

further refuted by a review carried out by the NHMRC that wind turbines cause this sort of symptoms. The review began in late 2012 and included a literature and background review of all available evidence on the exposure to the physical emissions produced by wind turbines. These emissions were noise, shadow flicker and electromagnetic radiation produced by wind turbines. The review concludes that the evidence considered does not support any direct association between wind farms and human health problems and that bias and confounding could be possible explanations for any reported association.

The international scientific journal "*Frontiers in Public Health*" published a study[47] in 2014 on the subject of wind turbines and human health. This review completed a bibliographic-like summary and analysis of the science around this issue, specifically in terms of noise (including audible noise, low-frequency noise, and infrasound), EMF, and shadow flicker. The study concluded as follows:

"The available scientific evidence suggests that EMF, shadow flicker, low-frequency noise, and infrasound from wind turbines are not likely to affect human health; some studies have found that audible noise from wind turbines can be annoying to some. Annoyance may be associated with some self-reported health effects (e.g., sleep disturbance) especially at sound pressure levels >40 dB(A). Because environmental noise above certain levels is a recognized factor in a number of health issues, siting restrictions have been implemented in many jurisdictions to limit noise exposure. These setbacks should help alleviate annoyance from noise. Subjective variables (attitudes and expectations) are also linked to annoyance and have the potential to facilitate other health complaints via the nocebo effect. Therefore, it is possible that a segment of the population may remain annoyed (or report other health impacts) even when noise limits are enforced." Based on the findings and scientific merit of the research conducted to date, it is our opinion that the weight of evidence suggests that when sited properly, wind turbines are not related to adverse health effects. This claim is supported (and made) by findings from a number of government health and medical agencies and legal decisions".

In general, there are no specific health and safety considerations in relation to the operation of a wind turbine. The area surrounding the turbine base will still be available for use as normal.

The potential effect of Noise and Vibration is assessed in **Chapter 11,** and the potential for Shadow Flicker from the Project is assessed in **Chapter 14**.

[47] L. D. Knopper, *et al*. (2014) *Wind turbines and human health*.

5.3.7.9 Turbine Safety

The Department of the Environment, Heritage and Local Government (DoEHLG)'s '*Wind Energy Development Guidelines for Planning Authorities 2006*' state that there are no specific safety considerations in relation to the operation of wind turbines. Fencing or other restrictions are not necessary for safety considerations. People or animals can safely walk up to the base of the turbines. The DoEHLG Guidelines state that there is a very remote possibility of injury to people from flying fragments of ice or material from a damaged blade. However, wind turbine blades are composite structures moulded in a single mould with no intermediate bolts or separate components and the danger is therefore minimised. The wind turbines will be fitted with anti-vibration sensors, which will detect any imbalance caused by icing of the blades. The sensors will prevent the turbine from operating until the blades have been de-iced.

Turbine blades are made of fibre-reinforced polymer (FRP's) or unsaturated polyester, a non-conducting material which will prevent any likelihood of an increase in lightning strikes within the Site or the local area. Lightning protection conduits will be integral to the construction of the turbines. Lightning conduction cables, encased in protection conduits, will follow the electrical cable which is run, from the nacelle to the base of the turbines. The conduction cables will be earthed adjacent to the turbine bases. The earthing system will be installed during the construction of the Turbine Foundations. In extremely high wind speed conditions, (usually at Beaufort Storm Force 10 or greater) the turbines will shut down to prevent excess wear and tear, and to avoid any potential damage to the turbine components.

5.3.8 Property Value

There is currently one Irish study undertaken to assess the impact of wind farms on property prices.

The study in question which was carried out by Tom Gillespie and Patrick McHale of the University of Galway concludes that, '*This paper investigated the effects of proximity to wind turbines on house prices in counties along the west coast of Ireland using a cross-sectional approach with spatial and temporal fixed effects. I found a significant and robust discount of 14.7% on properties within 1km of a wind turbine. Additionally, I identify significant effects from turbine density, a reduction in value of -2% per turbine within 1km. While effects appear to persist up to 3km, they are not statistically significant*.'

'*Furthermore, I present evidence that taller turbines incur a greater discount than shorter turbines. Additionally, I display evidence of heterogeneity in effect dependent on the level of urban influence in the surrounding population. To validate my results, I performed a novel test of robustness using zoning data to demonstrate that there is an insignificant price differential in and around areas zoned for wind development compared to areas that are not zoned. Despite the negative effects induced by wind turbines, my analysis shows that effects attenuate over time, becoming insignificant beyond 10 years post-connection*[48].'

As noted in the paper, the study has several limitations. For instance, the analysis focuses solely on wind development zones in Galway due to data constraints, but expanding it to include all counties would yield more accurate and generalizable results. Additionally, within the 1 km study area, only 255 homes were analysed, limiting the strength of the findings.

A number of studies have been undertaken in the United Kingdom (UK), with findings set out in **Table 5.5**.

The largest study of the effects of wind farms on property prices was conducted in the USA by Hoen *et al*[49] for the US Department of Energy. This study in the USA used data from 7,500 of homes located within 10 miles (c.16km) of 24 existing wind farms in nine States over a 10-yearstudy period. The findings are drawn from eight different pricing models, together with repat sales and sales volume models. None of the models found conclusive evidence of the existence of widespread effects on property values of properties surrounding wind farms. The study also found that neither the view of the turbines or the distance of the property to the turbines had any consistent, measurable and statistically significant effect on property prices in that area. The article does state that the analysis cannot dismiss the possibility that individual properties, or small numbers of properties could potentially be negatively affected, although if there are such properties, they are either too small or too infrequent to result any widespread, statistically observable effect.

The study outlined above was updated in 2013[50] where data was collected from 50,000 house sales in 27 counties in nine states across the USA. The properties were within 10 miles (16km) of 67 wind farms. Of these, 1,198 sales were of properties within one mile (1.6km) of a wind turbine. The data covers the period from before wind farms were consented in the areas to after their construction and into the operation phase. The authors

[48] Gillespie T, McHale P (2023) Wind Turbines and House Prices Along the West of Ireland: A Hedonic Pricing Approach, Centre for Economic Research on Inclusivity and Sustainability (CERIS) Working Paper Series, 2023/01. [Accessed 06/08/2025]
[49] https://www.researchgate.net/publication/242582095_The_Impact_of_Wind_Power_Projects_on_Residential_Property_Values_in_the_United_States_A_Multi-Site_Hedonic_Analysis [accessed 25/06/24]
[50] https://eta-publications.lbl.gov/sites/default/files/lbnl-6362e.pdf [Accessed 06/08/2025]

used Ordinary Least Squares (OLS) and spatial process difference-in-difference hedonic models to make an estimation of the effects on house prices from wind farms. Regardless of the model used, the study found no statistical evidence that property prices near turbines were affected in the pre-planning/pre-construction or post construction periods. The research suggests that the effects of wind turbines on property prices is likely to be small, if there is any effect at all.

