9. CLIMATE

9.1 Introduction

MKO prepared the Climate chapter of this Environmental Impact Assessment Report (EIAR) for the Proposed Development at Roadstone Ballyquin Quarry, Ballyquin, Co. Clare.

This chapter identifies, describes and assesses the potential significant direct and indirect effects on climate arising from the construction, operational and decommissioning phases of the Proposed Development.

The objective of this assessment is to assess the potential effects that the Proposed Development may have on Climate and sets out proposed mitigation measures to avoid, reduce or offset any potential significant effects that are identified. This EIAR comprehensively assesses the susceptibility of the Proposed Development to climate change across EIAR Chapters 4 through 14, outlining specific measures in each chapter to enhance the Proposed Development's ability to withstand potential impacts, including those from climate change. Chapter 4, Section 4.3.1 identifies the vulnerability of the project to natural disasters and major accidents.

9.1.1 Background

The Proposed Development site is located approximately 8 kilometres southwest of the town of Killaloe and 1.5 kilometres to the northwest of the village of Bridgetown and is accessed from an existing entrance on the R466 Regional Road. Current land-use on the subject site comprises quarrying and ancillary activities. Land-use in the wider landscape comprises agriculture, forestry, quarrying and one-off housing.

9.1.2 Relevant Guidance

The climate chapter of this EIAR is carried out in accordance with the 'EIA Directive' as amended by Directive 2014/52/EU and has been prepared in accordance with guidance listed in Section 1.7.2 of Chapter 1: Introduction. Due to the nature of the Proposed Development, the following methodology and guidance was utilised for the climate section of this EIAR:

- 'Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment' (2013) European Commission.
- Transport Infrastructure Ireland Carbon Tool for Road and Light Rail Projects: User Guidance Document, GE-ENV-01106 (TII 2022b).
- Transport Infrastructure Ireland (TII) Carbon Assessment Tool (Version 0.7.6) (TII, 2020).

Consideration has also been given to the *'Air Quality Assessment of Proposed National Roads – Standard PE-ENV-01107'* (Transport Infrastructure Ireland, December 2022a), *'Climate Assessment of Proposed National Roads – Standard (PE-ENV-01105)'* and *'Overarching Technical Documentation (PE-ENV-01104)'* (Transport Infrastructure Ireland December 2022c/d).

9.1.3 Scoping and Consultation

The scope for this chapter of the EIAR has also been informed by consultation with statutory consultees, bodies with environmental responsibility and other interested parties. This consultation process and the List of Consultees is outlined in Section 2.5 of this EIAR. Matters raised by Consultees in their responses with respect to climate are summarised in Table 9-1 below.

Table 9-1 Summary of Climate Related Scoping Responses

Consultee	Description	Addressed in Section
Transport Infrastructure Ireland (TII)	› The developer, in preparing the EIAR, should have regard to TII's Environmental Assessment and Construction Guidelines, including the Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (National Roads Authority, 2006).	9.1.2 Due to the interrelationship between air quality and climate, consideration has also been given to Chapter 8 of this EIAR: Air Quality.

9.2 Statement of Authority

This section of the EIAR has been prepared by Catherine Johnson and reviewed by Ellen Costello, both of MKO. Catherine is an Environmental Scientist and Climate Practitioner at MKO with over two years of consultancy experience in climate and sustainability. Prior to joining MKO in 2022, Catherine worked as an Environmental Social Governance (ESG) analyst for Acasta in Edinburgh. Catherine has expertise in international climate law and policy, earth science, and sustainability/ESG processes. Catherine has a BSc in Earth and Ocean Science and an LLM in Global Environment and Climate Change Law. Ellen is a Senior Environmental Scientist and Climate Practitioner with over four years of consultancy experience with MKO and has been involved in a range of projects including climate and sustainability context reports for masterplans and commercial developments, renewable energy infrastructure projects, and the compilation of numerous chapters including the preparation of climate assessments for Environmental Impact Assessment Reports. Ellen holds a BSc. in Earth Science and a MSc. in Climate Change: Integrated Environmental and Social Science Aspects where she focused her studies on climate adaptation and mitigation, and its implications on environment and society.

9.3 Climate Change and Greenhouse Gases

Although variation in climate is thought to be a natural process, the rate at which the climate is changing has been accelerated rapidly by human activities. Climate change is one of the most challenging global issues facing the world today and is primarily the result of increased levels of greenhouse gases in the atmosphere. Increasing human emissions of carbon dioxide and other greenhouse gases cause a positive radiative imbalance at the top of the atmosphere, meaning energy is being trapped within the climate system. The imbalance leads to an accumulation of energy in the Earth system in the form of heat that is driving global warming.[1,2] Greenhouse gases come primarily from the combustion of fossil fuels in energy use.

In March 2023 the European Environment Agency (EEA) published the European Climate Risk Assessment.[3] This assessment states that Europe is the fastest warming continent on the planet and is warming at about the twice the global rate. The average global temperature in the 12-month period between February 2023 and January 2024 exceeding pre-industrial levels by 1.5°C. 2023 was the warmest year on record over more than 100,000 years globally, at 1.48°C above pre-industrial levels, with the world's ocean temperature also reaching new heights.

[1] *Hansen, J.; Sato, M.; Kharecha, P. et al. Earth's Energy Imbalance and Implications. Atmospheric Chemistry and Physics 2011, 11 (24), 13421–13449. https://doi.org/10.5194/acp-11-13421-2011*
[2] *von Schuckmann, K.; Palmer, M. D.; Trenberth, K. E. et al. An Imperative to Monitor Earth's Energy Imbalance. Nature Clim Change 2016, 6 (2), 138–144. https://doi.org/10.1038/nclimate2876.*
[3] *European Environment Agency (2023) European Climate Risk Assessment <https://climate-adapt.eea.europa.eu/en/eu-adaptation-policy/key-eu-actions/climate_risk_assessment/index_html/>*

The Intergovernmental Panel on Climate Change (IPCC), in their AR6 Synthesis Report: Climate Change 2023[4], state that widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred. This has led to widespread adverse impacts and related losses and damages to people and nature due to the pressures of climate change and the inability to adapt to a rapidly changing environment. Moving away from our reliance on coal, oil and other fossil fuel-driven power plants is essential to reduce emissions of greenhouse gases and combat climate change.

9.3.1 International Greenhouse Gas Emission and Climate Targets

Globally, governance relating to climate change has changed significantly since 1994 when the United Nations Framework Convention on Climate Change (UNFCCC) entered into force. Greenhouse gas emissions have been a primary focus of climate related international agreements for almost two decades.

International greenhouse gas emission and climate targets play an important role in stimulating and enabling action for developed and developing nations. The following sections provide an overview of the international agreements that have played key roles in establishing climate governance.

9.3.1.1 Kyoto Protocol

The Kyoto Protocol was adopted on 11th December 1997; this Protocol operationalised the UNFCCC and was the first international agreement that committed countries to reduce their greenhouse gas emissions. It set limitations and reduction targets for greenhouse gases for developed countries (Annex I countries) and set a special obligation for certain countries to provide financial resources and facilitate technology transfer to developing countries (Annex II countries). The EU, and therefore Ireland, was both an Annex I and Annex II country.

The Kyoto Protocol came into effect in 2005, as a result of which, emission reduction targets agreed by developed countries, including Ireland, became binding for the first time.

Under the Kyoto Protocol, the EU agreed to achieve a significant reduction in total greenhouse gas emissions in the period 2008 to 2012. These EU emission targets are legally binding in Ireland. Ireland's contribution to the EU commitment for the period 2008 – 2012 (the first commitment period) was to limit its greenhouse gas emissions to no more than 13% above 1990 levels. Ireland achieved its Kyoto Protocol targets under the EU burden-sharing agreement.

9.3.1.1.1 *Doha Amendment to the Kyoto Protocol*

In Doha, Qatar, on 8th December 2012, the "Doha Amendment to the Kyoto Protocol" was adopted. The amendment includes:

- New commitments for Annex I Parties to the Kyoto Protocol who agreed to take on commitments in a second commitment period starting in 2013 and lasting until 2020.
  - The amendment entered into force on 31st December 2020
- A revised list of greenhouse gases to be reported on by Parties in the second commitment period; and
- Amendments to several articles of the Kyoto Protocol which specifically referenced issues pertaining to the first commitment period and which needed to be updated for the second commitment period.

[4] *IPCC AR6 Synthesis Report: Climate Change 2023.* https://www.ipcc.ch/report/sixth-assessment-report-cycle/

During the first commitment period, 37 industrialised countries and the European Community committed to reduce greenhouse gas emissions to an average of 5% below 1990 levels. During the second commitment period, Parties committed to reduce greenhouse gas emissions by at least 18% below 1990 levels in the eight-year period from 2013 to 2020. The composition of Parties in the second commitment period is different from the first; however, Ireland and the EU signed up to both the first and second commitment periods. Under the protocol, countries must meet their targets primarily through national measures, although market-based mechanisms (such as international emissions trading) can also be utilised.

Although the 1997 Kyoto Protocol and 2012 Doha Amendment were in force in 2020, the 2015 Paris Agreement superseded the Kyoto Protocol as the principle regulatory instrument governing the global response to climate change.

9.3.1.2 Conference of the Parties

Every year since 1995, the Conference of the Parties (COP) has gathered the 196 Parties (195 countries and the European Union) that have ratified the Convention in a different country, to evaluate its implementation and negotiate new commitments, and is the supreme decision-making body of the UNFCCC.

The following details the most significant COPs in terms of impact on climate action as well as a summary of the most recent COP, COP28, which took place in Dubai.

9.3.1.2.1 *COP21 Paris Agreement*

COP21 was the 21st session of the COP to the UNFCCC. COP21 was organised by the United Nations in Paris and held from 30th November to 12th December 2015.

COP21 closed on 12th December 2015 with the adoption of the first international climate agreement (concluded by 195 countries and applicable to all). The twelve-page text, made up of a preamble and 29 articles, provides for a limitation of the temperature rise to below 2°C above pre-industrial levels and even to tend towards 1.5°C. It is flexible and takes into account the needs and capacities of each country. It is balanced as regards adaptation and mitigation, and durable, with a periodical ratcheting-up of ambitions.

9.3.1.2.2 *COP25 Climate Change Conference – Madrid*

The 25th United Nations Climate Change conference, COP25, was held in Madrid and ran from December 2nd to December 13th, 2019. While largely regarded as an unsuccessful conference, the European Union launched its most ambitious plan, 'The European Green Deal' which aims to lower CO_2 emissions to zero by 2050. The deal includes proposals to reduce emissions from the transport, agriculture and energy sectors and will affect the technology chemicals, textiles, cement, and steel industries. Measures such as fines and pay-outs by member states who rely on coal power will be in place to encourage the switch to renewable clean energies such as wind. On the 4th of March 2020, the European Commission put forward the proposal for a European climate law. This aims to establish the framework for achieving EU climate neutrality. It aims to provide a direction by setting a pathway to climate neutrality and to this end, aims to set in legislation the EU's 2050 climate-neutrality objective.

