



Cush Wind Farm
Phase II

Environmental Impact Assessment Report

Chapter 4: Population & Human Health

Cush Wind Limited

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4.1 INTRODUCTION

This chapter presents an assessment of the likely and significant effects of the project on population and human health. Human beings comprise a significant and important environmental factor which must be comprehensively assessed. This includes effects on the existence, activities and wellbeing of people, including the local population. While there is no specific definition of the meaning of the term 'Human Health', the European Commission *Guidance on the preparation of the Environmental Impact Assessment Report* (2017) states that:-

"Human health is a very broad factor that would be highly project dependent. The notion of human health should be considered in the context 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".

Many of the likely significant effects on population and human health are therefore addressed in the specific, relevant chapters of this EIAR including, for example, Land & Soils (**Chapter 6**), Water (**Chapter 7**), Air Quality (**Chapter 8**), Climate (**Chapter 9**), Landscape (**Chapter 10**), Noise & Vibration (**Chapter 12**), Shadow Flicker (**Chapter 13**) and Interactions between these environmental factors and population and human health (**Chapter 15**).

In accordance with Environmental Protection Agency (EPA) *Advice Notes on Current Practice in the preparation of Environmental Impact Statements* (2003), issues which are specifically examined in this chapter include *inter alia*:-

- Economic Activity – will the development stimulate additional development and/or reduce economic activity and, if either, what type, how much and where?
- Social Consideration – will the development change patterns and types of activity and land use?;
- Land-uses – will there be severance, loss of rights of way or amenities, conflicts, or other changes likely to ultimately alter the character and use of the surroundings?;
- Tourism – will the development affect the tourism profile of the area?; and,
- Health and Safety – will there be risks of death, risks to public health, disease, discomfort or nuisance?

Likely significant effects may occur as a result of direct interaction between the project and population and human health receptors, such as farming operations affected as a result of construction activities, or indirectly, such as employment created as a result of the local spending of wages earned by the construction workforce during the construction phase of the project.

4.1.1 STATEMENT OF AUTHORITY

This chapter was prepared by various members of the Galettech Energy Services (GES)

Planning & Environment Team. GES has substantial socio-economic/population and human health assessment experience having prepared Population & Human Health (Human Beings) chapters for multiple projects which have been subject to EIA, including those listed at **Section 1.7.4 (Chapter 1)**.

4.1.2 DESCRIPTION OF THE PROJECT

The project site is located in rural Co. Offaly, approximately 4km north of the town of Birr and c.28km south-west of Tullamore, Co. Offaly.

The project assessed within this EIAR comprises a 3 no. wind turbine extension to the permitted Cush Wind Farm Phase I, together with all associated and ancillary infrastructure and works. This includes turbine foundations, crane hardstanding areas, access tracks, internal underground electrical and communications cabling, site drainage and rehabilitation works, peat/spoil management, a proposed electrical switch room building, and a c.5km underground electricity line extending from the proposed electrical switch room to facilitate connection of the proposed wind farm to the national electricity network.

The proposed turbines will be selected from within the turbine dimension range assessed in this EIAR, comprising an overall tip height of 199.1m to 200m, a rotor diameter of 158m to 175m and a hub height of 111.6m to 120.9m.

The turbine component haul route and associated temporary and permanent accommodation works, as described in Chapter 3, extend through Counties Galway, Roscommon, Westmeath and Offaly. Turbine components will be transported from the Port of Galway via the N6, M6, N52 and N62 before accessing the project site from the permitted construction phase site entrance from the N62 national road.

A full description of the project is presented in **Chapter 3**.

4.2 POLICY AND GUIDANCE

This section sets out the policy and guidance which is considered to be of relevance to an assessment of effects on population and human health for a project of this type i.e. Project Type 33 as described in the EPA's *Advice Notes on Current Practice in the preparation of Environmental Impact Statements (2003)*.

4.2.1 NATIONAL POLICY

4.2.1.1 Wind Energy Development Guidelines for Planning Authorities 2006

The *Wind Energy Development Guidelines for Planning Authorities 2006* ('the 2006 Guidelines') offer advice to planning authorities in determining planning applications for wind farm developments, including the likely significant effects on human health and population.

4.2.1.2 Draft Revised Wind Energy Development Guidelines (December 2019)

The *Draft Revised Wind Energy Development Guidelines* ('the Draft Guidelines') were published in December 2019. The Draft Guidelines include updates to several key aspects of the 2006 Guidelines including in respect of matters which interrelate with population and human health effects; namely noise, visual amenity and shadow flicker.

4.2.2 REGIONAL POLICY

Regional policy, as it relates to population and human health, is derived from the *Eastern and Midland Regional Assembly Regional Spatial and Economic Strategy 2019–2031* (RSES). The RSES seeks to provide a framework through which national policies; including in relation to economic, environmental and quality of life factors; are implemented across the Eastern and Midland Region, which includes County Offaly.

4.2.3 LOCAL POLICY

4.2.3.1 Offaly County Development Plan 2021-2027

The *Offaly County Development Plan 2021-2027* ('the Offaly CDP 2021-2027') includes a set of Strategic Objectives which also relate to population & human health, including as follows:-

- Plan for a population increase in County Offaly during the plan period of 9,239 persons;
- Ensure better alignment between the location of population growth and employment growth. This will allow settlements to become more self-sustaining, sustainable and balanced rather than based on long distance commuter driven activity;
- Protect and enhance Offaly's natural assets of clean water, biodiversity, landscape, green infrastructure, heritage and agricultural land;
- Make more efficient use of key resources such as land, water, energy, waste and transportation infrastructure;
- Create a competitive business environment supporting economic development, job creation, tourism and prosperity for all;
- Achieve transition to a competitive, low carbon, climate resilient and environmentally sustainable economy. This should be facilitated through reducing the need to travel, by integrating land use and sustainable modes of transport, and by reducing the use of non-renewable resources. In line with this, promote active and healthy lifestyles through increased opportunities for walking, cycling and active sport recreation; and
- Encourage inclusive and active sustainable communities based around a strong network of community facilities and amenities.

In addition, the Offaly CDP 2021-2027 also includes three high level 'key principles', each of which are also directly related to population & human health, including:-

- Healthy Placemaking is focused on promoting people's quality of life through the creation of healthy and attractive places to live, work, visit and study in;
- Climate Action recognises the need to enhance climate resilience and to accelerate a transition to a low carbon economy recognising the role of natural capital and ecosystem services in achieving this; and
- Economic Opportunity develops from creating the right conditions and opportunities for the county to realise sustained economic growth and employment that ensures good living standards for all.

4.2.4 GUIDANCE

4.2.4.1 *EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022)*

The Environmental Protection Agency *Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022)* ('the EPA Guidelines') state that an EIAR does not generally require assessment of land-use planning, demographic issues or detailed socio-economic analysis unless the project gives rise to likely significant effects which affect economic or settlement patterns.

Whilst the project will not result in such development, it will give rise to the generation of employment during both the construction and operation phases as well as inward investment which may affect the local supply chain. On this basis, the EIAR baseline contains a brief summary of key socio-economic baseline data relating to the wider study area (see **Section 4.3.2** below) and the likely effects on this receiving environment are considered.

In relation to likely effects on human health, the EPA Guidelines highlight the importance of avoiding duplication of assessments (i.e. care should be taken to avoid 'double-counting' effects that are identified elsewhere in the corresponding chapter of the EIAR e.g. noise or air quality effects etc). As a result, likely effects on population and human health which may arise from these specific environmental factors are addressed in their respective chapters. The likely interactions of these effects, if any, are also addressed in **Chapter 15**.

The EPA Guidelines further state that assessments of other health and safety issues, as relevant, may be carried out under other EU Directives (e.g. reports prepared under the Integrated Pollution Prevention and Control frameworks or SEVESO Directive etc.). In keeping with the requirement of the EIA Directive, an EIAR should take account of the results of such assessments without duplicating them.

