- **Green finance for the net zero economy – establishment of the Glasgow Financial Alliance for Net Zero of $130 trillion of private capital to accelerate the transition to a net-zero economy.**
- **Disclosure and transparency for the private sector.**
- **Increasing the pace of implementing the Paris Agreement.**

#### 10.3.2.1.5 COP28 Climate Change Conference – Dubai

The 28th Conference of the Parties for the United Nations Framework Convention on Climate Change (COP28) took place in Dubai from the 30th of November 2023 to the 13th of December 2023.

COP28 resulted in a landmark deal to 'transition away' from fossil fuels, the UAE Consensus. The agreement calls for 'transitioning away from fossil fuels in energy systems, in a just, orderly, and equitable manner.' This is the first time in 28 years that fossil fuels have been mentioned in a COP outcome. However, it is noted that the text of 'phase out as soon as possible inefficient fossil fuel subsidies' does not address energy poverty or the just transition. The UAE Consensus also calls for more explicit near-term goals in the lead up to 2050, calling for the world to cut greenhouse gas emissions by 43% by 2030 as compared to 2019 levels. However, many island states have criticised that despite the text being an improvement over previous agreements, there is a litany of loopholes that will enable destructive environmental practices to continue and do not assuage their concerns over rising sea levels and other climate change impacts.

COP28 concluded the first ever Global Stocktake under the Paris Agreement. The Global Stocktake recognises that the world is not on track to meet 1.5°C and will require Parties to align their national targets and measures with the Paris Agreement. Parties have two years to submit their Nationally Determined Contributions for 2035, these need to be aligned with the best available science and the outcomes of the Global Stocktake.

An unusual aspect that came out of COP28 in the final hours of discussion was the quantity of decisions and documents which remain unfinished and not signed off. Notably, discussions on carbon markets collapsed in the final days of COP28 as no consensus could be reached on the country-to-country trading regimes or rules for the market in relation to Article 6 of the Paris Agreement. Negotiations will be continued at COP29 in Azerbaijan.

### 10.3.2.2 United Nations Sustainable Development Goals Report 2023

*Transforming our World: the 2030 Agenda for Sustainable Development* which includes 17 Sustainable Development Goals (SDGs), and 169 targets was adopted by all UN Member States at a UN summit held in New York in 2015. The agenda is universally applicable with all countries having a shared responsibility to achieve the goals and targets which came into effect on January 1st, 2016. The goals and targets are to be actions over the 15-year period, are integrated and indivisible i.e., all must be implemented together by each Member State. On 10th July 2023, the United Nations published '*The Sustainable Development Goals Report 2023*'[17], highlighting that the lasting impacts of the COVID-19 pandemic, the war in Ukraine and subsequent refugee crisis, and the increasing consequences of the climate crisis have hindered the achievement of the SDGs. The report stipulates that due to these unprecedented events, the world is falling short of meeting most of the SDGs by 2030, especially in terms of climate action. An assessment of the around 140 targets for which trend data is available shows that about half of these targets are moderately or severely off track; and over 30% have either seen no movement or regressed below the 2015 baseline.

In October 2022 the Department of Communications, Climate Action & Environment in partnerships with all Government Departments, key stakeholders, and based on input from two public consultation

[17] *United Nations (2023)* https://unstats.un.org/sdgs/report/2023/The-Sustainable-Development-Goals-Report-2023.pdf

processes published the Sustainable Development Goals National Implementation Plan 2022-2024[18]. The Plan identifies that, overall, the world is not on track to achieve the global Goals by 2030. The Plan sets out how Ireland will work to achieve the goals and targets of the Agenda for Sustainable Development both domestically and internationally. Ireland's first National Implementation Plan provided a framework for Ireland to work towards the implementation of the SDGs; the new Implementation Plan aims to build on the structures and mechanisms from the first Plan and to develop and integrate additional approaches in areas identified as requiring further action.

In September 2023, the UN Summit on the SDGs took place in New York and was co-facilitated by Ireland and Qatar. Representing the halfway mark to achieving the SDGs by 2030, it marked the beginning of a new phase of accelerated progress towards the SDGs with high-level political guidance on transformative and accelerated actions. The Global Sustainable Development Report 2023[19] was published in September 2023. The previous Global Sustainable Development Report (2019[20]) found that for some targets the global community was on track, but for many others the world would need to quicken the pace. In 2023, the situation is much more worrisome owing to slow implementation and a confluence of crises. The 2023 Report goes on to highlight the current standing of each SDG and its relevant indicators. A 2023 UN Special Report[21] found that over 30% of the SDGs have seen either no improvement or reverse trends in progress. The push for transformation to achieve the SDGs will come by through shifts in six key entry points:

1. *Human Well Being and Capabilities*
2. *Sustainable and Just Economies*
3. *Food Systems and Healthy Nutrition*
4. *Energy Decarbonisation with Universal Access*
5. *Urban and Peri-Urban Development*
6. *Global Environmental Commons*

The Proposed Development will contribute to Entry Point 4 due to the clean and renewable energy it will provide over its extended operational life. The phase out of fossil fuels in a manner that is globally and domestically just, while strengthening the transition to renewables by increasing energy efficiency and encouraging behavioural change will be key to achieving the relevant SDGs to the Proposed Development.

Relevant SDGs to the Proposed Development and how they are implemented into Irish National plans and policies can be found in Table 10-19.

[18] *National Implementation Plan for the Sustainable Development Goals 2022-2024. Available at: https://www.gov.ie/en/publication/e950f-national-implementation-plan-for-the-sustainable-development-goals-2022-2024/*
[19] *Global Sustainable Development Report 2023 https://sdgs.un.org/sites/default/files/2023-09/FINAL%20GSDR%202023-Digital%20-110923_1.pdf*
[20] *Global Sustainable Development Report 2019 https://sdgs.un.org/sites/default/files/2020-07/24797GSDR_report_2019.pdf*
[21] *The Sustainable Development Goals Report 2023: Special Edition https://unstats.un.org/sdgs/report/2023/The-Sustainable-Development-Goals-Report-2023.pdf*

*Table 10-19 United Nations Sustainable Development Goals adopted in 2015. https://sustainabledevelopment.un.org/sdgs*

| SDG | Targets | International Progress/ downfalls to Date (2023) | National Relevant Policy |
|---|---|---|---|
| SDG 7 Affordable and Clean Energy: *Ensure access to affordable, reliable, sustainable and modern energy for all* | › By 2030, ensure universal access to affordable, reliable and modern energy services<br>› By 2030, increase substantially the share of renewable energy in the global energy mix<br>› By 2030, double the global rate of improvement in energy efficiency<br>› By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology<br>› By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support | The war in Ukraine and global economic uncertainty continue to cause significant volatility in energy prices, leading some countries to raise investments in renewables and others to increase reliance on coal, putting the green transition at risk.<br>The share of renewable sources in total final energy consumption amounted to 19.1% globally in 2020, or 2.4 percentage points higher than in 2015. Part of this progression is due to lower final energy demand in 2020, as the pandemic disrupted social and economic activities worldwide. The electricity sector shows the largest share of renewables in total final energy consumption (28.2% in 2020) and has driven most of the growth in renewable energy use, while the heat and transport sectors have seen limited progress over the past decade.<br>The rate of improvement in primary energy intensity, which had already slowed in recent years, dropped to 0.6% in 2020. This makes it the worst year for energy intensity improvement since the global financial crisis. This slowdown was influenced by a shift in the economic structure during Covid towards more energy-intensive industrial production, combined with only modest rates of technical efficiency improvements, in the context of low energy prices. | *Ireland's Transition to a Low Carbon Energy Future 2015-2030;*<br>*Energy Poverty Action Plan;*<br>*Ireland's Transition to a Low Carbon Energy Future 2015-2030;*<br>*National Mitigation Plan;*<br>*National Energy Efficiency Action Plan;*<br>*One World, One Future;*<br>*The Global Island Economic Recovery Plan*<br>*Project Ireland 2040: National Planning Framework;*<br>*Project 2040;*<br>*National Development Plan 2021-2030;*<br>*Climate Action Plan 2024* |
| SDG 9: Industry, Innovation, and Infrastructure *Build resilient infrastructure, promote inclusive and sustainable industrialisation* | › Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.<br>› Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross | The manufacturing industry's recovery from COVID-19 remains incomplete and uneven: some high-income regions achieved record-high manufacturing value added per capita in 2022 but levels in least developed countries were not much higher than the 2015 baseline.<br>Global carbon dioxide (CO2) emissions from energy combustion and industrial processes grew by 0.9% in 2022 to a new all-time high of 36.8 billion tonnes. Emissions shrank by more than 5% in 2020, but rebounded past pre – pandemic levels in 2021, growing | *National Development Plan 2021-2030;*<br>*National Economic Recovery Plan;*<br>*Climate Action Plan 2024;*<br>*National Implementation Plan on Persistent Organic Pollutants;*<br>*Waste Action Plan for a Circular Economy;* |

