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Acronyms and Abbreviations

GHG	Greenhouse Gas
CO ₂ e	Carbon Dioxide Equivalent
CO ₂	Carbon Dioxide
CH ₄	Carbon Monoxide
N ₂ O	Nitrous Oxide
RCP	Representative Concentration Pathways
DECC	Department of the Environment, Climate and Communications
RICS	Royal Institution of Chartered Surveyors
AFOLU	Agriculture, Forestry and Other Land Use
IEMA	Institute of Environmental Management and Assessment
SEAI	Sustainable Energy Authority of Ireland
WLCA	Whole Life Cycle Assessment
kWh	Kilowatt Hour
CCAC	Climate Change Advisory Council

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Introduction

Background

- 9.1 This chapter of the Environmental Impact Assessment Report (EIAR), prepared by SLR Consulting Ltd, assesses significant effects of the Proposed Development on the climate and the impacts of the climate on the Proposed Development. Where required, appropriate mitigation measures to avoid, prevent or reduce and, if possible offset, likely significant, adverse effects to climate are recommended. The Proposed Development is located at the existing Killough quarry facility in Gaile townland, Holycross, Co. Tipperary.
- 9.2 The Proposed Development comprises:
- An overall planning application site area of c. 6.3 hectares consisting of a proposed bio-renewables production facility, buffer screening, ancillary facilities and site access via the existing permitted quarry entrance.
 - The proposed bio-renewables production facility (incorporating anaerobic digestion) compound will cover an area of c. 4 hectares with c. 16,820m² of new buildings consisting of; an administration building, a dry matter reception building, a workshop, a bio-conversion building, a pre-treatment, equalisation and gas upgrading building, a digestate handling building, a warehouse storage building, a bio-filling station building, an odour abatement and pumping station building, a linear generator building, and an ESB sub-station building.
 - Ancillary site facilities to be provided will include, a wheel wash, a weighbridge, surface water and fire water storage ponds, storage tanks for water, silage feed, cattle manure, biodegradable material, maize and chicken litter and gas, effluent collection and storage tanks, staff and visitor car parking and bicycle storage, HGV parking, hydrocarbon interceptors, wastewater treatment equipment, bunding and surface treatments, boundary treatments and fencing, lighting, services, drainage, landscaping, and all associated ancillary works.

Scope of Work

- 9.3 The chapter is presented in two parts:
- Part A assesses the likely effects of the Proposed Development on climate change through a whole life cycle assessment of the greenhouse gas emissions (GHG). Part A also determines its significance in the context of local and national climate change policy.
 - Part B considers the resilience of the Proposed Development to future changes in climate.
- 9.4 Mitigation measures have been identified to avoid, reduce or offset any significant adverse effects and/or enhance likely beneficial impacts. The nature and significance of the likely residual effects are reported.
- 9.5 The chapter describes the following:
- climate change legislative framework / policy context;
 - analysis of evolving environmental baseline trends;
 - identifying climate change concerns in relation to the Proposed Development;
 - assessing effects (cumulative effects and uncertainty);

- identifying alternatives and mitigation measures; and
- identifying monitoring and adaptive management.

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Consultations / Consultees

- 9.6 A formal pre-planning consultation meeting was held online between officials of Tipperary County Council, SLR Consulting Ireland and the Applicant on 20th November 2023 and no specific matters in relation to climate arose.
- 9.7 There were no items relating to climate included in any of the statutory consultees' responses.
- 9.8 Following a review of published development plans and site surveys, it was considered that there was no requirement for any further formal external consultations to be carried out. There was however consultation with other specialist contributors to this EIA Report.

Contributors / Author(s)

- 9.9 The climate impact assessment presented in this chapter was prepared by SLR Consulting.
- 9.10 This chapter has been supported and reviewed by Nicola Herschell MSc, MIEMA, CEnv. Nicola is a Technical Director in SLR's Carbon & Energy Management team within the ESG Strategic Advisory technical discipline. Nicola has over 14 years professional experience, with 8 years in her current role at SLR, where she manages a team of consultants. Nicola has worked with a wide variety of large, high profile, multi-site organisations to help manage their reporting requirements and to ensure both Group and site-level compliance with the full suite of carbon and energy legislation, with particular specialism in the EU/UK Emissions Trading Scheme, GHG permitting, Climate Change Agreements, Climate disclosures, Streamlined Energy & Carbon Reporting, and the GHG Protocol. Nicola has supported companies across a range of industry sectors including manufacturing, infrastructure, food & drink, chemicals, pharmaceuticals, data centres, cold storage, distribution, and private equity. Nicola also helps organisations with the calculation and reporting of their greenhouse gas emissions, assessment of climate risks and opportunities to their business, and works with them to set targets and understand the strategies and opportunities to reduce their footprints and progress towards Net Zero. Nicola holds a first-class honours BSc in Geography, an MSc in Environmental Management and Sustainable Development and is a Full member and Chartered Environmentalist of the Institute of Environmental Management and Assessment.
- 9.11 This chapter has been prepared by Luke Moseley BSc, PG Cert. Luke is an Associate Consultant in SLR's Carbon & Energy Management team within the ESG Strategic Advisory technical discipline. Luke has 5 years professional experience and has been responsible for the delivery and Project Management of Scope 1, 2 and 3 greenhouse gas emissions and energy calculations, with the creation of GHG inventories across a variety of projects and clients. Luke has 3 years' experience in emission monitoring across a variety of industrial sites, including energy from biomass such as the Holbrook biomass plant in Sheffield UK. Luke's academic research for his MSc has a focus on biogenic and land-related emissions, with a specialism in legislation and guidance to support companies in this area. Luke holds a BSc in Environmental Science, a PG Cert in Environmental Management and is a member of the Institute of Environmental Management and Assessment.

Limitations / Difficulties Encountered

- 9.12 This assessment is compiled based on published regional and local data, guidance documents.
- 9.13 It was necessary to make several assumptions when carrying out the GHG assessment, although assumptions made sought to reflect a realistic worst-case scenario.

Relevant Terminology

Greenhouse Gas Emissions

- 9.14 Carbon Dioxide (CO₂) along with other gases such as Nitrous Oxide (N₂O) and Methane (CH₄) absorb and trap infrared radiation, creating a 'greenhouse' effect. Collectively these gases are known as greenhouse gases (GHG) and emissions are commonly expressed as the standardised unit of CO₂ equivalent (CO₂e). CO₂e is calculated by converting the volume of other gases into the equivalent amount of CO₂ with the same global warming potential to allow easier comparison. These GHGs contribute to rising global temperatures.
- 9.15 Direct emissions (Scope 1) are from sources that are owned or operated by the organisation. These include emissions from the combustion of natural gas and other fuels in boilers, generators, vehicles etc.
- 9.16 There are two types of indirect emissions. The first are Scope 2 from the indirect emissions related to the generation of purchased electricity, steam, heat or cooling.
- 9.17 The second type of indirect emissions are Scope 3 emissions. These occur because of the organisations business activities but are not linked to emissions sources owned or operated by the organisation. They can occur upstream or downstream of the operations of the company, in the supply or value chain. Examples include transportation of goods by third party vehicles, extraction of raw materials, manufacturing of purchased goods, employee commuting, procured services and use of sold products.

Biogenic Emissions

- 9.18 Biogenic emissions occur from land based natural sources. These are often in the form of CO₂ and based on the carbon stocks stored within biomatter and soils during the lifetime of a living organism.
- 9.19 When biomatter is sustainably managed, the original CO₂ removals from the atmosphere during growing/photosynthesis are generally equal to the CO₂ emitted from harvesting or during the degradation process. All CO₂ emissions and removals from harvesting of biomatter is accounted for under the Agriculture, Forestry and Land Use (AFOLU) sector. If biomatter is used for biofuels, the CO₂ aspect is accounted as 0 to avoid double accounting of emissions.
- 9.20 Some biogenic emissions are in the form of CH₄ or N₂O, such as the manure and urine management of livestock. These have more significant impacts on the environment and are not recaptured by sequestration into the carbon pools. Better management of manure can lead to reduction in potential methane emissions.

Legislative Framework / Policy Context

Legislation Context

- 9.21 The following legislation is relevant to the Proposed Development:
- Kyoto Protocol (1997)¹

¹ United Nations (1997) Kyoto Protocol to the United Nations Framework Convention on Climate Change Available at: [Kyoto Protocol to the United Nations Framework Convention on Climate Change. | UNFCCC](#) Accessed: November 2024

- Paris Agreement (2015)²
- EU Emissions Trading Scheme³
- Renewable Energy Directive (including amendments and revisions)⁴
- EIA Directive 2014/52/EU⁵
- Carbon Border Adjustment Mechanism⁶
- Corporate Sustainability Reporting Directive⁷

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Planning Policy Context

National

9.22 The following planning policy is relevant to the Proposed Development:

- National Adaption Framework⁸
- Sectoral Planning Guidelines for Climate Change Adaption⁹
- Climate Action Plan¹⁰

Regional

9.23 The following planning policy is relevant to the Proposed Development:

- Regional Spatial & Economic Strategy for the Southern Region¹¹
- Strategic Environmental Assessment Statement¹²

Local

9.24 The following planning policy is relevant to the Proposed Development:

- Tipperary County Council Local Authority Action Plan¹³

Guidance

9.25 The following guidance is relevant to the Proposed Development:

² United Nations (2015) Paris Agreement Available at: [ADOPTION OF THE PARIS AGREEMENT - Paris Agreement text English](#) Accessed: November 2024

³ European Union (2003) Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a system for greenhouse gas emission allowance trading within the Union and amending council Directive 96/61/EC Accessed: November 2024

⁴ European Union (2023) Renewable Energy Directive Available at: [Renewable Energy Directive](#) Accessed: November 2024

⁵ European Union (2014) Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment Accessed: November 2024

⁶ European Union (2023) Regulation 2023/956 of the European Parliament and of the Council of 10 May 2023 establishing a carbon border adjustment mechanism Accessed: November 2024

⁷ European Union (2022) Directive 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting Accessed: November 2024

⁸ DECC, (2024) National Adaption Framework Available at: [gov.ie - National Adaptation Framework \(NAF\)](#) Accessed: October 2024

⁹ DECC (2024) Sectoral Planning Guidelines for Climate Change Adaption Available at: [gov.ie - Sectoral Planning Guidelines for Climate Change Adaption](#) Accessed: October 2024

¹⁰ DECC (2024) Climate Action Plan 2024 Available at: [gov.ie - Climate Action Plan 2024](#) Accessed: October 2024

¹¹ Southern Regional Assembly (2020) Strategic Environmental Assessment Statement Available at: [Southern Regional Assembly](#) Accessed: October 2024

¹² Southern Regional Assembly (2021) Regional Spatial & Economic Strategy for the Southern Region Available at: [Southern Regional Assembly](#) Accessed: October 2024

¹³ Tipperary County Council (2024) Tipperary County Council Climate Action Plan Available at: [Tipperary County Council Climate Action Plan | Tipperary County Council](#) Accessed: October 2024

- Institute of Environmental Management and Assessment (IEMA) Guidance on Assessing Greenhouse Gas Emissions and Evaluating their Significance (2022)¹⁴;
- The Greenhouse Gas Protocol Corporate Accounting and Reporting Standard (GHG Protocol) (2021)¹⁵;
- Publicly Available Standard (PAS) 2080:2016 – Carbon Management in Infrastructure¹⁶;
- Royal Institution of Chartered Surveyors (RICS): Whole Life Carbon Assessment for the Built Environment, 2nd edition (2023)¹⁷;
- Guidance on Integrating Climate Change and Biodiversity into EIA¹⁸
- European Commission (2016) Climate Change and Major Projects¹⁹
- Sector Planning Guidelines for Climate Change Adaption²⁰

Receiving Environment

Study Area

9.26 The site is situated at the existing Killough quarry facility in Gaile townland, Holycross, Co. Tipperary.

Carbon Budgets

9.27 The current carbon budgets have been approved by the government and adopted by both houses of the Oireachtas. A carbon budget represents the total amount of emissions, measured in tonnes of CO₂ equivalent, that may be emitted by a country during a specific time period. The carbon budget programme comprises of three five-year periods from 2021-2035.

9.28 The carbon budget for Ireland are as follows:

- 2021-2025 295 MtCO₂e
- 2026-2030 200 MtCO₂e
- 2031-2035 151 MtCO₂e

9.29 Following the approval of the carbon budgets, the government has agreed on sectoral emission budgets that refer to the total amount of permitted greenhouse gas emissions that each sector of the economy can produce during a specific time period.

9.30 The carbon budget for the industrial sector are as follows:

- 2021-2025 30 MtCO₂e
- 2026-2030 24 MtCO₂e

¹⁴ IEMA, (2022). Assessing Greenhouse Gas Emissions and Evaluating their Significance. 2nd Edition

¹⁵ World Resources Institute, World Business Council for Sustainable Development, (2001). The Greenhouse Gas Protocol, A Corporate Accounting and Reporting Standard. World Resource Institute, Revised Edition.

¹⁶ Various, (2016). Publicly Available Standard (PAS) 2080 Carbon Management in Infrastructure. BSI.

¹⁷ RICS (2023). Whole Life Carbon Assessment for the built Environment. 2nd edition. Available at: [Whole life carbon assessment \(WLCA\) for the built environment](#) Accessed: December 2023

¹⁸ European Commission (2013) Directorate-General for Environment, *Guidance on integrating climate change and biodiversity into environmental impact assessment*, Publications Office, Available at: <https://data.europa.eu/doi/10.2779/11735> Accessed: November 2024

¹⁹ European Commission (2016) Climate Change and Major Projects Available at: [major projects_en.pdf](#) Accessed: November 2024

²⁰ DECC (2024) Sectoral Planning Guidelines for Climate Change Adaption Available at: [gov.ie - Sectoral Planning Guidelines for Climate Change Adaption](#) Accessed: November 2024

Part A: Greenhouse Gas Assessment

Assessment Methodology

Study Area and Scope

- 9.31 The primary GHG of concern with respect to this development is CO₂ which is emitted from combustion sources. Other GHGs contribute to climate change and are accounted for based on their Global Warming Potential (GWP). The combined effect of these gases will be presented as CO₂e this will account for all GHGs included in the United Nations Framework Convention on Climate Change's (UNFCCC) Kyoto Protocol specifically: CO₂, CH₄, N₂O, Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs) Sulphur Hexafluoride (SF₆), and Nitrogen Trifluoride (NF₃).
- 9.32 The scope of the assessment was defined by:
- Geographic scope;
 - Temporal scope;
 - Activities contributing to GHG emissions.

Geographic Scope

- 9.33 Climate change is a global environmental effect and as such the study area for the assessment is not limited by a specific geographical scope or defined by specific sensitive receptors.
- 9.34 The geographic scope was determined by identifying emission sources associated with the Proposed Development in respect of which the applicant has the ability to influence or control, in line with IEMA guidance²¹.

Temporal Scope

- 9.35 The temporal scope was consistent with assessing the Whole Lifecycle (WLCA) GHG emissions from the Proposed Development in line with the Royal Institution of Chartered Surveyors (RICS) WLCA for the Built Environment guidance²².
- 9.36 The construction, operational and end-of-life phases of the Proposed Development were considered as follows:
- **Construction Phase:** Direct and indirect GHG emissions from the Proposed Development over the construction period. The construction period is assumed to start in 2025 with the construction period expected to be 18 months. Daily or annual emissions estimations have been extrapolated over an 18 month period. The modelling of related activities and associated emissions utilises the most up to date emission factors at the time of assessment.
 - **Operational Phase:** Direct and indirect GHG emissions from the operation of the Proposed Development are assumed to start from 2027. This will be used as the assessment year. GHG emissions in the assessment year are worst case as they represent the highest annual GHG emissions for the Proposed Development over its

²¹ IEMA, (2022). Assessing Greenhouse Gas Emissions and Evaluating their Significance. 2nd Edition

²² RICS (2023). Whole Life Carbon Assessment for the Built Environment. 2nd edition. Available at: [Whole life carbon assessment \(WLCA\) for the built environment](#) Accessed: December 2023

lifetime. This is due to the economy decarbonizing over time consistent with meeting the country's climate change target to be net zero by 2050.