9.3.1.2.3 *COP28 Climate Change Conference – Dubai*

The 28th COP for the UNFCCC (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 United Arab Emirates (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.

9.3.1.3 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 the 28th of June 2024, the United Nations published '*The Sustainable Development Goals Report 2024*'[5] (hereafter referred to as the UN SDG 2024 Report) highlighting how the lasting impacts of the COVID-19 pandemic, the war in Ukraine, ongoing and escalating geopolitical conflicts, and the increasing consequences of the climate crisis have hindered the achievement of the SDGs. The UN SDG 2024 Report finds that, following an assessment of all 169 targets, for which trend data is available, only 17% of the SDG targets are on track, 48% of SDG targets are showing minimum or moderate progress, 18% having stalled in progress and 17% having regressed from 2023. The UN SDG 2024 Report highlights the urgent need for stronger and more effective international cooperation to maximize progress, with immediate effect.

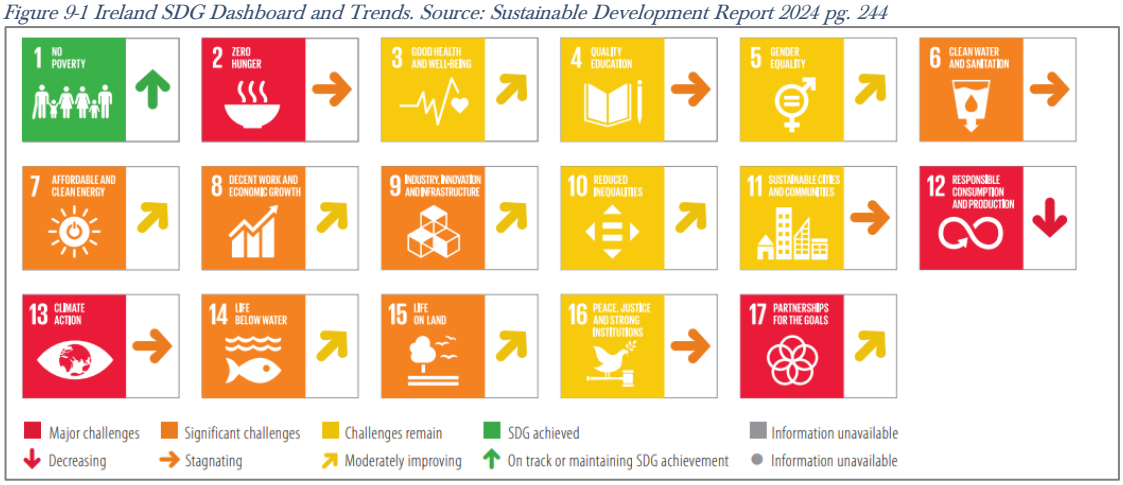
On the 17th of June 2024 the Dublin University Press published the *'Sustainable Development Report 2024'*.[6] The report highlights five key findings:

- On average, only 16% of the SDG targets are on track to be met globally by 2030, with the remaining 84% showing limited progress or a reversal of progress.
  - At the global level, SDG progress has been stagnant since 2020.
- The pace of SDG progress varies significantly across country groups.
  - As in previous years, European countries – notably the Nordic countries – top the 2024 SDG Index.

[5] *The Sustainable Development Goals Report (2024). Available at: https://unstats.un.org/sdgs/report/2024/*
[6] *Dublin University Press (2024) Sustainable Development Report 2024 The SDGs and the UN Summit of the Future Includes the SDG Index and Dashboards. <https://s3.amazonaws.com/sustainabledevelopment.report/2024/sustainable-development-report-2024.pdf>*

- Sustainable development remains a long-term investment challenge. Reforming global financial architecture is more urgent than ever. The world requires many essential public goods that far transcend the nation-state.
- Global challenges require global cooperation.
    - The report's new Index of support to UN-based multilateralism ranks countries based on their engagement with the UN system – including treaty ratification, votes at the UN General Assembly, membership in UN organisations, participation in conflicts and militarisation, use of unilateral sanctions, and financial contributions to the United Nations.
        - Ireland is ranked 28/167 with an overall country score of 78.7/100 (this is higher than the regional average 77.2); please see Figure 9-1 below for a detailed breakdown of Irelands SDG trends for each goal.
- The SDG targets related to food and land systems are particularly off-track.
    - Greenhouse gas emissions from agriculture, forestry, and other land use account for almost a quarter of total annual global GHG emissions.
    - The Food, Agriculture, Biodiversity, Land-Use, and Energy (FABLE) Consortium determined a "global sustainability" pathway which would avoid up to 100 million hectares of deforestation by 2030 and 100 gigatons of CO_2 emissions by 2050. Additional measures would be needed to avoid trade-offs with on-

Figure 9-1 Ireland SDG Dashboard and Trends. Source: Sustainable Development Report 2024 pg. 244



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 processes published the Sustainable Development Goals National Implementation Plan 2022-2024 ('the SDG Plan').[7] The SDG Plan identifies that, overall, the world is not on track to achieve the global Goals by 2030. The SDG Plan sets out how Ireland will work to achieve the goals and targets of the Agenda for Sustainable Development both domestically and internationally. Irelands first National Implementation Plan provided a framework for Ireland to work towards the implementation of the SDGs; the SDG Plan aims to build on the structures and mechanisms from the first National Implementation 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

[7] *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/>

on transformative and accelerated actions. The Global Sustainable Development Report 2023[8] was published in September 2023. The previous Global Sustainable Development Report (2019[9]) 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[10] 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 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 2 and 5 by continuing the facilitation of local employment and locally sourced materials in the wider area of the Proposed Development. As the intrinsic value of this natural resource is often low, it is essential that quarries can be located where the resource, and reserves are found, as well as been close to the markets they serve. Ballyquin Quarry supplies sand and gravel to the local and regional markets, keeping the cost of those materials competitive for the end users given the location of the quarry and proximity to the markets and outlets for the product. Furthermore, the infilling and restoration works proposed will enhance the overall environmental quality of the land; this will foster ecosystem recovery as a means to increase resilience and conserve biodiversity, while also benefiting society, the environment and the economy.

Relevant SDGs to the Proposed Development and how they are implemented into Irish National plans and policies can be found in Table 9-2.

[8] *Global Sustainable Development Report 2023* <https://sdgs.un.org/sites/default/files/2023-09/FINAL%20GSDR%202023-Digital%20-110923_1.pdf>
[9] *Global Sustainable Development Report 2019* <https://sdgs.un.org/sites/default/files/2020-07/24797GSDR_report_2019.pdf>
[10] *The Sustainable Development Goals Report 2023: Special Edition* <https://unstats.un.org/sdgs/report/2023/The-Sustainable-Development-Goals-Report-2023.pdf>

Table 9-2 Sustainable Development Goals Report 2023, Relevant SDGs to the Proposed Development, and Implementation into Irish National Plans

SDG	Targets	International Progress/Downfalls to Date (2024)[11]	National Relevant Policy
SDG 8: Decent Work and Economic Growth *Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all*	› Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 per cent gross domestic product growth per annum in the least developed countries. › Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high value added and labour-intensive sectors. › Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-Year Framework of Programmes on Sustainable Consumption and Production, with developed countries taking the lead	Progress towards SDG 8 faces challenges from COVID-19 aftermath, trade tensions, rising debts in developing nations, conflicts, and geopolitical strains, collectively threatening global economic growth. While labour markets have shown resilience, uneven pandemic recovery, the declining protection of labour rights and emerging vulnerabilities erode social justice prospects. The report foresees a worsening labour market outlook, with higher unemployment and sluggish growth in 2024, exacerbating income inequality and jeopardizing equitable pay for women and decent work for young people. Achieving SDG 8 mandates policies fostering economic growth with a focus on social justice and inclusive employment. After a sharp 3.9% decline in 2020 due to the COVID-19 pandemic, the global economy rebounded with a 5.3% increase in real GDP per capita in 2021. However, growth slowed to 2.2% in 2022 and is forecasted to slow down further to 1.0% in 2023, before picking up slightly to 1.8% and 1.5% in 2024 and 2025, respectively. For LDCs, real GDP growth dropped from 5.1% in 2019 to 0.7% in 2020, then recovered to 3.8% in 2021 and 4.6% in 2022. Growth is expected to rise to 4.4% and 5.5% in 2023 and 2024. However, it's projected to slow down to 4.9% in 2025. Productivity growth stagnated in 2022 and 2023, remaining below 0.5%. This sluggish trend stands in stark contrast to the pre-pandemic period of 2015 to 2019, where the rate exceeded 1.5%. The pandemic sharply interrupted this trend, with 2020 registering a marked decline as output fell faster than employment—though this was fully offset by a short-lived rebound of productivity during 2021. The recent slow productivity growth poses a risk to	*Annual National Budgets;* *A Better World;* *National Economic Recovery Plan;* *National Social Enterprise Policy for Ireland 2019-2022;* *Food Vision 2030* *National Implementation Plan on Persistent Organic Pollutants;* *Waste Action Plan for a Circular Economy;* *National Waste Prevention Programme;* *Climate Action Plan 2024*

[11] *United Nations, the 17 Goals – Sustainable Development* <https://sdgs.un.org/goals>

SDG	Targets	International Progress/Downfalls to Date (2024)[11]	National Relevant Policy
		economic development and living standards, given its crucial role as a driver of growth.	
SDG 9: Industry, Innovation, and Infrastructure *Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation*	› 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. › Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries. › 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	In 2022, global electricity access declined for the first time in a decade, primarily due to disruptions from COVID-19 and the Ukraine conflict. Despite improvements in energy intensity and renewable energy growth, international financial flows for clean energy in developing countries remain insufficient. At the current rate, 660 million people will still lack electricity and 1.8 billion will not have access to clean cooking by 2030. To achieve universal access to energy by 2030, we need to expedite electrification efforts, boost investments in renewable energy, enhance energy efficiency, and establish supportive policies and regulatory frameworks. In 2021 the global share of renewable sources in total final energy consumption stood at 18.7%. Excluding traditional use of biomass, the share of modern renewable sources rose gradually from 10% in 2015 to 12.5% in 2021. The electricity sector led the charge with renewables, contributing 28.2% to total final electricity consumption. However, insufficient progress in the heat and transport sectors underscores the need for stronger conservation measures and policy actions. Tripling world's installed renewable energy generation agreed at the COP28 is an important step aligning with the SDG7. Installed renewable energy capacity is on the rise worldwide, reaching 424 watts per person globally in 2022. Developed nations averaged 1,073 watts per person, while developing countries averaged 293 watts per person. This represents an 8.5% increase from 2021, maintaining a steady compound annual growth rate of 8.1% over five-year periods.	*National Development Plan 2021-2030;* *National Economic Recovery Plan;* *Climate Action Plan 2024;* *National Implementation Plan on Persistent Organic Pollutants;* *Waste Action Plan for a Circular Economy;* *National Waste Prevention Programme;* *A Better World*