| | | | |
|---|---|---|---|
| *and foster innovation* | domestic product, in line with national circumstances, and double its share in least developed countries<br>› **Support domestic technology development,** research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities | more than 6% in tandem with economic stimulus and a surge in coal demand even as renewables capacity additions scaled record heights. CO2 growth in 2022 was well below GDP growth of 3.2%. | *National Waste Prevention Programme;*<br>*A Better World* |
| SDG 11: Sustainable Cities and Communities<br>*Make cities and human settlements inclusive, safe, resilient and sustainable* | › **By 2030, ensure access for all to adequate, safe** and affordable housing and basic services and upgrade slums<br>› **By 2030, provide access to safe, affordable,** accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons<br>› **Strengthen efforts to protect and safeguard the** world's cultural and natural heritage<br>› **By 2030, reduce the adverse per capita** environmental impact of cities, including by paying special attention to air quality and municipal and other waste management | Climate change, the pandemic, and conflicts tend to have a disproportionate impact on cities. These factors mean that the world is far from achieving the goal of sustainable cities. In many developing countries, slum populations have been growing, putting at risk the target of adequate housing for all by 2030. Since 2015, the number of countries with national disaster risk reduction strategies has more than doubled.<br>According to 2022 data from 1,507 cities in 126 countries, only 51.6% of the world's urban population has convenient access to public transport, with considerable variations across regions. Data for 2020 from 1,072 cities in 120 countries indicate that more than three-quarters of these cities have less than 20% of their area dedicated to open public spaces and streets, about half of the proportion recommended.<br>By the end of 2022, 102 countries reported having local governments with disaster risk reduction strategies, an increase from 51 countries in 2015. | *Rebuilding Ireland Action Plan for Housing and Homelessness;*<br>*Housing for All;*<br>*EU Regulation 1370/2007 on Public Passenger Transport Services by Rail and by Road;*<br>*Project Ireland 2040 National Planning Framework;*<br>*National Clean Air Strategy;*<br>*Rural Development Programme 2014-2022;*<br>*National Implementation Plan on Persistent Organic Pollutants;*<br>*Waste Action Plan for a Circular Economy;*<br>*National Waste Prevention Programme;*<br>*A Better World* |
| SDG 12 Responsible Consumption and production: *Ensure* | › By 2030, achieve the sustainable management and efficient use of natural resources.<br>› By 2020, achieve the environmentally sound management of chemicals and all wastes | Unsustainable patterns of consumption and production are the root cause of the triple planetary crisis:<br>1. *Climate Change*<br>2. *Biodiversity Loss*<br>3. *Pollution* | *National Implementation Plan on Persistent Organic Pollutants;*<br>*Waste Action Plan for a Circular Economy;* |

| | | | |
|---|---|---|---|
| *sustainable consumption and production patterns.* | throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment<br>› **Encourage companies, especially large and** transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle<br>› **Promote public procurement practices that are** sustainable, in accordance with national policies and priorities.<br>› **Develop and implement tools to monitor** sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products | The world is seriously off track in its effort to halve per-capita food waste and losses by 2030.The COVID-19 pandemic has had significant impacts on consumption and production patterns, with disruptions to global supply chains and changes in consumer behaviour. Responsible consumption and production must be an integral part of the recovery from the pandemic. But the global economy also needs to speed up the decoupling of economic growth from resource use by maximizing the socio-economic benefits of resources while minimizing their negative impacts. Reporting on corporate sustainability has tripled since the beginning of the SDG period, but the private sector will need to significantly improve reporting on activities that contribute to the SDGs.<br>Global data showed a rise in fossil fuel subsidies in 2021, after a brief fall in 2020 which was largely caused by a drop in energy prices. In 2021, Governments spent an estimated $732 billion on subsidies to coal, oil, and gas, against $375 billion in 2020. This brings the subsidies back to pre-2015 levels. High oil and gas prices in 2022 will likely bring a new increase, as subsidies are often linked to the price of energy. | ***National Waste Prevention Programme;***<br>***Climate Action Plan 2024***<br>***Tourism Action Plan;***<br>***National Clean Air Strategy;***<br>***Towards Responsible Business: Ireland's Second National Plan on Corporate Social Responsibility (CSR) 2017-2020;***<br>***Sustainable, Inclusive and Empowered Communities 2019-2024;*** |
| SDG 13 Climate Action: *Take urgent action to combat climate change and its impacts* *Acknowledging that the United Nations Framework Convention on Climate Change is the primary international,* | › **Strengthen resilience and adaptive capacity to** climate-related hazards and natural disasters in all countries<br>› **Integrate climate change measures into national** policies, strategies and planning<br>› **Improve education, awareness-raising and** human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning | The world is on the brink of a climate catastrophe and current actions and plans to address the crisis are insufficient. Without transformative action starting now and within this decade to reduce greenhouse gas emissions deeply and rapidly in all sectors, the 1.5°C target will be at risk and with it the lives of more than 3 billion people. Failure to act leads to intensifying heatwaves, droughts, flooding, wildfires, sea-level rise, and famines. Emissions should already be decreasing now and will need to be cut almost by half by 2030 - a mere seven years from now.<br>Global temperatures have already hit 1.1°C, rising due to increasing global greenhouse gas emissions, which reached record highs in 2021. Real-time data from 2022 show emissions | ***National Adaptation Framework;***<br>***Building on Recovery: Infrastructure and Capital Investment 2016-2021;***<br>***National Mitigation Plan;***<br>***National Biodiversity Action Plan 2017-2021;***<br>***National Policy Position on Climate Action and Low Carbon Development;*** |

| | | | |
|---|---|---|---|
| *intergovernmental forum for negotiating the global response to climate change.* | | continuing an upward trajectory. Instead of decreasing emissions as required by the target to limit warming, carbon dioxide levels increased from 2020 to 2021 at a rate higher than the average annual growth rate of the last decade and is already 149% higher than pre-industrial levels. Projected cumulative future CO2 emissions over the lifetime of existing and currently planned fossil fuel infrastructure exceed the total cumulative net CO2 emissions in pathways that limit warming to 1.5°C (>50%) with no or limited overshoot. | *Project 2040: National Development Plan 2021-2030;*<br>*Climate Action Plan 2024;*<br>*National Dialogue on Climate Action;*<br>*Agriculture, Forest, and Seafood Climate Change sectoral Adaptation Plan;*<br>*The National Strategy on Education for Sustainable Development in Ireland* |

#### 10.3.2.2.1 Climate Change Performance Index 2024

Established in 2005, the Climate Change Performance Index (CCPI) is an independent monitoring tool which tracks countries climate protection performance. It assesses individual countries based on climate policies, energy usage per capita, renewable energy implementation and Greenhouse Gas Emissions (GHG) and ranks their performance in each category and overall. The 2024 CCPI was published in December 2023. While the CCPI 2024 indicates signs of potential reductions in global emissions, no country achieved its Paris Climate targets and therefore the first three places of the ranking system remain unoccupied.

Ireland, ranked 37th in 2023, has fallen 6 places to 43rd for 2024, and remains as a "low" performer in international performance. The CCPI states that Ireland's policies are missing a long-term strategy for phasing out fossil fuel infrastructure and shifting investments from natural gas towards an emissions-neutral energy supply. Rebound effects from economic growth in emissions-intensive sectors (such as agriculture and land use) cause absolute emissions to remain high. The chance to integrate clear sanctions into the framework has so far been missed.

However, the CCPI experts welcome Ireland's medium-term offshore wind and solar plans. They feel the country's offshore wind offers considerable opportunities for capitalising on renewable energy and (over the long term) potential for electricity export.

Ireland has moved to the 'low' category in 2024 from 'very low' in 2023 on the Greenhouse Gas Emissions ratings despite falling to 54th in the world from 47th in 2023. Ireland remains in the 'Medium' category in the Renewable Energy rating table; however, Ireland has fallen from 23rd in 2023 to 31st in 2024.

### 10.3.2.3 State of the Global Climate 2023

In March 2023, the World Meteorological Organisation (WMO) published a report entitled the '*State of the Global Climate 2023*'.[12] This report provided a summary on the state of the climate indicators in 2023 with sections on key climate indicators, extreme events and impacts. The key messages in the report include:

- 2023 was the warmest year on record at 1.45 ± 0.12 °C above the pre-industrial average.
- Concentrations of the three main greenhouse gases – carbon dioxide, methane, and nitrous oxide – reached record high observed levels.