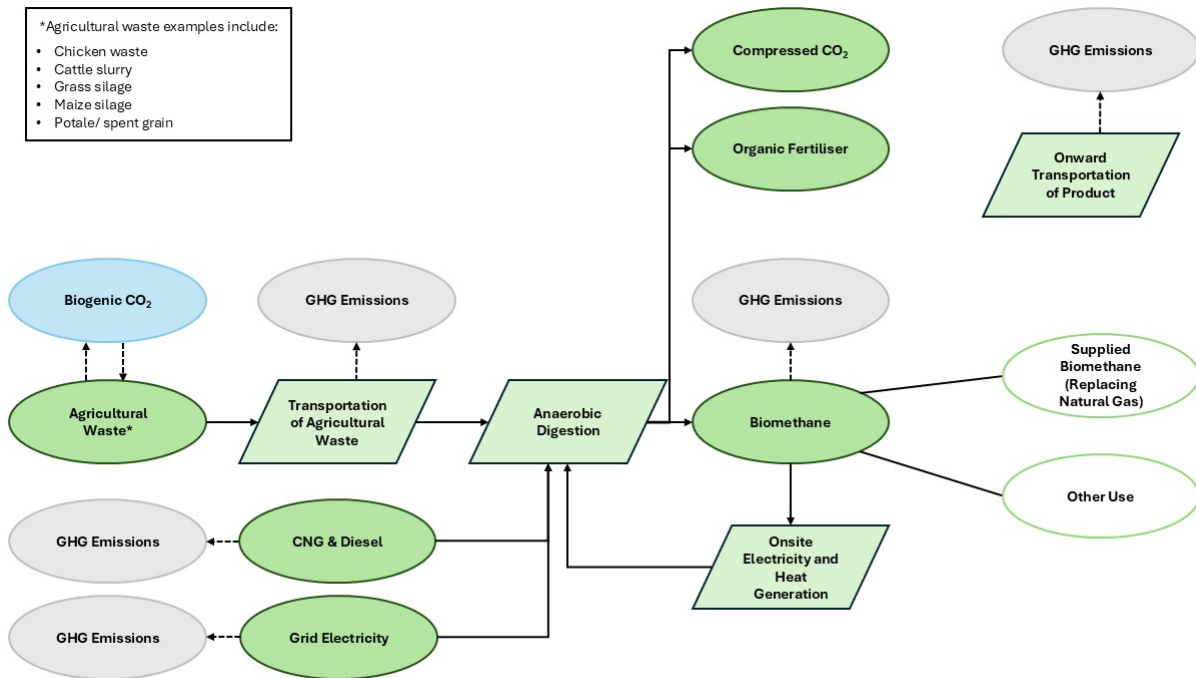
- **Decommissioning Phase:** Direct and indirect GHG emissions from the decommissioning of the Proposed Development at the end of its life including demolition of buildings, transport of waste, processing of waste and disposal. The modelling utilises the most up to date emission factors at the time of assessment.

9.37 The whole life cycle emissions are considered from the commencement of construction phase to the demolition phase over an assessment timespan of 25-years.

Activities Contributing to GHG Emissions

9.38 **Figure 9-1** below shows the inputs, outputs and emissions involved with the Proposed Development.

Figure 9-1: Operational Flow Diagram of The Proposed Development



9.39 Table 9-1 details activities included in the whole life cycle assessment covering demolition and construction, operational and end of life phases of the Proposed Development. It is consistent with the life cycle stages adopted by RICS.

Table 9-1: GHG Activities Included in Assessment

Development Phase	RICS Stage Identifier	Stage Name and Scope	Description
Construction Phase	A1 – A3	Product Stage	Raw materials used to construct the Proposed Development to completion and operation.
	A4	Material Transport to Site	Transportation of goods to site.
	A5	Construction Installation Process	Machinery/process used in construction. This also includes emissions from demolition of existing buildings.
Operational Phase	B1	In Use Emissions	Emissions arising during the life of the building from its components – such as the emissions from HFCs which can leech from air conditioning units over time.
	B2	Maintenance, Cleaning, and Associated works	Emissions associated with energy and product for maintenance
	B3	Repair Emissions	Reasonable allowance for repairing unpredictable damage over and above the standard maintenance regime
	B4	Replacement Emissions	Emissions associated with the replacement of items within the Proposed Development, in accordance with the standard expected lifespan.
	B6	Operational Energy Use	Emissions associated with the operation of the Proposed Development through the operations of its technical systems over the lifetime.
	B7	Operational Water Use	Emissions associated with the water use during the operation of the Proposed Development over its lifetime
	B8	User Carbon	Activities not included elsewhere. For example, emissions from vehicle use
Decommissioning	C1	Deconstruction and Demolition	Emissions covered by all site activity required to dismantle, deconstruct and/or demolish the built asset
	C2	Transport	Transport emissions associated with the discarded items from site.
	C3	Waste Processing for Reuse, Recovery or Recycling	Processing emissions for waste arising from the demolition of the site when processing for recycling, reuse, or recovery
	C4	Disposal	Emissions associated with the disposal of materials which are not being recycled and are disposed of.

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- 9.40 IEMA guidance suggests a small number of minor activities can be scoped out of the assessment if activities individually make up less than 1% and in total equal less than 5% of the lifecycle emissions of the Proposed Development.
- 9.41 There were no activities scoped out of the assessment.

Baseline Conditions

- 9.42 Baseline conditions were established by assessing the 'do-nothing' scenario. The do-nothing scenario assumes without the Proposed Development biofuels will not be produced. This will lead to a continued use of natural gas within the national gas grid. It is also assumed the development will support replacement of diesel engine vehicles to those with suitable for use with bio-CNG. In the do-nothing scenario it assumes diesel will continue to be consumed. The calculations include the GHG emissions from these sources.
- 9.43 The do-nothing scenario has emissions related to the current transportation and distribution of feedstock required by the Proposed Development. However, this has not been estimated in this assessment as emissions cannot be reasonably determined. This approach establishes a worst-case comparison.
- 9.44 To establish a worst-case assessment, embodied GHG emissions in materials present in the baseline are ignored even if those materials are reused/recycled by the Proposed Development. Water consumption used in the baseline is zero due to no current water use in the Proposed Development site.

Decarbonisation

- 9.45 Where applicable, projections to account for energy decarbonisation and future activity has been considered. The most conservative decarbonisation scenarios published by central governments or relevant designated bodies²³ were used.
- 9.46 The decarbonisation of emissions associated with natural gas and diesel has not been calculated. This is due to the uncertainty with the level of decarbonisation due to the potential future addition of biofuels into the national grid and forecourt fuel blends.
- 9.47 Bio-CNG can be used as an alternative fuel for vehicles currently using diesel as a lower carbon alternative. The Proposed Development will create essential fuels for decarbonisation of the transportation sector. Forecourt fuels will be decarbonised as more biofuels are included into the blend, however there are currently no accurate projections of what this blend may be in the future.
- 9.48 It is also reasonable to assume the biomethane will be used to displace fossil fuel fraction within the national gas grid thus lowering the overall emissions of the grid.
- 9.49 Decarbonisation of upstream emissions associated with energy production, distribution and storage have also been included following the guidance from RICS Appendix G.
- 9.50 Materials have been decarbonised in the model in line with the guidance of RICS. These have been presented side by side with projections for non-decarbonised emissions.

Baseline & Future GHG Emissions from Energy Use

- 9.51 The current baseline of the Proposed Development site for energy GHG emissions are zero. However, to estimate a reasonable comparison of the Proposed Development a calculation of the 'avoided-emissions' have been made. The calculation of avoided emissions assumes

²³ Environmental Protection Agency (2024) Ireland's Greenhouse Gas Emissions Projections 2023-2050 Available at: [Ireland's Greenhouse Gas Emissions Projections 2023-2050 | Environmental Protection Agency](#) Accessed: November 2024

the biomethane displaces emissions which would have occurred without the Proposed Development. In this scenario it is the emissions from natural gas and diesel.

- 9.52 The baseline GHG emissions considers the emissions from the upstream production and use of natural gas and diesel that has been derived from conventional sources. These fuels will continue to be used if not replaced with alternative fuel sources such as the biomethane generated from the Proposed Development.
- 9.53 Displaced fossil fuel energy has been calculated based on the expected biomethane production volumes and its expected destination streams and end-use.
- 9.54 All energy values have been multiplied by UK Government emission factors (2024)²⁴ or the Sustainable Energy Authority of Ireland (SEAI) 2024 emissions factors²⁵. Emission factors published by SEAI do not currently provide factors for CH₄ and N₂O and only include CO₂.

Baseline & Future GHG Emissions from Transportation

- 9.55 The baseline transport movements have not been calculated. This is due to the unknown destination and use of current agricultural wastes that will be used as feedstocks for the Proposed Development. The emissions for baseline transportation are thus 0 tCO_{2e}, concluding a worst-case comparison to the Proposed Development.

Whole Life Cycle Assessment

- 9.56 This section sets out the life cycle phases that have been considered when calculating the potential impact of the Proposed Development.
- 9.57 The net change in GHG emissions from the Proposed Development were calculated by a comparison of the avoided emissions from the baseline and future baseline. It is presented over the whole life of the Proposed Development.
- 9.58 The assessment presents the GHG mitigation being proposed, which follows the principles of the GHG management hierarchy (avoid, reduce, off-set) to minimise, as far as reasonably practicable, the anticipated GHG emissions over the Proposed Development's lifecycle.

Construction Phase

- 9.59 The GHG emissions from the construction phase (stage A1 to A5 covering demolition, construction materials, traffic, equipment, and waste materials) were calculated using the WLCA software OneClick LCA. The assessment considered all the upstream and downstream processes and transport flows needed to construct the Proposed Development.

Operational Phase

- 9.60 The GHG emissions from the operational phase (stage B1 to B8 covering in-use and operational energy and water) were calculated using the WLCA software OneClick LCA. The assessment considered all the upstream and downstream processes and transport flows needed to construct the Proposed Development. The assessment considered all the upstream and downstream processes and transport flows needed to operate the Proposed Development until the end of life (25 year timespan).
- 9.61 The assessment only includes an assessment of the emissions related to the use of sold biomethane products.

²⁴ UK Government (2024) Greenhouse Gas Reporting: Conversion Factors Available at: [Greenhouse gas reporting: conversion factors 2024 - GOV.UK](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/123456/greenhouse_gas_reporting_conversion_factors_2024.pdf) Accessed: November 2024

²⁵ Sustainable Energy Authority of Ireland (2024) Conversion Factors Available at: [Conversion Factors | SEAI Statistics | SEAI](https://www.seai.ie/Statistics/Conversion-Factors) Accessed: November 2024

- 9.62 The assessment has not included emissions related to the downstream use of fertiliser and compressed CO₂ produced. It is expected that the fertiliser produced locally would reduce emissions from the use of synthetic fertilisers or imported fertilisers reducing carbon leakage.²⁶
- 9.63 The assessment of operational effects of the completed development adopted the following approaches:
- The Proposed Development's GHG emissions from operational transport in the assessment year were calculated using UK Government emission factors (2024). The emission are calculated using the transport mode, distance travelled and number of movements.
 - GHG emissions from operational energy consumption in the assessment year were based on expected maximum energy use for the Proposed Development. The whole life emissions from electricity were modelled using the Environment Protection Agency's (EPA) emission projections²⁷ to account for grid decarbonisation.

Decommissioning Phase

- 9.64 The GHG emissions from the decommissioning phase (stage C1 to C4 covering Demolition, Transport, Waste Processing and Disposal) were calculated using the WLCA software OneClick LCA. This stage considered all the upstream and downstream processes and transport flows needed to decommission the Proposed Development at the end of life.

Determining Likely Significant Effects and Effect Significance

- 9.65 The assessment considered the whole life GHG emissions of the Proposed Development. This included GHG emissions during the construction phase, operational phase, and decommissioning phase.
- 9.66 For GHG emissions there are no recognised significance criteria and thresholds that relate to the specific quantity of GHG emissions released.
- 9.67 The approach to classify and define likely significant effects relies on IEMA guidance and applies expert judgement on the significance of the Proposed Development's lifecycle GHG emissions considering their context, compliance with policy and mitigation measures.
- 9.68 The IEMA guidance defines five distinct levels of significance. The methodology has been explained further in **Appendix 9-B**.
- 9.69 IEMA also advises that:
- Major adverse, moderate adverse and beneficial effects should be considered significant in the context of EIA. Negligible and minor adverse are considered not significant.
 - In the case of large-scale developments, irrespective of the level of mitigation, if net GHG emissions exceed 5% of the country or devolved administration's carbon budget, then this is a level of change considered significant.
- 9.70 The assessment of significance is established as follows:

²⁶ European Commission (2023) Directorate-General for Taxation and Customs Union, *Carbon border adjustment mechanism – Information for importers of fertilisers*, Publications Office of the European Union, Available at: <https://data.europa.eu/doi/10.2778/667> Accessed: November 2024

²⁷ Environmental Protection Agency (2024) Ireland's Greenhouse Gas Emission Projections 2023-2050 Available at [Ireland's Greenhouse Gas Emissions Projections 2023-2050 | Environmental Protection Agency](https://www.epa.ie/publications-and-reports/air-quality-and-atmosphere/ireland-greenhouse-gas-emissions-projections-2023-2050) Accessed: October 2024

- **Establishing context of GHG Emissions:** context for decision making is provided by comparing the net change in the whole life GHG emissions resulting from the Proposed Development with local, regional, and national GHG emission totals and carbon budgets.
- **Determining Significance of Effects:** Significance of effects established through applying the criteria detailed in **Appendix 9-B** based on professional judgement. This considers the consistency of the Proposed Development with national targets to meet net zero targets, and the robustness, timeliness and efficacy of mitigation measures proposed to avoid, reduce and compensate GHG emissions.

Cumulative Effects

- 9.71 Climate change is a large, interrelated, and cumulative environmental effect and emission impacts have resulting effects that are on a global scale.
- 9.72 In terms of this assessment the following are relevant:
- The assessment considers the effects of the Proposed Development in the context of national and local cumulative totals. The national totals assume that other developments also contribute to GHGs and will consider their significance.
 - The geographical location of emissions has no relevance to the assessment. Therefore, the effects of the Proposed Development are independent of any local cumulative emissions.
- 9.73 In line with IEMA Guidance an assessment of the GHG emissions associated with cumulative developments was not undertaken. This is because the impact of Greenhouse Gases are global, rather than regional or local therefore an assessment of cumulative developments and their associated impact is not necessary.

Receptor Sensitivity

- 9.74 The assessment of the impact on climate change only identifies a single receptor of atmospheric concentration of GHGs. This is because all global cumulative GHG sources are relevant to the effect on climate change. The sensitivity is categorised as **high** sensitivity in line with IEMA guidance.

Baseline & Future Conditions

Baseline GHG Emissions from Energy

- 9.75 Baseline GHG emissions for the site's energy usage are summarised in **Table 9-2**. The current baseline emissions or 'do nothing' scenario does not consume energy. To provide a meaningful comparison, an investigation of the potential avoided emissions has been conducted. This includes an assessment of the emissions associated with the displaced fuels (emissions from fuels that have been replaced by instead using the generated biomethane).
- 9.76 Baseline GHG emissions from energy have been calculated using SEAI 2024. The indirect emissions associated with production of fossil fuels have been calculated using UK Gov Conversion Factors 2024.
- 9.77 Energy values were derived from the Proposed Development's estimated fuel output. Total estimated biomethane production is 133,079,119 kWh. 20,000,000 kWh will be used for the generation of electricity in an on-site CHP as a worst case scenario it has been assumed this energy will be used as a parasitic load by the Proposed Development for the generation of Biomethane. 70,000,000 kWh will be distributed off site and assumed to replace natural gas

and 43,079,119 kWh has been assumed to be used for other applications of compressed biomethane. These assumptions were the basis of our calculations for avoided emissions. **Table 9-2** summarises the emissions:

Table 9-2: Energy Baseline GHG Emissions (Annual)

Fuel Output	Assumed Displaced Fuel Source	Energy (kWh)	Direct and Indirect Emissions (tCO ₂ e)
Distributed Off-site	Natural Gas	70,000,000	14,993
Compressed Biomethane	Diesel	43,079,119	12,889
Total		113,079,119	27,882

9.78 **Table 9-2** shows that the baseline GHG emissions from direct and upstream energy used is equal to 27,882 tCO₂e over a 12-month period.

Baseline Future Emissions Projection

- 9.79 Future emissions of the baseline were modelled assuming energy continues to be used as it does currently should the Proposed Development not occur. This activity includes emissions from natural gas and diesel.
- 9.80 The decarbonisation of emissions associated with fossil fuels such as natural gas and diesel, have not been modelled over the life of the project. As explained in sections 9.46 to 9.48.
- 9.81 **Table 9-3** shows the future baseline GHG by year to 2053 from energy, and details the underlying activity and emissions data that were used to calculate the GHG emissions:

Table 9-3: Baseline Future GHG Emissions from Energy Consumption by Year to 2053

Year	tCO ₂ e per Annum
2027	27,882
2028	27,882
2029	27,882
2030	27,882
2031	27,882
2032	27,882
2033	27,882
2034	27,882
2035	27,882
2036	27,882
2037	27,882
2038	27,882
2039	27,882
2040	27,882
2041	27,882
2042	27,882

Year	tCO ₂ e per Annum
2043	27,882
2044	27,882
2045	27,882
2046	27,882
2047	27,882
2048	27,882
2049	27,882
2050	27,882
2051	27,882
2052	27,882
2053	27,882
Total Lifetime	697,042

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Development Design and Management

Completed Development

9.82 The Proposed Development has been designed using best available techniques. This seeks to maximise biomethane output whilst limiting the requirement for fossil fuels and consumption of grid electricity with the use of onsite self-generated electricity. The design will accord with Best Available Technology (BAT) regulations and will apply the Circular Economy Action Programme (CEAP) recommendations.

Assessment of Effects

9.83 The climate change assessment considers the net GHG emissions resulting from the Proposed Development and is structured as follows:

- Quantification of the net GHG emissions from the Proposed Development over;
 - The construction phase.
 - The operational phase (Proposed Development Lifespan).
 - The decommissioning phase.
- Assessment of likely significant effects; and
- Assessment of residual effects.

Quantification of Construction Phase GHG Emissions

9.84 The GHG emissions from the construction phase have been calculated in the whole life cycle assessment. This includes cradle-to-gate emissions of construction materials, transportation of construction material and the transportation of construction workers. The estimated material usage for calculation of the construction phase includes:

- Structural Steel 1,300 tonnes;
- Sheeting Steel 260 tonnes;
- Fencing Steel 24 tonnes;

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- Tank Steel 760 tonnes;
- Equipment Steel 1,000 tonnes;
- Reinforcing Steel 1,640 tonnes;
- Buildings Concrete 12,000 tonnes;
- Tank Concrete 2,600 tonnes;
- Yard and Ponds Concrete 10,000 tonnes;
- Copper Cabling 16 tonnes;
- Copper in motors and generators 3 tonnes;
- Aluminium frame window 229 m²;
- Aluminium entrance door 67m²;
- Steel curtain rolling door 210 m²; and
- Solar panels 10565 m².