4.2.4.2 *EIAR Guidelines for the Consideration of Tourism and Tourism Related Projects*

These guidelines ('the Fáilte Ireland Guidelines') recognise that the impact and interaction of tourism with the environment is complex and the assessment of environmental impacts is crucial to creating a sustainable tourism economy and protecting natural resources. It is also acknowledged that tourism can be affected both by direct and indirect effects of new developments as well as by interactions between new activities and tourism activities; for example, the effects of high volumes of heavy goods vehicles passing through hitherto quiet, scenic, rural areas.

The Fáilte Ireland Guidelines set out that the EIAR should indicate the location of sensitive nearby tourism resources that are likely to be directly affected, and other premises which may be the subject of secondary impacts such as alteration of traffic flows or increased urban development. The EIAR should indicate the numbers of premises and visitors likely to be affected, both directly and indirectly.

4.2.4.3 *EMF & You: Information about Electric & Magnetic Fields and the electricity network in Ireland*

The provision of electrical apparatus is common practice throughout Ireland and its installation does not give rise to any specific health concerns. The extremely low frequency (ELF) and electrical magnetic fields (EMF) associated with the operation of the electrical equipment will, as is required by legislation, comply fully with the

international guidelines for ELF and EMF set by the International Commission on Non-Ionizing Radiation Protection (ICNIRP), a formal advisory agency to the World Health Organisation, as well as the EU guidelines for human exposure to EMF.

The document 'EMF & You' (ESB, 2017)¹ provides further practical information on EMF.

4.2.4.4 Supplementary Guidance & Information Sources

Other advice and guidance, reviewed as part of the baseline assessment and in developing the assessment methodology include:-

- *Code of Practice for Wind Energy Development in Ireland* (Department of Communications, Climate Action and Environment, 2016);
- *Best Practice Guidelines for the Irish Wind Energy Industry* (Irish Wind Energy Association, 2012);
- *Best Practice Principles in Community Engagement and Community Commitment* (Irish Wind Energy Association, 2013);
- *An Enterprising Wind: An economic analysis of the job creation potential of the wind sector in Ireland* (Irish Wind Energy Association, 2014);
- *Wind Turbine Experiences – 2012 Survey Results* (British Horse Society, 2013);
- *Wind Turbines and Horses - Guidance for Planners and Developers* (British Horse Society, 2015); and,
- *Electricity Transmission Studies: Evidence-Based Environmental Studies* (EirGrid, various).

Key socio-economic data for the baseline has been derived from:-

- Central Statistics Office (CSO);
- Offaly County Development Plan 2021-2027;
- Pobal Profiling GIS Data (<https://maps.pobal.ie/>);
- Fáilte Ireland data in conjunction with websites of relevant tourism sites and amenities in the area;
- Fáilte Ireland – Key Tourism Facts 2024 (2025);
- Offaly Tourism Strategy 2026-2031;
- Offaly County Council – Offaly Economic Development Strategy and Action Plan 2022-2027;
- Offaly County Council – Local Economic and Community Plan 2024-2029 – County wide Framework;
- Offaly County Council – A Socio-Economic and Demographic Profile of Co. Offaly; and,
- OSI mapping and aerial photography.

4.3 METHODOLOGY

¹ https://esb.ie/docs/default-source/default-document-library/emf-public-information_booklet_v9.pdf?sfvrsn=0

4.3.1 DESK BASED RESEARCH

The majority of effects on population and human health receptors are likely to be experienced during the construction phase. These are likely to include potential beneficial effects on the local economy, including employment opportunities and increased spend on local services as well as potential adverse effects, such as restrictions on farming operations, neighbouring businesses or general disruption to the amenity of the local area, including in respect of road traffic, which may indirectly impact on its recreation or tourism value. Once operational, effects are likely to be primarily related to the visual impact and potential noise effects from the project.

In respect of human health, the chapter takes into consideration the results of other assessments in the EIAR which have relevance to health, namely soils; water; air quality; climate; noise; shadow flicker; and landscape. The findings of these assessments are cross referenced in this chapter, but the assessment will not be repeated to avoid duplication.

Employment effects and direct expenditure are quantified using data provided by the Developer and, where necessary, using standard industry data. Opportunities for local businesses and the local labour market to be involved in supply chain activities will be identified and where possible quantified.

4.3.2 STUDY AREA

The spatial focus of the assessment is undertaken at two levels. Firstly, effects on specific community, recreation and tourism receptors are assessed at a local level which is defined as 5km from the wind turbines and 500m from the grid connection (underground electricity line) and is referred to as the 'Local Study Area' (LSA).

Economic effects are assessed with regard to a wider study area that takes account of a likely catchment for provision of domestically sourced goods and services relating to the construction and operation of the wind farm. This study area comprises the county within which the project is situate, i.e. County Offaly, and is referred to as the 'Wider Study Area' (WSA). Whilst it is recognised that the project is located in relatively close proximity to surrounding counties, including, most notably, Tipperary, given that County Offaly is presented as a statistical unit in CSO Census data and that the WSA is used as a measure of key population, labour market and economic statistics and trends, it was considered the most appropriate study area. It is, however, noted that the 5km LSA includes a small area of northern County Tipperary, to the southeast of the project site. Given the scale of the project it is not considered necessary to assess effects at a national or international level.

Study Areas	Spatial Extent
Wider Study Area	County Offaly
Local Study Area	5km from the wind turbines and 500m from the grid connection (underground electricity line)

Table 4.1: Study Area Details

A desk-based review of existing conditions in the area has been undertaken, covering the following themes:-

- Wider Study Area:-
 - Population;

- Labour market, education and skills;
- Business diversity and supply chain; and,
- Visitor economy.
- Local Study Area:-
 - Recreational assets;
 - Community;
 - Land use;
 - Visitor attractions; and,
 - Visitor accommodation and other businesses/services serving the tourism economy.

4.3.3 CONSULTATION

A range of statutory and non-statutory organisations have been consulted as part of the EIAR scoping process. The responses which are relevant to likely effects on population and human health are summarised in **Table 4.2** and provided at **Annex 1.7**.

Consultee	Comments	Reference within EIAR
Failte Ireland	Supplied copy of <i>EIAR Guidelines for the Consideration of Tourism and Tourism Related Projects</i> .	Incorporated into methodology.

Table 4.2: Scoping advice relating to Population & Human Health

Separately, the Developer has undertaken an extensive programme of community consultation and engagement in relation to the project. This builds upon the consultation previously undertaken in respect of Cush Wind Farm Phase I. Local residents, community groups and elected representatives were initially engaged from February 2022 in relation to the then proposed Cush Wind Farm. As that project evolved, the proposed layout was reduced from 11 no. turbines to the 8 no. turbines subsequently permitted as Cush Wind Farm Phase I. During that process, local stakeholders were advised that the remaining 3 no. turbines could be progressed through a future planning application, subject to further assessment.

Project specific consultation in respect of the proposed 3 no. turbine extension commenced in March 2026. Local elected representatives were contacted by email on 18 March 2026 and provided with information on the proposed development and contact details through which further engagement could take place. Further contact was made with local representatives on 3 June 2026 in advance of the public consultation clinic.

A dedicated project website, www.cushwindfarm.ie, was launched in March 2026 and has been maintained and updated as project information has become available. A dedicated freephone number (1800 140 240) and email address (clo@cushwindfarm.ie) were also established to provide direct channels through which members of the local community could contact the Community Liaison Officer and project team.

Door-to-door consultation also commenced in March 2026, with engagement principally targeted at residents within 2km of the project. Residents were provided

with information on the project, anticipated project milestones, details of the project website and contact details for the Community Liaison Officer (CLO). Where residents were unavailable, information was left at the property to provide an opportunity for subsequent engagement. The wider Cush consultation programme involved visits to 146 no. dwellings, including additional dwellings identified specifically in connection with the proposed 3 no. turbine extension.