The State of the Global Climate report goes on to state that renewable energy generation, primarily driven by the dynamic forces of solar radiation, wind and the water cycle, has surged to the forefront of climate action for its potential to achieve decarbonization targets. There has been a substantial worldwide energy transition, with renewable capacity additions increasing by nearly 50% from 2022, totalling 510 gigawatts (GW).[13] This growth represents the highest rate observed in the past two decades, signalling a significant momentum toward achieving the clean energy goal set at COP28 meeting in 2023 to triple renewable energy capacity globally to 11,000 GW by 2030.

Alterations in the physical climate can trigger a series of repercussions on national advancement and the pursuit of SDGs (Section 10.3.2.3 above). The interconnections between the climate emergency and development pathways can foster synergistic endeavours, resulting in positive benefits for communities and human well-being (refer to Chapter 5 of this EIAR for more details). This synergy serves as a potent driver for adapt to climate change and lay the groundwork for the global energy transition. Emphasizing wind energy and other renewable sources enables the global energy transition towards sustainability.

## 10.3.2.4 National Greenhouse Gas Emission and Climate Targets

### 10.3.2.4.1 Programmes for Government

The Programme for Government: Our Shared Future was published in October 2020 and last updated April 2021. In relation to climate change the programme recognises that the next ten years are a critical period in addressing the climate crisis. It is an ambition of the programme to more than halve carbon emissions over the course of the decade (2020-2030). The programme notes that the government are committed to reducing greenhouse gas emissions by an average 7% per annum over the next decade in a push to achieve a net zero emissions by the year 2050. The programme also recognises the severity of the climate challenge as it clarifies that:

***"Climate change is the single greatest threat facing humanity"***

### 10.3.2.4.2 Climate Action and Low Carbon Development (Amendment) Act 2021

The Climate Action and Low Carbon (Amendment) Act 2021 is a piece of legislation which commits the country to move to a climate resilient and climate neutral economy by 2050. This was passed into law in July 2021.

The Programme for Government has committed to a 7% average yearly reduction in overall greenhouse gas emissions over the next decade, and to achieve net zero emissions by 2050. This Act will manage the implementation of a suite of policies to assist in achieving this target.

The Act includes the following key elements, among others:

- Places on a statutory basis a 'national climate objective', which commits to pursue and achieve no later than 2050, the transition to a climate resilient, biodiversity-rich, environmentally sustainable and climate-neutral economy.
- Embeds the process of carbon budgeting into law, Government are required to adopt a series of economy-wide five-year carbon budgets, including sectoral targets for each relevant sector, on a rolling 15-year basis, starting in 2021.
- Actions for each sector will be detailed in the Climate Action Plan, updated annually.
- A National Long Term Climate Action Strategy will be prepared every five years.
- Government Ministers will be responsible for achieving the legally binding targets for their own sectoral area with each Minister accounting for their performance towards sectoral targets and actions before an Oireachtas Committee each year.
- Strengthens the role of the Climate Change Advisory Council, tasking it with proposing carbon budgets to the Minister.
- Provides that the first two five-year carbon budgets proposed by the Climate Change Advisory Council should equate to a total reduction of 51% emissions over the period to 2030, in line with the Programme for Government commitment.

### 10.3.2.4.3 Climate Change Advisory Council 2023

The Climate Change Advisory Council (CCAC) was established on 18th January 2016 under the Climate Action and Low Carbon Development Act 2015. The CCAC aims to provide independent evidence-based advice and recommendations on policy to support Ireland's Just Transition to a biodiversity-rich, environmentally sustainable, climate-neutral, and resilient society.

**The Annual Review 2023[22] is the seventh annual review carried out by CCAC and details the CCAC concerns that the necessary national actions are not taking place or being enabled at the required speed, going on to state that 'at the current rate of policy implementation, Ireland will not meet the targets set in the first and second carbon budget periods unless urgent action is taken immediately, and emissions begin to fall much more rapidly.'**

#### 10.3.2.4.4 Carbon Budgets

The first national carbon budget programme proposed by the Climate Change Advisory Council, approved by Government and adopted by both Houses of the Oireachtas in April 2022 comprises three successive 5-year carbon budgets. The total emissions allowed under each budget are shown in Table 10-20.

*Table 10-20 Proposed Carbon Budgets of the Climate Change Advisory Council*

| | 2021 – 2025 Carbon Budget 1 | 2026 – 2030 Carbon Budget 2 | 2031 – 2035 Provisional Carbon Budget 3 |
|---|---|---|---|
| | All Gases | | |
| Carbon Budget (Mt $CO_2$eq) | 295 | 200 | 151 |
| Annual Average Percentage Change in Emissions | -4.8% | -8.3% | -3.5% |
| The figures are consistent with emissions in 2018 of 68.3 Mt $CO_2$eq reducing to 33.5 Mt $CO_2$eq in 2030 thus allowing compliance with the 51% emissions reduction target by 2030 | | | |

Ireland has expended 47% of its emissions for the first carbon budget period in the first two years. Thus, only 53% is leftover, requiring a 12.4% reduction in emissions each year to stay in budget.

#### 10.3.2.4.5 Sectoral Emissions Ceilings

The Sectoral Emissions Ceilings were launched in September 2022. The objective of the initiative is to inform on the total amount of permitted greenhouse gas emissions that each sector of the Irish economy can produce during a specific time period. The Sectoral Emissions Ceilings alongside the annual published Climate Action Plan provide a detailed plan for taking decisive action to achieve a 51% reduction in overall greenhouse gas emissions by 2030.

Section C of the Climate Action and Low Carbon Development (Amendment) Act 2021 provides the minister with a method of preparing the Sectoral Emissions Ceiling within the bounds of the carbon budget. The Sectoral Emission Ceilings for each 5-year carbon budget period was approved by the government on the 28th of July 2022 and are shown in Table 10-21 below.

*Table 10-21 Sectoral Emission Ceilings 2022*

| | Sectoral Emission Ceilings for each 5-year carbon budget period (MtCO2eq.) | |
|---|---|---|
| Sector | 2021 – 2025 Carbon Budget 1 | 2026 – 2030 Carbon Budget 2 |
| Electricity | 40 | 20 |
| Transport | 54 | 37 |
| Built Environment-Residential | 29 | 23 |

[22] *Climate Change Advisory Council 2023 Review*
*https://www.climatecouncil.ie/councilpublications/annualreviewandreport/CCAC-AR-2023-FINAL%20Compressed%20web.pdf*

| | Sectoral Emission Ceilings for each 5-year carbon budget period (MtCO2eq.) | |
|---|---|---|
| Built Environment-Commercial | 7 | 5 |
| Industry | 30 | 24 |
| Agriculture | 106 | 96 |
| LULUCF[1] | Yet to be determined | Yet to be determined |
| Other (F-Gases, Waste & Petroleum refining) | 9 | 8 |
| Unallocated Savings | | -26 |
| Total[2] | Yet to be determined | Yet to be determined |
| Legally binding Carbon budgets and 2030 Emission Reduction Targets | 295 | 200 |

*[1] Finalising the Sectoral Emissions Ceiling for the land-use, Land-use Change and Forestry (LULUCF) sector has been deferred for up to 18 months to allow for the completion of the Land-use Strategy*
*[2] Once LULUCF sector figures are finalised, total figures will be available.*

The electricity sector is the third largest emitting sector in Ireland and the successful decarbonisation of this sector could lead to decarbonisation in other sectors, such as the electrification of transport and heating. The Annual 2023 Review states that the electricity sector has been set one of the smallest sectoral emission ceilings and the steepest decline in emissions of all sectors with emission ceilings of 40MtCO$_2$eq for the first carbon budget period (2021–2025) and 20MtCO$_2$eq for the second carbon budget period (2026–2030) (further detailed in Section 11.3.2.4 and Section 11.3.2.5 below). This equates to a headline target of a 75% reduction in emissions in the sector from 2018 levels by 2030, which will be achieved by increasing the share of renewable electricity to 80%, encompassing 9GW of onshore wind capacity, at least 5GW of offshore wind capacity, with 2 GW earmarked for green hydrogen production, and 8GW of solar photovoltaic capacity, supported by a range of actions set out in the Climate Action Plan 2024[23].