9.85 For construction material wastage, a worst-case scenario was used from default percentages available from RICS. The energy estimation from construction is based on the average construction for site activities assuming a size of 63,000 m².

9.86 For embodied emissions a worst-case LCA emissions factor has been used. For transportation of materials the concrete has been assumed to be provided by the existing quarry batching plant. Other materials used are assumed to be imported to the country from China then to the site from Dublin port. China was selected due to it being a manufacturer of these materials and represents a worst-case distance for freighting emissions.

9.87 The results have been summarised in **Table 9-4**.

Table 9-4: Construction Phase GHG Emissions

Source	Lifecycle Reference	tCO ₂ e
Construction Phase	A1 to A3	26,812
	A4	579
	A5	10,874
Construction Related Transport	N/A	377
Total		38,641

9.88 **Table 9-4** shows that the GHG emissions from over this phase are 38,641 tCO₂e.

Quantification of Operational Phase GHG Emissions

9.89 The net operational GHG emissions has been presented as non-decarbonised and decarbonised scenarios. The decarbonised scenario applies a projection of expected electricity grid emissions across the timespan of the assessment period.

9.90 The net operational GHG emissions from the Proposed Development are summarised in **Table 9-5**.

- 9.91 The refurbishments and repairs are based on data from the whole life cycle assessment. In this it has been assumed that windows will be replaced on a 15 year cycle and doors on a 30 year cycle. Solar panels have also been assumed to have a service life of 25 years.
- 9.92 Information on the travel of employees, feedstocks and visitors have been taken from the transport chapter (EIAR Chapter 14).
- 9.93 The energy-based emissions have been calculated based on the generation of 12,170,000 Nm³ of bio-methane production. The Proposed Development is expected to consume 55,000 litres of diesel, 90,000 kWh of CNG and 1,500,000 kWh of grid electricity.
- 9.94 In the calculation of B7 it has been assumed there is no third-party treatment of water as this will be generated during the AD process and treated for application on site.
- 9.95 The decarbonisation scenario has been calculated using the published emissions projection for public electricity and heat production from the Irish Environment Protection Agency. The projection expects a reduction in these emissions of 66% by 2050.

Table 9-5: Non-Decarbonised Operational Phase GHG Emissions

Source	Lifecycle Reference	Emissions Development Case (tCO ₂ e)	Emissions Baseline (tCO ₂ e)	Net Change (tCO ₂ e)
Use, Maintenance, Repair and Replacement	B1 to B5	47	0	+ 47
Operational Energy	B6	576	0	+ 576
Operational Water Use	B7	0	0	0
Use of Sold Product	N/A	43	27,882	- 27,839
Transport	N/A	1,973	0	+ 1,973
Total		2,626	27,882	- 25,243

- 9.96 **Table 9-5** shows that the net change of operational GHG emission in the first year of production for the Proposed Development are -25,243 tonnes CO₂e.
- 9.97 Biofuels emit CO₂ at time of combustion; however, this CO₂ has been sequestered during the lifecycle of the fuel and stored within the biomatter. For transparency, the estimated CO₂ emissions from the combustion of the anaerobically digested agricultural and animal organic matter used to produce the biomethane are 26,484 tCO₂ on an annual basis. However, these are classified as carbon neutral, and the net emissions are 0 tCO₂e when from sustainable sources.

9.98 Sustainable sourced organic biomass refers to materials such as forestry or agricultural residues harvested in a method that will maintain biodiversity and ensuring the renewal of biota equal to or greater than the consumptions so not to lead to land management or land use change emissions.

Table 9-6: Decarbonised Operational Phase GHG Emissions

Source	Lifecycle Reference	Emissions Development Case (tCO ₂ e)	Emissions no Development Case (tCO ₂ e)	Net Change (tCO ₂ e)
Use, Maintenance, Repair and Replacement	B1 to B5	26	0	+ 26
Operational Energy	B6	461	0	+ 461
Operational Water Use	B7	0	0	0
Use of Sold Product	N/A	43	27,882	- 27,839
Transport	N/A	1,973	0	+ 1,973
Total		2,490	27,882	- 25,392

9.99 **Biofuels emit CO₂** at time of combustion; however, this CO₂ has been sequestered during the lifecycle of the fuel and stored within the biomatter. For transparency, the estimated CO₂ emissions from the combustion of the anaerobically digested agricultural and animal organic matter used to produce the biomethane are 26,484 tCO₂ on an annual basis. However, these are classified as carbon neutral, and the net emissions are 0 tCO₂e when from sustainable sources.

9.100 Sustainable sourced organic biomass refers to materials such as forestry or agricultural residues harvested in a method that will maintain biodiversity and ensuring the renewal of biota equal to or greater than the consumptions so not to lead to land management or land use change emissions.

9.101 Table 9-6 shows that the net change of operational GHG emission in the first year of production for the Proposed Development when accounting for decarbonisation are -25,392 tonnes CO₂e.

Quantification of Decommissioning Phase GHG Emissions

9.102 The GHG emissions from the Decommissioning phase have been calculated in the whole life cycle assessment for the Proposed Development. The decommissioning has been calculated by using the material quantities provided for construction and assuming a do-nothing scenario in line with the RICs guidance.

9.103 The results have been summarised in **Table 9-7**.

Table 9-7: Decommissioning Phase GHG Emissions

Source	Lifecycle Reference	Non-Decarbonised (tCO ₂ e)	Decarbonised (tCO ₂ e)
Decommissioning Phase	C1 to C4	788	394

9.104 **Table 9-7** shows that the GHG emissions from the Proposed Development during this phase are 788 tCO₂e. These estimates are based on current day emission factors and are considered highly conservative due to the projected decarbonisation of the country's economy.

9.105 The decarbonised emissions estimated are 394 tCO₂e

Quantification of Whole Life GHG Emissions

9.106 Table 9-8 details the whole life net GHG emissions from the Proposed Development. The net GHG emissions are the difference between the GHG emissions without the Proposed Development and with the Proposed Development.

Table 9-8: Non-Decarbonised Net Whole Life GHG Emissions

Phase	Emissions Development Case (tCO ₂ e)	Emissions no Development Case (tCO ₂ e)	Net Increase (tCO ₂ e)
Construction	38,641	0	+ 38,641
Operational	65,958	697,042	- 372,143
Decommissioning	788	0	+ 788
Total	105,207	697,042	-591,835

9.107 **Table 9-8** shows that the net whole life GHG emissions from the Proposed Development is calculated as -591,835 tCO₂e. The most significant source of GHG emissions is from the construction phase however the operational phase presents significant avoided emissions.

Table 9-9: Decarbonised Net Whole Life GHG Emissions

Phase	Emissions Development Case (tCO ₂ e)	Emissions no Development Case (tCO ₂ e)	Net Increase (tCO ₂ e)
Construction	38,641	0	+ 38,641
Operational	59,905	697,042	- 378,196
Decommissioning	394	0	+ 394
Total	98,940	697,042	-598,102

9.108 **Table 9-9** shows that the net whole life GHG emissions from the Proposed Development when accounting for decarbonisation is calculated as -598,102 tCO₂e.

Assessment of Effects

9.109 The assessment of the significance has been informed through IEMA guidance detailed in **Appendix 9-B** and follows the process below.

Establishing Context

9.110 The GHG emissions are compared to national and local targets to establish context.

National

9.111 Ireland has legislated a 2050 net zero target following recommendations and analysis completed by the Climate Change Advisory Council (CCAC)²⁸. The analysis defines carbon budgets which create specific pathways to meet net zero.

9.112 Emissions budgets are currently available for the periods up to 2035. To analyse potential budgets for future periods these have been projected to 2050 assuming a linear reduction towards net zero.

9.113 **Table 9-10** summarises the net change in GHG emissions from the Proposed Development as a percentage of the relevant annual carbon budget.

Table 9-10: Net GHG Emissions from the Proposed Development as % of Carbon Budgets

Period	Budget Value (MtCO _{2e})	Average per Annum (MtCO _{2e})	Net Period Change in GHG due to development (MtCO _{2e})	Average Annual Change in GHG due to development (mtCO _{2e})	% of Annual Carbon Budget
2026-2030	200	40	-0.037	-0.007	-0.02%
2031-2035	151	30	-0.126	-0.025	-0.08%
2035-2040	113	23	-0.126	-0.025	-0.11%
2041-2045	76	15	-0.126	-0.025	-0.17%
2046-2050	38	7	-0.126	-0.025	-0.33%
2050 and beyond	0	0	-0.050	-0.006	

9.114 **Table 9-10** shows that the net change in GHG emissions (-591,831 tonnes) as a percentage of the carbon budgets. On an annual basis during production this is an average reduction of circa 25,000 tCO_{2e}. This leads to overall reduction in national emissions and therefore beneficially significant due to the support towards emission reduction goals.

Biomethane Target

9.115 The Irish government is committed to supporting delivery of up to 5.7TWh per annum of indigenously produced biomethane by 2030 (10% of natural gas demand)²⁹.

9.116 The Proposed Development is estimated to generate 0.133 TWh of biomethane, equivalent to 2.3% of the total biomethane target.

Determining Significance

9.117 Significance of effects is established through applying the criteria as detailed in **Appendix 9-B**. This requires judgments on:

- The consistency of the Proposed Development to meet national and local policies,

²⁸ CCAC (2024) "Climate Change Advisory Council Annual Review 2024" Available at: [CCAC-AR-2024-SfA-final.pdf](#) [Accessed December 2024]

²⁹ DECC & DAFM (2024) National Biomethane Strategy Available at: [gov.ie - National Biomethane Strategy](#) Accessed: November 2024

- The robustness, timeliness, and efficacy of mitigation to avoid, reduce and compensate GHG emissions

National

- 9.118 In terms of future emissions, the CCAC has established a “balanced net zero pathway” which considers feasible and cost-effective policy and technology interventions to ensure the country can meet its new net zero target.
- 9.119 The CCAC considers that 100% of power generation by 2050 will be low carbon and forecasts all ground transportation (apart from small number of HCVs) will be electrically powered.
- 9.120 It is therefore reasonable to assume that energy and transport emissions relating to the Proposed Development will be decarbonised consistent with the country’s net zero target.
- 9.121 The Proposed Development has adopted measures that are supportive of national policies to meet net zero.

Local

- 9.122 The Tipperary decarbonisation zone is the only inland rural zone in the country. The zone is focused on the bioeconomy and relates to the production of renewable biological resources and the conversion of these resources and waste streams into value added products such as food and bioenergy.

Mitigation Activities

Whole Life of the Proposed Development

- 9.123 Key mitigation measures adopted by the Proposed Development to minimise GHG emissions are inherent in the design and described in 9.82.

Summary of GHG Assessment

- 9.124 The assessment of significance has followed the process consistent with IEMA Guidance and is summarised in **Table 9-11**.

Table 9-11: Development Approach to Mitigation in Accordance with IEMA Mitigation Principles

Stage	Description	Applicable Rating	Is the Effect Significant?
Construction Phase	Release of direct and indirect GHG emissions during the construction phase	Minor Adverse	Not Significant
Operational Phase	Release of direct and indirect GHG emissions during the operational phase	Beneficial	Significant
Decommissioning Phase	Release of direct and indirect GHG emissions during the Decommissioning phase	Minor Adverse	Not Significant

- 9.125 Based on **Table 9-11** and with reference to IEMA’s significance criteria (see **Appendix 9-B**).

9.126 The assessment finds that the effects are minor adverse during the construction and decommissioning phases and not significant. However, are beneficial in the operational phase and are assessed as significant.

Residual Effects

9.127 The effects of the project are beneficial and suitable to meet the environmental related targets of the national frameworks.

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Part B: Resilience to Climate Change

Assessment Methodology

9.128 This part of the chapter provides a qualitative assessment of the embedded mitigation and resilience of the Proposed Development to climate change. The assessment methodology considers the recommendations in the IEMA EIA guide to Climate Change Resilience and Adaption³⁰.

Study Area and Scope

9.129 There are two areas to assessing climate change resilience issues within EIA, which need separate treatment:

- The risks of changes in the climate to the project (i.e., the resilience or vulnerability of a project to future climate changes). A climate risk assessment has been carried out to establish likely significant effects resulting from climate change on the Proposed Development.
- The extent to which climate exacerbates the effects of the Proposed Development on the environment. This has been analysed in line with IEMA Guidance. The effects of the Proposed Development on various environmental receptors have been assessed, then these effects have been re-assessed considering climate change.

Geographical Scope

9.130 The study area for climate resilience focuses on the impact that the climate will have on the Proposed Development. The study area is therefore the footprint of the Proposed Development split into its receptors.

Temporal Scope

9.131 As the permission for the Proposed Development is open ended the climate projections from Met Éireann for the 2041-2060s³¹ have been used (Representative Concentration Pathway (RCP) 8.5 – high emissions scenario). This is the latest time horizon for which Met Éireann Projections are available.

Establishing Baseline Conditions

9.132 The assessment for the Proposed Development's resilience to the impacts of climate change was informed by regional scale information on historic and projected change in climate variables, and other studies undertaken relevant to the Proposed Development.

9.133 The future conditions were defined by potential climate risks identified in the Ireland's Climate Change Assessment³², National Adaption Framework³³, and the Climate Projections 2020 by the Met Éireann.

³⁰ IEMA, (2020). Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation

³¹ Met Éireann (2020) New Climate Projections 2020 Available at: [New Climate Projections 2020 - Met Éireann - The Irish Meteorological Service](#)

Accessed: October 2024

³² Environment Protection Agency, (2024) Ireland's Climate Change Assessment available at: [Ireland's Climate Change Assessment \(ICCA\) | Environmental Protection Agency](#) accessed: October 2024

³³ Department for Environment, Climate and Communications (DECC), (2024). The National Adaption Framework (NAF). Available at: [gov.ie - National Adaptation Framework \(NAF\)](#) accessed: October 2024

Identifying Likely Significant Effects

- 9.134 The focus of this assessment is the future when it is anticipated that changes from the existing climate will occur. These may pose risks in relation to the operational functions of the Proposed Development and its users. This component of the assessment does not explicitly consider climate risks during the demolition and construction period as these will not be subject to additional climate change effects.
- 9.135 Mitigation to climate change is a function of the design which will anticipate future risks and build in appropriate adaption measures as required.
- 9.136 The assessment starts by establishing potential receptors, and climate risks whilst considering the significance of that risk in an assessment of likelihood and consequence accounting for embedded design measures.
- 9.137 The assessment identifies additional mitigation as required to address any significant effects and concludes on the residual risks.
- 9.138 The assessment follows IEMA guidance outlined in **Appendix 9-C**.

Assumptions and Limitations

- 9.139 This assessment provides a broad indication of the potential impacts of climate change on the Proposed Development based on a qualitative assessment and professional judgement. The Met Éireann projections are the most up-to-date projections of climate change for Ireland.
- 9.140 The New Climate Projections 2020 provides probabilistic projections of future climate for a range of emissions scenarios. Future GHGs emissions, and resulting pathway are uncertain. A precautionary approach, consistent with IEMA Guidance has therefore been adopted by selecting a high emissions scenario (RCP8.5) and long-term time slice (2060s) which offer the longest-term and worst-case projections into the project timescale.
- 9.141 The determination of significance has been undertaken under the assumption that industry design standards will be adhered to where detailed design information is unavailable.

Baseline Conditions

- 9.142 **Table 9-12** sets out the current understanding of climate hazards within the Proposed Development, based on the assessments carried out within the Planning system and Flood Risk Management Guidelines for Planning Authorities by the Department of Housing Government and Heritage³⁴, Ireland's Climate Averages (1991-2020) Summary Report³⁵, and Water Risk Atlas by the World Resource Institute (WRI)³⁶.

Table 9-12: Qualitative Description of Likelihood

Climate Hazard	Current Baseline
Extreme Rainfall and Flood Risk	The observed number of mean annual wet days (precipitation >20mm) and very wet days (precipitation >30mm) averaged over the 20-year period 1981–2000 was 5 and 3 respectively.