A public consultation clinic was subsequently held at Birr Golf Club on 4 June 2026 between 12:00 and 20:00. The event was publicised through the project website, local newspaper and radio advertising, while residents contacted during the door-to-door consultation were also advised of the event. Members of the project team were available to discuss the project, and attendees were provided with information including the proposed layout, maps, photomontages and a project presentation. Appointments were facilitated throughout the day, with capacity also retained to accommodate walk-in attendees.

The principal matters raised through the consultation process included the proposed community benefit and near-neighbour arrangements; the relationship between the proposed 3 no. turbines and Cush Wind Farm Phase I; the concentration of wind energy development in the wider area; operational noise; electricity costs; and the anticipated construction programme for Cush Wind Farm Phase I and the proposed project. These matters have informed the continuing engagement undertaken by the Developer, the environmental assessment of the project and the development of the proposed community benefit arrangements.

A comprehensive account of the consultation process, together with supporting consultation material, is provided in the Community Consultation Report at **Annex 1.8**.

4.3.4 APPROACH TO ASSESSMENT OF EFFECTS

The approach to the assessment of effects assesses the likely construction, operational and decommissioning effects on:-

- the local economy (employment and economic output);
- the local population;
- opportunities for local involvement in the business supply chain and employment, i.e. how the key construction and operational activities will translate into investment;
- recreation and tourism assets; and,
- land use, including potential temporary disruption to agricultural/forestry operations, access arrangements and reinstatement.

Decommissioning phase effects are assessed as being largely similar to construction effects.

4.3.5 SENSITIVITY CRITERIA, MAGNITUDE AND SIGNIFICANCE THRESHOLDS

Likely effects will be assessed in line with the following parameters:-

- beneficial or adverse (or neutral);
- extent (the area over which the effect occurs);
- likelihood (i.e. likely or unlikely);

- duration (the time for which the effect is expected to last prior to recovery or replacement of the resource or feature);
- reversibility (permanent or temporary); and,
- timing and frequency.

4.3.6 SENSITIVITY CRITERIA

There are no published standards that define receptor sensitivity relating to population and human health assessments. As a general rule, the sensitivity of each receptor or receptor group is based on its importance or scale and the ability of the baseline to absorb or be influenced by the identified effects. In assigning receptor sensitivity, consideration is given to the following:-

- importance of the receptor e.g. local, regional, national, international;
- availability of comparable alternatives;
- ease at which the resource could be replaced;
- capacity of the resource to recover or adapt to identified effects over a period of time; and,
- level of usage and nature of users (e.g. sensitive groups such as people with disabilities).

Based upon competent expert judgement, five levels of sensitivity are used: Very High, High; Medium, Low and Negligible. Proposed sensitivity criteria are set out in **Table 4.3** below.

4.3.7 MAGNITUDE CRITERIA

The magnitude of impact is evaluated based on the change that occurs with respect to the baseline conditions. Four degrees of magnitude are used: High, Medium, Low and Negligible.

4.3.8 DEFINING SIGNIFICANT EFFECTS

The level of an effect is assessed by combining the magnitude of the impact and the sensitivity of the receptor as illustrated at **Table 4.3**. Five main levels of effect are used: Imperceptible, Slight, Moderate, Substantial and Profound; while further sub-levels are formed by amalgamating the main levels (e.g. Moderate-slight).

Where an effect is classified as 'Profound' or 'Substantial', this is considered to represent a 'significant effect' in terms of the EIA Directive. Where an effect is classified as Moderate, this may be considered to represent a 'significant effect' but is subject to competent expert judgement and interpretation, particularly where the sensitivity or impact magnitude levels are not clear or are borderline between categories or the impact is intermittent.

Magnitude	Sensitivity of Receptor				
	Very High	High	Medium	Low	Negligible
Very High	Profound	Profound-Substantial	Substantial	Moderate	Slight
High	Profound-Substantial	Substantial	Substantial - moderate	Moderate-slight	Not Significant
Medium	Substantial	Substantial	Moderate	Slight	Imperceptible

		moderate			
Low	Moderate	Moderate-slight	Slight	Not Significant	Imperceptible
Negligible	Slight	Not Significant	Imperceptible	Imperceptible	Imperceptible

Table 4.3: Level of Significance Matrix

4.3.9 APPROACH TO MITIGATION

Mitigation measures, additional to those environmental measures embedded in the project design, are considered in order to mitigate any likely significant adverse effects that are identified through the assessment process.

4.3.10 CUMULATIVE EFFECTS

Consideration is given to the likely cumulative effect of the project in combination with other existing, permitted and proposed developments, including those listed in **Chapter 1**.

As set out at **Section 3.1, Chapter 3**, the project, together with the permitted Cush Wind Farm Phase I, is expected to be constructed as part of a single coordinated construction programme, with an overall construction period likely to last approximately 15–18 months.

4.3.11 LIMITATIONS OF ASSESSMENT

Certain information, in particular information regarding capital expenditure and construction employment, will not be available until the normal pre-construction procurement processes have been completed. This assessment provides estimates, based on experience from other projects, of likely spend and employment during construction sufficient to allow assessment in this EIAR.

Information on interrelated effects is informed by the assessments undertaken on other environmental factors which are set out in the relevant chapters of this EIAR. Any assessment limitations are also set out in those chapters.

The status of certain individual receptors (e.g. accommodation businesses etc.) may be subject to change. Information reported in this chapter is based on the receiving environment survey work, as described in **Section 4.4**.

4.4 DESCRIPTION OF EXISTING ENVIRONMENT

4.4.1 WIDER STUDY AREA

4.4.1.1 Population

The most recent estimates show that the current population of County Offaly stands at 83,150, which is less than 1.6% of Ireland's total population, as a whole, of 5.15 million according to CSO Census 2022 data.

4.4.1.2 Labour Market/Education and Skills

2022 Census data for County Offaly², published in September 2023, indicates that there were 35,248 persons aged 15 years and over whose principal economic status

² <https://visual.cso.ie/?body=entity/ima/cop/2022&boundary=C03789V04537&guid=2ae19629-1496-13a3-e055-000000000001>

was 'at work', whilst 1,136 were short term unemployed, 1,871 were long term unemployed and 644 were looking for their first regular job.

4.4.1.3 Business Diversity and Supply Chain

CSO Census data has been used to identify the occupational profile of the resident labour force within County Offaly. This provides an indication of the availability of labour, skills and occupational groups which may support supply chain activity associated with infrastructure and construction projects such as the project. **Table 4.4** provides the latest available (Census 2022) data on the structure of the local business base, both in absolute and relative terms.

Industry	Offaly 2022	
Managers, Directors and Senior Officials	2,542	6.6%
Professional Occupations	5,881	15.4%
Associate Professional and Technical Occupations	3,659	9.6%
Administrative and Secretarial Occupations	3,414	8.9%
Skilled Trades Occupations	6,639	17.4%
Caring, Leisure and Other Service Occupations	3,313	8.7%
Sales and Customer Service Occupations	2,232	5.8%
Process, Plant and Machine Operatives	3,590	9.4%
Elementary Occupations	3,422	8.9%
Not stated	3,563	9.3%
Total	38,255	-

Table 4.4: Persons at work or unemployed by occupation

Source: CSO Census Data 2022

The data in **Table 4.4** shows that 'Skilled Trades Occupations', 'Professional Occupations', and 'Associate Professional and Technical Occupations' have the highest percentage of the work force; whilst 'Not Stated' comprises 9.3% of the workforce.