A study undertaken in 2014 by the Centre of Economics and Business Research for Renewable UK found that house prices were driven by the property market and not the presence or absence of wind farms[51]. The study analysed house prices at 7 sites across England and Wales at either planning, construction or post construction. The report concluded that:

"We can conclude that local house price growth at these sites is best explained by variations in the county level property market. When homebuyers came to purchasing a property in areas within 5km of wind farm sites, it appears that other factors that determined demand for property, such as the supply of new housing and the condition of the local economy, were more influential than the fact that a wind farm was located nearby. This resulted in properties on average retaining their value."

Another study was undertaken in 2014 by the London School of Economics and it did find the presence of wind farms negatively impacted property values within 2km of very large wind farms[52]. In 2016, following on from the contrasting results of the 2014 studies ClimateXChange carried out their own research in Scotland. The ClimateXChange study found no significant effect on the change in price of properties within 2km or 3km of studied wind farms and found the property values trended in a positive direction in most cases[53]. The ClimateXChange study also found that some wind farms can provide economic and amenity benefits to an area.

In the absence of any peer reviewed/published evidence to the contrary, the above studies provide some context from the international perspective and indicate that on balance wind farms were not found to affect property/ house value.

[51] https://cdn.ymaws.com/www.renewableuk.com/resource/resmgr/publications/reports/ruk-cebr-study.pdf [Accessed 25/06/2024]
[52] http://eprints.lse.ac.uk/58422/1/__lse.ac.uk_storage_LIBRARY_Secondary_libfile_shared_repository_Content_SERC%20discussion%20papers_2014_sercdp0159.pdf [Accessed 06/08/2025]
[53] Heblich, D. S., Olner, D. D., Pryce, P. G. & Timmins, P. C., 2016. *Impact of wind turbines on house prices in Scotland,* Scotland: ClimateXChange - https://www.climatexchange.org.uk/media/1359/cxc_wind_farms_impact_on_house_prices_final_17_oct_2016.pdf [Accessed 06/08/2025]

In addition to this, the additional energy security, community benefits (EIAR **Section 1.10.2**) and creation of jobs throughout the construction, operational and decommissioning phases of the Project will contribute to the sustainable growth of property values.

Table 5.5: Summary of research finding between wind farms and property values

Year	Country	Research Group	Finding
2009 and 2013	USA	LBNL	Analysed nearly 7,500 home sales near wind farms and found no consistent negative impact on property prices. They found no statistical evidence of wind farms affecting home prices before or after construction.
2014	UK	Centre of Economic Research	In summary the analysis found that country-wide property market drives local house prices, not the presence or absence of wind farms; and The econometric analysis established that construction of wind farms at the sites examined across England and Wales has not had a detectable negative impact on house price growth within a 5km radius of the sites.
2014	UK	London School of Economics	There was an average reduction in the value of houses (based on 125,000 house sales between 2000 and 2012) of between 5% and 6% within 2km of very large wind farms.
2016	UK (Scotland)	ClimateXChange	Following a wide range of analyses, including results that replicate and improve on the approach used in the 2014 study by London School of Economics, the study did not find a consistent negative effect of wind turbines or wind farms when averaging across the entire sample of Scottish wind turbines and their surrounding houses. Most results either show no significant effect on the change in price of properties within 2km or 3km or find the effect to be positive. Some wind farms provide economic or leisure benefits (e.g., community funds or increasing

Year	Country	Research Group	Finding
			access to rural landscapes through providing tracks for cycling, walking
2023	Ireland	Centre for Economic Research University of Galway	The paper investigated the effects of proximity to wind turbines on house prices in counties along the west coast of which found a significant and robust discount of 14.7% on properties within 1km of a wind turbine. Additionally, it identified significant effects from turbine density, a reduction in value of -2% per turbine within 1km. While effects appear to persist up to 3km, they are not statistically significant. 'Furthermore, taller turbines incur a greater discount than shorter turbines. Additionally, I display evidence of heterogeneity in effect dependent on the level of urban influence in the surrounding population. Analysis shows that effects attenuate over time, becoming insignificant beyond 10 years post-connection

5.3.9 Natural Disasters and Major Accidents

A wind farm is not a recognised source of chemical pollution. Should a major accident or natural disaster occur, the potential sources of pollution onsite during both the construction and operational phases are limited. Sources of pollution with the potential to cause significant environmental pollution and associated negative effects on health include bulk storage of hydrocarbons or chemicals and storage of waste. Appropriate mitigation measures have been put in place to prevent the release of hydrocarbons, chemicals and waste into the environment as detailed in **Appendix 2.1: CEMP**. The Site is not regulated under the Control of Major Accident Hazards Involving Dangerous Substances Regulations[54] i.e., "*SEVESO sites*" due to there being none of these sites in proximity of the Project, therefore there is no potential effect envisaged from this source.

5.3.9.1 Natural Disasters

There is limited potential for significant natural disasters to occur at the Site. Ireland is a geologically stable country with a mild temperate climate. The potential natural disasters

[54] S.I. No. 209/2015 - Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 - https://www.irishstatutebook.ie/eli/2015/si/209/made/en/print [Accessed 06/08/2025]

that may occur are therefore limited to peat-slide, flooding and fire. The risk of peat-slide is addressed in **Chapter 9: Soils and Geology**.

A Stage III level site-specific FRA has been carried out for the Site to assess the capacity and design flood levels of the river channel network at the Site (Maigue River, River Loobagh and Charleville Stream). Proposed turbines T4, T5, T6, T7, and T8 are located in the 100-yr and 1000-yr design flood events. The northern parts of the main Access Track through the Site is located in the mapped flood zone and hence has been designed relative to existing ground levels to reduce the footprint of the Access Track and hardstand infrastructure in the floodplain during construction. The Hardstands will be reduced in size during the operational phase and the reduced footprint will be constructed above 1:20yr flood + climate change (cc) level. During the operational phase the Access Tracks in the floodplain will be constructed be above the 1 in 20 year level to allow access to all parts of the Site for maintenance and emergency service vehicles in the event of a flood. The top of foundation levels for all turbines within the flood zone will be designed so that the top of the plinth will be 150mm above the 1:1,000-year flood levels plus climate change (cc). This is due to having electrical equipment in the turbines positioned outside the flood level of 1:1,000 year + cc events. The arrangement is shown on **Drawing No. 6839-JOD-GGE-XX-DR-C-503**. The Project has been designed using the latest best practice guidance to ensure that there will be no significant change in modelled water levels downstream of the site after including the proposed wind farm and no potential to increase the flood risk downstream of the Site. The risk of flooding is addressed in **Chapter 10: Hydrology and Hydrogeology** and a Stage III Site Specific Flood Risk Assessment is also included as **Appendix 10.1** to the EIAR.