³⁴ Department of Housing, Local Government and Heritage (2020) available at: [gov.ie - The Planning System and Flood Risk Management - Guidelines for Planning Authorities \(Nov 09\)](http://gov.ie - The Planning System and Flood Risk Management - Guidelines for Planning Authorities (Nov 09)) accessed: October 2024

³⁵ Department of Housing, Local Government and Heritage (2023) available at: https://www.met.ie/cms/assets/uploads/2023/09/Irelands-Climate-Averages_1991-2020.pdf accessed: October 2024

³⁶ World Resource Institute (WRI) Aqueduct available at: <https://www.wri.org/aqueduct> accessed: October 2024

Climate Hazard	Current Baseline
	<p>Following the conclusions and recommendations of the water chapter there is currently a low risk of fluvial flooding. There are also no records of historic flooding.</p> <p>The WRI Water Risk Atlas currently classes the Proposed Development site as medium risk of drought</p> <p>The key findings of the EPA's Ireland Climate Change Assessment 2024 indicates that there has been an increase in heavy precipitation extremes across Ireland, when aggregated, across a range of indicators, in the period 1991–2020, compared to the 30-year period 1961–1990. Changes averaged across the island of Ireland show a slight increase of less than 10% in annual mean accumulated precipitation amounts but with large uncertainty.</p>
Frost Days and Ice Days	<p>The observed mean annual number of frost days and ice days over the period 1981-2000 (data from Walsh, 2012) were:</p> <ul style="list-style-type: none"> • Frost days – 60 • Ice days – 1.5
Extreme Temperatures and Urban Heat Effect	<p>The Proposed Development is not in a region expected to be impacted by the urban heat island effect as the surrounding areas are rural which will allow waste heat to dissipate.</p> <p>Ireland's Climate Change Assessment 2024 recorded the annual average temperatures over Ireland are approximately 1°C higher than the early 20th century with 16 of the 20 warmest years occurring since 1990, with 2022 being the hottest year on record to date. Under Late action scenarios (SSP5-8.5), it is projected that the temperature increases could be 2.77°C [2.02–3.49°C] by the end of the century.</p> <p>The observed number of dry periods averaged over the 20-year period 1981–2000 annually, in autumn and in summer were 10, 2 and 3 respectively. Dry periods are defined as at least 5 consecutive days on which the daily precipitation is less than 1mm.</p> <p>The observed number of heatwaves over the period 1981-2000 was 6. Heatwaves are defined as Periods of more than 3 consecutive days exceeding the 99th percentile of the daily maximum temperature of the May-to-September season of the control period (1981–2000).</p> <p>The mean average maximum summer air temperature in the past 30 years is 18.6°C with the mean average maximum winter temperature of 8.5°C</p>
Wind	<p>The Ireland Climate Change Assessment 2024 indicates from observations and analysis that there is no clear evidence to date for climate change influencing the frequency or intensity of other types of extreme weather in the region. However, the Ireland Climate Change Assessment 2024 also recognizes that extreme wind is a key risk for energy infrastructure given the potential impact on the electricity distribution network supply in Ireland.</p>

Future Baseline

- 9.143 For the future baseline the New Climate Projections 2020 (50th percentile, where applicable) for high emissions scenario (RCP8.5) are presented for 2041-2060, when compared to the past period, 1981- 2000.
- 9.144 The Climate Variables included in Table 9.13 include those that impact the Proposed Development, either directly or indirectly, including the operation of the facility and potential impact on feedstocks.

- 9.145 Approximate values have been taken from the map data available within the New Climate Projection reports for the high emissions scenario as a 'worst-case' estimate. These are summarised in **Table 9-13**.
- 9.146 The impacts of the future baseline conditions on the Proposed Development have been explained in sections 9.157 to 9.163. These have considered the potential receptors likely to be impacted by extreme weather events and future changes to the local climate.

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Table 9-13: Climate Projections for Tipperary using the New Climate Projections 2020 – RCP8.5 (2041-2060) 50th percentile, where appropriate.

Climate Variable ^a	Description	Projection 2040/60s	Baseline Data 1981-2000
Mean Annual Temperature	Ensemble mean of projections at 2m above the surface temperature change	+1.5°C	9°C mean annual temperature
Mean Winter Temperature	Mid-century seasonal projection of mean temperature change 2m above the surface	+1.7°C	-
Mean Summer Temperature	Mid-century seasonal projection of mean temperature change 2m above the surface	+1.6°C	-
Number of heatwaves	Periods of more than 3 consecutive days exceeding the 99th percentile of the daily maximum temperature of the May-to-September season of the control period (1981–2000)	10	-
Number of frost days	Days when the minimum temperature is <0°C	-50%	50 frost days
Number of ice days	Days when the maximum temperature is <0°C	-61%	1 Ice day
Snowfall	Annual change (%) in snowfall	-60%	-
Length of growing season	The number of days between the first occurrence of at least 6 consecutive days with a daily mean temperature >5°C and the first occurrence of at least 6 consecutive days with a daily mean temperature <5°C. (The temperatures are derived from daily mean temperature data provided by Walsh, 2012 ³⁷)	+15%	295 days
Start of the growing season	The first occurrence of at least 6 consecutive days with a daily mean temperature >5°C. (The temperatures are derived from daily mean temperature data provided by Walsh, 2012)	25 days earlier	35 - mean start day of growing season (where

³⁷ Walsh, S. (2012) "A Summary of Climate Averages for Ireland 1981–2010". Climatological Note No14. Available at: <https://www.met.ie/climate-ireland/SummaryClimAvgs.pdf> Accessed: December 2024

Climate 9

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Climate Variable ^a	Description	Projection 2040/60s	Baseline Data 1981 -2000
			day 1 is 1 January, day 2 is 2 January, etc.
Length of the grazing season	Based solely on temperature and does not take into account the delay before sufficient plant cover is available to support grazing animals or the ability of animals and machinery to pass over land.	+48 days	-
Growing Degree Days base temperature for Maize, rice, corn and tomato	The number of days required for the growth and development of specific bio-organisms based on temperature and the daily accumulation of heat.	+60%	Base Temperature 10°C
Growing Degree Days for pest based temperatures (Examples of pests provided)	The number of days required for the growth and development of specific bio-organisms based on temperature and the daily accumulation of heat.	Stalk borer +34% Corn rootworm +42% Lucerne weevil +50% Black cutworm, European corn borer and standard baseline for insect and mite pests of woody plants +66%	Base temperature Stalk borer 6°C Corn rootworm 7°C Lucerne weevil 9°C Black cutworm, European corn borer and standard baseline for insect and mite pests of woody plants 10°C
Mean Winter Precipitation	Seasonal change (%) in mean precipitation	0	-
Mean Summer Precipitation	Seasonal change (%) in mean precipitation	-6%	-
Number of wet days	Daily precipitation amount is greater than 20mm	+15%	7 days mean annual
Number of very wet days	Daily precipitation amount is greater than 30mm	+25%	2 days mean annual
Change in number of dry periods, annually	At least 5 consecutive days on which the daily precipitation is less than 1mm	+20%	10 Dry periods

Climate 9

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Climate Variable ^a	Description	Projection 2040/60s	Baseline Data 1981 -2000
Number of dry periods in summer	At least 5 consecutive days on which the daily precipitation is less than 1mm	+30%	3 Dry Periods
Number of dry periods in Autumn	At least 5 consecutive days on which the daily precipitation is less than 1mm	+30%	2 Dry Periods
Wind speeds at 10m above ground - Summer	Seasonal change (%) of wind speed at 10m above ground	-4%	-
Wind speeds at 10m above ground - Winter	Seasonal change (%) of wind speed at 10m above ground	-2%	-

^a change relative to 1981-2000 baseline

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Extreme Weather Events

- 9.147 Extreme weather events are considered for the Proposed Development comparing the future period, 2041-2060 with the past period 1981-2000 using the New Climate Projections 2020 – RCP8.5.
- Summer heatwaves are expected to occur more frequently, with the potential to experience 10 heat waves annually.
 - The frequencies of heavy precipitation events show notable increases in the autumn and winter months.
 - A likely increase of 15% in wet days
 - A likely increase of 25% in very wet days.
 - A likely increase in dry periods of 20%.
- 9.148 These projected changes to the climate in Ireland are translated into eight priority risk areas in Ireland's Climate Change Assessment:
- Risks to ecosystems including marine, terrestrial and freshwater habitats.
 - Risks to agriculture, forestry and land use change including heat stress and soil management
 - Risks to coastal environment including sea level rise and coastal erosion
 - Risks to water leading to decreases in water quality and a lack of resilience in water supplies with impacts likely across multiple sectors
 - Risks to the built environment, heritage and rural communities with increased flooding and amplified impacts of the urban heat island affect
 - Risks to critical infrastructure with damage costs expected to increase as soils become saturated and extreme wind speeds more prevalent.
 - Risks to health and wellbeing with a greater number of the population being exposed to heat stress and extreme weather.
 - Risks to business, industry and tourism climate change brings risks and costs to Ireland as a highly globalised country Ireland is vulnerable to shocks within supply chains and have not yet been sufficiently systematically assessed.

Precipitation

- 9.149 The figures show that there is large uncertainty in the projections, as demonstrated by a disagreement between the percentile projections. It is plausible that extreme precipitation related events could decrease in frequency but increase in intensity

Wind

- 9.150 MET Éireann projections, for the period 2041-2060, under a high emissions scenario (RCP8.5), show a 4% decrease in summer and a 2% decrease in winter wind speed, at 10m above the ground, relative to the 1981-2000 baseline.
- 9.151 Climate models such as Coupled Model Intercomparison Project (CMIP), a project of the World Climate Research Programme (WCRP) are essential to the Intergovernmental Panel on Climate Change (IPCC) and other international and national climate assessments, that

model changes to different climate variables, including wind, under different climate change scenarios into the future.

- 9.152 It is noted that there is low model agreement within CMIP5 and its successor CMIP6 climate models regarding wind speed projections for Northwest Europe and for Great Britain, making projections of this variable uncertain. While climate projections developed report close to 0 annual mean changes in surface wind temperatures, in global tropical storm modelling, some models indicate a decrease in frequency and many models project increases in intensities. Hence, with the uncertainty of wind projections, as well as consideration for non-uniform changes in wind speeds, it is plausible that extreme wind-related events could decrease in frequency but increase in intensity
- 9.153 Winds associated with major storm events can be some of the most damaging and disruptive events for Ireland with implications for property, power networks, road, rail and air transportation.

Assessment of Climate Resilience

- 9.154 The assessment has followed the process outlined in **Appendix 9-C** and detailed further below.

Relevant Local Policy Requirements

- 9.155 The Tipperary County Council Climate Action Plan is relevant to the assessment, this requires mitigation through supply of clean energy and adaptation through actions that manage and reduce the negative impacts of climate change.

Identification of Receptors

- 9.156 The key receptors identified are:
- Buildings: Structural stability and robustness
 - Buildings: Weather proofing and detailing
 - Buildings: Durability
 - Health and Safety of building occupiers, visitors and workforce
 - Building contents and business continuity
 - Landscaping and Biodiversity
 - Habitats and Biodiversity
 - Site Access and Infrastructure

Identification of Potential Impacts from Climate Change and Mitigation Activities

- 9.157 Several potential impacts were identified as well as confirming the designed measures to mitigate impacts considering policy requirements. These include:
- Change in temperatures, increased precipitation and wind speeds will potentially impact the buildings of the Proposed Development, in terms of structural stability and robustness, weather proofing and detailing and durability. In addition, these climate variables have the potential to impact energy supply from damaged energy infrastructure.
 - Significant impacts on biodiversity on land are projected. The increase in temperature, heatwaves, heavy precipitation, dry periods and drought along with the decrease in frost and ice days projections will have a substantial impact on agriculture. The growing

season, grazing and season and growing degree days are projected to increase so may have a positive effect on the supply chain for the Proposed Development. However, the decrease in frost and ice days will result in increasing pests, and droughts and increases in wet and very wet days, may result in a negative impact on the Proposed Development supply chain.

- Increasing precipitation can lead to increases in the prevalence of diseases in cattle and sheep. Increased temperatures and longer dry periods will increase the potential for animals to experience heat stress.
- Impacts on water supply, quality and resources may impact the Proposed Development from decreased precipitation due to warmer summers and increased heatwave events (drought).

9.158 The results are detailed in **Table 9-14**.

Table 9-14: Climate Risks and Mitigation

Receptor	Climate Variable	Impact No.	Potential Impact	Mitigation
Buildings	Overheating – due to warmer summers and more frequent severe weather events	1	Structural stability and robustness of Biomethane storage	The Proposed Development is to be developed using the best available techniques. This will minimize the impacts of increased temperatures on the AD plant and various auxiliary buildings.
		2	Effects of overheating on reinforced concrete	It is recommended to monitor concrete structures for cracking and signs of weakness to ensure sufficient repair regimes to limit the reduction of time to critical failure.
		3	Higher temperatures/increased ultraviolet (UV) exposure	It is recommended to use UV resistant sealings to protect concrete surfaces and expand time to failure.
	High winds – due to increased storm intensity and frequency	4	Storm damage to structure	Structure will be insulated and protected with regular inspections and maintenance.
	Increased precipitation (rain/snow) – due to wetter winters or increased storm intensity and frequency	5	Impact on structure	Use waterproof materials/coatings and veneers to prevent water ingress/erosion.
	Decreased precipitation due to warmer summers and increased	6	Increased weathering due to thermal action	Use building designs that optimize thermal performance and use low-carbon concrete.

Receptor	Climate Variable	Impact No.	Potential Impact	Mitigation
	heatwave events (drought)			
Building occupiers, visitors and workforce	Overheating – due to warmer summers and more frequent severe weather events	7	Heat Stress	Health and safety procedures ensuring access to cool rest areas, drinking water and exposure limitations.
		8	Reduced usability of areas due to extreme heat	
Site Access, Infrastructure and supply chain	All climate variables	9	Feedstock supply impacted by various climatic issues such as: <ul style="list-style-type: none"> • Increase occurrence of invasive species • Species unable to respond to climatic conditions • Heat stress in livestock 	During the operations of the Proposed Development, it is recommended to diversify supply chains, including dual sourcing strategies, shorter supply chains and working with local suppliers with continually monitor supply chains.
	Site access, infrastructure and supply chain	10	Loss of energy supply from damaged energy infrastructure	The use of best available techniques allows the Proposed Development to store and generate heat and electricity reducing the risk of loss of energy supply.

Assessment of Significance from the Effects of Climate Change

9.159 **Table 9-15** summaries and details the assessment of climate risks identified, considering design measures implemented to mitigate risks.

Table 9-15: Climate Resilience Assessment

Receptor	Climate Hazard	Impact No.	Risk Evaluation		
			Consequence	Likelihood	Risk Rating
Buildings	Overheating – due to warmer summers and more frequent severe weather events	1	Moderate adverse	Low	Low risk
		2	Moderate adverse	Low	Low risk
		3	Minor adverse	Low	Low risk
	High winds – due to increased storm intensity and frequency	4	Moderate adverse	Medium	Medium risk
	Increased precipitation (rain/snow) – due to wetter winters or increased storm intensity and frequency	5	Moderate adverse	Medium	Medium risk

Receptor	Climate Hazard	Impact No.	Risk Evaluation		
			Consequence	Likelihood	Risk Rating
	Decreased precipitation due to warmer summers and increased heatwave events (drought)	6	Minor adverse	Medium	Low risk
Building occupiers, visitors and workforce	Overheating – due to warmer summers and more frequent severe weather events	7	Moderate adverse	Medium	Medium risk
		8	Moderate adverse	Low	Low risk
Site Access, Infrastructure and supply chain	All Climate Variables	9	Moderate adverse	Medium	Medium risk
	Site Access, Infrastructure and supply chain	10	Minor adverse	Medium	Low risk

Further Adaptation Measures and Residual Effects

9.160 **Table 9-15** shows that there are no significant effects on the Proposed Development due to future climate change. The biggest impact is due to continuation of supply through supply chain management and should be considered when agreeing contracts.

Residual Effects

9.161 The residual effects are in line with those described in **Table 9-15** and are not significant

Cumulative Effects

9.162 The vulnerability assessment considers the impacts of climate change on the Proposed Development. The changes in climate variables will be experienced by all developments in the vicinity however the impacts may alter due to cumulative developments.

9.163 Given the rural location of the Proposed Development, it is not expected that there will be significant cumulative effects from climate change on the project.

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Summary

Table 9-16 Summary of Residual Effects

Part A: GHG Assessment

Effect	Receptor (Sensitivity)	Geographic Scale	Temporal Scale	Magnitude of Impact
Construction, In use, Decommissioning				
Whole Life GHG Emissions	Atmospheric Concentration of GHG	Global	Permanent	Significant Beneficial

Part B: Resilience to Climate Change

Effect	Receptor (Sensitivity)	Geographic Scale	Temporal Scale	Magnitude of Impact
Construction, In use, Decommissioning				
Resilience to Climate Change	Not Applicable	Local	Permanent	Not Significant

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Appendices

Appendix 9-A CRH Decarbonization Policy



Decarbonization

Innovating for a low-carbon future

In this section

- Solutions for a Net-Zero Future  31
- Driving Forward on our Targets  34
- 2030 Decarbonization Roadmap  35
- Climate Governance and Policy  39



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Lower-Carbon Asphalt using Recycled Materials on the N22 Dual Carriageway, Ireland Roadstone, CRH Europe Division

Solutions for a Net-Zero Future

The Challenge

With 2023 reported to be the warmest year on record¹, some regions are already experiencing extreme events, and associated environmental and social implications. According to the Paris Agreement, society must mitigate emissions in pursuit of a maximum 1.5°C warming and implement measures to adapt to the consequences of climate change.

Society relies on the built environment - our homes, buildings, and infrastructure - but the built environment sector accounts for about 37% of energy-related global CO₂ emissions². In buildings, the major contributor is the energy used to heat, cool, and operate them, followed by emissions from the manufacturing of the materials used in their construction.

Our Response

CRH is well positioned to meet the increasing customer demand for solutions to mitigate and adapt to the effects of climate change. We are:

- **Delivering Lower-Carbon Solutions** to construct and renovate resilient, lower-carbon buildings and infrastructure, and to enable clean energy and transportation.
- **Replicating and Scaling our Solutions** across our markets, underpinned by significant U.S. and EU funding programs and regulatory policies.
- **Decarbonizing our Business** by reducing our CO₂ emissions, while achieving significant business growth.
- **Innovating New Technologies** through our CRH Ventures and iCSC.