4.4.1.4 Visitor Economy

Fáilte Ireland combines counties together to form four different regions across Ireland for which tourism strategies and statistics are produced. County Offaly forms part of the 'Ireland's Hidden Heartlands' region along with counties Cavan, Clare, Galway, Leitrim, Limerick, Longford, Roscommon, Tipperary and Westmeath.

The latest data for Ireland's Hidden Heartlands region³ indicates that:-

- there was a total of 424,000 overseas visitor trips to the region, generating approximately €259 million in revenue;
- there was a total of 1.7 million trips by Irish residents (domestic tourists) to the region generating approximately €326 million in revenue; and,

³ [Fáilte Ireland Key Tourism Facts 2024: Ireland's Hidden Heartlands.](#)

- there was a total of 93,000 trips by residents from Northern Ireland to the region generating approximately €33 million in revenue.

The policies and objectives contained within the Offaly CDP 2021-2027 are also focussed on developing the county as a tourism destination.

The Offaly CDP 2021-2027 sets out that the county is strategically located in the centre of Ireland on a rail line, canal, River Shannon and with easy motorway access.

The Offaly Tourism Strategy 2026-2031 provides the current strategic framework for tourism development in County Offaly. The Strategy seeks to establish a shared understanding of the key factors capable of supporting sustainable tourism growth in the County and includes an action plan for shared delivery. The Strategy is focused on establishing a strong base for future growth in tourism, including through investment in infrastructure, public realm, recreation and heritage.

County Offaly is promoted as a destination with a diverse natural, cultural and recreational tourism offer, including rivers, lakes, peatlands, mountains and trails. The County's tourism assets include major heritage, landscape and outdoor recreation destinations such as Lough Boora Discovery Park, Birr Castle Demesne, Tullamore DEW, Clonmacnoise, the Slieve Bloom Mountains, the River Shannon, the Grand Canal and Clara Bog.

Further amenity or tourism attractions located within County Offaly include:-

- Clonmacnoise Monastic Site;
- Birr Castle Gardens and Science Centre;
- Tullamore Dew Visitor Centre;
- Lough Boora Discovery Park;
- Slieve Bloom Mountains;
- River Shannon;
- Grand Canal; and,
- Clara Bog Nature Reserve and Visitor Centre.

The Offaly CDP 2021-2027 also refers to the 'Feasibility Study on the Development of a Major Cycling Destination in the Midlands of Ireland, 2016', commissioned by Offaly County Council in association with Bord na Mona and Coillte. The study encourages amenity trail linkages between the existing greenways/blueways in the county, towards the south of the county, with particular reference to a link between Lough Boora and Birr, which includes the identification of an indicative potential future link in lands within and surrounding the project site.

4.4.2 LOCAL STUDY AREA

The following section describes the baseline environment for the LSA i.e. within 5km from the wind turbines and 500m from the grid connection. As set out at **Section 4.3.2**, this component of the baseline covers:-

- Community;
- Recreation;
- Visitor economy assets; and,

- Land use.

4.4.2.1 Community

The proposed wind farm is located in southwest County Offaly; c. 4km north of the town of Birr and the only notable settlement located within the LSA; however, a number of nucleated clusters (of development) exist at crossroads/junctions e.g. Fivealley and Rath.

The settlement of Birr is identified in Policy SSP-08 of the Offaly CDP 2021-2027 as a 'Self Sustaining Growth Town':-

"It is Council policy that Birr, a Self-Sustaining Growth Town, continues to grow at a sustainable level and at a commensurate scale in accordance with the Core Strategy Table in an effort to become more self-sustaining.."

The Offaly CDP 2021–2027 identifies Birr as a Self-Sustaining Growth Town. Census 2022 data records the population of Birr, including Crinkill, as 5,521. The Offaly CDP 2021-2027 projects a population increase of 1,263 within the CDP period (2021-2027). The centre of Birr and the area around Birr Castle is designated in the Offaly CDP 2021-2027 as being within an Area of Archaeological Potential and an Area of Archaeological Notification (National Monuments Service), see **Section 11.4.9.1, Chapter 11**.

The Offaly CDP 2021-2027 notes that Birr is a sub-county market town that has significant employment and service functions relative to its regional and local catchment. It further notes that Birr supports the regional driver role of Tullamore and acts as an important local driver providing a range of functions for its resident population and its surrounding catchment including housing, employment, services, retail and leisure opportunities. As well as Birr Castle and the archaeological significance of Birr town centre, the town also contains a series of Recorded Monuments and Protected Structures.

4.4.2.2 Recreation

Given the rural nature of the LSA and the absence of a significant number of settlements, recreational facilities are quite limited and are mainly centred around the town of Birr.

Birr Castle, Gardens and Science Centre

Birr Castle Demesne is one of the principal heritage, science, tourism and recreational attractions within County Offaly. Located within the town of Birr, the demesne comprises approximately 120 acres of gardens, parkland, woodland walks and visitor facilities, together with Ireland's Historic Science Centre and the historic Great Telescope, known as the 'Leviathan of Parsonstown'. The Great Telescope remained the largest telescope in the world for over 70 years and continues to form a central element of the visitor experience at Birr Castle Demesne.

Birr Castle Demesne has a longstanding association with astronomy, engineering, photography and botany through the work of the Parsons family. The site accommodates the Irish Low Frequency Array platform, I-LOFAR, which forms part of the wider European LOFAR radio astronomy network. The visitor offer includes gardens, trails, woodland walks, the Historic Science Centre, family recreation facilities, seasonal events, guided tours and associated visitor facilities.

Fáilte Ireland's Visitor Numbers to Attractions Dashboard⁴ records 93,292 visitors to Birr Castle Gardens and Science Centre in 2024, which represents the most up-to-date visitor attraction data available at the time of preparation of this assessment. Birr Castle Demesne therefore continues to represent one of County Offaly's key heritage, tourism and recreation attractions and is identified by Visit Offaly as a major visitor attraction within the county.

Having regard to the recorded visitor numbers, its heritage, scientific, tourism and recreational function, and its role within the tourism offer of Birr and County Offaly, Birr Castle Demesne is assessed to be of regional value and therefore of medium sensitivity for the purposes of this assessment.

Birr GAA Club

Birr GAA Club is located within Birr and c. 4km south of the project. The facilities include a football playing field (St. Brendan's Park) with associated changing facilities, spectator stand(s) and parking. The receptor is assessed to be of local value and therefore sensitivity is low for the purposes of this assessment.

Drumcullen GAA Club

Drumcullen GAA Club is located south of Rath and c. 4km east of the project. As with Birr GAA Club, the facilities include a football playing field (Drumcullen GAA Grounds) with associated changing facilities, spectator stand(s) and parking. The receptor is assessed to be of local value and therefore sensitivity is low for the purposes of this assessment.

Birr Rugby Football Club

Birr Rugby Football Club is located within Birr and c. 4km south of the project. The facilities include four playing pitches and a training pitch, five changing rooms, changing facilities and bar/function room (club house) with associated parking. The receptor is assessed to be of local value and therefore sensitivity is low for the purposes of this assessment.

Birr Golf Club

Birr Golf Club is located in the townland of Glenns, c. 2.5km north of Birr and to the southwest of the project (c. 2.3km from its southern boundary). The facilities include an 18-hole golf course, clubhouse (including restroom facilities, bar, restaurant and club shop) with associated parking. The receptor is assessed to be of local value and therefore sensitivity is low for the purposes of this assessment.

Highfield United Football Club

Highfield United Football Club is located to the north of Birr, c. 4km south of the project. Facilities include playing pitches, changing facilities and associated parking. The receptor is assessed to be of local value and therefore sensitivity is low for the purposes of this assessment.

Birr Town Football Club

Birr Town Football Club is located to the north of Birr (Frank O'Connell Park), c. 4km south of the project. Facilities include playing pitches, club house, changing facilities and associated parking. The receptor is assessed to be of local value and therefore

⁴ <https://www.failteireland.ie/en/research-and-insights/visitor-numbers-dashboard>

sensitivity is low for the purposes of this assessment.