It is considered that the risk of significant fire occurring, affecting the Project and causing the Project to have significant environmental effects is limited. As described earlier, there are no significant sources of pollution associated with the Project with the potential to cause environmental or health effects. Also, the spacing of the turbines and distance of turbines from any properties limits the potential for impacts on human health. The issue of turbine safety is previously addressed in **Section 5.3.7.9**.

In relation to earthquake risk, there are several fault lines across Limerick; the Site is partially dissected by a fault line[56] There are no historical records of any earthquake causing serious damage in County Limerick, the surrounding counties or on the island of Ireland.

[56] https://gis.epa.ie/EPAMaps/ {Accessed Online 06/08/2025].

5.3.9.2 Major Accidents

The duties on designers and manufacturers of machinery including wind turbines are set out in the Machinery Directive, which has been transposed into national law by the 2008 European Communities (Machinery) Regulations as amended[57]. Properly designed and maintained wind turbines and associated infrastructure are a safe technology. A suitable separation distance from turbines and other key infrastructure to properties has been embedded in the Project design. These outlined measures will minimise the risk to humans. Overall impacts associated with weather, including extreme winds, lightning strikes, ice-throws, heat waves and structural failure have been removed or reduced through inbuilt turbine mechanisms in modern machinery and have been scoped out of the assessment. Potential health impacts are therefore related to decommissioning/construction related impacts and operational impacts on residential amenity.

With mitigation measures in place, it is considered unlikely that the impacts on population and human health (from a pollution perspective, environmental hazards or visual amenity) would be significant and can be ruled out and are therefore not discussed further in this chapter.

5.4 ASSESSMENT OF POTENTIAL IMPACTS

5.4.1 Population and Settlement Patterns

The Project does not contain a housing or services element and is not considered to have any direct positive or negative impact on the local or regional population levels. There is however, the benefit which would accrue to the region in terms of the ability to provide electricity to industry and business in a high-quality supply. This will lead to the region becoming more attractive to business with the subsequent benefit of increased employment opportunities in the region. A renewable, green energy supply could potentially be attractive for companies looking to develop in County Limerick and locating in the vicinity of the Site. However, construction workers who are not based locally may temporarily relocate to the region, this is more likely for the initial construction and decommissioning phase than for the operational phase and would be a direct effect in terms of influencing change in local population dynamics. Overall, it is the likely effect in terms of population dynamics considered to be **imperceptible**.

The predicted effect on the immediate settlement patterns and social patterns is also **slight to non-existent**.

[57] European Communities (Machinery) Regulations (2008) Statutory Instrument (S.I.) No. 407 of 2008 as amended by S.I. 310 of 2011 and S.I. 621 of 2015.

During the construction phase there is the potential for limited impacts on the residential amenity of the local population. These would be short-term impacts relating primarily to an increase in construction traffic causing noise, dust, and an increase in traffic volume. These potential effects are assessed in EIAR **Chapter's 11**, **13** and **17**: **Noise and Vibration**, **Air Quality and Climate** and **Traffic and Transport** respectively. The levels been defined as **slight adverse** in the construction and decommissioning phases and **imperceptible i**n the operational phase.

While this is not likely to result in a marked increase in settlement in the area, or a change in social patterns in the area, it should provide the provision of a secure, renewable energy source which would prove attractive to industry. This is dependent on national and global economic conditions, as well as the types of industry which may locate in the region.

The overall impact of the construction phase is predicted to be **slight positive and short-term** in nature should construction workers relocate to the area for the duration of these phases. The overall impact is predicted to be **slight positive** at the local level in terms of settlement patterns where increased business is attracted to the area during the operational phase.

5.4.2 Economic Activity

During the initial construction and decommissioning phase, there would be economic effects resulting from the expenditure on items such as site preparation, site access roads, purchase and delivery of materials, plant, equipment and components. Information provided by the Developer on experience at other wind farms indicates that there is expected to be a peak onsite workforce of 60 workers. Some of these workers will be sourced from the local labour market in Study Area 2 and Study Area 3. However, professional and skilled personnel may be required to be sourced from areas inclusive of Study Area 4 or even further afield.

During the initial decommissioning and construction phase, jobs are likely to be created. Local employment will be provided, as well as employment on local, national and international levels both directly and indirectly. Throughout the Project lifetime, employment will be both created and maintained on local, regional, national and international levels as discussed in **Section 5.4.3** below.

It is envisaged that labour and materials will be sourced from the local area during construction where possible (on-site borrow pit). Ready-mix concrete and crushed stone

will also be sourced from a local supplier, again subject to authorisation, and to quality and quantity being available.

BVG Associates carried out extensive assessments on the economic benefits from eight onshore wind farms in Southwest Scotland[58]. Each contract value was assigned to one or more relevant elements of a supply chain. Capital expenditure (CAPEX) was found to relate to turbine, civil works and electrical works supply chains, whereas the operational expenditure (OPEX) relates to transmission operations, Maintenance and Service (OMS) supply chain, the windfarm OMS and also the decommissioning supply chain.

Based on this research and the largest capacity being installed, the CAPEX for the Project is estimated to be approximately € 81- 109 million. This expenditure will result in economic benefit at a national, regional and local level. The OPEX (based on a conservative 24-year period) in nominal terms is estimated to be €105 million. The BVG report found, for the eight projects studied, that 66% of the total project spend (CAPEX & OPEX) was retained within the National economy, 17% of the total was retained in the local region hosting the project.

Employees involved in the construction of the Project will most likely use local shops, restaurants and hotels/accommodation. Therefore, overall, there will be a **slight, positive impact** on employment in the Study Areas. Employees also involved in the subsequent operation of the Project will use local shops, restaurants and hotels/accommodation.