Decarbonizing the Built Environment

Climate change and the need to decarbonize the built environment to achieve net-zero CO₂ emissions presents a major global challenge and a significant opportunity for transformation of the construction value chain. Solutions are needed to eliminate CO₂ across the life-cycle of buildings and infrastructure projects, from building product manufacturing, transportation and construction, as well as from their operation and use, and end-of-life.

The transition to a net-zero built environment represents an important commercial opportunity for CRH. We have a pivotal role through our geographical locations and increasing range of lower-carbon solutions. We are seeing an increase in U.S. and European Union (EU) funding programs designed to accelerate the energy transition. Regulations are also reshaping the way the built environment is constructed in Europe. As we pilot and bring to market new products, we can replicate and scale our solutions to customers in North America, as the market evolves.

Key Fact

Awarded an

A

for CDP Climate



Designing Lower Carbon Solutions

CRH's ambition is to be a net-zero business by 2050 and we are taking action to reduce CO₂ across our business and value chain. Through our 2030 decarbonization roadmap, we are building on the actions already taken and scaling decarbonization strategies across our supply chain, manufacturing operations, and transportation fleet to produce lower-carbon solutions for our customers. Read more on pages 35 to 38.

We are also reducing the life-cycle carbon footprint of building products and the buildings and infrastructure made from them. By enhancing durability and implementing end-of-life strategies, such as re-using, re-purposing and recycling components and their materials, we can reduce the need for repair, maintenance or re-building and avoid CO₂ emissions.

We also provide expert support and services to our customers to help them use our solutions to reduce CO₂ in the most effective manner. In addition to the development and provision of Environmental Product Declarations or certified product carbon footprints, our technical experts can help customers to design their projects with the lowest environmental impact.

Through our innovative approach to new technologies and reducing CO₂ emissions, we are successfully creating the low embodied CO₂ products and solutions to help our customers address complex construction challenges and deliver on their own climate commitments.

We are supporting UN SDG 9: Industry, Innovation and Infrastructure,



The sub-goals we focus on are:

- 9.1 Develop quality, reliable, sustainable and resilient infrastructure.
- 9.2 Promote inclusive and sustainable industrialization.
- 9.4 Upgrade infrastructure and retrofit industries to make them sustainable.
- 9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries.

We are supporting UN SDG 13: Climate Action



The sub-goals we focus on are:

- 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.
- 13.2 Integrate climate change measures into policies, strategies and planning.

“We continue to make progress on our decarbonization roadmap, while innovating the solutions our customers need to decarbonize the built environment and enhance the resilience of our communities.”

Randy Lake,
Chief Operating Officer, CRH



¹ Source: <https://www.nasa.gov/news-release/nasa-analysis-confirms-2023-as-warmest-year-on-record/>
² Source: <https://wedocs.unep.org/handle/20.500.11822/43293>

Solutions for a Net-Zero Future

Continued



EV Charging Installation, UK
NAL, CRH Europe Division



**SOLUTIONS
SPOTLIGHT | FLEXIBLE
DESIGN**

Supporting Technological Advancements

CRH looks at ways to design our solutions to support electrification and the transition to a low-carbon future.

NAL, in CRH's Europe Division, has developed modular foundations to support electric vehicle (EV) charging station installations across the UK. For example, they supplied a range of systems for EV charging infrastructure at the Gateway Cafe in Cirencester, in the UK. The systems enabled a substantial reduction in concrete usage, with flexibility to add more power cabinets without extensive civil works, and the ability to re-use dispenser foundations for future upgrades.

Reducing Energy Demand

In addition to reducing the embodied carbon of our products, services, and solutions, we also play an important role in reducing CO₂ emissions during the operational or in-use phase of buildings and infrastructure.

We provide a range of solutions that enable the design and construction of more energy efficient buildings.

For example, in CRH's Europe Division, Leviat produces structural and thermally efficient connections that are used between walls, slabs, columns, beams and balconies, reducing heat loss and preventing condensation. Tarmac produces aerated blocks with higher thermal performance and reduced insulation costs than traditional aggregate blocks and UBAB produces prefabricated outer walls made of two concrete layers with intermediate insulation.

We also work with our trade associations and others to raise awareness of how concrete's thermal mass properties can be applied to reduce energy used for building heating and cooling. Concrete's durability also increases building and infrastructure lifespans, thereby reducing life-cycle CO₂ emissions.

Deploying Energy Infrastructure

Energy infrastructure is a critical component of modern society and must become more secure, sustainable, and resilient. Our building solutions play an important part in the transition to clean, resilient electricity infrastructure. They are used in the construction of solar and wind electricity installations, and other low-carbon forms of energy generation, as well as electric vehicle (EV) charging stations.

Oldcastle Infrastructure, in CRH's Americas Division, is supplying 674 transformer vaults to a planned wind energy project that will be the largest in U.S. history. These wind and transmission facilities will provide safe, affordable, renewable electricity, enough to power the needs of more than 3 million Americans.

Cubis, in CRH's Europe Division, supported the construction of one of the most significant lower-carbon and renewable energy infrastructure assets in Northern Ireland at Kilroot Energy Park. Cubis' RapidSTACK™ modular access chamber system was used as a utilities network access point, saving time, labor, and cost.

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Solutions for a Net-Zero Future

Continued

Collaborating for Progress

CRH has an ambitious approach to decarbonization, through our lower-carbon technologies, operational excellence practices, and 2030 decarbonization roadmap. To deliver on our net-zero ambitions, we collaborate across our geographies, operating companies, and with external organizations.

We focus on innovation and investment in novel, forward-thinking decarbonization technologies. Harnessing the opportunities presented by scientific and technological breakthroughs, we are creating value and developing innovative solutions that help our customers to decarbonize their building and infrastructure projects.

We partner with academia, industry peers, and other industries. Through our iCSC, we have over 400 global research and innovation projects, with a priority being decarbonization solutions. Notable projects include carbon capture, utilization, and storage (CCUS), AI, automation, circular solutions, electrification, and process improvements.

Stakeholders Tell Us

“Construction materials have an important role to play in decarbonizing the built environment. The industry can leverage new technologies and innovations, such as AI, to optimize concrete mixes, reducing both the carbon footprint and the cost of production. CRH has advanced its sustainability goals utilizing AICrete’s technology.”

Parham Aghdasi,
CEO & Founder AICrete



Venturing and Innovation

CRH Ventures invests strategically in construction technology and climate technology start-ups. We continue to develop new, cutting-edge, mutually beneficial partnerships to accelerate sustainable innovation that will enable safer, smarter, and more sustainable construction. We offer partners decades of expertise, a huge network for scaling, and access to invaluable business relationships.

Our \$250 million Venturing and Innovation Fund supports our investment in start-ups, developing new ideas, technology, and solutions focused on decarbonization and other sustainability challenges. The fund also supports our operating companies to develop, pilot and deploy innovative, new ideas and technologies that can add value to our business.

Dufferin Concrete, in CRH’s Americas Division, are developing a new technology called Carbonject™, that uses CO₂ as a key ingredient to enhance concrete properties. It produces a concrete mix that has equivalent strength performance with less cement (compared with a regular mix), lowering the overall carbon footprint of the concrete. This technology was tested in the concrete produced to restore a taxiway at Toronto Pearson International Airport in Canada.

CRH is also using AI to optimize the carbon footprint of our products and processes. CRH Ventures invested in AICrete in 2023, a start-up that combines data, AI, and robotics to optimize and develop more cost-effective, durable, and sustainable concrete that meets customer needs. In a trial, Century Concrete, in CRH’s Americas Division, worked with AICrete to achieve an average 5% reduction in the carbon footprint of its concrete mixes.



Low Carbon Road Project, UK
Tarmac, CRH Europe Division



SOLUTIONS SPOTLIGHT | **ROADS OF THE FUTURE**

Accelerating Low-Carbon Roads

CRH partners with other industry leaders to deliver integrated solutions and shape our net-zero future.

Tarmac, in CRH’s Europe Division, brought together local councils and international partners including Shell, Volvo CE, and Wirtgen, to deploy advanced technologies to reduce the CO₂ footprint of three road infrastructure projects by up to 80%.

In this industry first, innovative asphalts were made using warm-mix formulations, high proportions of RAP from old road surfaces and a new biogenic binder from Shell. These, together with 100% renewable electricity and low-carbon fuels for manufacturing, transportation, and construction and fully electric and hybrid prototype mobile plant and vehicles, delivered the CO₂ savings.

Driving Forward on our Targets



2030 TARGET

30%

reduction in absolute group-wide CO₂e emissions by 2030 (on a 2021 base year)

Goals and Targets

In 2023, we announced a target to reduce our absolute CO₂e emissions by 30% by 2030 (from a 2021 base year). This target, which is inclusive of organic business growth, applies to our group-wide gross emissions, covers our footprint across Scope 1, 2, and 3 emissions and aligns with our 2050 net-zero ambition.

The Science Based Target initiative (SBTi) has validated our targets for both the cement and non-cement businesses for Scope 1 and 2, as well as Scope 3 for purchased clinker and cement, to be in line with a 1.5°C trajectory:

- CRH commits to 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 year¹.
- CRH also commits to reduce absolute gross Scope 1 and Scope 2 GHG emissions from other activities by 42.0% by 2030 from a 2021 base year¹.
- CRH further commits to reduce gross Scope 3 GHG emissions by 23.5% from purchased clinker and cement per tonne purchased over the same timeframe.

We are also part of the Business Ambition for 1.5°C initiative.

Our Scope 1, 2 and 3 Emissions

We are focused on decarbonizing our business and value chain to achieve our ambition of becoming a net-zero business by 2050.

We have continued to reduce our CO₂e emissions while delivering significant business growth. In 2023, our CO₂e intensity fell to 0.9kg/\$ revenue (2022: 1.0kg/\$ revenue) for Scope 1 and 2 emissions.

In 2023, we also decreased our Scope 1 and 2 absolute CO₂e emissions by 8%, from 33.6 million tonnes in 2022 to 31.0 million tonnes in 2023, as we executed against the levers in our roadmap and benefited from lower cement clinker production.

We have also made progress on our cement-specific net² CO₂ emissions per tonne of cementitious product target of 520kg by 2025. We achieved a reduction from 566kg in 2022 to 562kg in 2023. This represents a 28% reduction on 1990 levels. For more information, including our cement specific gross CO₂ emissions per tonne of cementitious product, see pages 36 to 37.

Key Fact

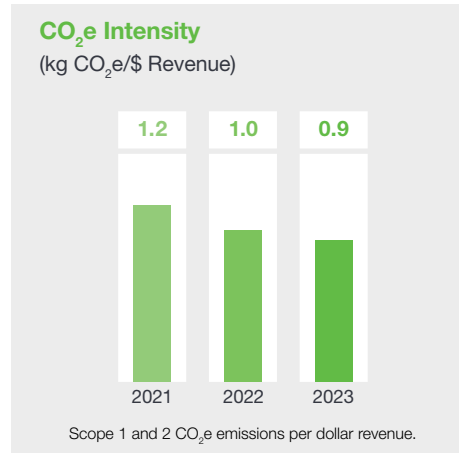
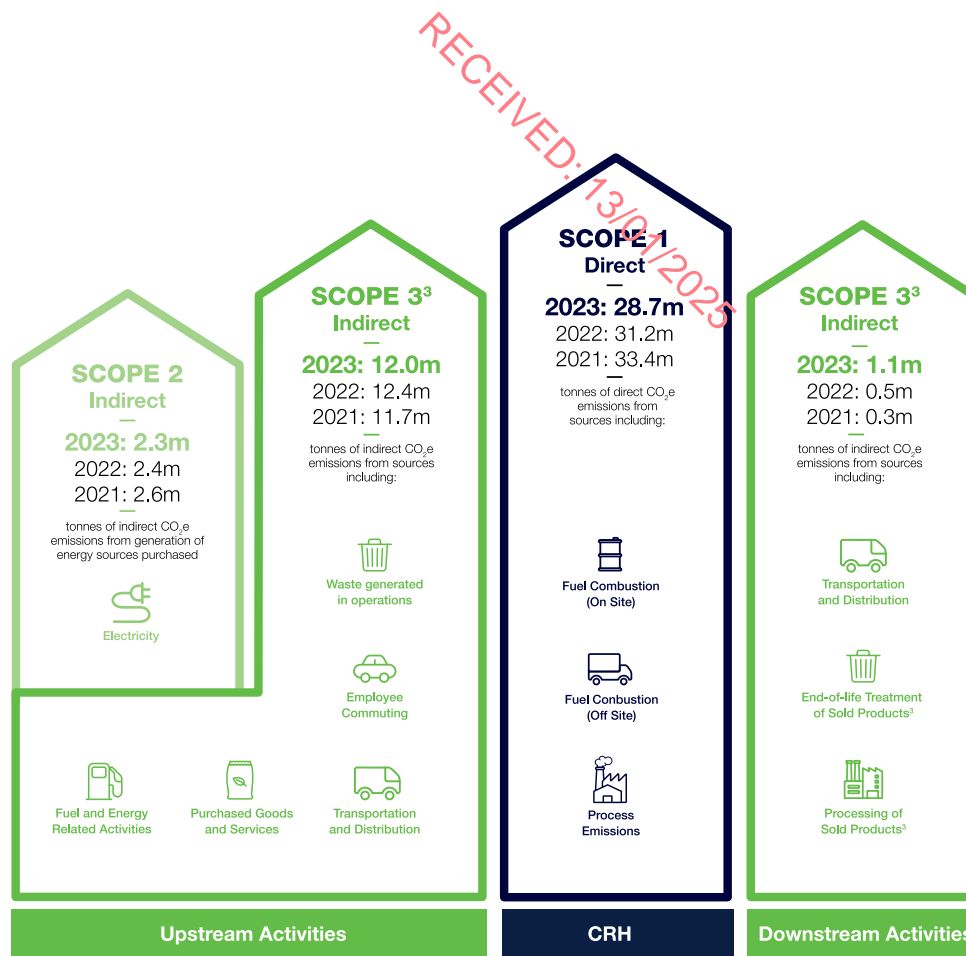
1.5°C



aligned 2030 targets validated by SBTi

³ Following a materiality analysis on sources of Scope 3 CO₂e emissions, CRH has affirmed that the eight categories listed across upstream and downstream are the most relevant for our business. In 2023, we expanded the categories to include Processing of Sold Products and End-of-life Treatment of Sold Products.

⁴ In 2022, to better reflect our decisions on where we source power, we adopted a market-based Scope 2 CO₂ emissions approach. Note the 2021 Scope 2 emissions have not been restated from location-based (total emissions incorporating market-based scope 2 equivalent is 48.3 million tonnes).



¹ The target boundary includes land-related emissions and removals from bioenergy feedstocks.

² Total direct CO₂e emissions – net: gross CO₂e emissions minus CO₂e emissions from alternative fossil fuels.

2030 Decarbonization Roadmap

Our 2030 Decarbonization Roadmap

Our 2030 decarbonization roadmap sets out the key steps to achieve our 2030 target. These steps are based on known technologies, well-established operational excellence programs and activities in which CRH has a proven track record of delivering.

Our roadmap is based on a bottom-up process and consists of local action plans managed

and implemented by our operating companies. Delivery of our 2030 decarbonization roadmap includes incremental capital expenditure of approximately \$150 million per annum on average, which is subject to strict internal investment criteria, and the net business benefit is expected to increase revenues and profitability. In 2023, CRH established a Carbon Reduction

Council (CRC) to provide central internal oversight and coordination of these plans. The CRC helps to drive decarbonization across the business through technical expertise and support.









The majority of our CO₂ emissions come from the decarbonation of minerals, fuel combustion in processes and transport, and the products and

services we consume (e.g. electricity, raw materials, and other supplies).

Our 2030 roadmap identifies eight decarbonization levers to address these emissions sources. Each lever is important in decarbonizing our business, which in turn allows us to provide lower-carbon products and solutions for our customers.

Our Decarbonization Levers

This table illustrates examples of how we are actioning our eight decarbonization levers across our operations and value chain. Our decarbonization levers are:

	Upstream Activities Production and Transportation of Purchased Goods, Raw Materials and Fuels	CRH Operations Material Handling and Manufacturing	Downstream Activities Product Delivery, Processing and Use
 Clinker Substitution		Substituting clinker with lower-carbon materials	
 Recycled and Alternative Materials	Replacing virgin materials with lower-carbon recycled materials		
 Energy Efficiency		Reducing energy consumption through continuous process improvement	
	Using lower-carbon fuels for own transportation	Using lower-carbon fuels for on-site equipment	Using lower-carbon fuels for own transportation
 Low-Carbon Fuels		Replacing traditional fuels with waste-derived and bio-based alternative fuels in cement production	
		Increasing use of lower-carbon fuels in asphalt production and other processes	
 Clean Electricity	Investing in purchase and generation of clean electricity for existing processes and to enable further electrification		
	Optimizing logistics		
 Sustainable Transportation and Mobile Plant	Upgrading and optimizing equipment		
	Using lower-carbon contracted transportation		Using lower-carbon contracted transportation
 Next-Generation Technologies	Partnering to innovate and develop new technologies for decarbonization		
	Sourcing lower-carbon materials		
 Value Chain Emission Reduction	Reducing material consumption through product redesign		Optimizing products to reduce emissions from processing, use, and end-of-life

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2030 Decarbonization Roadmap

Continued



Wall Constructed with JURA ECO 3, Switzerland
JURA Materials, CRH Europe Division



SOLUTIONS SPOTLIGHT | LOWER-CARBON FOOTPRINTS

Launching Lower-Carbon Products

CRH is developing lower-carbon cements, essential solutions for a net-zero built environment.