Wilmer Tennis Club

Wilmer Tennis Club is located to the north of Birr, c. 4km south of the project. Facilities include tennis courts, changing facilities and associated parking. The receptor is assessed to be of local value and therefore sensitivity is low for the purposes of this assessment.

Birr Leisure Centre

Birr Leisure Centre is located within Birr and c. 4km south of the project. The centre is a community owned facility and facilities include a swimming pool, gymnasium, and private studios. The receptor is assessed to be of local value and therefore sensitivity is low for the purposes of this assessment.

Mill Island Park and Birr play Park

Both Mill Island Park (walking trail and gardens) and Birr Play Park (children's playground) are located within Birr, c. 4km south of the project. Both facilities provide a local recreational amenity within the LSA and are of local value.

Walking Paths, Trails, and Cycling

Sport Ireland Outdoors (formerly National Trails Office of Sport Ireland) is responsible for all waymarked trails. There are no national waymarked walking or off-road cycling trails which pass through the LSA. The LSA does however include a series (Loops 1-5) of 'on-road' cycling routes, as identified by Sport Ireland Outdoors (SIO). These loops are part of the Birr Cycle Hub Loops. The loops centre on Birr and extend as far north as Ferbane, east to Kilcormac, and south to Roscrea. The closest SIO registered walkway/off road cycleway is the Knockbarron Eco Trail, located c. 9km east of the project. Whilst not a SIO registered trail, the boardwalk at Killaun, located c. 4.5km southeast of the project and c. 3km east of Birr, is a local walking route and a recreational facility of local value.

4.4.2.3 Tourism

Accommodation

Five accommodation businesses, located within Birr; the County Arms Hotel, Dooly's Hotel, Keeles Guesthouse, The Stables Guesthouse and Townsend House Guesthouse, have been identified within the LSA. There are, however, a small number of self-catering properties/rental properties within the LSA which are marketed via third party marketing sites, such as Airbnb. The accommodation businesses identified are considered to be of local value and their sensitivity is therefore assessed as low.

4.4.2.4 Land Use

The project site, and the LSA, is predominately used for agricultural/forestry related purposes and, outside of those land uses described above, does not generally provide for notable recreational uses.

4.5 DESCRIPTION OF LIKELY EFFECTS

The following sections assess the effects which are likely to arise during the construction, operation and decommissioning phases of the project.

4.5.1 CONSTRUCTION PHASE

4.5.1.1 Effects on the WSA

Employment and Local Investment

During the 15-18 month construction phase of the project, there will be economic effects resulting from expenditure on site preparation, purchase and delivery of materials, plant, equipment and components. Information provided by the Developer and based on experience at other similar projects in Ireland, indicates that there is expected to be a peak on-site workforce of c. 40 no. workers, however this figure will likely rise to c. 140 workers when considered cumulatively with the c. 100 workers anticipated during the construction phase for Cush Wind Farm Phase I. It is highly likely that a significant percentage of these workers will be recruited from the local labour market within the WSA, with the remainder being recruited from Ireland as a whole.

The most significant project infrastructure are the 3 no. wind turbines and the underground electricity line. The indicative investment sums have been set out in **Table 4.5** which provides a breakdown of the total development and capital expenditure required to develop and construct the project. Total investment comprises approximately €31.3 million for the project, including turbines, civil engineering works, electrical plant and grid connection.

Item	Description	Cost
Development Expenditure	Works undertaken up to the point of commencement of construction.	€2.6 million
Turbines & Ancillary Equipment	The activity by wind turbine manufacturers and suppliers, including nacelle/hub component manufacture and assembly and blade and tower manufacture. It includes transport, installation and commissioning but excludes the turbine service/maintenance agreement.	€20.9 million
Civil Works	The activity by civil contractors and their suppliers; including access tracks and drainage, crane hardstands, turbine foundations, cable trenches and buildings for electrical switch gear, and public road upgrade works.	€6 million
Electrical Works, including UGL.	The activity by electrical contractors and their suppliers, including cables, electrical switch room and switch gear, protection and control system.	€1.8 million
Total		€31.3 million

Table 4.5: Breakdown of Estimated Capital Investment

The procurement of goods and services is likely to have a significant positive effect on the local economy. Of the level of investment presented above, local contract spend (within the WSA) could be in the region of €7.8 million (c. 25%) over the development and construction period.

The types of supply chain companies that could benefit from this expenditure are wide ranging and are likely to include, but not limited to, the following:-

- haulage and transport services;

- traffic management;
- materials supply, e.g. stone aggregates and concrete;
- plant and equipment hire;
- vehicle servicing/tyres;
- fencing;
- fuel;
- security;
- waste management;
- building construction, electrical, plumbing, roofing, flooring, plastering and joinery services;
- signage and lighting;
- telecommunications;
- drainage;
- planting and landscaping;
- catering;
- professional services; and,
- accommodation.

The contractors appointed by the Developer will be actively encouraged to develop local supply chains throughout the WSA and work with local subcontractors and service providers.

In addition, local businesses and services are likely to experience indirect benefits during the construction phase works as the workforce spend locally on general living costs whilst they are based in the area. These effects are further explored in the following section.

Tourism Economy

The construction period is anticipated to last for approximately 15-18 months and, as stated, is likely to benefit the local economy through expenditure on purchases of accommodation, food, fuel etc. which will be required to sustain the construction workforce. These beneficial effects would be experienced by businesses already operating within the tourism sector, as well as those that are partly dependent on tourism for their income, for example the retail sector.

Anecdotal evidence, based on other similar construction projects, demonstrates that local businesses such as accommodation providers welcome the enhanced level of occupancy that is achieved due to 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 longer term enhancement.

The positive effects arising during the construction period are assessed to more than offset any likely temporary negative effects to the tourism economy that may occur in the event that tourist visitors were unable to find local accommodation (for

example, if accommodation was in use by construction workers) during the construction phase.

Whilst overall effects on the tourism economy are assessed to be imperceptible and not significant (beneficial or adverse), the benefits to individual businesses is likely to be substantial and may indeed be significant. However, until such time as contracts are agreed by the Developer, it is not possible to quantify the precise level of benefit to individual businesses.

4.5.1.2 Effects on the LSA

Population Sustainability & Residential Amenity

Construction of the project is expected to take approximately 15–18 months. Normal construction working hours will be 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 on Saturdays, with no works generally undertaken on Sundays or public holidays. It may, however, be necessary on occasion to undertake works outside of these hours to avail of favourable weather conditions, including periods of low wind speed for turbine installation, or where particular construction activities require extended working periods, such as turbine foundation concrete pours. Where works are required outside of normal construction hours, local residents and the Planning Authority will receive prior notification.

Construction activities will give rise to temporary noise and vibration effects at nearby noise-sensitive locations. **Chapter 12** assesses the principal construction activities, including works associated with the wind farm infrastructure, underground electricity line and construction traffic, and concludes that, with the implementation of the identified good practice and mitigation measures, residual construction noise and vibration effects will not be significant. Works associated with the underground electricity line will, at certain locations, take place in relatively close proximity to residential properties; however, these works will be progressive and of short duration at any individual location. On this basis, and having regard to the findings of **Chapter 12**, construction noise and vibration are not anticipated to result in significant effects on population or residential amenity.

Chapter 14 (Transport & Access section) notes that the construction phase of the project is estimated to generate 7,730 no. heavy goods vehicle (HGV) trips during the 15-18 month construction period. When assessed cumulatively with the permitted Cush Wind Farm Phase I, and taking account of the adjusted HGV movements associated with the revised grid connection arrangements, the total cumulative number of estimated HGV delivery trips is 22,540. It is also estimated that approximately 14 no. light goods vehicle (LGV)/crew vehicle visits will be generated daily as staff and personnel travel to and from the project site.