Limerick City and County Council will benefit from payments under section 48 Limerick City and County Council's Development Contribution Scheme 2022 and from the annual rate payments. The Developer is also committed to a '*Community Benefit'* package. This package will be advertised annually and managed by the local community, or an independent body appointed by the local community. The purpose of the community fund is to enable the local community to share in the benefits of the Project. The Developer's community benefit funds typically support local projects, with funds allocated to projects from all aspects of the community.

During the construction and decommissioning phase of the Project, the overall impact is predicted to be **positive, moderate and short-term** impact and **positive, moderate and long-term** during the operational phase.

[58] Economic Benefits from onshore wind farms, September 2017, BVG Associates [Accessed 24/09/2024]

The overall impact is considered to be **positive and moderate** in terms of economic activity.

5.4.3 Employment

In addition to the economic benefits outlined in the previous section, there will be employment effects that are attributable to the Project. These will be direct, indirect and induced throughout the phases of the Project.

Direct: Employment and other economic outputs that are directly attributable to the delivery of the Project. These include any new jobs that are created to manage and supervise the construction phase, operational and decommissioning phases of the Project and that are filled by employees of the Developer or the appointed contractor (or sub-contracted employees).

Indirect: Employment and other outputs created in other companies and organisations that provide services to the Project, (i.e., procurement and other supply chain effects). Most manufactured materials like towers, blades and subcomponents are assumed to be imported (import intensity of 66%) with major infrastructure delivery through Foynes Port, Co. Limerick and the Port of Galway; fewer indirect manufacturing jobs will be generated domestically in Ireland.

Induced: Additional jobs and other economic outputs that are created in the wider economy, as a result of the spreading of employee incomes and other ripple effects that occur as a result of the direct and indirect effects of the Project.

The Project will create local employment opportunities throughout the construction, operational and decommissioning phases. These opportunities include local contractors being employed, local suppliers being sourced when possible and employment due to increased activity in local businesses, such as restaurants, hotels and accommodation, shops and delicatessens.

Sustainable Energy Authority of Ireland (SEAI) researched the flow of investment and sales revenue from onshore wind and the transmission grid through the different industrial sectors in the supply chain required for input–output macro-analysis (**Table 5.6**).

Table 5.6: Capital Investment breakdown for onshore wind supply (Source SEAI, 2015)

	Industrial Sectors
€192 million average annual capital investment to reach 2020 NREAP/NEEAP targets	Manufacturing (70%): turbines, blades, towers, gearbox, generator, electrical equipment, transformer etc.
	Construction (12%)
	Electricity Supply Services (10%)
	Transport (2.5%)
	Finance (2.5%)
	Professional Services (3%)

In 2014, Siemens[59] published a report analysing the job creation potential of the wind sector in Ireland in conjunction with the Irish Wind Energy Association. The report states that: '*A major programme of investment in wind could have a sizeable positive effect on the labour market, resulting in substantial growth in employment.'*

Direct employment identified in the report includes; Installation, Development, Planning, Operation and maintenance, Investor Activity, Grid network employment and potential Turbine Manufacturing employment.

The 2021, Wind Energy Ireland report; Economic Impact of Onshore Wind in Ireland60, notes that the onshore wind sector employed approximately 5,130 people in 2020, not including employment in grid development. This includes significant employment in rural communities. The majority (62%) of income generated is in the sectors supply chain, showing that the sector acts as a catalysis for wider employment. In the SEAIs Wind energy Roadmap 2011-2050[61], it is estimated that onshore and offshore wind could have an investment potential of €6 million to €12 million by 2040 and create 20,000 direct installation and operation/maintenance jobs.

In terms of its capacity to capture capital investment domestically, Ireland has strong indigenous feasibility, planning, foundations and engineering expertise, with the skills and knowledge base to potentially supply niche markets in controls and instrumentation, albeit the bulk of heavy manufacturing (blades, towers) is necessarily imported. Similarly, the Irish

[59] Siemens. (2014). An Enterprising Wind. https://www.esri.ie/publications/an-enterprising-wind-an-economic-analysis-of-the-job-creation-potential-of-the-wind [Accessed 06/08/2025]
[60] WEI. (2021). Economic Impact of Onshore Wind in Ireland. https://windenergyireland.com/images/files/economic-impact-of-onshore-wind-in-ireland.pdf
[61] SEAI. (2011). Wind Energy Roadmap 2011-2050 https://www.seai.ie/publications/Wind_Energy_Roadmap_2011-2050.pdf [Accessed 06/08/2025]

supply chain is very well positioned in all the preliminary design and operational aspects of the electricity grid, providing a significant boost to local employment. However, some manufactured materials such as cables, underground pipes, insulators and conductors are sourced from abroad. According to SEAI, there are approximately 0.34 new long-term jobs per MW, which falls in line with European Wind Energy Association (EWEA) estimates for direct employment in Europe. In the case of the Project, this translates to between 17-18 new long-term jobs for the 54MW wind farm.

According to the Institute for Sustainable Future Documents (2015)[62], 3.2 jobs are created per MW of wind energy development during the construction and installation phase, the report assumes a 2-year construction period. Based on this employment estimate and an approximate two-year construction phase, between 163 and 172 jobs could be created during the construction phase (although the capacity of the Project is not fixed, this is based on an estimated capacity of 54 MW).

The SEAI' 2015 report '*A Macroeconomic Analysis of Onshore Wind Deployment*'[63] puts direct construction jobs from wind farm developments at 1.07 jobs per MW based on 1 year of construction. Using this figure, a projection of between 55 and 58 jobs could be created as a result of the construction of the Project (although the capacity of the Project is not fixed, this is based on an estimated capacity of 54 MW).

Therefore, considering the estimated construction periods and possible capacity range', it is estimated that between 40 and 60 direct and indirect jobs could be created during the construction phase of the Project. It is not expected that all of these jobs will be based at the Site, however, the employment of tradespeople, labourers, and specialised contractors for the construction phase will have a direct, short-term significant, positive impact on employment within all Study Areas.

60 persons will be employed during the peak of the construction phase during the civil engineering of site access tracks, Turbine Hardstands, Turbine Foundations, and Electrical Substation construction. These numbers will be somewhat less for the turbine delivery, assembly, commissioning and decommissioning activities. A mixture of skills will be required, including unskilled/semi-skilled/skilled manual (construction labour and machine

[62] Institute for Sustainable Futures, Calculating Global Energy Sector shadow – 2015 Methodology Update, 2015. [Accessed 06/08/2025]
Available:https://opus.lib.uts.edu.au/bitstream/10453/43718/1/Rutovitzetal2015Calculatingglobalenergysectorjobsmethodology.pdf
[63] Sustainable Energy Authority Ireland (SEAI) (2015), A Macroeconomic Analysis of Onshore Wind Deployment to 2020. : https://www.seai.ie/publications/A-Macroeconomic-Analysis-of-Onshore-Wind-Deployment-to-2020.pdf [Accessed 06/08/2025].

operators), non-manual (administration roles), managerial and technical (civil, electrical, mechanical technical and engineering) and professional roles (legal, business and accounting). The manual roles will be site-based with the other roles being predominately office-based, with site visits as and when required. During construction, personnel will be at the Site over a number of months and during these times will likely use local accommodation and restaurants and other facilities.