### 10.3.2.4.6 Climate Action Plan 2024

The National Climate Action Plan 2024 (CAP 2024)[24] was launched in December 2023. Following on from Climate Action Plans 2019, 2021, and 2023, CAP 2024 sets out the roadmap to deliver on Ireland's climate ambition. It aligns with the legally binding economy-wide carbon budgets and sectoral ceilings that were agreed by Government in July 2022 following the Climate Action and Low Carbon Development (Amendment) Act 2021, which commits Ireland to a ***legally binding target of net-zero greenhouse gas emissions no later than 2050, and a reduction of 51% by 2030.*** CAP 2024 seeks to build on the progress made under Climate Action Plan 2023 by delivering policies, measurements and actions that will support the achievement of Irelands carbon budgets, sectoral emission ceilings, and 2030 and 2050 climate targets; while further enabling the closure of identified emissions gaps and the allocation of unallocated emission savings associated with each carbon budget period.

Six Vital High Impact Sectors were identified within Climate Action Plan 2023[25] relating to the sectoral emission ceilings (Section 11.3.2.5 above). These sectors and their associated targets are as follows:

- Powering Renewables – 75% Reduction in emissions by 2030
- Building Better – 45% (Commercial/Public) and 40% (Residential) Reduction in Emissions by 2030

[23] *Department of Environment, Climate and Communications (2023) Climate Action Plan 2024* https://www.gov.ie/en/publication/79659-climate-action-plan-2024/
[24] *Department of the Environment, Climate and Communications (2023) Climate Action Plan 2024. Available at:* https://www.gov.ie/en/publication/79659-climate-action-plan-2024/#new-approach-to-the-2024-annex-of-actions
[25] *Department of the Environment, Climate and Communications (2022) Climate Action Plan 2023 – Summary Document*

- **Turning Transport Around – 50% Reduction in Emissions by 2030**
- **Making Family Farms More Sustainable – 25% Reduction in Emissions by 2030**
- **Greening Business and Enterprise – 35% Reduction in Emissions by 2030**
- **Changing Our Land-Use – Exact reduction target for this sector is yet to be determined.**

**CAP 2024 provides a more enhanced sectoral breakdown of these Vital High Impact Sectors as the majority have since developed their own independent, but complimentary, analytical approaches to emissions reductions.**

**CAP 2024 goes on to highlight the need for adaptation to climate change. Adaptation is the process of adjustment to actual or expected climate change and its effects. Observations show that Irelands climate is changing in terms of coastline, sea level rise, seasonal temperatures, and changes in typical weather patterns. Climate change is expected to have diverse and wide-ranging impacts on Ireland's environment, society, and economic development, including on managed and natural ecosystems, water resources, agriculture and food security, the built environment, human health, and coastal zones.**

### 10.3.2.5 Irelands Climate Change Assessment

In 2023 the EPA published Irelands Climate Change Assessment (ICCA).[26] This assessment provides a comprehensive overview and breakdown of the state of knowledge around key aspects of climate change with a focus on Ireland. The ICCA report is presented in four volumes.

- Volume 1: Climate Science – Ireland in a Changing World
- Volume 2: Achieving Climate Neutrality in 2050
- Volume 3: Being Prepared for Irelands Future
- Volume 3: Realising the Benefits of Transition and Transformation

The ICCA Synthesis Report states that having peaked in 2001, Irelands greenhouse gas emissions have reduced in all sectors except agriculture. However, Ireland currently emits more greenhouse gases per person than the EU average. The report goes on to state that there has been an identified gap in policy that indicates that Ireland will not meet its statutory greenhouse gas emission targets. Achieving net zero carbon dioxide emissions by 2050 requires significant and unprecedented changes to Ireland's energy system. Policies tailored to suit different stages of technology development are critical for achieving a net zero energy system. Established technologies, such as wind energy, solar photovoltaics and bioenergy, will be key in meeting short-term emission reduction targets (i.e. 2030), whereas offshore wind infrastructure is expected to be the backbone of future energy systems. This can only be achieved with appropriate support schemes, regulation and investments for synergistic growth of offshore wind and other renewable technologies.

There are well-established 'no-regret options' that need to happen now, which can get Ireland most of the way to net zero carbon dioxide emissions. Beyond that, there are 'future energy choices' relating to the scale and magnitude of technologies that will assist in achieving Ireland statutory climate targets. Ireland's no-regret options are demand reduction (e.g. through energy efficiency and reduced consumption), electrification (e.g. electric vehicles and heat pumps), deployment of market-ready renewables (e.g. wind energy and solar photovoltaics) and low-carbon heating options (e.g. district heating); Irelands future choices include hydrogen, carbon capture and storage, nuclear energy and electro-fuels. Renewable energy can increasingly provide our future energy needs but will need to be complemented with carbon dioxide removals to achieve a net zero energy system in hard-to-abate sectors.

#### 10.3.2.5.1 *Greenhouse Gas Emissions Projections*

[26] *Environmental Protection Agency (2023) Irelands Climate Change Assessment.* https://www.epa.ie/our-services/monitoring-assessment/climate-change/irelands-climate-change-assessment-icca/

In its approach to decarbonising, the EU has split greenhouse gas (GHG) emissions into two categories, the Emissions Trading System (ETS) and the non-ETS. Emissions from electricity generation and large industry in the ETS are subject to EU-wide targets which require that emissions from these sectors be reduced by 43% by 2030, relative to 2005 levels. Within the ETS, participants are required to purchase allowances for every tonne of emissions, with the amount of these allowances declining over time to ensure the required reduction of 43% in GHG emissions is achieved at EU-level[27].

Emissions from all other sectors, including agriculture, transport, buildings, and light industry are covered by the EU Effort Sharing Regulation (ERS[28]). This established binding annual GHG emission targets for Member States for the period 2021–2030. Ireland is required to reduce its emissions from these sectors by 30% by 2030, relative to 2005 levels. Under the EU Green Deal, the targets for the ETS and non-ETS sectors will be revised upwards in order to achieve the commitment, at EU level, to reach an economy-wide 2030 reduction in emissions of at least 55%, compared to 1990 levels[1].

The Environmental Protection Agency (EPA) publish Ireland's greenhouse gas emission projections and at the time of writing, the most recent report, *'Ireland's Greenhouse Gas Emissions Projections 2023-2050* was published in May 2024. The report includes an assessment of Ireland's progress towards achieving its emission reduction targets out to 2030 set under the ESR.

The EPA has produced two scenarios in preparing these greenhouse gas emissions projections: a "With Existing Measures" (WEM) scenario and a "With Additional Measures" (WAM) scenario. These scenarios forecast Irelands greenhouse gas emissions in different ways. The WEM scenario assumes that no additional policies and measures, beyond those already in place by the end of 2020. This is the cut off point for which the latest national greenhouse gas emission inventory data is available, known as the 'base year' for projections. The WAM scenario has a higher level of ambition and includes government policies and measures to reduce emissions such as those in Ireland's Climate Action Plan 2024 that are not yet implemented. As implementation of policies and measures occurs, they will be migrated into the WEM Scenario.

The EPA Emission Projections Update notes the following key trends:

- Ireland is not on track to meet the 51% emissions reduction target by 2030 (as compared to 2018 levels) based on most up to date EPA projections which include the majority of CAP 2024 measures
- The first two carbon budgets (2021-2030), which aim to support achievement of the 51% emissions reduction goal, are projected to be exceeded by a significant margin of between 17% and 27%.
- Sectoral emissions ceilings for 2025 and 2030 are projected to be exceeded in almost all cases, including Agriculture, Electricity, Industry and Transport.
    - Total emissions from the agriculture sector are projected to decrease by between 1 and 18% over the period 2022 to 2030
    - Transport emissions are projected to decrease by 5 to 26% over the period 2022-2030
    - Emissions from the LULUCF sector have been revised significantly to reflect new science. Total emissions from the LULUCF sector are projected to increase over the period 2022 to 2030
- Emissions from the Energy Industries sector are projected to decrease by between 57% and 62% over the period 2022 to 2030
    - Renewable energy generation at the end of the decade is projected to range from 69% to 80% of electricity generation as a result of a projected rapid expansion in wind energy and other renewables

[27] *Government of Ireland (2023) - Climate Action Plan 2023 https://www.gov.ie/en/publication/7bd8c-climate-action-plan-2023/*
[28] *Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013 (Text with EEA relevance)*

- **Ireland will not meet its non-ETS EU targets of a 42% emissions reduction by 2030 in WAM even with both the ETS and LULUCF flexibilities.**
- **Emissions in the WEM Scenario are projected to be 29% lower in 2030 (compared with 2018) whereas in the WAM Scenario the emissions reduction is projected to be 11%**
  - There has been no improvement in these figures since EPA projections published in 2023.