Overall, the likely effects are not assessed to be significant and are assessed as ranging from moderate-to-slight, direct, indirect, negative, positive, short-term and long-term.

No likely significant effects on population sustainability are anticipated and likely effects on residential amenity are expected to be slight to moderate negative, of a temporary nature with the specific effects dictated by the proximity of individual residences to the project site.

Land Use

The project site comprises a mix of operational agricultural landholdings and cutover/cutaway peat⁵ and includes land parcels which are owned by a number of private landowners. The Developer is in regular dialogue with each landowner and each has entered into a legal agreement to allow the Developer to use the land for the project. The legal agreements include a series of measures designed to minimise any likely land use effects including the clear identification of lands which may be subject to works; measures to ensure that disturbed lands are reinstated appropriately; and provision for the use of proposed access tracks by landowners during the operation phase of the project. Measures to facilitate the safe continuation of agricultural operations during the construction phase have also been developed.

Tourism and Recreation Assets

As the sensitivity of all but one of the tourism/recreational receptors within the LSA is assessed to be low, and the magnitude of any adverse effects would also be low, the effect on receptors in the LSA would be negligible (adverse) and not likely to be significant. This effect would be further reduced, or may become beneficial overall, if businesses in this area generate additional revenue as a result of the project. It has been assessed that Birr Castle, Gardens and Science Centre will have a medium level of sensitivity, due to its regional importance, however the magnitude of adverse effects is assessed as being low and therefore the overall level of significance (of effect on this recreational facility) is assessed as being 'slight', in line with **Table 4.3** above.

The impact on businesses within the LSA, would be beneficial although, as the sensitivity is low, the level of beneficial effect is not expected to be more than negligible. Beneficial effects on individual businesses may be higher, particularly where they are regularly used by construction staff, as this affords them regular income that is not seasonally dependent. However, until contracts are agreed, and construction commences, it is not known which businesses would specifically benefit.

The planning-stage CEMP, which will be further developed prior to construction, will set out measures to ensure that local residents/businesses are informed of the construction work including the location and duration of temporary road closures and the identification of alternative routes during the construction works. Given the temporary nature of the construction works, the measures to be implemented and the low sensitivity of the receptors, the effect is assessed to be negligible and not likely to be significant.

Major Accidents or Natural Disasters

As set out within **Chapter 6** and **Chapter 7** of this EIAR, the project is not identified to be a likely source of pollution during either the construction or operation phases, predominately due to the limited volume of hydrocarbons stored on site and the bunding arrangements to ensure that spillages do not occur. In the event of an accident on site, mitigation measures set out in the above chapters will ensure that significant environmental effects are unlikely to occur.

There is limited likelihood for significant natural disasters to occur at the project site. Ireland is a geologically stable country with a generally mild temperate climate. The

⁵ In this EIAR, 'cutover' bog refers to small areas of peatlands that have been domestically cut for peat extraction and which generally have greater and often more variable depths of peat remaining. 'Cutaway' bog, on the other hand, refers to large areas of peatlands that were industrially cut in the past, often leaving little (up to 50cm) or no peat layer remaining.

potential natural disasters that may occur are therefore limited to ground instability, flooding and fire. The risk of ground instability is addressed at **Chapter 6** and risk of flooding is addressed in **Chapter 7**. It is assessed that the risk of significant fire occurring, affecting the project and causing it to have significant environmental effects, is limited. As discussed above, there are no significant sources of pollution from the project with the potential to cause environmental or health effects. Furthermore, one of the core 'mitigation by design' features of the project (maximising the distance to residential dwellings) further limits any likelihood of significant human health effects as a result of accidents or natural disasters.

Major industrial accidents involving dangerous substances pose a significant threat to human health and the environment. Such incidents can give rise to serious injury to local residents or result in damage to the environment, both within project sites and in the vicinity. However, the project site is not regulated by or connected/proximate to any site regulated under the Control of Major Accident Hazards Involving Dangerous Substances Regulations (COMAH/SEVESO Directive) and so there is no likelihood for cumulative effects or interactions with any such site.

4.5.1.3 Cumulative Effects

This assessment has taken into account the cumulative impact of the project including all elements i.e. wind farm and associated ancillary infrastructure, underground electricity line and upgrade works to the turbine component haul route. It has also considered the cumulative effects associated with the construction of the permitted Cush Wind Farm Phase I which is to be built out concurrently with the proposed project, see **Section 3.4, Chapter 3**.

There is potential for cumulative effects to arise in relation to the construction of other permitted or proposed developments should the construction phases overlap with the project. While there are a number of existing, permitted or currently proposed developments within the WSA and LSA, it is assessed that none of these projects are of a sufficient scale or nature to be likely to result in cumulative socio-economic, population or human health effects.

4.5.2 OPERATION PHASE

4.5.2.1 Effects on the WSA

Employment and Investment

When the project is operational, it will require a team of personnel to provide servicing, maintenance, repairs and other operational support. It is estimated that up to 5 no. engineers and technicians (full time equivalent), supported by operation/maintenance activities within the wider area, will be needed to provide operational support to the project. It is likely that these staff will be based within the WSA i.e. County Offaly.

Further employment is anticipated to be supported directly and indirectly elsewhere in Ireland during the operation phase. Additional to the direct impacts on employment, there will also be indirect effects generated throughout the operation phase. Indirect effects arise from the placing of contracts with other businesses, both in the local area and elsewhere in Ireland, supplying services and materials to the project. Examples of such supply chain activity would include the procurement of:-

- site and building maintenance;
- waste management;
- civil engineering contractors for access track maintenance, ditching, crane hardstanding repairs, and weed control etc.;
- supply of consumable items (e.g. lubricants and oils, spare parts, office supplies, etc.); and,
- turbine inspections.

In addition to the above, local shops, cafes and accommodation providers often experience an increase in business during the operation phase e.g. personnel onsite during wind farm maintenance and servicing.

The Developer will seek to secure positive benefits for the local economy by encouraging the use of local labour, manufacturers and suppliers where possible during the operation phase.

Tourist Economy

Chapter 10 of the EIAR assesses in detail the likely landscape and visual effects of the project. The chapter concludes that the significance of visual impact during the operation phase will range between 'Substantial-Moderate' to 'Imperceptible' for visual receptors and that the project will not give rise to significant landscape and visual effects. With regard to cumulative visual impact the chapter concludes that, when assessed in combination with other proposed, permitted, and operational wind farms and other forms of development (refer to **Table 1.5, Chapter 1**), the project will not give rise to significant cumulative landscape and visual effects.

Notwithstanding these considerations, it is assessed that there is no evidence to suggest that an occasional view of the project might adversely affect the visitor appeal of the area. Based on the evidence gathered from previous and ongoing studies, as referred to above, the occasional views of the project are assessed as not likely to be a deterrent to visitors or discourage repeat visits to the area. Accordingly, it is assessed that the project will not result in any significant effect on the tourism economy.

Furthermore, the Developer has participated in early-stage, pre-planning engagement with Offaly County Council in terms of the provision of amenity infrastructure within the WSA. As described in **Section 4.4.1.4** above, the project site is located in an area of interest to Offaly County Council in terms of providing an amenity connection between the existing Lough Boora Complex (and associated trails), the proposed amenity trail infrastructure, to be developed as part of the Derrinlough Wind Farm (operational), and Birr. Whilst the project does not include for the amenity trail provision the Developer has provided Offaly County Council with a firm commitment to work with them in order to increase amenity infrastructure and connectivity in the project site area, if the required land becomes available.