Anecdotal evidence received by the Developer on other wind farm construction projects shows that local businesses such as accommodation providers welcome the enhanced level of occupancy that is achieved due to the construction contractors using their accommodation on a year-round basis, including periods of the year that are traditionally considered *'low season*'.

The benefits of increased business, although temporary, can allow businesses to invest in improvements that would not otherwise be affordable, leading to a long-term enhancement.

Whilst the effects on the tourism economy are considered to be not significant, based on the studies referred to in **Section 5.4.5**, the overall effects of the Project with regards to tourism are considered to be, **slight, adverse** during the construction, operational and decommissioning phases. The benefits to individual businesses will be substantial and significant.

The Project will create two full-time jobs during the operational phase. In addition to these jobs, various personnel will be required for the successful and continued operation of the wind farm. During the operation phase of the wind farm, the operation and reliability, maintenance (turbines, civil works and electrical infrastructure) finance, ongoing compliance with permissions and permits, safety, security, community relations and benefits and land-owner agreements must be continually managed. These requirements are widely distributed over various employment sectors and are an integral part of the ongoing operation of the Project and will provide continuous employment for the lifetime of the wind farm. A general outline of the employment associated with the operational phase of the wind farm is outlined in **Table 5.7.**

Table 5.7: Contractor and Other Stakeholders involved during the operational phase[64]

Maintenance Contracts	Financial and Services Contracts	Other Stakeholders
Project Manager	Lenders	Local Community
Asset Management	PPA Provider	Local Authority (incl. rates payments)
Turbine Contractor • Transport Companies • Crane Hire • Plant and Vehicle Hire • Site Facilities	Landowner Agreements	Construction and Maintenance material suppliers: • Local shops • Food providers • Accommodation providers
	Insurance	Plant Hire companies
	Accountancy	Telecom provider
	Safety Consultants	
	Community Liaison Officer	
Electrical Works Contractor	Environmental Monitoring • Noise • Ornithology • Habitat Management	
Civil Works Contractor		
Utility		

The persons fulfilling these roles may live and work anywhere in Ireland, visiting the Site as and when required, to operate and maintain the plant and equipment. During major service operations, personnel may be at the Site over several days and during these times may use local accommodation and restaurants.

The impact is predicted to be a **moderate, positive, short-term** impact during the construction and decommissioning phase of the Project and **slight, positive long-term** during the operational phase.

Overall, there is expected to be a **slight, positive, long-term** impact on employment in the area.

[64] Irish Wind Energy Association (2019) *Life-cycle of an Onshore Wind Farm.* Ionic Consulting. Available online at: https://www.iwea.com/images/files/iwea-onshore-wind-farm-report.pdf [Accessed 26/06/24]

5.4.3.1 Embedded measures

The Developer has a proven track record of developing renewable energy development and operation. The company has played a key role in the development of renewable energy projects in Ireland[65]. The Developer's experience from previous wind farm construction projects is that expenditure in local goods and services is widely spread and makes a difference to existing businesses. The Developer is committed to employing good practice measures with regard to maximising local procurement and will adopt measures such as those set out in the Renewables UK Good Practice 2014: *'Local Supply Chain Opportunities in Onshore Wind*' (Renewables UK, 2014).

The Developer will work with a variety of contractors who will be actively encouraged to develop local supply chains throughout the local area, and work with subcontractors to invest in training and skills development.

At this stage in the Project process, it is not possible however, to quantify economic benefits in respect of individual supply chain companies, as contracts would not be let until a consent is granted. However, it is evident from the Developer's recent experience that local and regional suppliers of a wide range of goods and services will benefit from such a Project (in this case, Limerick and Ireland as a whole).

5.4.4 Land Use and Topography

The total land-take of the Project is as follows:

- 11.256Ha (7.1% of total Site 158.75Ha) – Construction Phase (all infrastructure excluding cabling)
- 5.095Ha (3.2% of total Site 158.75Ha) – Operational phase (new Access Tracks, reduced hardstands, Substation, Met Mast, Permanent Spoil Area and Met Mast)
- 1.598 Ha (1.0% of total Site 158.75Ha) – Decommissioning Phase (new Access Tracks and Substation)

The Project Access Tracks and upgrade to existing tracks will improve access for surrounding agricultural use.

The construction, operational and decommissioning phase of the Project will result in a change of agricultural land use, in areas where new Access Tracks, wind turbine foundations, hardstanding areas, Met Mast, the Substation, site compounds and associated

[65] https://greensource.ie/

drainage infrastructure will be located. The immediate surrounding agricultural grasslands will remain in agricultural use.

The construction of the Turbine Delivery Route will only require relatively localised temporary accommodation requirements within the curtilage of the public road network, with no excavation or enabling works envisaged in private lands outside of the Redline Boundary. Full reinstatement will occur where temporary accommodation requirements are undertaken.

The Project will have a **temporary, slight, adverse effect** on agricultural land use due to the removal of grazing lands during the construction phase and a **long-term, slight, adverse effect** on agricultural land use for the duration of the operation phase of the Project.

With reference to **Chapter 9: Soils and Geology** concludes that Landslide Susceptibility within the Application Site and along the grid connection is LOW or LOW (INFERRED) risk and peat landslide has also been screened out for the Site. Providing the mitigation measures proposed are fully implemented and best practice, as described, is followed on Site, it is not expected that there will be any significant impacts associated with the Project. It is recommended that suitable monitoring programmes are proposed and implemented to see that there is adherence to the CEMP and to the mitigation measures outlined here during construction, operation and decommissioning of the wind farm.

5.4.5 Tourism

Fáilte Ireland were consulted in the scoping process of this Project and their guidelines '*EIAR Guidelines for the Consideration of Tourism and Tourism Related Projects'*, which describes the effects of projects on tourism, were considered in this assessment. Many of the issues covered in the report are similar to those covered in this EIAR, for example, scenery is assessed in **Chapter 12: Landscape and Visual Amenity**.