SDG	Targets	International Progress/Downfalls to Date (2024)[11]	National Relevant Policy
SDG 12 Responsible Consumption and production: *Ensure sustainable consumption and production patterns.*	› By 2030, achieve the sustainable management and efficient use of natural resources. › By 2020, achieve the environmentally sound management of chemicals and all wastes 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. › Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle. › Promote public procurement practices that are sustainable, in accordance with national policies and priorities. › Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products.	Unsustainable patterns of consumption and production are the root cause of the triple planetary crisis: a) *Climate Change* b) *Biodiversity Loss* c) *Pollution* The world is seriously off track in its effort to halve per-capita food waste and losses by 2030. While countries are fulfilling their environmental agreement obligations and embracing comprehensive approaches to address environmental degradation, public funding supporting the production and consumption of fossil fuels has more than tripled since 2015, impeding the transition to net-zero emissions. Each stage of production or manufacturing presents an opportunity to reduce resource and fossil fuel use, foster innovation, conserve energy, cut emissions, and advocate for a circular economy approach. From 2019 to 2023, one-third of member states (63 countries) have reported 516 policy instruments related to sustainable consumption and production. In 2021-2022, 73% of companies included in the sample published sustainability reports, with the number of companies tripling since 2016. This growth was observed in all regions in 2022. Fossil fuel subsidies hit a record high of $1.53 trillion in 2022, reversing the declining trend observed from 2012 to 2020. The post-COVID energy price surge inflated these subsidies, prompting some governments to introduce new support measures. Consequently, public funding for oil, coal, and gas production and consumption more than doubled from 2021 to 2022 and tripled since 2015, impeding progress towards net-zero transition.	*National Implementation Plan on Persistent Organic Pollutants;* *Waste Action Plan for a Circular Economy;* *National Waste Prevention Programme;* *Tourism Action Plan;* *National Clean Air Strategy;* *Towards Responsible Business: Ireland's Second national Plan on Corporate Social Responsibility (CSR) 2017-2020;* *Sustainable, Inclusive and Empowered Communities 2019-2024;* *Climate Action Plan 2024*

SDG	Targets	International Progress/Downfalls to Date (2024)[11]	National Relevant Policy
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, intergovernmental forum for negotiating the global response to climate change.*	› Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries. › Integrate climate change measures into national policies, strategies and planning. › Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	Climate records were shattered in 2023, with the world watching the climate crisis unfold in real time. Communities around the world are suffering the effects of extreme weather, which is destroying lives and livelihoods on a daily basis. The roadmap to limit the rise in global temperature to 1.5°C and avoid the worst of climate chaos cannot afford any delays, indecision or half measures by the global community. It demands immediate action for drastic reductions in global greenhouse gas emissions in this decade and the achievement of net zero by 2050. The number of disaster-related deaths and missing persons per 100,000 population (excluding COVID-19 deaths) has nearly halved from 1.62 in the decade 2005-2014 to 0.82 in 2013-2022. However, the absolute number remains high. Between 2013 and 2022, disasters worldwide claimed 42,553 mortalities each year. Further, the number of persons affected by disasters per 100,000 population has increased by over two-third, from 1,169 in 2005-2014 to 1,980 in 2013-2022. The year 2023 broke every single climate indicator and was the warmest year on record according to the World Meteorological Organization. Global temperatures rose to 1.45°C, dangerously close for the first time to the 1.5°C lower limit of the Paris Agreement on climate change. Despite some reduction in greenhouse gas emissions in developed countries, concentrations of greenhouse gases reached record high observed levels in 2022 and real-time data in 2023 show greenhouse gases continuing to increase. Carbon dioxide levels are 150% above pre-industrial levels. Climate finance, reported by Annex I Parties as support provided to developing countries, has increased at a compound rate of 5% from 2015 to 2020, amounting to $41 billion. Although there are a range of estimates and a lack of an agreed accounting methodology on the $100 billion per year goal, the goal was not yet met as of 2021. However, recent progress made in the	*National Adaptation Framework;* *Building on Recovery: Infrastructure and Capital Investment 2016-2021;* *National Mitigation Plan;* *National Biodiversity Action Plan 2017-2021;* *National Policy Position on Climate Action and Low Carbon Development;* *Project 2040: National Development Plan 2021-2030;* *Climate Action Plan 2024;* *National Dialogue on Climate Action;* *Agriculture, Forest, and Seafood Climate Change sectoral Adaptation Plan;* *The National Strategy on Education for Sustainable Development in Ireland 2014-2020*

SDG	Targets	International Progress/Downfalls to Date (2024)[11]	National Relevant Policy
		provision and mobilization of climate finance amounted to $89.6 billion in 2021.	
SDG15 Life on Land: *Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.*	› Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species › By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts. › By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world › Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species	SDG 15 underscores the critical importance of biodiversity as humanity's life-support system. Yet, the relentless depletion of forests, coupled with an alarming rate of species extinction and stagnation in safeguarding key biodiversity areas, jeopardizes the delicate balance of our ecosystems. To address the pressing global environmental challenges and crises, including climate change, biodiversity loss, and pollution, as well as desertification, land and soil degradation, drought and deforestation, it is imperative to intensify efforts in fulfilling our global environmental and biodiversity commitments. Species extinction risk continues to worsen, as evidenced by a 12% deterioration in the aggregate Red List Index between 2024 and 1993 (and 4% since 2015). The extinction risk of the world's amphibian species was recently comprehensively re-assessed, revealing that for amphibians, climate change impacts, habitat conversion and alien invasive fungal disease are the most severe drivers of increasing extinction risk. In 2023, 90 countries implemented the international statistical standard to measure the environment and ecosystems and their connection to the economy, an increase of 30% since 2017.	*Climate Action Plan 2024* *Enhanced Decommissioning, Rehabilitation and Restoration Scheme (2020)* *National Biodiversity Action Plan*

9.3.1.4 Climate Change Performance Index 2024

Established in 2005, the Climate Change Performance Index (CCPI)[12] 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 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.

Ireland has moved to the 'low' category in 2024 from the 'very low' category in 2023 on the Greenhouse Gas Emissions ratings despite falling to 54th in the world in 2024 from 47th in 2023.

9.3.1.5 Corporate Sustainability Reporting Directive

On the 5th of January 2023, the Corporate Sustainability Reporting Directive (CSRD)[13] entered into force. This new directive modernises and strengthens the rules concerning the social and environmental information that companies have to publicly report. The CSRD serves as a major update to the Non-Financial Reporting Directive and will place environmental social governance (ESG) considerations at the forefront of European company reporting. The new rules will ensure that investors and other stakeholders have access to the information they need to assess the impact of companies on people and the environment and for investors to assess financial risks and opportunities arising from climate change and other sustainability issues. The new rules proposed in the Directive will increase the number of companies required to report from 12,000 to over 50,000 and will be implemented in phases for different financial sectors to allow for adequate prep time. The timelines for implementation are:

- 1 January 2024 for reporting year 2025 for public interest entities in scope of EU non-financial reporting rules (greater than 500 employees).
- 1 January 2025 for reporting year 2026 for other larger companies and public interest entities (greater than 250 employees).
- 1 January 2026 for reporting year 2027 for listed SMEs, with an 'opt out' possible until 2028.

The CSRD requires its disclosures be made in accordance with the European Financial Reporting Advisory Group (EFRAG) new standards, the European Sustainability Reporting Standards (ESRS). The ESRS were adopted on July 31st, 2023, with the period for possible objections ending in October 2023. The ESRS were fully integrated into the European legal framework and published in the Official Journal of the European Union on December 22nd, 2023.

[12] *Climate Change Performance Index 2024* <https://ccpi.org/>
[13] *European Commission (2023) Corporate Sustainability Reporting Directive* <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022L2464>

9.3.1.6 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*'.[14] 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.

Changes to the physical climate, measured in the State of Global Climate report by key indicators, has had cascading effects on national development across the globe and has hindered progress towards achievement of the SDGs (Section 9.2.1.3 above). Climate science has a critical role to play in facilitating sustainable development. Recognizing the interconnections between climate and development can therefore lead to synergistic action—an increasing necessity as the world gets further off-track from achieving both the SDGs and the Paris Agreement goals.

Alterations in the physical climate can trigger a series of repercussions on national advancement and the pursuit of SDGs. 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 4 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.

9.3.2 National Greenhouse Gas Emission and Climate Targets

9.3.2.1 Programme for Government

The Programme for Government – Our Shared Future ("Programme for Government")[15] was published in October 2020 and last updated July 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".*

9.3.2.2 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 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 these annual targets.

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[14] *WMO (2024) State of the Global Climate 2023* <https://library.wmo.int/records/item/68835-state-of-the-global-climate-2023>
[15] *Programme for Government – Our Shared Future.* <https://assets.gov.ie/130911/fe93e24e-dfe0-40ff-9934-def2b44b7b52.pdf>

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, the 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 (CCAC) should equate to a total reduction of 51% emissions over the period to 2030, in line with the Programme for Government commitment.

On a local level, the Climate Action and Low Carbon Development (Amendment) Act 2021 requires each local authority in Ireland to prepare a Local Area Climate Action Plan for its respective administrative areas. Please see Section 9.3.3.1 below for details on the Clare Local Authority Climate Action Plan.

9.3.2.3 Climate Change Advisory Council 2023

The 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.

In July 2023, the CCAC published the *'Annual Review 2023'*[16], this 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.'

In 2024 the CCAC has changed it approach to produce sector specific annual reviews in order to emphasise the requirement for greater effort across all sectors to remain within their sectoral emission ceiling. In a statement released on 9th July 2024 the CCAC state that while '*the provisional greenhouse gas emissions data published today by the EPA shows some positive results across the sectors but overall, it is increasingly unlikely that the first carbon budget will be achieved. Much more urgent action is required from Government if Ireland is to achieve its climate change objectives.*'[17]

The Annual Review 2024: Industry and Waste[18] report has been released by the CCAC and focuses specifically on key findings and recommendations for the Industry and Waste sector. Detail on the Industry sectors carbon budget is provided in Section 9.3.2.4 and 9.3.2.5 below.