JURA Materials in Switzerland, in CRH's Europe Division, launched JURA ECO3, one of the first lower-carbon cements using calcined clay on the European market. JURA ECO3 yields c.20% lower CO₂ per m³ of concrete compared with traditional Portland cement.

Finnsementti in Finland, also in CRH's Europe Division, launched KolmosBertta, a lower-carbon cement product that replaces clinker with c.70% GGBS, a by-product of steel production. KolmosBertta CO₂ emissions are only about a third of traditional Portland cements.



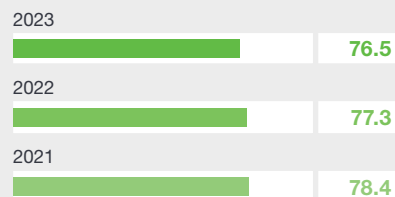
Clinker Substitution

In most cement types, the principal active ingredient is clinker, which is also the main source of CO₂ emissions. Concrete is made from aggregates, cement, and water.

Clinker CO₂ emissions arise from the combustion of fuels in the kiln and from "process emissions" which are a by-product of heating the mineral raw materials that make clinker. We are actively working to reduce clinker content in our cements and concretes by substituting with low-carbon ingredients called supplementary cementitious materials (SCMs). SCMs contribute to the properties of cement and concrete but have lower carbon footprints, and include ground limestone, Ground Granulated Blast-furnace Slag (GGBS), fly ash, natural pozzolans, and calcined clay.

In 2023, we made further progress on reducing our average clinker content in our cements to 76.5%, from 77.3% in 2022. We continue to introduce many new, lower-carbon cements which use SCMs to replace clinker. For example, Ash Grove, in CRH's Americas Division, is continuing to roll out Portland Limestone Cement. Read about some other examples in the Solutions Spotlight on this page.

Clinker/Cement (%) (equivalent) factor



Recycled and Alternative Materials

For decades, CRH has recycled significant amounts of lower-carbon by-products and wastes from other industries and used them in its own manufacturing to reduce the carbon footprint of its products.

In 2023, CRH used a total of 7.7 million tonnes of alternative raw materials (ARM) in our cement plants (2022: 8.4 million tonnes). For example, we replace limestone with recycled ARM to reduce cement CO₂ emissions. Danucem in Slovakia, in CRH's Europe Division, uses approximately 20% ARM to reduce the overall carbon footprint of cement by about 7%.

We use extensive amounts of recovered road pavement materials, RAP and RAS, to make new asphalt. This significantly saves on energy, CO₂ emissions, and material use. In 2023, we increased our use of RAP and RAS to 13.2 million tonnes (2022: 11.8 million tonnes).

Discover more about our use of recycled by-products and wastes in the Circularity section on page 27.

Key Fact

13.2million

tonnes of RAP and RAS used in 2023

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2030 Decarbonization Roadmap

Continued

Energy Efficiency

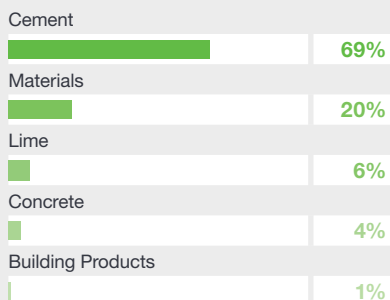
We focus on optimizing the energy efficiency of our operations to reduce energy consumption and CO₂ emissions. Our approach is built on applying good practice, continuous improvement, and process optimization. Our Performance teams have created programs and support our operating companies. In Europe, 662 of our locations have Energy Management Systems (EnMS) verified to ISO 50001, with 54% of our materials operations certified in 2023.

Many of our asphalt businesses now offer Warm Mix Asphalt (WMA) manufactured at lower production temperatures to reduce energy use. Energy efficiency is especially relevant in our cement operations, which account for 69% of our total energy use. In CRH's Americas Division, Ash Grove's Seattle cement plant was awarded an EPA Energy Star in 2023 for meeting the highest energy efficiency standards.

In 2023, energy use across our operating locations totaled 50.2 TWh (2022: 54.5 TWh). Businesses representing 91% of CRH's energy use have set energy reduction targets and programs that saved over 1 TWh of energy in 2023.

Energy Use by Activity 2023

(% of total energy: 50.2 TWh)



Low-Carbon Fuel

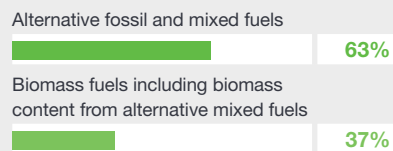
We are switching to lower-carbon fuels to reduce the energy-related CO₂ emissions of our production processes. Many of our cement plants already use a wide range of alternative fuels, including solid recovered fuels (SRF), used tires, bone meal, solvents, and used oil. The use of such fuels in cement manufacture is known as "co-processing", which involves the simultaneous recovery of energy and the non-combustible content, which becomes part of the final cement product. This makes co-processing in cement an important waste management solution.

In 2023, our subsidiary cement plants used 2.1 million tonnes (2022: 2.2 million tonnes) of by-products and wastes as alternative fuels, providing 35.9% (2022: 36.3%) of the total thermal energy requirements, 55% for our EU cement plants. The carbon neutral biomass fraction of these fuels has increased to 12.5% (2022: 11.8%) of thermal energy.

We are also trialing and deploying a wide range of alternative fuels and new types of very low-carbon energy, such as Hydrotreated Vegetable Oil (HVO), biogas, and hydrogen. Some of our locations continue to reduce CO₂ emissions by switching to transitional fuels, like natural gas, a lower-carbon fuel than oil.

Thermal Energy from Alternative Fuels in Cement 2023

(% of total thermal energy: 2.1 million tonnes)



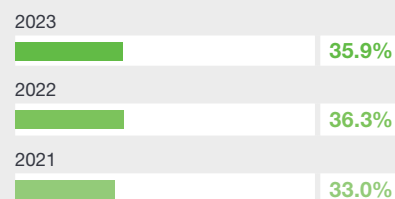
Clean Electricity

In 2023, the proportion of renewable electricity in the electricity we used increased to 31% (2022: 25%).

We are investing in the clean power transition by actively targeting an increase of renewable and low-carbon electricity across our operations. We procure power from renewable sources such as solar and wind and some of our sites generate renewable electricity on-site. In some locations, we also generate electricity through waste heat recovery. Romcim, in CRH's Europe Division, recently announced they will install wind turbines near their cement plant in Medgidia, Romania. The five turbines with an installed capacity of 30 MW will contribute approximately 50% of the plant's power demand.

Danucem's Rohoznik cement plant, in Slovakia, in CRH's Europe Division, employs an organic Rankine cycle, a technology that uses excess heat from the production process to generate up to 10% of the plant's electricity needs.

Alternative Fuel Rate for Cement (kiln fuels) (%)



Sustainable Transportation and Mobile Equipment

We are investing in solutions for our off-road and on-road logistics. This includes upgrading our transportation and mobility practices, and increasing fuel efficiency, mainly through established fleet fuel reduction targets, and a sustainable transportation model across road, rail, and water.

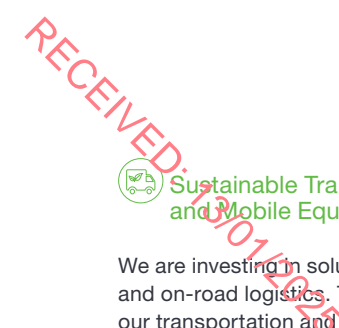
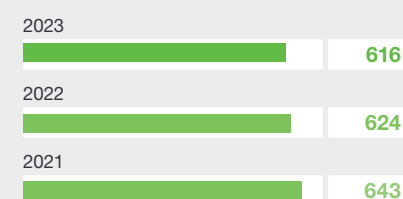
Across CRH, we have initiatives in place to optimize transport use in 73% of our operating companies (which represents 95% of total product delivered).

In addition, our operating companies are advancing their transition to renewable energy to power their transport fleets and mobile equipment, for example, using renewable electricity or HVO. We are currently trialing electric vehicles at multiple locations across our business.

We use our own trucks to transport 28% of our products, with the rest through contractors or customers. In 2023, our fleet used 159 million litres of fuel (2022: 155 million litres).

CRH and Volvo Group have signed a Memorandum of Understanding to accelerate net-zero innovations in the design and deployment of on-road vehicles and off-road equipment. Read more on page 46.

Specific CO₂ Emissions—Gross (kg CO₂/tonne of cementitious product)



2030 Decarbonization Roadmap

Continued



Solar Panel Installation, Northern Ireland
Northstone Materials, CRH Europe Division



**SOLUTIONS
SPOTLIGHT** | **CLEAN
POWER**

Using Solar Electricity

CRH has many examples of accelerating the use of solar power across our operations.

In CRH's Europe Division, JURA Materials in Switzerland met 50% of its electricity requirements for three plants, an office and a workshop during the summer months, using a privately-owned local solar electricity installation.

In Ireland, Roadstone has implemented a solar project at its Duleek site and Northstone Materials recently installed a solar array at its concrete roof tile factory in Northern Ireland.

CRH Poland has also implemented a solar project at its Ozarow plant.



Next-Generation Technologies

We are developing next-generation technologies such as electrification of processes and transportation, hydrogen as fuel, AI and capturing CO₂ from processes. We are working to accelerate these breakthrough technologies and supporting the development of regulatory policies to facilitate progress. For example, Finnsementti, in CRH's Europe Division, has partnered with VTT Technical Research Centre of Finland to test a new electrically heated, rotating drum furnace for cement production.

Through CRH Ventures, we are investing in, and partnering with, construction and climate technology companies. Together we can pilot and scale new technologies and innovations. Read more on page 28.

Technologies, such as CCUS, present an opportunity to abate emissions that cannot be eliminated by other decarbonization levers. We are investigating technologies to capture CO₂ in our operations and prevent its release to the atmosphere. Captured carbon is typically transported for permanent geological storage or can be permanently stored or used in products.

Significant amounts of CO₂ are captured naturally through a process called carbonation, which permanently binds CO₂ into mortar, concrete, or other minerals over their lifetime. This counters some of the CO₂ emitted during cement manufacturing. We are innovating to speed up this process by developing accelerated mineralization technologies that permanently lock up captured CO₂ from industrial processes.



Value Chain Emission Reduction

As a leading player in our industry, we drive decarbonization beyond the boundaries of our own operations, by addressing what are referred to as Scope 3 emissions.

We partner closely with our suppliers and customers, to further drive decarbonization upstream and downstream of our operations.

In our 2030 Decarbonization Roadmap we focus on reducing Scope 3 emissions by:

- Reducing carbon intensity in the cement and clinker we purchase.
- Reducing embodied carbon in purchased raw materials:
 - By integrating circular models, increasing durability, the ability to be re-used, re-purposed and recycled, and replacing virgin materials with alternative recycled materials.
 - Reducing the volume of materials used by redesigning and optimizing product formulations.
 - Partnering with suppliers to innovate and develop new technologies and processes to reduce CO₂ emissions.
- Optimizing logistics to reduce transportation-related emissions upstream and downstream of our operations.

We also embed circular principles in the design of products and solutions, including resilience, durability, and the ability to be re-used, re-purposed and recycled. This reduces the need for new materials for repair, maintenance, and re-building, significantly reducing CO₂ emissions in our downstream value chain.

RECEIVED: 13/10/2025

Climate Governance and Policy

Climate Governance

Sustainability, including climate change impacts, is embedded in our strategy, business model, Sustainability Framework and Environmental Policy (page 77). The SESR Committee, to which the Board has delegated primary responsibility for monitoring developments related to climate, and providing strategic direction, oversight, and support to the Board, meets quarterly. The Board monitors and oversees progress against climate-related targets and goals through detailed reports of discussions and recommendations which are presented to it by the SESR Committee.

The Chief Executive executes strategy agreed with the Board and regularly reports to them on progress and performance, including on climate-related matters. The Chief Executive is supported by the Global Leadership Team (GLT), which is responsible for implementing strategy, performance delivery and progressing our climate-related agenda. Responsibility for formulating and executing our climate strategy sits with the Chief Operating Officer, while the GLT is supported by executive-level committees and other working groups and functions.

Climate-Related Disclosure

As part of our Enterprise Risk Management (ERM) program, we assess the climate-related risks split into short, medium, and long-term exposures. These risks are regularly reviewed and represent the key risks faced by CRH. Our climate risk assessment ensures that our business is ready to manage and adapt to the challenges ahead.

CRH has a long history of reporting our climate performance. We engage with multiple mandatory and voluntary carbon disclosure requirements, organizations, and platforms. See our TCFD disclosures and voluntary disclosures against relevant criteria under the EU Taxonomy regulation in the financial statements of the Company for the fiscal year ended December 31, 2023 prepared in accordance with International Financial Reporting Standards (IFRS) as adopted by the European Union (the "Irish Statutory Accounts"), available on crh.com.

We have continued our reporting to the Carbon Disclosure Project (CDP), and in 2023 achieved a score of A for Climate reflecting our comprehensive approach to managing and reporting climate impacts, risks and opportunities.

Sector Decarbonization

Collaboration across industry, academia, society, and government is important to create the technologies, infrastructure, and favorable policy environment that can serve as a catalyst for emissions reduction.

CRH is actively involved in the development of decarbonization roadmaps with a number of organizations, including the Global Cement and Concrete Association's (GCCA) Cement and Concrete Industry Roadmap for Net-Zero Concrete, the National Asphalt Pavement Association's (NAPA) Towards Net-zero Carbon Emissions, CEMBUREAU's 2050 Carbon Neutrality Roadmap, as well as the Portland Cement Association's (PCA) Roadmap for Carbon Neutrality.

Climate Policy Positions

We believe the transition to a more sustainable built environment represents a commercial opportunity for CRH. Certain government legislation designed to accelerate the energy transition has had a positive impact on our business, and we see increasing opportunities as public policy changes begin to increase demand for lower-carbon products. We are well positioned to capitalize on this increased demand, which is underpinned by significant U.S. and EU funding programs and regulatory policies (such as the EU Emissions Trading System).

While there are regulations in some markets that we operate in, which may require us to absorb increases in carbon costs through pricing to maintain or enhance our margins, it is not possible at this time to predict how future legislation that may be enacted or environmental regulations that may be adopted to address Greenhouse Gas emissions would impact our business.

We see the need for informed, appropriate, and robust climate policy to help achieve the Paris Agreement. Our published policy positions illustrate our stance on climate-related topics. Our advocacy activities aim to create the conditions needed to achieve our decarbonization and climate change adaptation objectives.

CRH works at local, national, and global levels to anticipate, understand, and inform public decision making. We directly engage with policymakers through transparent, responsible corporate advocacy, and indirectly through industry associations and membership organizations.

Our climate advocacy practices and related disclosures have been reviewed to ensure alignment with stakeholder expectations, as set out in our Climate Advocacy Review (available at crh.com).

RECEIVED 12/20/2023

Collaborating to Achieve Net-zero Ambitions

Here we profile some of the industry associations we work with as we collaborate for climate action:



Appendix 9-B IEMA Methodology for the Assessment of Greenhouse Gas Emissions and Evaluating Significance

- 9.B.1 The five distinct levels of significance in Table 9.B.1 are not solely based on whether a project emits GHG emissions alone, but the degree to which the project's GHG emissions are consistent with science-based 1.5°C aligned emission trajectories towards net zero. Country specific carbon budgets are legislated, including any sectoral pathways to achieve the country's 2050 net zero target.
- 9.B.2 IEMA established three underlying principles to establishing significance as follows:
- The GHG emissions from all projects will contribute to climate change, the largest interrelated cumulative environmental effect.
 - The consequences of a changing climate have the potential to lead to significant environmental effects on all topics in the EIA directive.
 - GHG emissions have a combined environmental effect that is approaching a scientifically defined environmental limit, as such any GHG emissions or reductions from a project might be significant.
- 9.B.3 Based on these principles IEMA conclude:
- When evaluating significance, all new GHG emissions contribute to a negative environmental impact; however, some projects will replace existing development or baseline activity that has a higher GHG profile. The significance of a project's emissions should therefore be based on its net impact over its lifetime, which may be positive, negative or negligible.
 - Where GHG emissions cannot be avoided, the goal of the EIA process should be to reduce the project's residual emissions at all stages.
 - Where GHG emissions remain significant, but cannot be further reduced, approaches to compensate the project's remaining emissions should be considered.
- 9.B.4 The significance of any net change of GHG resulting from the Proposed Development has been assessed by its ability to contribute to reducing GHG emissions consistent with a trajectory towards net zero by 2050.
- 9.B.5 To establish the significance of the GHG emissions from the Proposed Development, judgements were made on:
- The Proposed Developments consistency with policy requirements, since these are specific to ensure the economy decarbonises in line with the country's net zero target.
 - The degree to which the Proposed Development has sought to mitigate its emissions.