#### 10.3.2.6 Local Greenhouse Gas Emission and Climate Targets

##### 10.3.2.6.1 *Wexford County Council Climate Action Plan 2024-2029*

The Wexford County Council Climate Action Plan 2024-2029[29] (Wexford CCCAP) highlights the current state of climate action in Ireland, and how Wexford County Council intends to deliver and enable climate action for a just transition to a low carbon and climate resilient future within County Wexford. The Wexford CCCAP will help address the mitigation of greenhouse gases, the implementation of climate change mitigation and adaption measures, and will strengthen the alignment between national climate policy and the delivery of effective local climate action.

Overall, the greenhouse gas emissions generated from County Wexford equated to 2,460.1 $ktCO_2eq$ in the baseline year, 2018. The top emitting sectors within County Wexford in terms of total greenhouse gas emissions in the baseline year were Agriculture, Residential, Transport and Manufacturing and Commercial producing 39.4%, 17.6%, 17.4% and 16.4% respectively of the total greenhouse gas emissions in the county, with Land Use, Land Use Change and Forestry (LULUCF), Waste, Industrial Processes and Wexford Couty Council emissions comprising the remaining 9.2%Wexford County Council, along with all public sector entities must reduce greenhouse gas emissions by 51% by 2030 as compared to 2018 in line with the National Climate Action Plan 2024, with the allowable greenhouse gas emissions for County Wexford in 2030 under this Plan 1,205.5 $ktCO_2eq$.

The Wexford CCCAP for Wexford assesses climate risk relevant to Ireland and to County Wexford, this, plus the evidence Baseline Emissions Inventory, inform the climate objectives and actions that will be undertaken by Wexford County Council to assist in the achievement of national and international climate targets.

The Wexford County Development Plan 2022-2028[30] sets out the overall strategy for the proper planning and sustainable development of the County over a 6-year period. The Development Plan includes numerous objectives on sustainability and climate within, as well as an Energy Strategy.

The Wexford County Council Climate Action Plan was adopted by the Elected members of Wexford County Council in February 2024, in line with the 2021 Climate Action and Low Carbon Development (Amendment) Act.

### 10.3.3 Climate and Weather in the Existing Environment

Climate change projections show that the Earth is getting warmer and extreme weather events are increasing in frequency on an annual basis. The Proposed Development will assist in mitigating these effects through the continuation of the deployment of clean renewable energy to the national grid and subsequent decarbonisation of energy systems. Changes to climate and weather in Ireland will occur as a result of climate change, for further details on the risks associated with the Proposed Development please refer to Chapter 15 Major Accidents and Natural Disasters.

---

[29] *Wexford County County Climate Action Plan 2024-2029. < https://www.wexfordcoco.ie/sites/default/files/content/Climate%20Action%20Plan%202024-2029%20English.pdf > >*

[30] *Adopted Wexford County Development Plan 2022-2028 <https://consult.wexfordcoco.ie/en/consultation/wexford-county-development-plan-2022-2028 >*

Ireland has a temperate, oceanic climate, resulting in mild winters and cool summers. The Met Éireann weather station at Kilkenny, which is located approximately 40 kilometres to the west of the Site, is the nearest weather and climate monitoring station to the Proposed Development site that has meteorological data recorded for the 30-year period from 1978-2007. Meteorological data recorded during the 30-year period from 1991 to 2020 has been published by Met Eireann, however data for the Kilkenny weather station was not available for this time period, as this station closed in early 2008. Although data was available for this more recent period at the next nearest weather and climate monitoring station at Casement Aerodrome, Co. Dublin, approximately 81km east if the site, it was deemed that the 1979-2008 data from the Kilkenny station was more relevant to the site of the Proposed Development. Meteorological data recorded at Kilkenny over the 30-year period from 1978-2007 is shown in Table 10-21 below. The wettest months are October and December, with April and July being the driest. July is the warmest month with an average temperature of 20.3° Celsius.

Recent monthly meteorological data recorded at Johnstown Castle in Wexford Town, Co Wexford, located approximately 32 kilometres southwest of the site, from January 2021 to January 2024 is available at: https://www.met.ie/climate/available-data/monthly-data. October 2023 was the wettest month in this time period, with 265mm of rainfall recorded, while February 2023 was the driest month with 7.4mm of rainfall. August 2022 was the warmest month in this time period, with a mean monthly temperature of 16.7° Celsius. January 2021 was the coldest month with a mean monthly temperature of 4.6° Celsius.

*Table 10-22 Data from Met Éireann Weather Station at Kilkenny, 1978-2007*

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Temperature (degrees Celsius)** | | | | | | | | | | | | | |
| Mean daily max | 8.2 | 8.6 | 10.6 | 12.9 | 15.7 | 18.2 | 20.3 | 20.2 | 17.8 | 14.1 | 10.8 | 8.8 | 13.8 |
| Mean daily min | 1.6 | 1.9 | 3.2 | 4.2 | 6.5 | 9.3 | 11.3 | 11.0 | 9.1 | 6.5 | 3.7 | 2.4 | 5.9 |
| Mean temperature | 4.9 | 5.2 | 6.9 | 8.5 | 11.1 | 13.8 | 15.8 | 15.6 | 13.4 | 10.3 | 7.3 | 5.6 | 9.9 |
| Absolute max. | 14.1 | 15.6 | 19.2 | 22.4 | 26.0 | 29.6 | 31.4 | 30.8 | 26.6 | 21.4 | 17.5 | 15.5 | 31.4 |
| Absolute Min. | -14.1 | -8.5 | -7.9 | -4.0 | -3.0 | 1.0 | 3.6 | 2.2 | -0.9 | -4.8 | -7.0 | -8.8 | -14.1 |
| Mean No. of Days with Air Frost | 10.9 | 9.0 | 5.4 | 3.2 | 0.7 | 0.0 | 0.0 | 0.0 | 0.2 | 2.0 | 6.6 | 8.9 | 46.9 |
| Mean No. of Days with Ground Frost | 20.0 | 16.0 | 15.0 | 14.0 | 9.0 | 2.0 | 0.0 | 1.0 | 4.0 | 9.0 | 15.0 | 18.0 | 123.0 |
| **Relative Humidity (%)** | | | | | | | | | | | | | |
| Mean at 0900UTC | 88.4 | 87.7 | 84.8 | 79.0 | 75.8 | 76.7 | 78.1 | 80.9 | 84.8 | 88.5 | 90.1 | 89.6 | 83.7 |
| Mean at 1500UTC | 79.5 | 74.3 | 69.2 | 63.6 | 63.4 | 65.9 | 65.2 | 65.1 | 67.5 | 74.2 | 78.9 | 81.8 | 70.7 |
| **Sunshine (hours)** | | | | | | | | | | | | | |
| Mean daily duration | 1.8 | 2.3 | 3.2 | 4.9 | 5.6 | 4.9 | 4.7 | 4.7 | 4.0 | 3.0 | 2.2 | 1.6 | 3.6 |
| Greatest daily duration | 8.4 | 9.8 | 11.6 | 13.7 | 15.5 | 16.3 | 15.4 | 14.5 | 11.8 | 10.2 | 8.7 | 7.2 | 16.3 |
| Mean no. of days with no sun | 9.9 | 7.1 | 5.4 | 2.3 | 1.7 | 1.7 | 1.8 | 2.2 | 2.9 | 5.4 | 8.7 | 11.6 | 60.8 |
| **Rainfall (mm)** | | | | | | | | | | | | | |
| Mean monthly total | 78.3 | 66.1 | 67.9 | 56.4 | 60.4 | 61.0 | 54.6 | 77.8 | 69.0 | 95.3 | 80.2 | 90.4 | 857.4 |
| Greatest daily total | 5.2 | 24.8 | 27.9 | 23.4 | 31.1 | 28.2 | 66.4 | 58.3 | 34.7 | 33.6 | 34.2 | 43.8 | 66.4 |
| **Wind (knots)** | | | | | | | | | | | | | |
| Mean monthly speed | 7.9 | 8.0 | 8.1 | 7.0 | 6.6 | 6.2 | 5.9 | 5.7 | 6.2 | 6.8 | 6.9 | 7.3 | 6.9 |
| Max. gust | 68 | 72 | 62 | 56 | 54 | 44 | 48 | 50 | 54 | 57 | 56 | 75 | 58 |
| Max. mean 10-minute speed | 44 | 39 | 43 | 34 | 32 | 27 | 29 | 29 | 30 | 38 | 36 | 47 | 35.7 |
| Mean num. of days with gales | 0.5 | 0.4 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.6 | 1.9 |
| **Weather (mean no. of days with...)** | | | | | | | | | | | | | |
| Snow or sleet | 3.6 | 3.6 | 2.5 | 0.8 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 2.0 | 12.8 |