4.5.2.2 Effects on the LSA

Community Benefit Funds and Near Neighbour Scheme

The operation of the project will give rise to a number of direct and indirect financial benefits within the LSA and wider County Offaly. These include the establishment of a Community Benefit Fund and associated Near Neighbour Scheme, the payment of

commercial rates to Offaly County Council, rental payments to participating landowners and expenditure associated with the operation and maintenance of the project.

The Developer is committed to establishing a Community Benefit Fund at a rate of €2 per megawatt hour (MWh) of electricity generated, in accordance with Wind Energy Ireland best practice and the applicable principles of the Renewable Energy Support Scheme (RESS). The value of the fund will therefore be linked directly to the actual electricity generated by the wind farm rather than to a fixed annual payment.

As part of the community consultation process, particular consideration was given to how the benefits of the project could be directed towards households located closest to the wind farm. Following engagement with local residents, the Developer has developed an enhanced Near Neighbour Scheme based on a sliding scale of annual payments. Under the proposed scheme, non-involved households located within 1km of Cush Wind Farm will receive an annual payment of €2,000 per household, while households located between 1km and 2km will receive an annual payment on a sliding scale ranging from approximately €1,983 to €514, with the level of payment reducing with increasing distance from the wind farm.

The Near Neighbour Scheme has been developed on the basis of the combined Cush Wind Farm development, comprising the 8 no. permitted turbines at Cush Wind Farm Phase I together with the 3 no. turbines comprising the proposed project. The Community Consultation Report identifies approximately 121 households/residential properties⁶ as benefiting from the scheme. The proximity payments associated with the Near-Neighbour Scheme will form part of the overall Community Benefit Fund rather than constituting a separate additional fund.

The Community Benefit Fund will be administered through an independent charitable trust on behalf of the Developer and will be designed, in consultation with the local community, to respond to identified local needs and sustainability objectives. Local community groups will be invited to submit funding applications, with preference given to projects which provide identifiable local community, social or environmental benefits. Unallocated funding will be carried forward for distribution in subsequent years and details of projects supported through the fund will be made publicly available.

In addition to the Community Benefit Fund, the project will generate annual commercial rates payable to Offaly County Council. Based on the current indicative rates methodology and the proposed installed generating capacity of approximately 18.3–21.6MW, annual rates payments are estimated to be in the region of €320,250–€378,000. The precise level of rates payable will ultimately depend on the final installed generating capacity and the applicable valuation at the time the project becomes operational.

Rental payments will also be made to participating landowners over the operational lifetime of the project. A proportion of these payments can reasonably be expected to be recirculated within the local economy through expenditure on goods, services and land-based enterprises, thereby giving rise to further indirect economic benefits

⁶ The 131 no. residential receptors identified at Annex 13.1 comprise all residential receptors included in the environmental assessment, including dwellings associated with commercially involved landowners. The Near-Neighbour Scheme applies to non-involved households only. This accounts for the difference between the 131 no. assessed residential receptors and the 121 no. households eligible to benefit from the Near-Neighbour Scheme.

within the LSA and WSA.

Taken together, the Community Benefit Fund, Near Neighbour Scheme, rates payments and landowner income will provide a long-term and recurring source of local and county-wide economic benefit throughout the operational phase of the project. The Community Benefit Fund will also provide an opportunity for local communities to identify and support projects which respond directly to local priorities. Accordingly, the socio-economic effect associated with these financial contributions is assessed as positive, long-term and moderate.

Property Values

The largest study of the impact of wind farms on property values to date has been carried out in the United States of America. The study, titled *The Impact of Wind Power Projects on Residential Property Values in the United States: A multi-Site Hedonic Analysis* and undertaken by Hoen et al. (2009), was carried out for the U.S Department of Energy. The study collected and examined data from in excess of 7,000 sales of single-family homes situated within 10-miles (c. 16km) of 24 no. existing wind farms in 9 no. States over an approximate period of 10- years. In addition to an examination of sales data, fieldwork was undertaken to verify and understand the degree to which wind energy development was visible.

The study concludes that:-

"Based on the data and analysis presented in this report, no evidence is found that home prices surrounding wind facilities are consistently, measurably, and significantly affected by either the view of wind facilities or the distance of the home to those facilities. Although the analysis cannot dismiss the possibility that individual or small numbers of homes have been or could be negatively impacted, if these impacts do exist, they are either too small and/or too infrequent to result in any widespread and consistent statistically observable impact."

A further study was undertaken and the results published in a paper titled *A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States* by Hoen et al. (2013). The 2013 study evaluated in excess of 50,000 residential property sales completed in the vicinity of almost 70 no. wind farms across 9 no. States. The study was undertaken on the basis of a substantially greater sample and assessed properties at varying distances from wind energy developments; with all properties located within 10-miles (c. 16km) of the wind farm, c. 1,100 were located within 1-mile (c. 1.6km) and c. 330 located within 0.5-mile (0.8km).

The 2013 study concludes that:-

"Across all model specifications, we find no statistical evidence that home prices near wind turbines were affected in either the post-construction or post announcement/pre-construction periods."

Each of the above studies highlight the fact that the findings do not confirm that there will never be an adverse effect on the values of individual properties as a consequence of a wind energy development; but, instead, that such cases are assessed to be statistically insignificant. Therefore, while claims regarding significant property value depreciation are regularly made by local residents and communities, the evidence of the studies carried out in the United States of America do not support

these claims.

In the United Kingdom, a study was carried out by the Centre for Economics and Business Research (CEBR) in March 2014 on behalf of Renewable UK and found that:-

- The status of the county-wide property market is the primary driver behind local house prices; and,
- The construction of wind farms at the 5 no. sites evaluated in England and Wales has not perceptibly affected house price growth within a 5km radius of the sites.

In Scotland, a study published in October 2016 titled *Impact of wind Turbines on House Prices in Scotland* (Heblich et al) sets out the main findings of a study assessing the effect on house prices from wind farm developments. The study is based on an extremely large sample size of in excess of 500,000 property sales in Scotland between the years of 1990 and 2014. The key findings of the study include:-

- No evidence of a consistent adverse effect on house prices. The analyses do not find evidence of a consistent adverse effect of wind energy development when averaging across the entire sample. In most cases, the results demonstrate either no significant negative effect on property prices within 2km or 3km or find a positive effect; and,
- Results vary across Scotland. The results demonstrated notable variances across differing regions of the country; however, the data is insufficient to assess the underlying reasons for the variances.
- Based on multiple long-term international assessments of property prices as described above, it is evident that wind energy developments have not impacted property values.

In Ireland, the University of Galway published a study in 2023 titled *Wind Turbines and House Prices Along the West of Ireland: A Hedonic Pricing Approach* (Gillispie et. al. 2023) which focusses on the effect of wind energy developments on property values on the western seaboard of Ireland. The study collected data from counties Donegal, Leitrim, Sligo, Mayo, Galway, Kerry and Cork; and assesses housing data taken from www.daft.ie and reviewed data from almost 65,000 no. property listings within 15km of a wind turbine between the years of 2016 and 2021.

The study concludes that:-

"It is clear from the analysis that turbines can incur a discount on nearby properties. However, there is evidence to suggest that the price effect is not persistent and can be minimised through siting decisions.

As renewable policies progress, the west and south of Ireland will likely continue to see disproportionately greater numbers of wind energy developments compared to the rest of the country. Therefore, the results outlined in this paper have important implications for policy, especially in terms of siting locations for wind turbine development.

While it is important to reach climate targets through growth in renewable electricity production, it is necessary do so at a minimal cost to the public by focusing developments to remote areas with limited urban influence."

Although this study gives an insight into effects in a specific geographical location over a specific timeframe, international studies have demonstrated that property

prices achieved over a longer period of time based on a larger sample size provides a more robust and accurate quantitative dataset when assessing the probable influence of wind turbines on that price.

It is assessed, therefore, based on national and international studies, that the development of the project is not likely to have a significant effect on property values.