[16] *Climate Change Advisory Council 2023 Review* <https://www.climatecouncil.ie/councilpublications/annualreviewandreport/CCAC-AR-2023-FINAL%20Compressed%20web.pdf>
[17] https://www.climatecouncil.ie/news/chairs-statement-irelands-provisional-greenhouse-gas-emissions-1990-2023.html
[18] *Climate Change Advisory Council (2024) Annual Report 2024: Industry and Waste* <https://www.climatecouncil.ie/councilpublications/annualreviewandreport/AR2024-IndustryWaste-FINAL.pdf>

Decarbonisation of construction materials will have a large impact on emissions from the sector, with cement plants comprising four of the top five industrial emitters in Ireland reporting to the EU ETS. The CCAC has made recommendations for the Government to promote sustainable construction, which include:

- Developing a strategy to increase the use of timber in construction and introducing whole-life carbon assessments and associated targets in the planning process for public buildings,
- Agreeing targets and implementing measures to reduce emissions in cement production processes,
- Reducing cement demand by providing financial incentives to encourage retrofitting of existing buildings instead of demolition and rebuilding.

9.3.2.4 Carbon Budgets

The first national carbon budget programme proposed by the CCAC, 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 9-3.

Table 9-3 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_2eq)	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_2eq reducing to 33.5 Mt CO_2eq 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 budget first two years. Thus, only 53% is leftover, requiring a 12.4% reduction in emissions each year to stay in budget.

9.3.2.5 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 9-4 below.

Table 9-4 Sectoral Emission Ceilings 2022

	Sectoral Emission Ceilings for each 5-year carbon budget period ($MtCO_2eq.$)	
Sector	**2021 – 2025 Carbon Budget 1**	**2026 – 2030 Carbon Budget 2**
Electricity	40	20
Transport	54	37
Built Environment-Residential	29	23
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.

Quarry activities fall into the 'Industry' sector when discussing emissions associated with quarry related activities in the context of the sectoral emission ceilings. The 'Industry' sector, as defined in the sectoral emission ceilings, accounts for emissions from both manufacturing and combustion along with industrial processes and has been set an emission ceiling of $30MtCO_2eq$ for the first carbon budget period (2021–2025) and $24MtCO_2eq$ for the second carbon budget period (2026–2030).

The Annual Review 2024: Industry and Waste report, detailed above, states that emissions from industry accounted for 7.1 Mt CO_2eq in 2021 and 6.6 Mt CO_2eq in 2022. This indicates that 45.6% of the sectoral emissions ceiling for industry has been used in the first 2 years of the first carbon budget period (2021–2025). Industrial emissions covered by the EU ETS, accounting for approximately 80% of the total, fell by 6% in 2023. Based on current trends, Industry sector emissions will need to be substantially reduced to stay within the sectoral emissions ceiling for the first carbon budget period.

9.3.2.6 Climate Action Plan 2024

The National Climate Action Plan 2024 (CAP 2024)[19] 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[20] relating to the sectoral emission ceilings (Section 9.3.2.5 above). These sectors and their associated targets are as follows:

Powering Renewables – 75% Reduction in emissions by 2030

We will facilitate a large-scale deployment of renewables that will be critical to decarbonising the power sector as well as enabling the electrification of other technologies.

- *Accelerate the delivery of onshore wind, offshore wind, and solar.*
- *Dial up to 9 GW onshore wind, 8 GW solar, and at least 7 GW of offshore wind by 2030 (with 2 GW earmarked for green hydrogen production).*
- *Support at least 500 MW of local community-based renewable energy projects and increased levels of new micro-generation and small-scale generation.*
- *Phase out and end the use of coal and peat in electricity generation.*
- *New, dynamic Green Electricity Tariff will be developed by 2025 to incentivise people to use lower cost renewable electricity at times of high wind and solar generation.*

Achievement of the 75% reduction in emissions by 2030 and the decarbonisation of the grid in Ireland would assist in the achievement of the Electricity sectoral emission ceiling.

Building Better – 45% (Commercial/Public) and 40% (Residential) Reduction in Emissions by 2030

We will increase the energy efficiency of existing buildings, put in place policies to deliver zero-emissions new builds, and continue to ramp up our retrofitting programme.

- *Ramp up retrofitting to 120,000 dwellings to BER B2 by 2025, jumping to 500,000 by 2030.*
- *Put heat pumps into 45,000 existing and 170,000 new dwellings by 2025, up to 400,000 existing and 280,000 new dwellings by 2030.*
- *Generation up to 0.8 TWh of district heating by 2025 and up to 2.5 TWh by 2030.*

Achievement of the 45% (Commercial/Public) and 40% (Residential) reduction in emissions by 2030 would assist in the achievement of the Built Environment (Commercial/Residential) sectoral emission ceiling.

[19] *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*
[20] *Department of the Environment, Climate and Communications (2022) Climate Action Plan 2023 – Summary Document*

Turning Transport Around – 50% Reduction in Emissions by 2030

We will drive policies to reduce transport emissions by improving our town, cities, and rural planning, and by adopting the Avoid-Shift-Improve approach: reducing or avoiding the need for travel, shifting to public transport, walking, and cycling and improving the energy efficiency of vehicles.

- *Change the way we use our road space.*
- *Reduce the total distance driven across all car journeys by 20%.*
- *Walking, cycling and public transport to account for 50% of our journeys.*
- *Nearly 1 in 3 private cars will be an Electric Vehicle.*
- *Increase walking and cycling networks.*
- *70% of people in rural Ireland will have buses that provide at least 3 trips to the nearby town daily by 2030.*

Achievement of the 50% reduction in emissions relating to transport by 2030 would assist in the achievement of the Transport sectoral emission ceiling.

Making Family Farms More Sustainable – 25% Reduction in Emissions by 2030

We will support farmers to continue to produce world class, safe and nutritious food while also seeking to diversify income through tillage, energy generation and forestry.

- *Significantly reduce our use of chemical nitrogen as a fertilizer.*
- *Increase uptake of protected urea on grassland farms to 90-100%.*
- *Increase organic farming to up to 450,000 hectares, the area of tillage to up to 400,000 ha.*
- *Expand the indigenous biomethane sector through anaerobic digestion, reaching up to 5.7TWh of biomethane.*
- *Contribute to delivery of the land use targets for afforestation and reduced management intensity of organic soils.*

Achievement of a 25% reduction in emissions by 2030 in agriculture and farming practices would assist in the achievement of the Agriculture sectoral emission ceiling.

Greening Business and Enterprise – 35% Reduction in Emissions by 2030

We're changing how we produce, consume, and design our goods and services by breaking the link between fossil fuels and economic progress. Decarbonising industry and enterprise are key to Ireland's economy and future competitiveness.

- *Reduce clinker content in cement and substitute products with lower carbon content for construction materials, ensuring 35% reduction in emissions by 2030 (against 2018).*
- *Reduce fossil fuel use from 64% of final consumption (2021) to 45% by 2025 and further by 2030.*
- *Increase total share of heating to carbon neutral to 50-55% by 2025, up to 70-75% by 2030.*
- *Significantly grow the circular economy and bioeconomy.*

Achievement of a 35% reduction in emissions by 2030 in relation to Irish production and consumption would enable a more circular economy and assist in the achievement of the Industry and Other sectoral emission ceilings.

Changing our land use

The first phase of the land use review will tell us how we are using our land now. Then, we can map, with evidence, how it can be used most effectively to capture and store carbon and to produce better, greener food and energy.

- *Increase our annual afforestation rates to 8,000 hectares per annum from 2023 onwards.*
- *Rethink our Forestry Programme and Vision.*
- *Promote forest management initiatives in both public and private forests to increase carbon sinks and stores.*
- *Improve carbon sequestration of 450,000 ha of grasslands on mineral soils and reduce the management intensity of grasslands on 80,000 ha of drained organic soils.*
- *Rehabilitate 77,600 hectares of peatlands.*

By improving the manner in which Ireland utilises its land use, Ireland can achieve emission reductions and mitigate the ongoing climate and biodiversity crisis's. The LULUCF sectoral emission ceiling will be set after completion of the Land-use Strategy.

Adaptation

CAP 2024 highlights 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 managed and natural ecosystems, water resources, agriculture and food security, the built environment, human health, and coastal zones.

Climate Sectoral Adaptation Planning[21] includes for 12 sectoral adaptation plans that describe and assess the extent of the risks presented by climate change to a sector, and present contingency plans to address these risks and ensure climate resilience. They include actions to mainstream adaptation into policy and administration at sectoral level to improve the resilience of existing and planned critical infrastructure, systems, and procedures, to the effects and variability of climate change, as well as to improve cooperation and coherence within and across sectors, as well as on a local and national level.

9.3.2.7 Irelands Climate Change Assessment

In 2024 the EPA published Irelands Climate Change Assessment (ICCA).[22] 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 4: 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. Already Ireland

[21] *Department of the Environment, Climate and Communications (2020) Sectoral Adaptation Planning.* https://www.gov.ie/en/collection/51df3-sectoral-adaptation-planning/
[22] *Environmental Protection Agency (2023) Irelands Climate Change Assessment.* https://www.epa.ie/our-services/monitoring--assessment/climate-change/irelands-climate-change-assessment-icca/

has seen significant and ongoing deterioration in environmental quality, including declines in water quality, biodiversity and ecosystem quality. Developing a climate-resilient Ireland will require sufficient public and private investment and financial support in ways that adequately recognise the value of ecosystem services and the importance of societal wellbeing.

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.

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 (i.e., 2050).

The ICCA serves as a stark warning: Ireland stands to face a myriad of challenges in efforts to mitigate and adapt to climate change at the almost halfway mark to 2030. Further decisive action is imperative to mitigate the escalating impacts of climate change on Irelands environment, economy, and society that are highlighted throughout the four volumes of the ICCA.