The 2017, BiGGAR Economics[67] study found that sustainable tourism appeared to perform better in areas surrounding wind farms compared to tourism at the level of the local authority area.

[67]BiGGAR. (2017). Wind Farms and Tourism Trends in Scotland. https://biggareconomics.co.uk/wp-content/uploads/2020/01/Wind-farms-and-tourism-trends-in-Scotland.pdf Accessed 26/06/2024

Fáilte Ireland published a study on '*Visitor Attitudes on the Environment'* in 2012[68] to assess the perceived impacts of wind farms on potential future visits to an area. The study found that 12% of those surveyed, responded that wind farms would have 'a strong positive impact' on their decision to visit Ireland, with 27% responding it would have a 'slight positive impact', whilst 38% said it would have 'no impact'. 7% of respondents stated it would have a 'strong negative impact' and 15% stated it would have a 'slight negative impact'. The survey also found that wind farms were noted as more favourable than other forms of development such as housing, mobile phone masts or electricity pylons.

Attitudes to wind power were found to be 54% strongly in favour in November 2018. While favourability towards wind continued to consolidate (compared to 47% in October 2017), the total number in favour remained steady at just over 4 in 5, there was a 7% shift in Irish adults from 'tending to favour' wind power into being 'strongly in favour'. [69]

Based on the findings of the collective Tourism and Economics studies referenced in **Section 5.3.5.3**, it is considered that the Project will not give rise to any significant effects on tourism resource potential. Overall effects of the Project with regards to tourism are considered to be, **slight, adverse** during the construction, operational and decommissioning phases.

5.4.6 Human Health

5.4.6.1 Electromagnetic fields

In 2014 a study was undertaken in Canada[70], measuring electromagnetic fields around wind farms and the impact on human health. The study found that:

"there is nothing unique to wind farms with respect to EMF exposure; in fact, magnetic field levels in the vicinity of wind turbines were lower than those produced by many common household electrical devices and were well below any existing regulatory guidelines with respect to human health".

As outlined in **Section 5.3.7.2**, the International Commission on Non-Ionising Radiation Protection (ICNIRP) Guidelines give a limit of 100 µT for sources of AC magnetic fields. Given the limit of 100 µT for sources of AC magnetic fields, a comparison of between 0.02

[68] Fáilte Ireland (2012) Visitors Attitudes on the Environment – Wind Farms - https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/3_Research_Insights/4_Visitor_Insights/WindFarm-VAS-(FINAL)-(2).pdf?ext=.pdf [Accessed on 25/06/2024]
[69] IWEA Public Attitudes Monitor 2018, Irish Wind Energy Association. Available online: https://windenergyireland.com/images/files/iwea-report-2018.pdf [Accessed 25/06/2024]
[70] Lindsay C McCallum, *et al*. (2014) *Measuring electromagnetic fields (EMF) around wind turbines in Canada: is there a human health concern?* [Accessed 24/09/2024]

μT and 0.41 μT arises when turbines operate under "high wind" scenarios, indicating that electromagnetic activity from wind turbines are extremely low. Refer to **Section 5.3.7.8** (Health Impact studies), which includes references to effects of Electromagnetic fields on Human Health.

Electromagnetic fields from other sources will also occur during the construction, operation and decommissioning of the Garrane Green Energy Project. Sources include power tools used during construction and decommissioning and from wind farm infrastructure, including the Grid Connection and the Substation. These EMFs are very localised and are considered to have an **imperceptible, adverse and short-term** effect during the construction and decommissioning phases and **imperceptible, adverse and long-term** during the operational phase.

Chapter 14: Shadow Flicker and EMI details how the potential effects of electromagnetic fields have been assessed in further detail.

5.4.6.2 Shadow flicker

Shadow Flicker will only occur during the operational phase of the wind farm development. The Department of Energy and Climate Change for England stated in its report Update of UK Shadow Flicker Evidence Base (2011) that it is considered that the frequency of the flickering caused by the wind turbine rotation is such that it should not cause a significant risk to health.

There are a total of 113 sensitive receptors within the Shadow Flicker Study Area (10xRD), 40 of these receptors exceed 30 minutes within 24 hours according to the Worst-Case Scenario under the 2006 Guidelines, with 5 receptors also surpassing 30 hours of shadow flicker per year in the 'real case' scenario. It is therefore considered that Garrane Green Energy Project Wind Farm will comply with the recommended limits of 30 hours per year and 30 minutes per day detailed within the Wind Energy Development Guidelines (2006) and has due regard for the zero shadow flicker policy as set out in the Draft Revised Wind Energy Development Guidelines (2019). It is proposed that a shadow control system be installed to eliminate mitigate the potential for adverse shadow flicker from the Project. This assessment has identified that by installing a blade shadow control system on the proposed turbines, there will be no significant direct or indirect effects. Given that only effects of significant impact or greater are considered "significant" in terms of the EIA Directive the potential effects of the Project as a result of shadow flicker, when mitigated, are considered to be not significant. The Project has been assessed as having the potential to result in

adverse, imperceptible, long-term effects overall with regards to shadow flicker. There are no predicted cumulative effects.

Chapter 14 provides an impact assessment of the potential for shadow flicker effects from the Project incorporating pre and post mitigation assessment conclusions.

5.4.6.3 Noise

The main noise sources will be associated with the construction of the turbine foundations and turbine hardstands. Lesser noise source activity will be construction of Access Tracks, temporary construction compound, turbine erection and the construction of the Substation. There is likely to be some noise and vibration from traffic within the vicinity of the Turbine Delivery Route and the Construction Haul Route which may cause disturbance to residents during construction. However, the effects are predicted to be **not significant** during the construction phase. This is detailed in EIAR **Chapter 11: Noise and Vibration.**

Operational noise, designed to meet the limits in the 2006 Wind Energy Development Guidelines will have a residual effect within the guideline limits and can be described as **Not Significant**. This is detailed in EIAR **Chapter 11: Noise and Vibration**.

Noise effects during decommissioning of the Project are likely to be of a similar nature to that during construction but of shorter duration and are therefore **not significant**. This is detailed in EIAR **Chapter 11: Noise and Vibration**. Existing site Access Tracks and turbine foundations (excluding plinths) will be left in place and naturally vegetated over. Any legislation, guidance or best practice relevant at the time of decommissioning will be complied with.

A baseline assessment of the existing background noise conditions was carried out, the results of which are presented in **Chapter 10: Noise and Vibration**.

5.4.6.4 Air Quality

Chapter 13: Air Quality and Climate provides an assessment of air quality and climate related effects resulting from the Project.