Table 9.B.1: GHG Significance Criteria (Based on IEMA Guidance)

Significance Rating	Description	Criteria to Determine Significance of net GHG Emissions
Major Adverse	A project with major adverse effects is locking in emissions and does not make a meaningful contribution the country's trajectory towards net zero	The project's net GHG impacts are: <ul style="list-style-type: none"> • Not mitigated or are only compliant with do-

Significance Rating	Description	Criteria to Determine Significance of net GHG Emissions
		<p>minimum standards set through regulation.</p> <ul style="list-style-type: none"> Do not provide further reductions required by existing local and national policy for projects of this type.
Moderate Adverse	<p>A project with moderate adverse effects falls short of fully contributing to the country's trajectory towards net zero.</p>	<p>The project's net GHG impacts are:</p> <ul style="list-style-type: none"> Partially mitigated. May partially meet the applicable existing and emerging policy requirements but would not fully contribute to decarbonisation in line with local and national policy goals for projects of this type.
Minor Adverse	<p>A project with minor adverse effects is fully in line with measures necessary to achieve the country's trajectory towards net zero.</p>	<p>The project's net GHG impacts are:</p> <ul style="list-style-type: none"> Fully consistent with applicable existing and emerging policy requirements. In line with good practice design standards for projects of this type
Negligible	<p>A project with negligible effects provides GHG performance that is well 'ahead of the curve' for the trajectory towards net zero and has minimal residual emissions.</p>	<p>The project's net GHG impacts are:</p> <ul style="list-style-type: none"> Reduced through measures that go well beyond existing and emerging policy. Better than good practice design standards for projects of this type, such that radical decarbonisation or net

Significance Rating	Description	Criteria to Determine Significance of net GHG Emissions
		zero is achieved well before 2050.
Beneficial	A project with beneficial effects substantially exceeds net zero requirements with a positive climate impact.	<p>The project's net GHG impacts are:</p> <ul style="list-style-type: none"> • Below zero • It causes reduction in atmospheric GHG concentrations, whether directly or indirectly compared to the without project baseline.

Appendix 9-C IEMA Methodology for the Assessment of Climate Resilience

9.C.1 The IEMA Methodology is carried out over five-steps as follows:

Step 1: Establish Relevant Local Policy Requirements

9.C.2 This step establishes any relevant policy that informs the assessment of climate risks, and requirements for measures to manage these risks

Step 2: Identify Receptors

9.C.3 Relevant receptors within the Proposed Development that may be affected by climate change are identified.

Step 3: Identify Potential Impacts of Climate Change and Confirm Mitigation

9.C.4 Identification of potential impacts of changes in a range of climate variables on the receptors identified in step 2. This is undertaken using professional judgement with reference to the climate resilience assessment and identifies the design measures to mitigate the impacts considering policy requirements from step 1.

Step 4: Assess the Significance of the Climate Change Effects

9.C.5 This step assesses the level of risk of each hazard as defined in Table 9.C.3 based on scoring the likely consequence and likelihood of that hazard arising, using a five-point scale described in Table 9.C.1 and Table 9.C.2. The assessment of significance and scoring and for likelihood and significance is based on IEMA Guidance.

9.C.6 The assessment is qualitative and based on expert judgement on knowledge of similar schemes, engagement with the wider Project Team and a review of relevant literature.

Table 9.C.1: Qualitative Description of Consequence

Measure of Consequence	Description
Negligible	No damage to the Proposed Development, minimal adverse effects on health, safety and the environment or financial loss. Little change to service and disruption lasting less than one day.
Minor Adverse	Localised disruption or loss of service. No permanent damage, minor restoration work required: disruption lasting less than one day. Small financial losses and/or slight adverse health or environmental effects.
Moderate Adverse	Limited damage and loss of service with damage recoverable by maintenance or minor repair. Disruption lasting more than one day but less than one week. Moderate financial losses. Adverse effects on health or the environment.
Large Adverse	Extensive damage and severe loss of service. The disruption lasting more than one week. Early renewal of 0-90% of the Proposed Development. Permanent physical injuries and/or fatalities. Major financial loss. Significant effect on the environment. Requiring remediation.
Very Large Adverse	Permanent damage and complete loss of service. The disruption lasting more than one week. Early renewal of more than 90% of the Proposed Development. Severe health effects or fatalities. Extreme financial loss. Very significant loss to the environment requiring remediation and restoration.

Table 9.C.2: Qualitative Description of Likelihood

Measure of Likelihood	Description
Very High	The event occurs multiple times during the lifetime of the Proposed Development e.g., approximately annually.
High	The event occurs several times during the lifetime of the Proposed Development e.g. approximately once every five years
Medium	The event occurs limited times during the lifetime of the Proposed Development e.g., approximately once every fifteen years
Low	The event occurs occasionally times during the lifetime of the Proposed Development e.g. once every 30 years.
Very Low	The even may occur once during the lifetime of the Proposed Development.

9.C.7 Events identified as High Risk (red) are considered significant effects.

Table 9.C.3: Significance Rating Matrix

Measure of Likelihood	Consequence of Hazard Occurring				
	Negligible	Minor Adverse	Moderate Adverse	Large Adverse	Very Large Adverse
Very High	Medium Risk	Medium Risk	High Risk	High Risk	High Risk
High	Low Risk	Medium Risk	Medium Risk	High Risk	High Risk
Medium	Low Risk	Low Risk	Medium Risk	Medium Risk	High Risk
Low	Low Risk	Low Risk	Low Risk	Medium Risk	Medium Risk
Very Low	Low Risk	Low Risk	Low Risk	Low Risk	Medium Risk

Step 5: Establish Further Adaptation Measures and Determine Residual Effects

9.C.8 In the fifth step, further adaptation and mitigation measures for significant effects are identified through expert opinion and residual effects are then assessed from Table 9.C.1 through Table 9.C.3

Appendix 9-D CRH Climate Advocacy Review

RECEIVED: 13/01/2025



21 March 2022

RECEIVED 13/01/2025

CRH Climate advocacy review

About CRH

CRH is the leading diversified building materials business in the world. We manufacture and supply a diverse range of integrated building materials, products and innovative end-to-end solutions, which can be found throughout the built environment, from major public infrastructure projects to commercial buildings and residential homes.

CRH and the Paris Agreement

At CRH, we fully support the goal of the Paris Agreement to limit global warming to well below 2°C, with efforts towards 1.5°C, compared to pre-industrial levels. In August 2021 we accelerated our previous decarbonisation roadmap, bringing forward our 2030 target to 2025. In addition, in early 2022 we adopted a new group-wide target representing a 25% reduction in absolute carbon emissions (Scope 1 and 2) by 2030 (on a 2020 baseline), as validated by the Science Based Targets initiative.

Our ambition is to be carbon neutral along the cement and concrete value chain by 2050, underpinned by a strategy to grow and improve our business in a sustainable and responsible way. This includes, for example, using alternative fuels and materials to drive the circular economy; investing in cutting-edge decarbonisation technologies through a new \$250 million innovation fund; and developing sustainable building solutions for our customers.

In support of the Paris Agreement, CRH is focused on the following climate policies:

- Training personnel and revising product standards to develop a new generation of low-carbon, sustainable building solutions;
- Supporting carbon pricing and trading mechanisms that create incentives to invest in low-carbon technology and infrastructure and safeguard the competitiveness of industries at risk of carbon leakage;
- Investing in research and development of decarbonisation technologies – such as those that enhance concrete’s ability to act as a carbon sink and carbon capture, utilisation and storage (CCUS) – and collaborating with research institutions and regulatory bodies to promote these innovations; and
- Deploying renewable energy sources, such as biomass and wastes, to aid our industry’s clean energy transition.

As well as decarbonising our own business, we are also working across our sector with other industry players and stakeholders to build a net-zero, circular value chain.



CRH and advocacy

At CRH, we are committed to being transparent about our climate lobbying, including both direct advocacy and indirectly through trade associations.

We have undertaken this review to ensure that our direct lobbying and trade groups' lobbying aligns with the Paris Agreement, as we recognise a supportive climate policy environment is essential for us to deliver our 2050 carbon neutrality ambition.

Our trade bodies are engaged on a range of climate issues, including public procurement reforms, carbon pricing and trading mechanisms, the circular economy and new decarbonisation technologies, whereas CRH only undertakes limited direct lobbying on our priority climate policies in specific circumstances.

We recognise that tackling global warming is only possible through deep collaboration between governments, investors, companies, NGOs, civil society groups, academia, employees and others to develop the solutions needed for a net-zero economy. CRH is fully committed therefore to working in close partnership with all these stakeholders, for society today and for future generations.

CRH operates to the highest levels of legal, ethical and moral standards – including in respect of political contributions – and this document builds on disclosures in our Sustainability and Annual Reports in relation to our approach and practices.

CRH employees have a duty to read, understand and comply with our 'Code of Business Conduct', which stipulates best practices in relation to legal, compliance and ethical matters. Employees who participate in trade bodies also undertake advanced compliance training on a regular basis to ensure they are aware of their responsibilities. Furthermore, our 'Anti-Bribery Policy' explicitly states that CRH does not tolerate any form of bribery.

In the US, CRH supports the rights of employees to participate in the political process through employee-funded Political Action Committees (PACs) and CRH's US operations provide administrative support – consistent with applicable laws – to their affiliated federal and state PACs.

Our executive leadership team is responsible for ensuring these policies and practices are implemented across our business. The Board and its Committees, including the Safety, Environment and Social Responsibility Committee, monitors progress to ensure the company fulfils these obligations.



CRH climate policies

- 1) CRH supports the goals of the Paris Agreement to limit the average rise in global temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit this to 1.5°C

At CRH, we are committed to combating the risks of climate change and meeting the goals of the Paris Agreement by driving progress towards our science-based decarbonisation target. We are joining forces with others through our membership of global, regional and national industry associations to accelerate bold climate action.

- 2) CRH supports skills and training across the building materials sector and new product standards to incentivise the development of low-carbon processes and products

Circular economy opportunities are critical to realising our industry's decarbonisation ambitions. CRH fully understands this imperative and is continuously innovating to commercialise new low-carbon processes and products for a more resilient and circular built environment. In 2021, products with enhanced sustainability attributes accounted for 46% of our product revenue. We believe success also depends on supportive regulatory and standardisation frameworks being established to facilitate new markets for sustainable building solutions.

- 3) CRH supports carbon pricing and trading mechanisms that create incentives to invest in low-carbon technology and infrastructure and safeguard the competitiveness of industries at risk of carbon leakage

CRH supports the use of market-based carbon pricing and trading mechanisms to incentivise investments in low-carbon technology and infrastructure. We believe this can best be achieved by creating a level playing field on carbon costs between domestic producers and importers to avoid carbon leakage; and, where carbon pricing disparity exists, implementing border mechanisms that apply a fair carbon cost to importers. We also believe a carbon consumption charge – covering all embodied emissions in products, as well as carbon absorbed over an asset's life – would be a fair way to apply carbon pricing, based on robust life-cycle monitoring, reporting and accounting.

- 4) CRH supports the development of advanced technologies to decarbonise the cement and concrete sector

Cutting-edge decarbonisation technologies have a pivotal role to play in accelerating our sector's transition to a net-zero pathway and at CRH we believe sustainability is an opportunity for innovation. Together with others in the cement and concrete industries, our Innovation Centre for Sustainable Construction is leading efforts to scale carbon capture and utilisation solutions, as well as other break-through technologies, to help deliver our vision of net-zero concrete and a more sustainable built environment. We also believe regulators can support this agenda, for example, by providing increased fiscal support for R&D and capital/operating expenditure tied to decarbonisation innovation.

- 5) CRH supports the use of renewable energy sources, such as biomass and wastes, to accelerate the clean energy transition

At CRH, we are fully committed to limiting fossil fuel use at every point in our value chain and repurposing waste materials as alternative fuels to achieve carbon neutrality. Our waste minimisation practices help to address growing resource scarcity and reduce industrial waste and emissions. Regulators can also provide leadership. This includes prioritising 'co-processing' – utilising waste to recover energy and recycling materials at the same time – in waste treatment policies; banning the landfill of any residual waste with the potential to replace fossil fuels and/or natural resources; and supporting R&D initiatives that promote the increased recovery and recyclability of materials from waste.

Review methodology

We believe our trade bodies' advocacy must meet the same high professional and ethical standards expected across CRH. We are also clear that their representations on global warming issues should be aligned with the Paris Agreement and match CRH's ambition for bold climate action.

To ensure there is no misalignment, we have reviewed our most significant group-level trade bodies in strategic geographies. Two of our trade bodies have a global remit, while the remainder are located in North America and Europe, which are our largest markets and generate the vast majority of our revenues. CRH operating companies are engaged in additional trade groups, but these focus on safety and quality standards, certification and auditing, rather than climate advocacy.

Each trade body was asked to respond to a questionnaire and confirm whether they support:

- The goal of the Paris Agreement to limit global warming to well below 2°C, with efforts towards 1.5°C, compared to pre-industrial levels;
- Training personnel and revising product standards to develop a new generation of low-carbon, sustainable building solutions;
- Carbon pricing and trading mechanisms that incentivise investing in low-carbon technologies and infrastructure;
- Investing in research and development of innovative decarbonisation technologies, such as those that enhance concrete's ability to act as a carbon sink and carbon capture, utilisation and storage;
- Deploying renewable energy sources, such as biomass and wastes, to aid the clean energy transition; and
- Transparency and accountability in reporting lobbying activities.

CRH has also undertaken a review of its trade bodies' websites, communications, publications and social media to assess their policy positions on climate change.

Our engagement with policy and lawmakers is underpinned by our values, one of which is to 'do what we say and lead with integrity'. This means we do the right things, comply with the law, and work responsibly. To ensure our direct engagement with policy and lawmakers is in line with these values and supportive of our climate goals – as well as ensure our trade body review was as robust as possible – we completed interviews with colleagues across CRH who oversee public policy engagement, covering each of our three divisions and relevant corporate functions.



Main findings

Our review concluded that none of our trade groups are misaligned with CRH's climate policies. In a small number of instances our trade groups have not yet fully formulated their climate policies or may be advocating for a mix of policy options to address climate change. CRH will continue to call on its trade group representatives to advocate for policies that support the goals of the Paris Agreement.

In Europe, our trade groups have engaged with regulators on the European Green Deal (Fit for 55 Package) and draft legislation including: revising the Energy Efficiency Directive; Energy Taxation Directive; Climate, Energy and Environmental Aid Guidelines; and establishing a roadmap for the Hydrogen and Gas Markets Decarbonisation Package. They have also lobbied on the proposal to update the EU Emissions Trading Scheme (ETS), calling for an impact assessment to determine the technical and financial feasibility of any potential changes to the ETS 2030 target. In addition, they have lobbied for the proposed Carbon Border Adjustment Mechanism to become operational as soon as possible to mitigate the risk of carbon leakage, which is increasing under the pressure of growing imports and a sharp increase of the CO₂ price.

In the US, CRH and its trade groups are active at both the federal and state level. This includes advocacy on cap-and-trade schemes, which have a key role to play in driving CO₂ emission reductions.

CRH's trade bodies uphold the highest professional and legal standards in their lobbying. This includes, for example, participating in relevant oversight arrangements, such as the EU Transparency Register, and complying with relevant US transparency and disclosure rules.

CRH only undertook very limited direct lobbying during 2021 and our review concluded that this advocacy fully aligned with the goals of the Paris Agreement.

Full details about each trade group's climate policies can be found in the Summary and Appendix.

Looking ahead

CRH is committed to transparency and undertaking an annual review of its trade bodies to ensure their lobbying is aligned with the Paris Agreement and CRH's climate policies. We plan to publish our next review during 2023.

In case of any misalignment between CRH and its trade groups, we are committed to taking meaningful action. This could involve engaging with trade group representatives and members to communicate material differences and request that climate policy positions be revised, or demand advocacy be stopped. In more serious cases, we would consider terminating our membership of any trade group that contradicted the Paris Agreement and our own climate policies, if steps were not taken within a reasonable timeframe to amend misaligned practices.

Every review undertaken by CRH will be overseen by our executive leadership team and the Safety, Environment and Social Responsibility Committee of our Board.

RECEIVED: 10/12/2023

“CRH has a long and proud history of taking decisive steps to tackle climate change. Whether it's using alternative fuels and materials to drive the circular economy, investing in cutting-edge decarbonisation technologies, or developing integrated building solutions, CRH is fully committed to becoming a net-zero company by 2050.

We understand that realising this ambition will only be possible through deep collaboration with all stakeholders across our industry's value chain. We believe firmly therefore in the power of working in close partnership with governments, investors, companies, NGOs, civil society groups, academia, employees and others to drive bold climate action.”

Summary table

RECEIVED 10/01/2025

	Global Organisations		European Organisations		North American Organisations							
	WBCSD	GCCA	CEMBUREAU	EuLA	CAC	NAPA	ARTBA	NSSGA	PCA	US Chamber of Commerce	NAM	NRMCA
Supports the goal of the Paris Agreement to limit global warming to well below 2°C, with efforts towards 1.5°C, compared to pre-industrial levels	Yes	Yes	Yes	Yes	Yes	Yes	Other	Other	Yes	Other	Yes	Other
Supports training personnel and revising product standards to develop a new generation of low-carbon, sustainable building solutions	Yes	Yes	Yes	Yes	Yes	Yes	Other	Yes	Yes	Yes	Yes	Yes
Supports carbon pricing and trading mechanisms that incentivise investing in low-carbon technologies and infrastructure	Yes	Yes	Yes	Yes	Yes	Other	Other	Yes	Yes	Other	Yes	Yes
Supports investing in research and development of innovative decarbonisation technologies, such as those that enhance concrete's ability to act as a carbon sink and carbon capture, utilisation and storage	Yes	Yes	Yes	Yes	Yes	Yes	Other	Yes	Yes	Yes	Yes	Yes
Supports deploying renewable energy sources, such as biomass and wastes, to aid the clean energy transition	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports transparency and accountability in reporting lobbying activities	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Yes No Other

Global Organisations

WORLD BUSINESS COUNCIL FOR SUSTAINABLE DEVELOPMENT (WBCSD)

WBCSD is a platform of global companies working together to accelerate the journey towards sustainable development. It builds impactful coalitions and networks that: facilitate the sharing of knowledge; enable and accelerate the adoption of standards and tools; and create advocacy for common policy asks.