9.3.2.8 Circular Economy and Miscellaneous Provisions Act 2022

In July 2022 the Circular Economy and Miscellaneous Provisions Act 2022[23] became law in Ireland. This Act underpins Irelands shift from a 'take-make-waste' linear waste model to a more sustainable pattern of production and consumption. This Act defines the circular economy for the first time in Irish domestic law, stating that a circular economy means an economic model and the policies and practices that give effect to that model in which:

- Production and distribution processes in respect of goods, products and materials are designed so as to minimise the consumption of raw materials associated with the production and use of those goods, products and materials,
- The delivery of services is designed so as to reduce the consumption of raw materials,
- Goods, products and materials are kept in use for as long as possible thereby further reducing the consumption of raw materials and impacts harmful to the environment,
- The maximum economic value is extracted from goods, products, and materials by the persons using them, and
- Goods, products and materials are recovered and regenerated at the end of their useful life

The Act incentivises the use of reusable and recyclable alternatives to a range of single-use packaging and items and consolidates the government's policy of reducing use of fossil fuels by introducing prohibitions on exploration for and extraction of coal, lignite and oil shale. The move to a circular economy will enable an efficient and resourceful circular economy strategy. The placement of the

[23] *Department of the Environment, Climate and Communications, Circular Economy and Miscellaneous Provisions Act. July 2022. Available at: <https://www.irishstatutebook.ie/eli/2022/act/26/enacted/en/html>*

circular economy on a statutory footing places the use of resources and reduced consumption at the heat of the Irish economy.

The Proposed Development includes for the infilling and restoration of an existing and future quarry void, which will serve to return the land to a beneficial use for the environment, at the end of the operational life of the quarry (i.e., the end of the lands economic useful life). These infilling and restoration works will enhance the overall environmental quality of the land, fostering ecosystem recovery as a means to increase resilience and conserve biodiversity, while also benefiting society, the environment and the economy.

9.3.2.9 Greenhouse Gas Emissions Projections

In its approach to decarbonising, the EU has split greenhouse gas 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 greenhouse gas emissions is achieved at EU-level.[24]

Emissions from all other sectors, including agriculture, transport, buildings, and light industry are covered by the EU Effort Sharing Regulation (ESR[25]). This established binding annual greenhouse gas emission targets for Member States for the period 2021–2030. In April 2023 the Effort Sharing Regulation was amended (EU 2023/857) and Ireland's new 2030 target under the Effort Sharing Regulation is to limit its greenhouse gas emissions by at least 42% by 2030. 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.

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%.

[24] *Government of Ireland (2023) - Climate Action Plan 2023* https://www.gov.ie/en/publication/7bd8c-climate-action-plan-2023/
[25] *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)*

- 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.
- 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.

9.3.3 Local Greenhouse Gas Emission and Climate Targets

9.3.3.1 Clare Local Authority Climate Action Plan 2024-2029

The *'Clare Local Authority Climate Action Plan 2024-2029*[26] (Clare LACAP) was adopted in February 2024 and published in March of the same year.

The Clare LACAP highlights the current state of climate action in Ireland, and how Clare County Council intends to deliver and enable climate action for a just transition to a low carbon and climate resilient future within County Clare. The Clare LACAP forms part of longer-term effort that requires a sustained and planned response to support the delivery of the climate neutrality objective at local and community levels. It will provide a mechanism for bringing together both adaptation and mitigation actions to help drive positive climate action and outcomes across the local authority and its administrative area.

Overall, the greenhouse gas emissions generated from County Clare equated to 1,905,730 tCO_2eq in the baseline year, 2018. The top three emitting sectors within County Clare in terms of total greenhouse gas emissions in the baseline year were agriculture, transport and residential, producing 45%, 20%, and 16% of total emissions respectively. The commercial and industrial sector was the fourth largest emitter in 2018, representing 15% of emissions for County Clare. Clare 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 (Section 9.3.2.6).

The Clare LACAP assesses climate risk relevant to Ireland and to County Clare, this, plus the evidence baseline, inform the climate objectives and actions that will be undertaken by Clare County Council to assist in the achievement of national and international climate targets.

[26] *Clare Local Authority Climate Action Plan 2024-2029.* <https://clarecococlimateactionplan.ie>

9.3.3.2 Clare County Development Plan 2023-2029

The Clare County Development Plan 2023-2029[27] (CCDP) sets out the overall strategy for the proper planning and sustainable development of the County over a 6-year period. The CCDP includes numerous actions and objectives on sustainability and climate for Clare to achieve over the 6-year period.

In relation to minerals, mining and quarrying, CCDP objective CDP8.14 states the following:

'It is an objective of Clare County Council:

a) *To promote the extraction of minerals and aggregates and their associated processes where such activities do not have a significant negative impact on the environment, landscape, public health, archaeology, County Geological sites and/or sites of geological importance or residential amenities of the receiving environment and where such operations are in compliance with all national regulations and guidelines applicable to quarrying and mining activities.*
b) *To avoid an unreasonable risk of environmental harm due to the toxicity of chemicals and their demonstrated potential to cause damage to the environment, the use of the following chemicals as a processing agent shall be prohibited from use in any proposed processing operation located above or adjacent to surface or ground water or which could potentially impact such waters regardless of their location – mercury, cyanide or cyanide compounds, breakdown products of cyanide or sulfuric acid.*
c) *To support the satisfactory and sensitive re-instatement and / or re-use of disused quarries and extraction facilities, where active extraction use has ceased. Future uses should include amenity, recreation and biodiversity areas and shall be informed by an assessment of the specific site/lands in accordance with the restoration plan under the facility's EPA licence.'*

The Proposed Development will directly assist in the achievement of CDP8.14.a, and CDP8.14.c by continuing the supply of minerals and aggregates from an existing quarry to the wider area of the Proposed Development and by infilling and restoring existing and future quarry voids back to a beneficial land use.

Further detail on local policy relating to quarries and the extractive industry in Co. Clare can be found in Section 2.3.3 of Chapter 2 of this EIAR.

The CCDP details the most recent figures from the Southern Region Waste Management Plan[28], stating that that 95% of construction and demolition (C&D) is being reused or recycled in the Southern Region of Ireland, encompassing a total of 10 local authorities, including Clare. Developments should, where appropriate, seek to reuse excavated material from sites for landscaping and land restoration or alternatively the material should be reused in the building process. Also, waste management plans should demonstrate how C&D waste is segregated at site so that it can be reused, recycled, or disposed of in an appropriate way. Where construction or demolition wastes cannot be reused or recycled, that waste must be transported to authorised waste facilities using the services of authorised waste collectors. Detail on waste at the Proposed Development site is detailed in Appendix 3-1, Construction and Environmental Management Plan, and further information is provided in Section 9.7.3.1 below.

[27] *Clare County Council (2023) Clare County Development Plan 2023-2029* <https://clarecdp2023-2029.clarecoco.ie/stage3-amendments/adoption/>
[28] *Southern Region Waste Management Plan 2015-2021* <https://www.southernwasteregion.ie/content/southern-region-waste-management-plan-2015-2021-associated-reports>

9.4 Climate and Weather in the Existing Environment

9.4.1 Climate Risk 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. Changes to climate and weather in Ireland will occur as a result of climate change, details of the Proposed Development susceptibility to climate change are provided in EIAR Chapters 4 through 14. Further information on the Proposed Development sites susceptibility to major accidents and natural disasters is provided in Chapter 4, Section 4.3.1.

Due to the location and nature of the Proposed Development site, the main risk associated with climate change to the Proposed Development is flooding. While other risks such as hazardous site emergencies or critical infrastructure emergencies may occur at the site, they are deemed extremely unlikely, if they were to occur the provisions set out in the Clare Major Emergency Plan[29] and actions laid out in the CCDP to adapt and mitigate to risks are deemed sufficient. Therefore, they are not considered further in this assessment.

9.4.2 Flood Risk

Chapter 7 Water, and the accompanying Flood Risk Assessment (FRA) (Appendix 7-1) detail the flood risk of the Proposed Development site. Based on the information provided in the stated documents, the areas of the Proposed Development at risk of flooding were identified.

The closest mapped recurring flood event is on the Bridgetown River immediately downstream of the Proposed Development site where the R466 road is affected. According to the OPW Flood Hazard Mapping area engineer notes "*The R466 is flooded and impassable once every two years. Maximum depth of up to 300mm. Surrounding land is also flooded. Cause is rainfall/runoff and back up of stream due to poor maintenance of stream downstream".*

There is also a recurring flood event on the Broadford watercourse approximately 3.5km downstream of the Proposed Development site that's also affects the R466. *"Land on North side of R466 floods over an extensive area on average twice per year. Cause is rainfall/runoff causes stream running by road to overflow. Stream is in need of maintenance. Problem has only occurred in last 10 to 15 years since maintenance work on the stream was discontinued".*

The Proposed Development site is not mapped within any historic or modelled groundwater flood zone. The GSI Maximum Historic Groundwater Flood Map, produced based on flood extents for the 2015/2016 winter flood event, does not record any groundwater flood zones within the Proposed Development site or nearby.

The site is not susceptible to pluvial flooding (surface water ponding) or fluvial flooding. Pluvial flooding was deemed to not pose a risk to the Proposed Development site due to the permeable nature of the soils and subsoils and that fact that no such pluvial flood zones are mapped within the Proposed Development site or in the surrounding lands. Fluvial flood modelling was also completed in order to consider future climate scenarios where the potential effects of climate change can increase rainfall. The National Indicative Fluvial Flood Mapping mid-range future scenarios models flood extents based on a 20% increase in rainfall and the high-range scenario models flooding based on a 30% increase in rainfall. As stated in the FRA both modelled flood extents demonstrate similar flooding as seen in the Present

[29] *Clare County Council (2018) Major Emergency Management Plan* <https://www.clarecoco.ie/services/emergency-services/publications/clare-major-emergency-plan-2018-20125.pdf>

Day Scenario and therefore the Proposed Development site is unlikely to be significantly impacted by future climate change.

The FRA concludes that as the Proposed Development will not discharge water to surface waters, there is no potential of increased flood risk downstream of the site, furthermore all surface water runoff generated at the site will be managed in a sustainable manner. The overall risk of flooding posed by the Proposed Development and associated works within the site is negligible.

9.4.3 Weather in the Existing Environment

Ireland has a temperate, oceanic climate, resulting in mild winters and cool summers. The Met Éireann weather station at Shannon Airport is the nearest weather and climate monitoring station to the Proposed Development site that has meteorological data recorded for the 30-year period from 1991-2020. The monitoring station was located approximately 35km southwest of the site. Meteorological data recorded at Shannon Airport over the 30-year period from 1991-2020 is shown in Table 9-5. The wettest months are November and December, with April and May being the driest. July is the warmest month with an average temperature of 16° Celsius.

Recent monthly meteorological data recorded at Shannon Airport, Co Clare, located approximately 35km southwest of the site, from January 2021 to January 2024 is available at: https://www.met.ie/climate/available-data/monthly-data. July 2023 was the wettest month in this time period, with 155mm of rainfall recorded, while April 2021 was the driest month with 15.4mm of rainfall. July 2021 was the warmest month in this time period, with a mean monthly temperature of 17.8° Celsius. January 2021 and December 2022 were the coldest months in this time period with a mean monthly temperature of 4.5° Celsius.