Other effects within the LSA

Based on a review of the findings of the assessment in **Chapter 14**, no significant effects are likely as a result of maintenance vehicles accessing the site as this would be on an occasional basis only and would not significantly increase vehicular movements in the local area.

There would also be some likely minor beneficial effects on local businesses within the LSA, probably most likely around Birr arising from expenditure on goods and services by staff and suppliers employed at the project site. This is expected to benefit local shops and food and drink businesses. Although the expenditure would be intermittent, and is therefore difficult to quantify, the benefit would be enhanced by the fact that workers visiting the project would do so all year round, unlike tourism expenditure which tends to be seasonal.

Visual effects on recreational receptors are assessed in **Chapter 10** and the findings have been taken into account in the assessment above, although it is important to note that a significant landscape and visual effect does not necessarily result in a significant effect on population & human health. In assessing effects, there is not a straightforward relationship between users experiencing views of turbines from a point or along a route (for example a passing cyclist) and impacts on usage. Some people may be encouraged/discouraged from using the receptor due to the presence of turbines, but for others there may be no effect, or even a positive effect.

The assessment of landscape and visual effects finds that the greater effects will be contained within a relatively limited area around the site, and the magnitude of likely effects will dissipate with distance. It is assessed that these visual effects will not result in any significant adverse effects on any receptors.

4.5.2.3 Human Health

Noise

With implementation of the mitigation measures specified in **Chapter 12**, noise levels sufficient to cause nuisance or sleep disturbance are not assessed as likely to occur during the construction and operation phases of the project. The full results of this assessment are presented in **Chapter 12**.

Lightning Protection

Appropriate lightning protection measures are incorporated in modern wind turbines to ensure that lightning is conducted harmlessly past the sensitive parts of the nacelle and down into the earth. The rotor blades of the wind turbines are similarly equipped with lightning receptors mounted in the blade. The turbine is grounded and shielded to protect against lightning. In the event of a lightning strike, or an abnormal increase in voltage (overvoltage), the entire electrical and electronic equipment is protected by built-in energy absorbing components with surge protection in the electrical components.

Based on the above, it is assessed that the overall sensitivity of the project to lightning strike is low, and the magnitude of impact is assessed as negligible. The overall significance of impact is therefore assessed as being imperceptible.

Ice Fall

In extremely cold climates or at high altitude, ice can potentially build up on blades or other parts of the turbines. Ice can potentially fall off and cause injury although there is no experience of any such incident occurring in Ireland. Most modern turbines are fitted with anti-vibration sensors, which will detect any imbalance caused by the icing of the blades. The sensors will cause the turbine to wait until the blades have been de-iced prior to beginning operation. All occupied/habitable properties in the vicinity of the wind turbines are located sufficiently distant from a wind turbine and therefore there is no likely impact in respect of ice throw.

Based on the above, it is assessed that the overall sensitivity of the project to ice fall is low, and the magnitude of impact is assessed as negligible. The overall significance of impact is therefore assessed as being imperceptible.

Electric and Magnetic Fields (EMF)

All electricity, both natural and man-made, produces two types of fields – electric fields and magnetic fields. The on-site electrical cabling, underground electricity line and switch room will comply with the international guidelines for ELF-EMF set by the International Commission on Non-Ionizing Radiation Protection (ICNIRP), which is recognised by the World Health Organisation, and with EU guidelines for human exposure to EMF. In addition, all electricity lines/cable will be located below-ground, thus avoiding any likelihood of significant adverse EMF effects.

Based on the above, it is assessed that the overall sensitivity of the project to EMF interference is low, and the magnitude of impact is assessed as negligible. The overall significance of impact is therefore assessed as being imperceptible.

Shadow Flicker

Shadow flicker is assessed in detail in **Chapter 13**. While, in the absence of mitigation measures, shadow flicker is predicted to be experienced at dwellings; the Developer has committed to the implementation of technological measures such that no dwelling will experience shadow flicker effects, as set out in the *Draft Revised Wind Energy Development Guidelines 2019*. This commitment can be achieved by automatically switching off the wind turbines, if the sun is shining, at predetermined times when shadow flicker is predicted to occur at any particular dwelling. This process can be completed by software installed within the turbine's computer system. Accordingly, the assessment concludes that there will be no likely significant shadow flicker effects arising from the project.

4.5.2.4 Cumulative Effects

While there are a number of existing, permitted or currently proposed developments within the WSA and LSA, including the permitted Cush Wind Farm Phase I, it is assessed that none of these projects are of a sufficient scale or nature to have the likelihood to result in significant in-combination population and human health effects during the operation phase of the project.

4.5.3 DECOMMISSIONING PHASE

The likely population and human health effects associated with the decommissioning phase will generally be similar in nature to those identified for the construction phase, including temporary employment and local expenditure, construction traffic, noise and disturbance, and temporary effects on residential amenity. However, the scale, intensity and duration of these effects will be substantially reduced relative to the construction phase. Decommissioning is anticipated to take approximately 3 months and will generate significantly fewer HGV movements, while elements of the project infrastructure, including access tracks and certain below-ground infrastructure, will be retained in situ where appropriate.

Accordingly, while some temporary adverse and beneficial socio-economic effects are likely to arise during decommissioning, these will be short-term and are not assessed as likely to result in significant effects on population or human health.

4.6 MITIGATION & MONITORING

4.6.1 CONSTRUCTION PHASE

Allowing for the implementation of embedded mitigation set out elsewhere within this EIAR, no likely significant adverse effects have been identified in respect of socio-economic receptors arising from construction of the project and therefore no additional population and human health specific mitigation is required beyond the embedded and topic specific measures identified elsewhere in this EIAR. In terms of beneficial effects, individual businesses or receptors may experience substantial positive effects during the construction phase of the project.

As identified above, a series of measures has been agreed with involved landowners regarding the management of agricultural activities during the construction phase. These measures have been incorporated into signed legal agreements with the landowners and will be implemented in full.

4.6.2 OPERATION PHASE

No likely significant adverse effects have been identified in respect of socio-economic receptors arising from the operation of the project and therefore no mitigation measures are required to reduce or remedy any adverse effect.

Mitigation measures proposed elsewhere in this EIAR; including in respect of water protection, noise minimisation and the avoidance of shadow flicker will ensure that significant population or human health effects are unlikely to occur.

4.6.3 DECOMMISSIONING PHASE

No likely significant adverse effects have been identified in respect of socio-economic receptors arising from the decommissioning of the project and therefore no mitigation measures are required to reduce or remedy any adverse effect.

4.7 RESIDUAL EFFECTS

4.7.1 CONSTRUCTION PHASE

No significant residual adverse construction effects are assessed as likely to occur.

4.7.2 OPERATION PHASE

No significant residual adverse operation phase effects are assessed as likely to occur.

4.7.3 DECOMMISSIONING PHASE

No significant residual adverse decommissioning effects are assessed as likely to occur.

4.8 SUMMARY

The assessment undertaken in this chapter has evaluated data from a range of sources, including the findings and conclusions of other assessments within this EIAR, to determine the likely effects of the project on population and human health. In order to avoid 'double-counting', the assessment focuses on those factors which might result in economic, social and health and safety effects. Other specific assessments on population and human health, including, for example, in respect of noise, visual impact and air quality, are undertaken separately elsewhere in this EIAR.

It is assessed that the construction phase of the project will bring about likely beneficial effects on employment and local investment, on the tourism economy and, to a greater extent, local businesses including tourism businesses operating within the WSA. The operation phase of the project will have a positive effect on employment and investment, including community benefits, as well as a minor beneficial effect on local businesses. The overall assessment of this chapter is that the project will have no likely significant adverse effects on population and human health. No specific mitigation measures, other than full adherence to all best practice measures and health and safety guidance, have therefore been identified as being required.