The significance of potential effects of the Project on air quality has been assessed as having the potential to result in **slight, adverse** and **temporary/short-term** effects on air quality during construction and decommissioning. There will be no significant effect on air quality during construction and decommissioning.

There will be **slight, long term, positive** effects on air quality because of the wind farm during operation.

5.4.6.5 Water Contamination

Chapter 10: Hydrology and Hydrogeology provides an assessment of the hydrological effects in relation to the Project, including the potential for water contamination. The conclusion is referenced at **Section 10.8** and states that given the significant distances which exist between local dwellings and proposed infrastructure locations, local topography and prevailing groundwater flow directions, there is no potential for effects on groundwater well supplies.

Due to the shallow nature of the proposed works (road upgrade and widening) along the Grid Connection, no effects on private groundwater well supplies will occur. Implementation of the control measures outlined in this EIAR will result in a robust environmental management plan which will target and mitigate likely sources and pathways of contaminants arising at the Site.

5.4.6.6 Traffic

Chapter 17: Traffic and Transport provides an assessment of the traffic effects in relation to the Project. The conclusion is referenced at **Sections 17.7** and **17.8** and states that the potential effects of the project are considered to be **Moderate** on the local road network and **Slight / Moderate** on the national and regional road network during the construction of the Project. The potential effects of the project on traffic during the operation of the Project are considered to be **Not Significant** on the public road network. The potential effects of the Project on traffic and transport during the decommissioning of the Project are considered to be **Moderate** on the local road network and **Slight / Moderate** on the national and regional road network.

5.4.6.7 Accidents/Disasters (incorporating Health & Safety)

As with any Project of this type, there is the potential for accidents to occur. In the context of human health and safety, these are addressed under two main headings, accidents to personnel and accidents to plant and equipment ('infrastructure').

Accidents to Personnel

Risks present during the construction, operation and decommissioning phases of the Project, which have potential to cause injury to personnel, may include but are not limited to:

- Burial under earthfalls / falling into bog holes or soft peat areas.
- Falling from height
- Work which puts personnel at work at risk from chemical or biological substances
- Work which involves energies – utilities such as electricity, gas, water, pressurized equipment.
- Work exposing personnel to the risk of drowning.
- Work involving the assembly or dismantling of heavy prefabricated components.
- Construction activities which have potential to cause accidents/incidents.
- Use of vehicles or mobile plant / machinery / equipment

Accidents to Infrastructure

Potential risk to infrastructure, again for the construction, operation and decommissioning phases include but are not limited to:

- Burial under earthfalls / falling into bog holes or soft peat areas which impact the ground conditions of nearby structures, collapse of structures.
- Falling from height causing damage to property
- Work which puts personnel at work at risk from chemical or biological substances
- Work which involves energies – utilities such as electricity, gas, water, pressurised equipment which have potential to cause damage through fire, explosion, pressure release etc.
- Work involving the assembly or dismantling of heavy prefabricated components.
- Construction activities which have potential to cause accidents/incidents.
- Use of vehicles or mobile plant / machinery / equipment – failure of plant/machinery/ equipment, loss of control.

The above health and safety risks are addressed within the CEMP (**Appendix 2.1**). Emergency response protocols are also set out within the CEMP documentation. In terms of significance of effects, the risk potential for accidents and disasters on site has been evaluated in **Section 5.3.9** and is further addressed within **Section 5.5.7** below and in **Chapter 16: Material Assets and Other Issues.**

5.4.7 Property Value

The effects to property values have been reviewed and assessed within **Section 5.3.8**. Based on the evidence from a number of these published studies, the operation of a wind farm at the Site is considered to not significantly affect property values in the area. The Project will have a **medium-long-term, imperceptible** impact on property values.

5.5 MITIGATION MEASURES AND RESIDUAL EFFECTS

Although no negative impact of significance has been established, there are a number of measures, which may be implemented for the safety of workers and the public during the construction, operational and decommissioning phases.

5.5.1 Embedded Mitigation

The Project, as described in **Chapter 2: Project Description**, incorporates good practice measures for limiting the adverse effects of the construction works. The principal potential effects arising from works relate to construction traffic affecting the use of National Roads, local primary roads and access roads by the general public. Measures are set out in **Chapter 11: Noise and Vibration** and **Chapter 17: Traffic and Transport** relating to how construction work and delivery of materials, goods and services would be managed to minimise impacts. Embedded mitigation measures have also been developed for both the operational and decommissioning stages of the project and outlined in the referenced chapters. The proposed mitigation measures have been further developed in the CEMP (**Appendix 2.1**).

5.5.2 Population and Settlement Patterns

Given that no adverse effects have been identified, no additional mitigation measures are proposed.

5.5.3 Economic Activity

Allowing for the implementation of embedded mitigation, no significant effects have been identified in respect of socio-economic receptors arising from the construction of the Project and therefore no mitigation measures are required to reduce or remedy any adverse effect.

5.5.4 Employment

Given that potential impacts of the Project at construction, operation and decommissioning phases are predominantly positive in respect of socioeconomics, employment and economic activity, no mitigation measures are considered necessary.

5.5.5 Land Use and Topography

Given that no negative effects have been identified, no mitigation measures are proposed (other than embedded mitigation of minimising land take).

5.5.6 Tourism

Allowing for the implementation of embedded mitigation, no significant effects have been identified in respect of tourist receptors arising from the construction of the Project and therefore no mitigation measures are required to reduce or remedy any adverse effect.

5.5.7 Human Health

5.5.7.1 Accidents/Disasters (incorporating Health & Safety)

Accidents to Personnel

Potential risks to personnel are discussed in **Section 5.4.6.7.**

Current legislation relating to the Safety, Health and Welfare of persons at work and industry specific Codes of Practice / Guidance documents, are designed to assist in the management of risks associated with the construction, operation, maintenance and decommissioning phase of wind farm projects.

The construction, operation and decommissioning of the Project shall be managed in accordance with the Safety, Health and Welfare at Work Act 2005 (as amended), the Safety, Health and Welfare at Work (General Application) Regulations 2007 (as amended), and the Safety Health and Welfare at Work (Construction) Regulations 2013 (as amended).