Table 9-5 Data from Met Éireann Weather Station at Shannon Airport from 1991-2020

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
TEMPERATURE (degrees Celsius)													
Mean daily max	8.9	9.4	10.9	13.4	16	18.3	19.5	19.1	17.5	14.2	11.1	9.2	14
Mean daily min	3.3	3.3	4	5.8	8.1	10.8	12.6	12.4	10.7	8.1	5.5	3.7	7.4
Mean temperature	6.1	6.3	7.5	9.6	12	14.5	16	15.8	14.1	11.2	8.3	6.4	10.7
Absolute max.	14.7	15.5	19.6	23	27.8	32	30.2	29.2	25.6	21.9	17.2	15.4	32
Absolute min.	-11.2	-5.1	-5.8	-2.9	0.1	3.1	6.2	4.4	1.7	-2.3	-6.6	-11.4	-11.4
Mean num. of days with air frost	5.2	4.6	3.2	0.6	0	0	0	0	0	0.4	1.9	4.4	20.3
Mean num. of days with ground frost	13	11.8	11.9	7.7	2.9	0.2	0	0	0.8	3.3	8	11.3	70.9
RELATIVE HUMIDITY (%)													
Mean at 0900UTC	87.8	87.9	85	79.3	76.2	76.6	80	82.3	85.1	87.4	89.9	88.9	83.9
Mean at 1500UTC	81.2	75.4	69.8	64.1	63.5	64.6	69.3	69.1	70	75	81	83.5	72.2
SUNSHINE (Hours)													
Mean daily duration	1.7	2.4	3.6	5.4	5.9	5.5	4.4	4.6	3.9	3	2.1	1.5	3.7
Greatest daily duration	8.1	10.2	11.5	13.6	15.6	15.8	15.7	14.4	12.2	10.1	8.3	7.1	15.8
Mean num. of days with no sun	9.1	5.9	5.3	2.3	1.9	1.8	2.1	2.1	2.6	5.1	7.7	10.1	56
RAINFALL (mm)													
Mean monthly total	103.8	86.7	75.8	62.3	63.1	69.6	75.8	87.6	77.4	95.5	106.6	115.4	1019.7
Greatest daily total	38.2	33.8	34.8	40.2	25	45.3	39.5	51	52.3	36.9	29.4	33.5	52.3
Mean num. of days with >= 0.2mm	21.3	18.3	18	16.2	16.2	15.5	18.3	19	17.7	19.9	21.6	21	223
Mean num. of days with >= 1.0mm	16.9	13.9	13.4	11.4	12.1	11.3	13.5	13.7	12.9	15.4	16.8	17.2	168.5
Mean num. of days with >= 5.0mm	7.8	5.8	5.5	4.7	4.6	4.8	4.9	5.8	4.8	7	8	8.5	72.2
WIND (knots)													
Mean monthly speed	10	10.1	9.6	9.2	9	8.5	8.4	8.3	8.4	8.9	9.1	9.7	9.1
Max. gust	75	86	63	66	52	51	52	61	58	66	69	83	86
Max. mean 10-minute speed	47	61	44	45	37	37	38	44	44	47	50	57	61
Mean num. of days with gales	2.1	1.2	1.4	0.5	0.5	0.1	0	0.1	0.6	0.9	1	1.5	9.8

WEATHER (Mean No. of Days With:)													
Snow or sleet	1.5	1.8	1.2	0.3	0	0	0	0	0	0	0.1	1	5.9
Snow lying at 0900UTC	0.2	0	0.1	0	0	0	0	0	0	0	0	0.1	0.5
Hail	3.1	3.4	2.8	2	0.7	0	0	0.1	0.1	0.5	1	2.3	16
Thunder	0.9	0.4	0.3	0.3	0.5	0.4	0.7	0.5	0.2	0.3	0.3	0.4	5.2
Fog	3.4	2.2	2.4	1.8	1.3	1	0.9	1.6	2.8	3.1	4	3.8	28.3

9.5 Roadstone Sustainability Commitments

Roadstone is a part of Cement-Roadstone Holdings (CRH). CRH is ranked among sector leaders by Environmental, Social and Governance (ESG) rating agencies. They have been accredited by the National Standards Authority of Ireland (NSAI) in ISO 14001 (Environmental Management) and ISO 50001 (Energy Management). These systems are externally audited and verify the company's commitment to continuous assessment and improvement of their management systems in these areas. Roadstone is committed to the use of sustainable and recycled materials.

CRH publishes an annual sustainability report. The key highlights from the most recently published report, CRH 2023 Sustainability Report[30] are:

- An 8% reduction in Scope 1 and 2 CO_2e emissions in 2023;
- 43.9 million tonnes of alternative fuels and materials recycled;
- Approximately 153 billion litres of water saved by recycling at CRH locations;
- Validated Science Based Target Initiative (SBTi) target of:
  - Reduce gross Scope 1 and Scope 2 greenhouse gas (GHG) emissions by 33.5% per tonne of cementitious product by 2030 from a 2021 base year;
  - Reduce absolute gross Scope 1 and Scope 2 GHG emissions from other activities by 42.0% by 2030 from a 2021 base year;
  - Reduce gross Scope 3 GHG emissions by 23.5% from purchased clinker and cement per tonne purchased over the same timeframe.
- Awarded the highest 'A' score for climate related disclosures by the Carbon; Disclosure Project (CDP);
- Launched Water Solutions innovation accelerator.

Roadstone operates throughout Ireland and strive to serve the local communities surrounding each location. The average delivery trip of a Roadstone truck is approximately 12km which reduces the amount of greenhouse gas emissions associated with Roadstone vehicle usage and serves to assist the local economy.

Roadstone is committed to achieving and maintaining industry leading environmental standards. To this end, the company has established, and actively implements, an in-house Environmental Management System (EMS) at all its locations. The key objectives of the EMS are:

- Compliance with all relevant legislation, regulations and operation to the International Standard ISO 14001:2015.
- The continuous improvement of our environmental performance.
- Maintaining good relationships with our neighbours at each of our locations.
- Management of visual impact of our operations on the surrounding landscape.
- Managing efficiently the generation and disposal of waste and ensuring the prevention of pollution on all our sites.

The Proposed Development will be carried out in accordance with the requirements of the EMS. The EMS includes an 'Environmental Monitoring Programme (EMS 11)' for the monitoring of dust, noise and groundwater and will be revised subject to compliance with any conditions attached to any decision to grant planning permission and a Waste Management Licence for the Proposed Development. The monitoring programme results will be submitted to Clare County Council on a regular basis, and therefore made available at the council offices for inspection by interested parties. Monitoring results will also be issued to the EPA as per licence requirements.

[30] *CRH 2023 Sustainability Performance Report* <https://www.crh.com/media/5157/crh-sustainability-report-2023_interactive_vhr.pdf>

Although Roadstone's principal business interest is in rock extraction and manufacture of building materials and products, it is currently backfilling and restoring former quarries using imported soil and stone at several of its locations across Ireland to restore land to its original contours, promoting revegetation and biodiversity enhancement.

Circular Economy

The circular economy is defined by the European Commission as '*a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing, and recycling existing materials and products as long as possible.*'[31] The circular economy is further defined in Irish domestic law in the Circular Economy and Miscellaneous Provisions Act 2022, detailed in Section 9.3.2.8 above.

A circular economy aims to keep products, components and materials at their highest utility and value at all times. Quarry restoration in Ireland presents an opportunity to integrate principles of the circular economy, which emphasizes the reuse, recycling, and regeneration of materials to create sustainable system and transitions sites, such as the Proposed Development, into valuable assets both for the environment and surrounding communities. Once quarrying activities cease in a designated area, these landscapes can be repurposed for various sustainable uses; in the case of the Proposed Development, during the operational phase, it will be restored to agricultural use similar to the land use prior to quarrying, with agricultural grasslands bordered by hedgerows. The restoration phase of the Proposed Development will result in the replanting of 2,693 linear metres of hedgerow and 160 linear metres of treeline habitat within the Proposed Development site. As linear connectivity within the Proposed Development site is not common, the restoration replanting once matured will significantly improve the connectivity onsite and will provide connecting corridors between the immature woodlands (which will have matured over the 22 years during the operational phase). This gain of habitat onsite will open up new shelter, refuges and nesting areas for fauna that utilise the site. All plant species proposed for replanting will be indigenous to the local area and recommended under the All-Ireland Pollinator Plan.[32]

9.6 Calculating Carbon Losses from the Proposed Development

9.6.1 Background

The Industry sector accounted for 9.7% of Irelands greenhouse gas emissions in 2022.[33] Under the sectoral emissions ceiling agreed in July 2022, Industry must reduce emissions by 35% by 2030 relative to 7 $MtCO_2eq.$ in 2018.[34]

Quarrying is an essential component to the Irish economy and a vital element in a recovering construction sector. However, in Ireland, the construction sector is responsible for 37% of Ireland's emissions with 14% of this being from embodied carbon within construction materials.[35] CAP 2024 has reaffirmed the 2030 target of reducing embodied carbon emissions by at least 30% for all materials produced and used in Ireland and to reduce fossil fuel demand through energy efficient measures by

[31] *Circular economy: definition, importance and benefits (May 2023)* <https://www.europarl.europa.eu/news/en/headlines/economy/20151201STO05603/circular-economy-definition-importance-and-benefits#:~:text=The%20circular%20economy%20is%20a,reducing%20waste%20to%20a%20minimum.>
[32] *All-Ireland Pollinator Plan 2021-2025. National Biodiversity Data Centre Series No. 25, Waterford. March 2021.*
[33] *Department of Environment, Climate and Communications (2023) Climate Action Plan 2024*
[34] *EPA (2024) Irelands Greenhouse Gas Emission Projections 2023-2050* <https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/irelands-greenhouse-gas-emissions-projections-2023-2050.php>
[35] *Building a Zero Carbon Ireland – A roadmap to decarbonise Irelands Built Environment across it's Whole Life Cycle (2022)* <https://www.igbc.ie/wp-content/uploads/2022/10/Building-Zero-Carbon-Ireland.pdf>

10%. Achievement of these targets will equate to a 0.2MtCO_2eq and 0.4MtCO_2eq emissions abatement as compared to 2018 levels.

A higher emphasis on the decarbonisation of all sectors has been stressed in CAP 2024 due to the sharp increase in fossil fuel cost following the Russian invasion of Ukraine. The EU is looking to remove dependencies on Russia and REPowerEU[36], thus giving the Industry sector a further incentive to reduce costs through increasing efficiency and moving towards more sustainable and renewable energy options.