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Snow lying at 0900UTC | 1.5 | 1.1 | 0.3 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 3.2 |
| Hail | 0.7 | 1.0 | 2.1 | 2.5 | 1.2 | 0.3 | 0.2 | 0.1 | 0.1 | 0.3 | 0.2 | 0.2 | 8.9 |
| Thunder | 0.1 | 0.0 | 0.1 | 0.4 | 0.7 | 0.9 | 0.7 | 0.8 | 0.2 | 0.2 | 0.1 | 0.0 | 4.2 |
| Fog | 3.2 | 2.8 | 1.7 | 1.9 | 1.9 | 1.3 | 1.7 | 2.9 | 3.8 | 3.8 | 3.2 | 3.8 | 32.1 |

## 10.3.4 Calculating Carbon Savings from the Proposed Development

A simple formula can be used to calculate carbon dioxide emissions reductions resulting from the generation of electricity from wind power rather than from carbon-based fuels such as peat, coal, gas and oil. The formula is:

$$CO_2 \text{ (in tonnes)} = \frac{(A \times B \times C \times D)}{1000}$$

where: A = ..... The rated capacity of the wind energy development in MW

B = ..... The capacity or load factor, which takes into account the intermittent nature of the wind, the availability of wind turbines and array losses etc.

C = ..... The number of hours in a year

D = ..... Carbon load in grams per kWh (kilowatt hour) of electricity generated and distributed via the national grid.

For the purposes of this calculation, the rated capacity of the Proposed Development is assumed to be 25.3 MW (based on 11 No. 2.3 MW turbines).

A load factor of 0.31 (or 32%) has been used for the Proposed Development[31].

The number of hours in a year is 8,760.

A conservative figure for the carbon load of electricity generated by natural gas in Ireland was sourced from Sustainable Energy Authority Ireland's (SEAI) Conversion and Emissions Factors for Publication worksheet.[32] The emission factor for electricity generated in Ireland in 2023 was 229.9 $gCO_2/kWh$.[33]

The calculation for carbon savings is therefore as follows:

$$CO_2 \text{ (in tonnes)} = \frac{(25.3 \times 0.32 \times 8{,}760 \times 229.9)}{1000}$$

$$= 16{,}305 \text{ tonnes per annum}$$

Based on this calculation, **16,305** tonnes of carbon dioxide will be displaced per annum from the largely carbon-based traditional energy mix by the Proposed Development. Over the proposed 20-year extended lifetime of the development, therefore, **326,100** tonnes of carbon dioxide will be displaced from traditional carbon-based electricity generation.

---

[31] *Eirgrid, 2024 Enduring Connection Policy 2.3 Constraints Report for Solar and Wind* https://cms.eirgrid.ie/sites/default/files/publications/ECP-2.3-Solar-and-Wind-Constraints-Report-Assumptions-and-Methodology-v1.1.pdf
*The Proposed Development is located within the H2 wind region for Ireland with an associated capacity factor of 32%.*

[32] *Conversion and Emission Factors for Publication (2023)* https://www.seai.ie/data-and-insights/seai-statistics/conversion-factors/SEAI-conversion-and-emission-factors.xlsx

[33] *SEAI have published the provisional 2023 emission factor for electricity generation in Ireland as 229.9 gCO2/kWh. Please note that this is a provisional value that may change.*

## 10.3.5 Likely Significant Effects and Associated Mitigation Measures

### 10.3.5.1 'Do-Nothing' Effect

Under the Do-Nothing scenario, the existing wind farm would be decommissioned in accordance with the conditions of the current planning permission.

If the Proposed Development were not to proceed, the opportunity to further significantly reduce emissions of greenhouse gas emissions, including $CO_2$, $NO_x$ and $SO_2$ to the atmosphere would be lost. The opportunity to contribute to Ireland's commitments under the Kyoto Protocol and EU law would also be lost. This would be a **Long-Term, Indirect, Slight Negative** effect.

The use of machinery during the decommissioning of the existing wind farm would result in the emission of greenhouse gases. Operations such as the transport of equipment and materials as well as construction personnel are typical examples of machinery use. This impact is considered to be imperceptible, given the insignificant quantity of greenhouse gases that would be emitted. This would likely result in a **Short-Term, Imperceptible, Negative** effect.

### 10.3.5.2 Construction Phase

The Castledockrell Wind Farm is currently operational, and it is proposed to extend the duration of operation of the wind farm by 20 years, until 2045. No construction activities will occur as part of the Proposed Development, therefore there are **no construction phase effects** on climate.

### 10.3.5.3 Operational Phase

#### 10.3.5.3.1 *Greenhouse Gas Emissions*

##### Proposed Development

The Proposed Development will continue to generate energy from a renewable source. This energy generated will offset energy and the associated emission of greenhouse gases from electricity-generating stations dependent on fossil fuels, thereby having a net positive effect on climate. As detailed in Section 10.3.3 above, the Proposed Development will continue to displace carbon dioxide from fossil fuel-based electricity generation, over the proposed 20-year lifespan extension of the existing Castledockrell Wind Farm. The Proposed Development will assist in reducing carbon dioxide ($CO_2$) emissions that would otherwise arise if the same energy that the Proposed Development will generate were otherwise to be generated by conventional fossil fuel plants. This is a **Long-term Moderate Positive Effect**.

Some potential long-term imperceptible negative effects that may occur during the operational phase of the Proposed Development are the release of small amounts of carbon dioxide to the atmosphere due to potential maintenance and monitoring activities resulting in vehicle emissions. These impacts will be imperceptible. However, once emitted to the atmosphere, the greenhouse gas emissions that will arise from operational phase activities will have a permanent imperceptible negative effect on Climate. The Proposed Development will displace carbon dioxide from fossil fuel-based electricity generation, over the proposed 20-year lifespan extension of the existing Castledockrell Wind Farm. Therefore, while there will be greenhouse gas emissions associated with the operation of the Proposed Development, this will be offset by the operation of the Proposed Development.

### Waste

Waste is not proposed to be generated on the site during the operational phase, any waste that does arise will be minimal and any impact will be short-term and imperceptible. Waste management will be carried out in accordance with 'Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021) produced by the EPA.

### Residual Effect

**Long-term, Moderate, Positive** Effect on Climate as a result of reduced greenhouse gas emissions.

### Significance of Effects

Based on the assessment above there will be a **Long-Term Moderate Positive Effect** on Climate.

## 10.3.5.4 Decommissioning Phase

The potential impacts associated with decommissioning of the Proposed Development (2045 should planning permission be granted for the Proposed Development) will be similar to those associated with a typical wind farm construction but of a reduced magnitude, due to the reduced scale of the proposed decommissioning works, as outlined in Chapter 4, Section 4.6 of this EIAR.

A preliminary Decommissioning Plan for the Proposed Development, see Appendix 4-4, contains details which will be agreed with the local authority prior to any decommissioning. The potential for effects during the decommissioning phase of the Proposed Development has been fully assessed in the EIAR.

The dismantling of turbines and removal offsite, electrical cabling removal (ducting remaining), and turbine foundation backfilling (as outlined in Appendix 4-4 Decommissioning Plan) will require the operation of construction vehicles and plant on site and the transport of workers to and from the site. Exhaust emissions associated with vehicles and plant such as $NO_2$, Benzene and $PM_{10}$ will arise as a result of construction activities. This potential effect will not be significant and will be restricted to the duration of the decommissioning phase. Therefore, this is considered a **Short-term, Slight, Negative Effect.** The transport of turbine components, construction materials, waste and workers to and from the site, (see Section 14.1 of this EIAR), will also give rise to exhaust emissions associated with the transport vehicles. This constitutes a **Short-term, Slight, Negative Effect** in terms of air quality.

### Mitigation

Mitigation measures in relation to greenhouse emissions are presented below:

- All construction vehicles and plant used onsite during the decommissioning phase will be maintained in good operational order. If a vehicle requires repairs this work will be caried out, thereby minimising any emissions that arise.
- Turbines components will be transported from the Site on specified routes only, as agreed with the Planning Authority prior to decommissioning.
- All machinery will be switched off when not in use.
- Users of the Site will be required to ensure that all plant and vehicles are suitably maintained to ensure that emissions of engine generated pollutants are kept to a minimum.
- The Materials Recovery Facility (MRF) facility will be as close as possible to the Proposed Development site to reduce the amount of emissions associated with vehicle movements.

- **Where applicable, low carbon intensive construction materials will be sourced and utilised** onsite.