As required under the Safety, Health and Welfare at Work (Construction) Regulations 2013, the Developer shall appoint a Project Supervisor for the Design Process (PSDP) and a Project Supervisor for the Construction Stage (PSCS). The PSDP shall compile a Preliminary Safety and Health Plan (PSHP), which details general information about the Project and envisaged health and safety risks. The PSHP shall be made available to the PSCS. The PSCS shall develop a Construction Stage Health and Safety Plan (CSHSP) which incorporates the information contained in the PSHP and details how safety and health will be managed during the construction of the Project. The PSCS may also develop the following documents during the pre-construction stage of the Project, for implementation during the construction stage:

- Construction and Environmental Management Plan (updated from the CEMP in **Appendix 2.1**)
- Emergency Response Plan
- Detailed Traffic Management Plan

Accidents to Infrastructure

The PSDP shall see that the General Principles of Prevention, outlined under the safety design advice provided by the Health and Safety Authority (HSA) are taken into account for all designs relating to the project.

On very rare occasions, the structural integrity of wind turbines has failed. This is an extremely rare occurrence and given that the turbines will be designed and installed by an experienced turbine contractor and are located well away from public roads and dwellings in line with the Wind Energy Development Guidelines (2006), it is not considered (in the unlikely event of an accident of this type) that it would result in any significant impacts to population or human health.

Potential accidents, such as a risk of incident during transport, a fire on site or the risk of a turbine structural failure is assessed to be a **slight, adverse, long-term** effect.

5.5.7.2 Operation

For operation and maintenance staff working at the proposed wind farm, appropriate site safety measures will be utilised during the operational phase by all permitted employees. All personnel undertaking works in or around the turbines will be fully trained and will use appropriate Personal Protective Equipment (PPE) to prevent injury.

Equipment within high voltage substations presents a potential hazard to health and safety. The proposed Electrical Substation will be enclosed by palisade fencing and equipped with intruder and fire alarms in line with ESBN and EirGrid standards.

All electrical elements of the Project are designed to ensure compliance with electro-magnetic fields (EMF) standards for human safety.

All on-site electrical connections are carried by underground cable and will be marked out above ground where they extend beyond the site access track or Turbine Hardstand surface extents.

Lightning conductors will be installed on each turbine as all structures standing tall in the sky require this protection. Turbines specifically require this to prevent power surges to electrical components. Turbines will be fitted with ice detection systems which will stop the turbine from rotating if ice is forming on a turbine blade and this helps to prevent ice throw.

Rigorous statutory and engineering safety checks imposed on the turbines during design, construction, commissioning and operation will ensure the risk posed to humans is negligible. 24-hour remote monitoring and fault notifications are included as standard in the Turbine Operations and Maintenance Contracts. A Supervisory Control and Data Acquisition ("SCADA") system will monitor the Development's performance. If a fault occurs, then a message is automatically sent to the operations personnel preventing emergency situations.

In addition to scheduled maintenance, the maintenance contracts will allow for call out of local engineers to resolve any issues as soon as they are picked up on the remote monitoring system.

Access to the turbines inner structure will be locked at all times and only accessed by licenced employees for maintenance.

In line with the Health Service Executive's Emergency Planning recommendations, any incident which may occur at the Site which requires emergency services, incident information will be provided in the 'ETHANE' format:

- Exact location
- Type of incident
- Hazards Access and egress
- Number of casualties (if any) and condition
- Emergency services present and required

The design of the Project has considered the susceptibility to natural disasters. The proposed Site drainage (detailed in **Appendix 2.1**) will mitigate against any potential flooding risk due to run off with the use of Sustainable Drainage Systems (SuDS). Construction drainage will be left i*n-situ* for the lifespan of the Project through to decommissioning.

The Contractor's fire prevention/management plans will be reviewed and updated on a regular basis. A nominated competent person shall carry out checks and routine maintenance work to ensure the reliability and safe operation of firefighting equipment and installed systems such as fire alarms and emergency lighting. A record of the work carried out on such equipment and systems will be kept on Site at all times.

Detection systems and turbine control software will be installed on all turbines to (i.e. permit remote shutdown as necessary) prevent shadow flicker on nearby receptors.

The wind farm system shall include a system over-ride switch that can be operated at any time, to facilitate manual shutdown in case of an emergency.

5.5.7.3 Residual Risk

Once the mitigation established for the construction, operation and decommissioning stages of the project, as detailed in this Chapter of the EIAR and other EIAR chapters, namely Chapter's **11 (Noise and Vibration)**, **13 (Air Quality and Climate)**, **14 (Shadow Flicker and EMI**), **16 (Material Assets and Other Issues)** and **17 (Traffic and Transport)** are taken into account, the residual risk on population and human health is assessed to be an **imperceptible, long-term** effect.

5.5.8 Cumulative Effects

The nearest operational wind farm to the Project is Rathnacally Wind Farm comprising of two wind turbines located 5.9km to the south of the Site. The next nearest operational wind farm to the Project is the Boolard Wind Farm comprising of two turbines located 9.0km to the southwest of the Site.

The Project, along with other Irish renewables generation, is considered a fundamental change in the climate effects of Ireland's energy supply. They are an important, positive effect that is significant under the EIA Directive and will contribute to Ireland's legally binding CO_2 emission reduction targets. The Project will also contribute to the offset of burning of fossil fuels which has the potential to positively impact human health.

Human health was assessed in **Section 5.3.7** for the Project during the various stages of the Project. Chapter's **11: Noise and Vibration**, **13: Air Quality and Climate**, **14: Shadow Flicker and EMI**, **16: Material Assets and Other Issues**: and **17: Traffic and Transport** include specific assessments which include the assessment of cumulative effects. These EIAR chapters also conclude the cumulative effects of the Project is considered to be **not significant**.

The Landscape and Visual Impact Assessment is contained in **Chapter 12: Landscape and Visual Amenity** (**Section 12.4**) and details the effects of the setback distance which makes the apparent scale of the turbines similar to the other turbines in the area, and therefore, the proposed turbines are not to be considered overbearing. This confirms that

the cumulative effects of the Project in terms of visuals and tourism are considered to be **not significant**.

The cumulative effects of the Project can be predicted to be a **small, short-term adverse** effect on overall tourism and amenity during construction. There is predicted to be a **short-term, moderate positive** effect in terms of employment from the Project.

It is not predicted that the cumulative effect of this Project will have an impact on population or settlement patterns, nor will it have a significant impact on industry sectors in the three study areas.

5.6 SUMMARY OF SIGNIFICANT EFFECTS

The assessment has not identified any likely significant effects from the Project on population and human health.

5.7 STATEMENT OF SIGNIFICANCE

This chapter has assessed the significance of potential effects of the Project on population and human health. There are no likely significant effects for the Project, alone or cumulatively. Through the implementation of mitigation measures, the effects, including cumulative effects associated with the Project are predicted to be not significant.