The EU Corporate Sustainability Reporting Directive (Section 9.3.1.5) requires increased transparency on ESG impacts associated with an entity, this includes increased energy transparency requirements that will further assist in the decarbonisation of the Industry sector.

9.6.2 Calculating Carbon Losses

Roadstone are a leading manufacturer of ready-mix concrete, aggregates, asphalt and macadam, mortar and plaster, concrete blocks and masonry, paving products, roof tiles and agricultural lime in Ireland. Operations at all Roadstone's quarry and concrete production facilities adhere to the environmental guidelines of the Irish Concrete Federation (ICF) and current best practice in the quarrying industry, as set out in the publication Guidelines on Environmental Management in the Extractive Industries published by the EPA (EPA, 2006).

Carbon emissions or losses associated with embodied carbon of materials used in the construction, operational and decommissioning phase of the Proposed Development have been identified. Embodied carbon refers to the emissions associated with procuring, mining and harvesting raw materials, the transformation of those materials into construction products, transporting them to site, installation of these materials during a construction phase, and the subsequent replacement, removal, and disposal of these materials upon decommissioning.[37]

The emissions associated with the embodied carbon, along with the construction phase transport movements, of the Proposed Development site are considered using the Transport Infrastructure Ireland (TII) Carbon Tool (TII 2022)[38]. The TII Carbon Tool is customised for road and light rail projects in Ireland, using emission factors from recognised sources during the construction, maintenance and operation of TII projects in Ireland.

Section 13.5 in Chapter 13 of this EIAR outlines traffic generation numbers relative to quantum of materials required for the construction of the Proposed Development and the vehicle movements associated with the operational phase of the Proposed Development. The details of which have been utilised to determine the emissions associated with these activities and are included in Appendix 9-1: Carbon Calculations.

The construction works at the site will be minimal. The entire construction phase is estimated to take approximately one month. The proposed works will consist of the preparation of site for construction, the pouring of concrete for soil inspection area/refuelling area foundation, construction of new fuel/oil interceptor at refuelling area, the erection of quarantine inspection shed, road paving/improvements; and minor upgrades to existing weighbridge and wheel-wash. The construction phase will also involve the development of a new drainage network, minor excavations will be required for the installation of drainage pipework. All excavated soil material will be reused on site. Please refer to Section 3.3.1 for further information on the construction phase.

[36] *European Commission, REPowerEU (2022)* <https://data.europa.eu/doi/10.2775/076377>
[37] *Irish green Building Council – What is embodied carbon?* <https://www.igbc.ie/what-is-embodied-carbon/>
[38] *Transport Infrastructure Ireland Carbon Tool for Road and Light Rail Projects: User Guidance Document* https://www.tiipublications.ie/library/GE-ENV-01106-01.pdf

The operational phase of the Proposed Development will involve the extraction, processing and washing of sand and gravel from an area measuring approximately 16.3 ha which will allow for the extraction of approximately 1,428,571 tonnes of material. The site will be worked in 2 no. phases as described below:

- Phase 1: The first phase of extraction of sand and gravel will allow for the extraction of approximately 714,286 tonnes of material. Extraction of sand during Phase 1 is anticipated to occur during years 1 to 10.
- Phase 2: The second phase of extraction of sand and gravel will allow for the extraction of approximately 714,286 tonnes of material. Extraction of sand during Phase 2 is anticipated to occur during years 11 to 20.

It is intended to extend the extraction area of the existing quarry horizontally and vertically using mechanical excavation techniques. The depth of gravel varies across the extraction area, as a result levels of excavation will vary from approx. 76 metres above ordnance datum (mAOD) in the north of the site to 57.5mAOD in the south of the site. The zone of sand/gravel ranges from 7 to 14m in thickness.

During the operational phase, it is also proposed to import approximately 4,471,200 tonnes of inert soil and stone material or stone by-product, or river dredge spoil for the infilling and restoration of an existing and future quarry void in order to return the land to a beneficial use. The infilling will commence in the current void and proceed as extraction takes place and therefore infilling and extraction will run concurrently.

9.6.2.1 Carbon Losses

In relation to emissions associated with embodied carbon and associated transport movements, the TII Carbon Tool has been utilised to assess the impacts of the Proposed Development in terms of potential carbon losses, associated with the operational phase.

A copy of the outputs is provided as Appendix 9-1 of this EIAR, *'Carbon Calculations'*. Where available and relevant, site-specific information was inserted into the online carbon calculators. Otherwise, default values were used.

The main CO_2 losses due to the Proposed Development are summarised in Table 9-6.

Table 9-6 CO_2 Losses from the Proposed Development Operational Phase

Origin of Losses	CO_2 Losses (tonnes CO_2 equivalent)
Losses associated with construction phase transport movements	39
Sub-Total	39
Losses associated with the embodied carbon of extracted sand during Sand Extraction Phase 1	5,000
Losses associated with transport movements during Sand Extraction Phase 1	18
Losses associated with the embodied carbon of extracted sand during Sand Extraction Phase 2	5,000

Losses associated with transport movements during Sand Extraction Phase 2	18
Losses associated with operational phase water usage	292
Sub-Total	**10,329**
Losses associated with the embodied carbon of material for infilling and restoration of the existing and future quarry void	31,407
Losses associated with transport movements of material for infilling and restoration of the existing and future quarry void	373
Sub-Total	**31,779**
Total	**42,147**

The worksheet models and online tools calculate that the Proposed Development will give rise to **42,147** tonnes of CO_2 equivalent losses per annum. Of this total figure, carbon losses associated with the construction phase transport movements is 39 tonnes or 0.1%. Carbon losses associated with the embodied carbon of extracted sand during Sand Extraction Phase 1 is 5,000 tonnes or 12%. Losses associated with transport movements during Sand Extraction Phase 1 is 18 tonnes or 0.04%. Losses associated with the embodied carbon of extracted and during Sand Extraction Phase 2 is 5,000 tonnes or 12%. Losses associated with transport movements during Sand Extraction Phase 2 is 18 tonnes or 0.04%. Losses associated with operational phase water usage throughout both sand extraction phases for the purposes of washing aggregate is 292 tonnes or 0.7%. Losses associated with the embodied carbon of material for infilling and restoration of the existing and future quarry void is 31,407 tonnes or 75%. Losses associated with the transport movements of material for infilling and restoration of the existing and future quarry void is 1% or 373 tonnes.

The figure of 10,329 tonnes of CO_2eq associated with the embodied carbon of the 1,428,571 tonnes of sand material being extracted from the Proposed Development site in two phases over the twenty-year operational life. The figure of 31,407 tonnes of CO_2eq associated with the embodied carbon of the 4,417,200 tonnes of material for infill and restoration of the existing and future quarry void. All carbon losses associated with transport movements during the construction and operational phase are based on the assumption that all HGVs will be carrying material at its full capacity (i.e., 25 tonnes) and the assumed 236 traffic movements per week as identified in Section 13.3.1 of Chapter 13 of the EIAR. Assumptions associated with operational phase water usage for the purpose of washing aggregate is based on a maximum 320m^3 of water being used per day and the assumption that all water will be recycled. Further details on the assumptions made for the modelling of embodied carbon and operational phase transport emissions are included in Appendix 9-1: Carbon Calculations.

When considering these greenhouse gas emissions within the context of the National Industry Sectoral Emissions Ceilings detailed in Section 9.3.2.5, Carbon Budget 1 (2021-2025) has an Industry Sector budget of 30 $MtCO_2$eq and Carbon Budget 2 (2026-2030) has an Industry Sector budget of 24 $MtCO_2$eq. Within the context of the 5-year Carbon Budget periods, the Proposed Development will give rise to 42,147tCO_2eq or 0.0421$MtCO_2$eq; this accounts for **0.14%** of the available budget in the first carbon budgeting period and **0.18%** of the available budget in the second carbon budgeting period.

9.7 Likely Significant Effects

9.7.1 Characteristics of the Proposed Development

The Proposed Development will utilise the existing quarry infrastructure including internal roads, site office, weighbridge, wheel-wash, welfare facilities and other ancillaries to complete the works. A quarantine area and refuelling area will also be constructed as part of the development of the site. The wheelwash and weighbridge will be upgraded as part of the development proposals. A quarantine area and refuelling area will be provided as part of the Proposed Development. The quarantine area will comprise of a concrete foundation slab and inspection shed. Drainage from the refuelling areas will be routed through a full hydrocarbon interceptor, a wetland, and then a soakaway for final discharge to ground. The Proposed Development will include for upgrades to the drainage network and the addition of settlement ponds.

As detailed above in Section 9.6.2 the operational phase of the Proposed Development will involve the extraction, processing and washing of approximately 1,428,571 tonnes of sand and gravel from an area measuring approximately 16.3 ha. Washing will result in approximately 320m^3 of water used per working day. It is proposed to construct earth berms around the southern perimeter of the extraction area in order to assist in screening the quarry and assimilating into the landscape. The berms will be planted with native species to assist in screening the quarry and to prevent erosion of soil. This will supplement the existing berms and vegetation located on the western and northern boundaries.

It is also proposed to import approximately 4,471,200 tonnes of inert soil and stone material or stone by-product, or river dredge spoil for the infilling and restoration of an existing and future quarry void in order to return the land to a beneficial use. Please see Chapter 5 Biodiversity Section 5.5.4 and Appendix 5-1 Biodiversity Enhancement Management Plan (BEMP) for further details on the restoration phase of the Proposed Development.

9.7.2 'Do-Nothing' Effect

If the Proposed Development is not permitted, the site would remain largely unaltered as a result of the Do-Nothing Scenario. The potential for additional investment and employment in the area in relation to the Proposed Development would be lost.

9.7.3 Construction Phase

9.7.3.1 Greenhouse Gas Emissions

Proposed Development site

Construction activities will take place over a one-month period and will consist of the preparation of site for construction, the pouring of concrete for soil inspection area/refuelling area foundation, construction of new drainage network and fuel/oil interceptor at refuelling area, the erection of quarantine inspection shed, road paving/improvements; and minor upgrades to existing weighbridge and wheel-wash. Construction activities will result in the emission of greenhouse gases; these emissions are an inevitable consequence of construction works. This potential impact will be temporary and slight only, given the quantity of greenhouse gases emitted, and will be restricted to the duration of the construction phase. Mitigation measures to reduce this impact are presented below.

Traffic and Transport

As set out in Section 3.3 of Chapter 3 of this EIAR, the construction works associated with the Proposed Development will be minimal, with much of the work confined to the internal network. It is estimated that there will be additional traffic generated at the R466 / quarry access junction during the construction phase associated with the transport of construction materials to and from the site. These activities will give rise to greenhouse gas emissions associated with the transport vehicles and exhaust emissions. The potential impact will be temporary and slight only, given the quantity of greenhouse gases that will be emitted, and will be restricted to the duration of the construction phase. Mitigation measures to reduce this impact are presented below.