### Residual Effect

The implementation of the above mitigation measures will result in a residual **Short-term, Imperceptible, Negative Effect upon climate. However, once emitted to the atmosphere, the greenhouse gas emissions that will arise from operational phase activities will have a permanent imperceptible negative effect on Climate.**

### Significance of Effects

Based on the assessment above there will be **No Significant Direct or Indirect Effects**.

## 10.4 Cumulative Assessment

Potential cumulative effects on air quality and climate between the Proposed Development and other projects in the vicinity were also considered as part of this assessment. The projects considered as part of the cumulative effect assessment are described in Section 2.7 of this EIAR.

The nature of the Proposed Development is such that it will have a **Long-term, Moderate, Positive Effect** on the air quality and climate.

The Castledockrell Wind Farm is currently operational, and it is proposed to extend the duration of operation of the wind farm by 20 years, until 2045. No construction activities will occur as part of the Proposed Development, therefore there are no **cumulative construction phase effects** on climate.

There will be no net $CO_2$ emissions from operation of the Proposed Development. Emissions of $CO_2$, $NO_x$, $SO_2$ and dust during the operational phase of the Proposed Development will be minimal, relating to the use of operation and maintenance vehicles on-site, and therefore there will be **no measurable negative cumulative effect** with other projects on air quality and climate.

The potential cumulative impacts associated with decommissioning of the Proposed Development (2045 should planning permission be granted for the Proposed Development) will be similar to those associated with a typical wind farm construction but of a reduced magnitude, due to the reduced scale of the proposed decommissioning works, as outlined in Chapter 4, Section 4.6 of this EIAR. The mitigation measures as outlined in Appendix 4-4 Decommissioning Plan will be implemented during the decommissioning phase thereby minimising any potential cumulative effects. As a result there will be **no significant cumulative effects** on air quality and climate.

# 11. NOISE AND VIBRATION

## 11.1 Introduction

This chapter of the EIAR assesses the effects of the Proposed Development from noise and vibration impacts. The 'Proposed Development' refers to all elements of the application for the Castledockrell Wind Farm Extension of Operational Life as outlined in Chapter 4: Description. The assessment considers the potential effects during the following phases of the Development:

- Operation of the Proposed Development
- Decommissioning of the Proposed Development

This chapter is supported by the Figures and following Technical Appendices documents provided in Volume III of this EIAR:

- Technical Appendix 11-1: Examples of Local Authority and An Bord Pleanála Decisions
- Technical Appendix 11-2: Photos of noise monitors in-situ
- Technical Appendix 11-3: Methodology for calculating wind shear, different hub heights and standardising hub height wind speed
- Technical Appendix 11-4: Derived background noise levels
- Technical Appendix 11-5: Calibration certificates of noise instruments
- Technical Appendix 11-6: Noise Monitoring Locations
- Technical Appendix 11-7: Noise Sensitive Locations
- Technical Appendix 11-8: Noise Level Map
- Technical Appendix 11-9: Sound Power Level Data
- Technical Appendix 11-10: Cumulative Wind Farm List
- Technical Appendix 11-11: Noise Management Plan
- Technical Appendix 11-12: Amplitude Modulation Noise Assessment

## 11.2 Statement of Authority

Irwin Carr Consulting is based in County Down. The company has a proven track record in noise and vibration impact assessments throughout the UK and Ireland, with extensive knowledge of the issues in relation to noise from wind energy developments. Dr Chris Jordan and Brendan O'Reilly undertook the noise monitoring in this assessment and both contributed to the report. Brendan is a Director in Noise and Vibration Consultants Ltd, primarily responsible for environmental noise and noise monitoring. Brendan has extensive experience working in the private sector, especially in the field of wind farm noise level measurements. Chris is a Technical Director in Irwin Carr Consulting, primarily responsible for environmental noise and noise modelling. He has over 20 years' experience working in both the public and private sectors having previously obtained a BSc (Hons) Degree in Environmental Health, a Post-Graduate Diploma in Acoustics and a PhD in the field of acoustics. Chris has been responsible for undertaking and reviewing noise impact assessments on numerous large scale wind farms throughout the UK and Ireland.

## 11.3 Approach to Assessment

### 11.3.1 Introduction

The assessment within this section of the EIAR is laid out as follows:

- Assessment Methodology and Significance Criteria
  Description of the methods used in baseline surveys and in the assessment of the significance of effects;
- Baseline Description
  - Description of the baseline noise of the area surrounding the Proposed Development based on the results of surveys, desk information and consultations, and a summary of any information required for the assessment that could not be obtained;
- Assessment of Potential Effects
  - Identifying the ways in which noise receptors could be affected by the Proposed Development, including a summary of the measures taken during design of the Proposed Development to minimise noise effects;
- Mitigation Measures and Residual Effects
  - Description of measures recommended to offset potential negative effects and a summary of the significance of the effects of the Proposed Development after mitigation measures have been implemented;
- Cumulative Effects
  - Identifying the potential for effects of the Proposed Development to combine with those from other wind farm developments;
- Summary of Effects
- Statement of Significance

### 11.3.2 Acoustic Terminology

Sound is simply the pressure oscillations that reach our ears. These are characterised by their amplitude, measured in decibels (dB), and their frequency, measured in Hertz (Hz). Noise is unwanted or undesirable sound, it does not accumulate in the environment, is transitory, fluctuates, and is normally localised. Environmental noise is normally assessed in terms of A-weighted decibels, dB (A), when the 'A weighted' filter in the measuring device elicits a response which provides a good correlation with the human ear. The criteria for environmental noise control are of annoyance or nuisance rather than damage. In general, a noise level is liable to provoke a complaint whenever its level exceeds by a certain margin, the pre-existing noise level or when it attains an absolute level. A change in noise level of 3 dB (A) is 'barely perceptible', while an increase in noise level of 10 dB (A) is perceived as a twofold increase in loudness. A noise level in excess of 85 dB (A) gives a significant risk of hearing damage. Construction and industrial noise sources are normally assessed and expressed using equivalent continuous levels, $L_{Aeq}$[1]. Wind turbine source noise is generally expressed in $L_{eq}$ dBA and in sound power levels (LWA dB). Sound power level is a measure of the noise source while sound pressure level is a measurement taken at a distance from the noise source carried out with a noise meter.

Operational wind turbine noise is assessed using the $L_{A90}$[2] descriptor, which allows reliable measurements to be made without corruption from relatively loud transitory noise events from other sources. The $L_{A90}$ should be used for assessing both the wind energy development noise and background noise as stated in the 2006 and 2019 (draft) Irish Wind Energy Development

---

[1] *$L_{Aeq}$ is defined as being the A-weighted equivalent continuous steady sound level that has the same sound energy as the real fluctuating sound during the sample period and effectively represents a type of average value.*

[2] *$L_{A90}$, or $L_{90dBA}$ is defined as the noise level equalled or exceeded for 90% of the measurement interval and with wind farm noise the interval used is 10 minutes.*

Guidelines. As discussed in ETSU-R-97[3] the $L_{A90}$ is 1.5-2.5dBA less than the $L_{Aeq}$ measured over the same period. In this assessment, the difference between $L_{Aeq}$ and $L_{A90}$ is given as 2dBA which is best practice and the value most commonly applied in wind farm assessments in Ireland. Wind turbine noise levels are given as sound power levels (LWA) dB at integer wind speeds up to maximum LWA levels. Table 11-1 gives a comparison of noise levels in our everyday environment.