Waste Disposal

Waste will arise from the Proposed Development during the construction phase, mainly from unavoidable waste including material surpluses, damaged materials, and packaging waste. This potential impact will be temporary and slight only, given the quantity of greenhouse gases associated with the generation and management of these waste streams that will be emitted to the atmosphere, and will be restricted to the duration of the construction phase. 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. Mitigation measures to reduce this impact are presented below.

Please refer to Section 3.4.3 of Chapter 3 of this EIAR and Section 3.8 of the Construction and Environmental Management Plan (CEMP) for detailed processes on waste management during the construction phase of the Proposed Development.

Mitigation

- When stationary, delivery and on-site vehicles will be required to turn off engines.
- 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.
- A C&D Waste Management Plan will be prepared by the developer having regard to the '*Best Practice Guidelines for the Preparation of Resource Management Plans for Construction & Demolition Projects'* (EPA 2021) and any subsequent guidelines for new construction or demolition projects
- Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Proposed Development to reduce the emissions associated with vehicle movements.
- The methods of working will comply with all relevant legislation and best practice guidelines in reducing the environmental impacts of the works. A detailed CEMP will be prepared and submitted to Clare County Council for approval in advance of the works.
- Where applicable, low carbon intensive construction materials will be sourced and utilised onsite.

Residual Effects

Following implementation of the mitigation measures above, residual impacts of greenhouse gas emissions arising from the construction phase of the Proposed Development will have a temporary imperceptible negative effect. However, once emitted to the atmosphere, the greenhouse gas emissions

that will arise from construction phase activities will have a permanent imperceptible negative effect on Climate.

The potential for health effects is considered to be minor due to the quantity of greenhouse gases that will be emitted during the construction phase, as well as the short duration of construction works (approximately 1 month). Whilst the construction phase of the Proposed Development will result in greenhouse gas emissions, the implementation of the mitigation measures discussed above, and good management practices can prevent and minimise effects.

Significance of Effects

If the proposed mitigation measures and associated monitoring are implemented than there will be no significant impact on climate as a result of greenhouse gas emissions during the construction phase.

9.7.4 Operational Phase

9.7.4.1 Greenhouse Gas Emissions

Proposed Development site

Operational activities will consist of the continued extraction, processing and washing of sand and gravel and the infilling of an existing void with inert soil and stone. This will lead to emissions from transport movement (i.e. exhaust emissions), embodied carbon of material, and emissions from water usage associated with washing. Emissions of this type of this type are inevitable consequence of the production of quarry product due to the nature of the work and the historical lack of availability of more energy efficient technologies and infrastructure appropriate for this sector.

Following completion of the infilling works proposed as part of the operational phase, topsoil will be placed (approximate 300 mm depth) and the soils will be rolled and reseeded with grasses. The final landform will be profiled to ensure surface water run-off over the ground surface is directed to boundary ditches and site drainage infrastructure. At the end of the operational life of the void undergoing extraction, the same works to infill and restore will be deployed and the site will be restored. By allowing the site to return to its natural state, the Proposed Development will bring about a land use change with a higher carbon fixing potential.

Due to the nature of the Proposed Development, the effects that occur during the construction phase will largely be maintained during the operational phase. This effect is long-term and moderate, given the quantity of greenhouse gases that will be emitted as part of the Proposed Development.

Traffic and Transport

The transport of infill material and bulk aggregate away from the site will give rise to greenhouse gas emissions associated with the transport vehicles and exhaust emissions. Due to the nature of the Proposed Development, the traffic and transport effects that occur during the construction phase will largely be maintained during the operational phase. This effect is long-term and moderate, given the quantity of greenhouse gases that will be emitted as part of the Proposed Development.

Waste Disposal

Waste will arise from the Proposed Development during the operational phase, mainly unavoidable waste including material surpluses, damaged materials, and packaging waste. 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 and the

objectives contained with the CCDP relating to C&D (Section 9.3.3.2 above). Due to the nature of the Proposed Development, waste effects that occur during the construction phase will largely be maintained during the operational phase. This effect is long-term and slight only, given the quantity of greenhouse gases that will be emitted as part of the Proposed Development. .

Mitigation

- Any vehicles or plant brought onsite during the operational phase will be maintained in good operational order that comply with the Road Traffic Acts 1961 as amended, thereby minimising any emissions that arise.
- Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Proposed Development to reduce the emissions associated with vehicle movements.
- Restoration of the existing and future quarry void will result in a return of the site to a condition similar to that present prior to the utilisation of the site for extraction
- Truck movements relating to the operational phase transport of materials will operate to and from the closest plant where feasible.
    - The average distance of a roadstone truck delivery is 12km
- Driver Training programs will be undergone by all Roadstone drivers to improve fuel efficiency such as reducing idle times.
- HVO will be used as an alternative fuel to diesel.
- The Roadstone vehicle fleet will be upgraded to Euro 6 engines.
- Material/Product optimisation will be deployed to reduce the quantity of materials transported to Roadstone production plants.
- As detailed in Appendix 5-1, a BEMP for the Proposed Development has identified enhancement activities such as planting of hedgerow and woodland (approximately 2,693 linear metres of hedgerow and 160 linear metres of treeline habitat will be replanted).

Residual Effects

Following implementation of the mitigation measures above, and those outlined in the BEMP, residual effects of greenhouse gas emissions arising from the operational phase of the Proposed Development will have a long-term slight negative effect. However, once emitted to the atmosphere, the greenhouse gas emissions that will arise from operational phase activities will have a permanent slight negative effect on climate.

The potential for health effects is considered to be imperceptible due to the quantity of greenhouse gases that will be emitted. Whilst the operational phase of the Proposed Development will result in greenhouse gas emissions, the implementation of the mitigation measures discussed above, and good management practices can prevent and minimise effects.

When considering these greenhouse gas emissions within the context of the national Industry Sector Emissions Ceilings detailed in Section 9.3.2.5, Carbon Budget 1 (2021-2025) has an Industry Sector budget of 30 $MtCO_2eq$. and Carbon Budget 2 (2026-2030) has an Industry Sector budget of 24 $MtCO_2eq$. Within the context of the 5-year Carbon Budget periods, the Proposed Development will give rise to 42,147tCO_2eq or 0.0421$MtCO_2eq$; this accounts for **0.14%** of the available budget in the first carbon budgeting period and **0.18%** of the available budget in the second carbon budgeting period.

Significance of Effects

Based on the assessment above there will long-term slight negative effect.

9.7.5 Decommissioning Phase

Upon decommissioning, all site infrastructure including the weighbridge, wheel-wash facility, inspection shed, office and associated infrastructure will be decommissioned and removed off-site. As detailed in Section 4 of the BEMP (Appendix 5-1) monitoring will take place post-restoration to confirm that habitat creation and enhancement has been successful. These works will result in greenhouse gas emissions being emitted from onsite traffic movements. The mitigation measures prescribed for the construction phase of the Proposed Development will be implemented during the decommissioning phase, along with short-term (2 year) environmental monitoring of air, surface water and groundwater, thereby minimising any potential negative effects.

9.8 Cumulative Effects

Potential cumulative effects on climate between the Proposed Development and other permitted or proposed projects and plans in the area, as set out in Section 2.6 in Chapter 2 of this EIAR, were also considered as part of this assessment. The developments considered as part of the cumulative effect assessment are described in Section 2.6 of this EIAR, with relevant developments within 1km of the red line planning application boundary presented below in Table 9-7 below.

Table 9-7 Developments with the potential to cause cumulative effects on Climate alongside the Proposed Development.

Planning Ref.	Description	Decision
QDO3.QD0011	Extension to existing sand and gravel quarry	Granted
317227	Development of a wind farm together with the development of an underground grid connection cable to the national grid. The development will consist of 8 wind turbines, a permanent meteorological mast, an onsite 38kV electrical substation, and all associated site works. An Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS) have been submitted with the application	Granted

9.8.1 Construction Phase

During the construction phase of the Proposed Development and other permitted or proposed projects and plans in the area as set out in Section 2.6 in Chapter 2 of this EIAR, that are yet to be constructed, there will be cumulative greenhouse gas emissions arising from production of construction materials (such as cement), and the operation of construction vehicles and plant. These will be restricted to the duration of the construction phase (i.e., approximately 1 month), and as such will give rise to cumulative greenhouse gas emissions over a temporary duration. However, once emitted to the atmosphere, the greenhouse gas emissions that will arise from cumulative construction phase activities will have a permanent imperceptible negative effect on Climate.

9.8.2 Operational Phase

The existing land use activities noted above will require plant items and vehicles which consume fossil fuels and therefore will lead to a minor level of cumulative greenhouse gas emissions. The facilities surrounding the Proposed Development site will be managed to control emissions, and further mitigation to reduce operational phase greenhouse gas emissions are in Section 9.7.4 above. However, there is potential for effects arising from the Proposed Development and other local existing developments, projects and plans as once greenhouse gases are emitted to the atmosphere, they are considered permanent. The Proposed Development is located within the boundary of an existing quarry and the management of quarry site activity will occur within the environmental management

framework in place, which has proven to be effective. However, when considering the greenhouse gases in the context of the National Industry Sectoral Emissions Ceilings detailed in Section 9.3.2.5, Carbon Budget 1 (2021-2025) has an Industry Sector budget of 30 $MtCO_2eq$ and Carbon Budget 2 (2026-2030) has an Industry Sector budget of 24 MtCO2eq. Within the context of the 5-year Carbon Budget periods, the Proposed Development will give rise to 42,147tCO_2eq or 0.0421$MtCO_2eq$; this accounts for **0.14%** of the available budget in the first carbon budgeting period and **0.18%** of the available budget in the second carbon budgeting period.

Therefore, there will be cumulative greenhouse gas emissions associated with the operational phase of the Proposed Development along with other permitted or proposed projects, and these will take place under the Industry sector emissions ceiling and will have a long-term permanent slight negative effect on Climate.

9.8.3 Decommissioning Phase

The works required for restoration and aftercare of the site, i.e., decommissioning of onsite infrastructure and post-restoration monitoring works will result in greenhouse gas emissions. There is therefore potential for cumulative greenhouse gas emissions to result from the Proposed Development during the decommissioning phase as once greenhouse gases are emitted to the atmosphere, they are considered permanent. The mitigation measures prescribed for the construction phase of the Proposed Development will be implemented during the decommissioning phase, along with short-term (2 year) environmental monitoring of air, surface water and groundwater, thereby minimising any potential cumulative effects.