*Table 11-1 Comparison of sound pressure level in our Environment*[4]

| Source/Activity | Indicative noise level dB(A) |
|---|---|
| Threshold of hearing | 0 |
| Rural night-time background | 20-50 |
| Quiet bedroom | 35 |
| Wind farm at 350m | 35-45 |
| Busy road at 5 km | 35-45 |
| Car at 65km/hr at 100m | 55 |
| Busy general office | 60 |
| Conversation | 60 |
| Truck at 50km/hr at 100m | 65 |
| Inside a typical shopping centre | 70-75 |
| Inside a modern car at around 90km/hr | 75-80 |
| Passenger cabin of jet aircraft | 85 |
| City Traffic | 90 |
| Pneumatic drill at 7m | 95 |
| Jet aircraft at 250m | 105 |
| Threshold of pain | 140 |

## 11.3.3 Legislation and Guidance

The noise assessment has taken into consideration the guidance contained in the following documents:

- Wind Energy Development Guidelines[5] (DoEHLG 2006 Guidelines)
- Local Council and An Bord Pleanála Decisions on Noise Limits

[3] *ETSU-R-97, The Assessment & Rating of Noise from Wind Farms, June 1996*
[4] *Fact sheet published by the Australian Government (Greenhouse Office) and the Australian Wind Energy Association*
[5] *Department of Environment, Heritage and Local Government: Wind Energy Development Guidelines, Guidelines for Planning Authorities 2006 Energy*

- WHO 2018 Environmental Noise Guidelines for European Region (WHO 2018)
- Draft Revised Wind Energy Development Guidelines December 2019 (Draft DoEHLG 2019 Guidelines)
- A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise including Supplementary Guidance Note 4: Wind Shear'[6] (the Institute of Acoustic Good Practice Guide)(IOA GPG)
- ISO 1996[7] Acoustics-Description and Measurement of Environmental Noise - Part 1: Basic Quantities and Procedures (ISO 1996)
- ETSU-R-97[8]: The Assessment & Rating of Noise from Wind Farms (ETSU-R-97)
- Institute of Acoustics Amplitude Modulation Working Group[9], WSP Turbine AM Review[10] and IEC 61400[11]
- National Roads Authority (NRA) Guidelines for the Treatment of Noise and Vibration in National Road Schemes, 2004

### 11.3.4 Wind Energy Development Guidelines 2006

The following are a number of key extracts from the DoEHLG 2006 Guidelines in relation to noise impact:

General Noise Impact

*"Noise impact should be assessed by reference to the nature and character of noise sensitive locations."*

*"Separate noise limits should apply for day-time and for night-time"*

*"Noise limits should be applied to external locations and should reflect the variation in both turbine source noise and background noise with wind speed."*

Measurement Units

*"The descriptor [LA90 10min] which allows reliable measurements to be made without corruption from relatively loud transitory noise events from other sources, should be used for assessing both wind energy development noise and background noise."*

Specific Noise Limits

*"Noise limits should be applied to external locations and should reflect the variation in both turbine source noise and background noise with wind speed."*

*"In general, a lower fixed limit of 45 dB(A) or a maximum increase of 5 dB(A) above background noise at nearby noise sensitive locations is considered appropriate to provide protection to wind energy development neighbours.*

*However, in very quiet areas, the use of the margin of 5 dB(A) above the background noise at nearby noise sensitive properties is not necessary to offer a reasonable degree of protection and may unduly restrict wind energy developments. Instead in low noise*

---

[6] *Institute of Acoustics (2013) A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise*
[7] *ISO 1996/1- Acoustics-Description and Measurement of Environmental Noise - Part 1: Basic Quantities and Procedures*
[8] *ETSU-R-97: Acoustics-The Assessment & Rating of Noise from Wind Farms: ETSU for the DTI, UK, 1996*
[9] *IOA Noise Working Group (Wind Turbine Noise) Amplitude Modulation Working Group, Final Report, A Method for Rating Amplitude Modulation in Wind Turbine Noise, August 2016*
[10] *Wind Turbine AM Review, Phase 2 Report, Department of Energy & Climate Change, WSP/Parsons Brinckerhoff, August 2016*
[11] *IEC Technical Specification 61400-11-2 Wind energy generation systems – Part 11-2: Acoustic noise measurement techniques – Measurement of wind turbine sound characteristics in receptor position, 2024*

*environments where background noise is less than 30 dB(A), it is recommended that the daytime level of LA90,10min of the wind energy development noise should be limited to an absolute level within the range 35-40 dB(A)".*

*"During the night the protection of external amenity becomes less important and the emphasis should be on preventing sleep disturbance. A fixed limit of 43 dB(A) will protect sleep inside properties during the night"*

**The DoEHLG 2006 Guidelines do not specify daytime or night-time hours. However, it is considered good practice to follow the framework given in ETSU-R-97 and IOA Good Practice Guide where daytime and night-time hours are specified. The limits are based on the prevailing background noise level for 'quiet daytime' periods, defined in ETSU-R-97 as:**

- Quiet waking hours or quiet day-time periods are defined as:
  - All evenings from 18:00 to 23:00 hrs
  - Saturday afternoon from 13:00 to 18.00 hrs and all-day Sunday 07:00 to 18:00 hrs
- Night-time is defined as 23:00 to 07:00 hrs

### 11.3.5 Night-time noise limits

It is noted that the vague wording of DoEHLG 2006 Guidelines as currently drafted can be interpretated as either a fixed limit of 43 dB(A) for night-time hours or a fixed/relative limit of 43dB(A) or background +5dB(A), whichever is the higher. In those localities where the existing background noise level is already above 43 dB(A) (most localities exceed 43 dB(A) at higher wind speeds), it would be unduly restrictive on wind farm development and achievement of Ireland's renewable energy targets to maintain a fixed limit of 43 dB(A) across all wind speeds.

The IOA Good Practice Guide, ETSU-R-97 and the Draft DoEHLG 2019 Guidelines advocate a night-time relative limit of background noise levels +5dB(A), including a lower fixed limit of 43 dB(A). As stated in ETSU-R-97, *"On balance it is considered that a margin of 5dB(A) will offer a reasonable degree of protection to both the internal and external environment without unduly restricting the development of wind energy which itself has other environmental benefits."*

Technical Appendix 11-1 includes numerous examples of previous Local Council and An Bord Pleanála Decisions where it was accepted that night-time noise limits follow background noise levels +5dB(A), with a lower fixed limit of 43 dB $L_{A90}$. It is advocated that a similar approach is accepted at Castledockrell Wind Farm.

### 11.3.6 Planning Permission - Noise Conditions

The original 11-turbine Castledockrell Wind Farm (i.e. the Proposed Development) was granted planning permission by Wexford County Council on 16th March 2005 (Planning Permission 20044702), which was subsequently appealed to An Bord Pleanála and permitted in 2005 under Planning Reference PL26.211725. The ABP decision does not include any planning conditions with respect to noise limits and thus the Proposed Development is not currently bound to any noise limits. The additional 12th turbine was permitted under Planning Permission 20080335) as granted by Wexford County Council on 2nd April 2008.

Whilst the Proposed Development is not currently bound to any noise limits, it is noted that Wexford County Council recommended noise limits in the form of Condition 8.

Condition 8 of planning permission 20044702 states,

> *'Maximum noise levels at the nearest noise sensitive properties shall be:*
>
> *a) 40dB(A) $L_{Aeq}$, at a wind speed of 5 metres per second at hub height of nearest machine*
>
> *b) 45dB(A) $L_{Aeq}$, at a wind speed of 8 metres per second at hub height of nearest machine;*
>
> *In the event that the review/monitoring of the development shows that any turbine may be having detrimental noise impact, mitigating measures shall be proposed and submitted for the agreement of the Planning Authority.*
>
> *REASON:*
>
> *In the interests of residential amenity and the proper planning and sustainable development of the area.'*

It should be noted that the current consensus in measuring wind energy noise levels is $L_{A90}$ as opposed to $L_{Aeq}$.

ETSU-R-97 page 58 states, *"...the Noise Working Group is agreed that the $L_{A90}$ descriptor should be used for both the background noise and the wind farm noise and that when setting limits it should be borne in mind that the $L_{A90}$ of the wind farm is likely to be about 1.5 – 2.5dB(A) less than the $L_{Aeq}$ measured over the same period."*

The IOA Good Practice Guide furthers the above by stating in paragraph 4.2.5, *"The source sound power levels determined according to IEC 61400-11 are provided in terms of $L_{Aeq}$. To obtain the $L_{A90}$ parameter required by ETSU-R-97, it is necessary to apply a correction to the prediction results. Based on the experience of the IOA-NWG and recent research, the assumption described in ETSU-R-97 in this regard continues to remain valid. A correction of -2 dB is commonly applied."*

Thus applying a 2dB conversion factor between the two measurement parameters (i.e. $L_{A90} = L_{Aeq}$-2dB), the recommended Condition 8 noise limits when converted to $L_{A90}$ equate to:

> *"a) 38dB(A) $L_{A90}$, at a wind speed of 5 metres per second at hub height of nearest machine*
>
> *b) 43dB(A) $L_{A90}$, at a wind speed of 8 metres per second at hub height of nearest machine;"*

### 11.3.7 World Health Organisation Guidelines (WHO) 2018

The most recent WHO 2018 Guidelines: 'Environmental Noise Guidelines for the European Region' gives a recommendation limit of 45 dB $L_{den}$ which is based on low quality evidence. This is an annual average noise level, based on wind speed and direction in the vicinity of the site with no specific limits for night. The WHO advises that the 45 dB $L_{den}$ recommendation is 'conditional' i.e. the recommendation is made only to inform national policy, and 'requires a policy-making process with substantial debate and involvement of various stakeholders'. The 45 dB $L_{den}$ criterion does not directly apply to wind farm noise limits or impact assessment.