WBCSD facilitates interaction on cutting-edge climate and energy topics between its members, their peers and stakeholders as they address critical industry issues. It advocates for policy levers to support and enable implementation of innovative and sustainable solutions, but it is not involved in lobbying activities.

Membership criteria include: set an ambition to reach net zero greenhouse gas emissions; set ambitious, science-informed, short and mid-term environmental goals; declare support for the UN Guiding Principles on Business and Human Rights; declare support for inclusion, equality, diversity and the elimination of any form of discrimination; and operate at the highest level of transparency by disclosing material sustainability information in line with the Task Force on Climate-related Financial Disclosures.

During COP26, WBCSD published the 'Business Manifesto for Climate Recovery' to outline what is required to accelerate the global climate recovery. The manifesto sets out twelve action priorities framed around reducing, removing and reporting emissions and highlights the public-private collaborations required to drive climate action and keep the global temperature rise to 1.5°C.



Review findings

Supports the goal of the Paris Agreement to limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels	<input checked="" type="checkbox"/> Yes
Supports training personnel and revising product standards to develop low-carbon, sustainable building solutions	<input checked="" type="checkbox"/> Yes
Supports carbon pricing and trading mechanisms to incentivise investments in low-carbon technologies and infrastructure	<input checked="" type="checkbox"/> Yes
Supports the development of advanced technologies, such as CCUS	<input checked="" type="checkbox"/> Yes
Supports deploying renewable energy sources to aid the clean energy transition	<input checked="" type="checkbox"/> Yes
Supports lobbying transparency by publishing policy positions and documenting activities in the European Transparency Register	<input checked="" type="checkbox"/> Yes

GLOBAL CEMENT AND CONCRETE ASSOCIATION (GCCA)

GCCA – a CEO led initiative – is the global voice of the cement and concrete industry. Its mission is to position concrete to meet the world's needs for a material that can build and support growing, modern, sustainable and resilient communities. Together, with its member companies, it is committed to building a bright, resilient and sustainable concrete future for our industry and for the world.

The association and its member companies recognise that climate change is the number one crisis facing our world and are committed to taking climate action. In October 2021, GCCA published its cement and concrete industry '2050 Global Roadmap', which sets out the levers, milestones and actions needed to achieve net zero concrete for the world.

GCCA has launched and manages two world class global innovation programmes under its Innovandi brand. This includes a global research network and a global open innovation programme, which are focused on advancing decarbonisation innovations and technologies.

The association and its member companies recognise that climate action is only possible through collaboration with all stakeholders across the built environment. To date, GCCA has predominantly engaged with global intergovernmental organisations and bodies, as well as civil society groups and NGOs, rather than direct lobbying at a regional or national government levels.

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Review findings

Supports the goal of the Paris Agreement to limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels	<input checked="" type="checkbox"/> Yes
Supports training personnel and revising product standards to develop low-carbon, sustainable building solutions	<input checked="" type="checkbox"/> Yes
Supports carbon pricing and trading mechanisms to incentivise investments in low-carbon technologies and infrastructure	<input checked="" type="checkbox"/> Yes
Supports the development of advanced technologies, such as CCUS	<input checked="" type="checkbox"/> Yes
Supports deploying renewable energy sources to aid the clean energy transition	<input checked="" type="checkbox"/> Yes
Supports lobbying transparency by publishing policy positions	<input checked="" type="checkbox"/> Yes

European Organisations

CEMBUREAU

The European Cement Association – CEMBUREAU – is the representative organisation of the cement industry in Europe.

The association advocates for the cement industry before the EU institutions and public authorities and communicates the industry's views on all policy developments regarding technical, environmental, energy, employee health and safety and sustainability issues.

CEMBUREAU's 'Carbon Neutrality Roadmap' sets out the European cement industry's plans to reach net zero GHG emissions along the cement and concrete value chain by 2050. The roadmap looks at how CO₂ emissions can be reduced by acting at each stage of the value chain – clinker, cement, concrete, construction and (re)carbonation. By 2030, CEMBUREAU aspires to be in line with the Paris Agreement's 2°C scenario, reducing CO₂ emissions by 30% for cement and 40% down the value chain.

Currently, full members of CEMBUREAU are the national cement industry associations and cement companies of the European Union (except for Malta and Slovakia), plus Norway, Switzerland, Turkey and the United Kingdom. Croatia and Serbia are associate members; and cooperation agreements have been concluded with Vassiliko Cement in Cyprus and UKRCEMENT in Ukraine.



Review findings

Supports the goal of the Paris Agreement to limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels	<input checked="" type="checkbox"/> Yes
Supports training personnel and revising product standards to develop low-carbon, sustainable building solutions	<input checked="" type="checkbox"/> Yes
Supports carbon pricing and trading mechanisms to incentivise investments in low-carbon technologies and infrastructure	<input checked="" type="checkbox"/> Yes
Supports the development of advanced technologies, such as CCUS	<input checked="" type="checkbox"/> Yes
Supports deploying renewable energy sources to aid the clean energy transition	<input checked="" type="checkbox"/> Yes
Supports lobbying transparency by publishing policy positions and documenting activities in the European Transparency Register	<input checked="" type="checkbox"/> Yes

EUROPEAN LIME ASSOCIATION (EuLA)

The European Lime Association (EuLA) is involved in all non-commercial issues relating to the properties and safe use of lime, from extraction and processing to end-use applications. Health and safety at the workplace, environment protection, product safety, energy and climate and awareness about the importance of lime for society are at the core of EuLA's mission. EuLA provides sector-based representation for the European lime industry before the European Institutions.

The European lime sector is developing a roadmap to become carbon neutral and is committed to contributing to the European Green Deal, which aims to make Europe the first climate neutral continent by 2050.



Review findings

Supports the goal of the Paris Agreement to limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels	<input checked="" type="checkbox"/> Yes
Supports training personnel and revising product standards to develop low-carbon, sustainable building solutions	<input checked="" type="checkbox"/> Yes
Supports carbon pricing and trading mechanisms to incentivise investments in low-carbon technologies and infrastructure	<input checked="" type="checkbox"/> Yes
Supports the development of advanced technologies, such as CCUS	<input checked="" type="checkbox"/> Yes
Supports deploying renewable energy sources to aid the clean energy transition	<input checked="" type="checkbox"/> Yes
Supports lobbying transparency by publishing policy positions and documenting activities in the European Transparency Register	<input checked="" type="checkbox"/> Yes

North American Organisations

CEMENT ASSOCIATION OF CANADA (CAC)

CAC represents five cement companies with clinker and cement manufacturing facilities across Canada. It collaborates with stakeholders to achieve 'a sustainable and resilient future with net-zero concrete'.

CAC has consistently supported strong action on climate change. It proactively champions not only innovation in the manufacturing of cement and concrete, but also ground-breaking partnerships with governments, ENGOs, architects, engineers and others to advance the policy solutions needed to meet Canada's climate objectives.

A pioneering partnership between CAC and the Canadian government supports the cement sector's development and implementation of a 'Roadmap to Net-Zero-Carbon Concrete'. This work provides the Canadian cement and concrete industry with funding and the policy and regulatory support needed to develop the technologies and tools to achieve net-zero carbon concrete by 2050.



Review findings

Supports the goal of the Paris Agreement to limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels	Yes
Supports training personnel and revising product standards to develop low-carbon, sustainable building solutions	Yes
Supports carbon pricing and trading mechanisms to incentivise investments in low-carbon technologies and infrastructure	Yes
Supports the development of advanced technologies, such as CCUS	Yes
Supports deploying renewable energy sources to aid the clean energy transition	Yes
Supports lobbying transparency by publishing policy positions and documenting activities in a public register	Yes

NATIONAL ASPHALT PAVEMENT ASSOCIATION (NAPA)

NAPA works to promote the asphalt pavement industry.

Founded in 1955, the association counts more than 1,100 companies as members. It supports them through education, technical advice, recognition programmes and peer engagement; and it advances the industry through innovation and research, thought leadership and promoting safe, efficient and sustainable operations.

NAPA advocates on behalf of the industry by engaging and educating decision-makers. This includes representing the interests of asphalt producer and contractors with Congress, government agencies and other national trade and business organisations.

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Review findings

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Supports training personnel and revising product standards to develop low-carbon, sustainable building solutions	<input checked="" type="checkbox"/> Yes
Supports carbon pricing and trading mechanisms to incentivise investments in low-carbon technologies and infrastructure	<input checked="" type="checkbox"/> Other*
Supports the development of advanced technologies, such as CCUS	<input checked="" type="checkbox"/> Yes
Supports deploying renewable energy sources to aid the clean energy transition	<input checked="" type="checkbox"/> Yes
Supports lobbying transparency in line with the disclosure rules of the US House of Representatives and Senate	<input checked="" type="checkbox"/> Yes

*According to the organisation's questionnaire response, NAPA "does not currently have a specific policy on carbon pricing and trading mechanisms; however, in NAPA's Climate Action Plan, NAPA expresses support for incentivizing investments, by producer companies, which will reduce emissions for infrastructure. NAPA's current focus is to develop frameworks and member guidance to deliver on a net zero economy and specific policies on carbon pricing and trading mechanisms may be included in the future."

AMERICAN ROAD AND TRANSPORTATION BUILDERS ASSOCIATION (ARTBA)

Since 1902, ARTBA has helped shape the development of the United States' surface transportation infrastructure, including the Interstate Highway System.

It represents all facets of the transportation design and construction industry. Members include contractors, designers, equipment manufacturers, suppliers, public sector owners, research institutions and public private partnership experts.

ARTBA advocates on federal legislative and regulatory issues for infrastructure investment and policy that meets the nation's need for safe and efficient travel.

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Review findings

Supports the goal of the Paris Agreement to limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels	<input type="checkbox"/> Other*
Supports training personnel and revising product standards to develop low-carbon, sustainable building solutions	<input type="checkbox"/> Other*
Supports carbon pricing and trading mechanisms to incentivise investments in low-carbon technologies and infrastructure	<input type="checkbox"/> Other*
Supports the development of advanced technologies, such as CCUS	<input type="checkbox"/> Other*
Supports deploying renewable energy sources to aid the clean energy transition	<input checked="" type="checkbox"/> Yes
Supports lobbying transparency in line with the disclosure rules of the US House of Representatives and Senate	<input checked="" type="checkbox"/> Yes

*ARTBA does not have a position on the items marked 'Other' at this time. According to the organisation's questionnaire response, ARTBA has "routinely advocated for utilization of climate change-focused revenue streams in public transportation improvement and reductions in highway traffic congestion --including enhanced single occupancy vehicle capacity --which has been empirically demonstrated to reduce carbon emissions from automobiles" and "has long supported all manner of federal research to improve the delivery, effectiveness, and longevity of transportation infrastructure facilities."

NATIONAL STONE, SAND AND GRAVEL ASSOCIATION (NSSGA)

NSSGA is the leading voice and advocate for the aggregates industry.

Its members are stone, sand and gravel producers and the equipment manufacturers and service providers who support them. Member companies produce more than 90 per cent of the crushed stone and 70 per cent of the sand and gravel consumed annually in the United States.

NSSGA advances public policies that protect and expand the safe, environmentally responsible use of aggregates that build America's infrastructure and economy.

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NSSGA[®]

NATIONAL STONE, SAND
& GRAVEL ASSOCIATION

Review findings

Supports the goal of the Paris Agreement to limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels	Other*
Supports training personnel and revising product standards to develop low-carbon, sustainable building solutions	Yes
Supports carbon pricing and trading mechanisms to incentivise investments in low-carbon technologies and infrastructure	Yes
Supports the development of advanced technologies, such as CCUS	Yes
Supports deploying renewable energy sources to aid the clean energy transition	Yes
Supports lobbying transparency by publishing policy positions	Yes

*According to the organisation's questionnaire response, NSSGA "formed a Sustainability Task Force who has a goal to develop a GHG industry baseline in order to track improvements through the industry and find ways that the industry can reduce our emissions. The Task Force is also building a principles document."

PORTLAND CEMENT ASSOCIATION (PCA)

Founded in 1916, PCA is the premier policy, research, education and market intelligence organisation serving America's cement manufacturers.

PCA supports sustainability, innovation and safety, while fostering continuous improvements in cement manufacturing, distribution, infrastructure and economic growth. It conducts market development, engineering, research, education, technical assistance and public affairs programmes on behalf of its member companies.

The cement and concrete industry is fully committed to decarbonisation and has pledged to become carbon neutral across the cement and concrete value chain by 2050.



Review findings

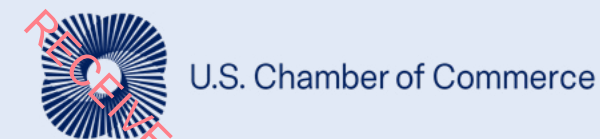
Supports the goal of the Paris Agreement to limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels	<input checked="" type="checkbox"/> Yes
Supports training personnel and revising product standards to develop low-carbon, sustainable building solutions	<input checked="" type="checkbox"/> Yes
Supports carbon pricing and trading mechanisms to incentivise investments in low-carbon technologies and infrastructure	<input checked="" type="checkbox"/> Yes
Supports the development of advanced technologies, such as CCUS	<input checked="" type="checkbox"/> Yes
Supports deploying renewable energy sources to aid the clean energy transition	<input checked="" type="checkbox"/> Yes
Supports lobbying transparency by complying with the Lobbying Disclosure Act and publishing policy positions	<input checked="" type="checkbox"/> Yes

U.S. CHAMBER OF COMMERCE

The U.S. Chamber of Commerce is the world's largest business organisation.

Its members range from small businesses and chambers of commerce to leading industry associations and global corporations.

Since its founding, the U.S. Chamber has advocated for policies that help businesses create jobs and grow the economy. The Chamber serves as their ally and champion on Capitol Hill, in the courts, in state houses and in markets around the world.



Review findings

Supports the goal of the Paris Agreement to limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels	<input type="checkbox"/> Other*
Supports training personnel and revising product standards to develop low-carbon, sustainable building solutions	<input checked="" type="checkbox"/> Yes
Supports carbon pricing and trading mechanisms to incentivise investments in low-carbon technologies and infrastructure	<input type="checkbox"/> Other**
Supports the development of advanced technologies, such as CCUS	<input checked="" type="checkbox"/> Yes
Supports deploying renewable energy sources to aid the clean energy transition	<input checked="" type="checkbox"/> Yes
Supports lobbying transparency by complying with the Lobbying Disclosure Act and publishing policy positions	<input checked="" type="checkbox"/> Yes

*According to the organisation's questionnaire response, the U.S. Chamber of Commerce "welcomed the Biden Administration's decision to rejoin the Paris Climate Agreement, as we have always believed the U.S. must take a strong leadership role in the Paris talks to facilitate meaningful global progress and to maintain and enhance the competitiveness of U.S. business in a global market. The Chamber supports reducing emissions at the pace of innovation."

**The U.S. Chamber of Commerce "supports a market-based approach to greenhouse gas (GHG) emissions reductions across the U.S. economy, and believes that advanced technology and innovation offer the best solutions for managing climate risks and reducing GHG emissions."

NATIONAL ASSOCIATION OF MANUFACTURERS (NAM)

Founded in Cincinnati, Ohio, in 1895, NAM represents 14,000 member companies – from small businesses to global corporations – in every industrial sector.

Its work is centred around four values: free enterprise, competitiveness, individual liberty and equal opportunity.

NAM advocates with White House and administration officials, on Capitol Hill and in the media to advance the interests of manufacturers.

Review findings

Supports the goal of the Paris Agreement to limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels	<input checked="" type="checkbox"/> Yes
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Supports training personnel and revising product standards to develop low-carbon, sustainable building solutions	<input checked="" type="checkbox"/> Yes
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Supports carbon pricing and trading mechanisms to incentivise investments in low-carbon technologies and infrastructure	<input checked="" type="checkbox"/> Yes
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Supports the development of advanced technologies, such as CCUS	<input checked="" type="checkbox"/> Yes
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Supports deploying renewable energy sources to aid the clean energy transition	<input checked="" type="checkbox"/> Yes
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Supports lobbying transparency by complying with the Lobbying Disclosure Act and publishing policy positions	<input checked="" type="checkbox"/> Yes
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NATIONAL READY MIXED CONCRETE ASSOCIATION (NRMCA)

Founded in 1930, NRMCA represents the ready mixed concrete industry through leadership, promotion, education and partnering.

NRMCA advocates on behalf of the industry with the administration and on Capitol Hill for legislative and regulatory outcomes that benefit its members and help their businesses thrive.

NRMCA is committed to working with its corporate, academic and association partners in furthering research and development of technologies and materials that reduce concrete's carbon footprint. NRMCA also supports ongoing research, promotion and education in the development and adoption of low carbon and energy efficient concrete construction materials that reduce the embodied and operational carbon of concrete structures.

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Review findings

Supports the goal of the Paris Agreement to limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels	<input type="checkbox"/> Other*
Supports training personnel and revising product standards to develop low-carbon, sustainable building solutions	<input checked="" type="checkbox"/> Yes
Supports carbon pricing and trading mechanisms to incentivise investments in low-carbon technologies and infrastructure	<input checked="" type="checkbox"/> Yes
Supports the development of advanced technologies, such as CCUS	<input checked="" type="checkbox"/> Yes
Supports deploying renewable energy sources to aid the clean energy transition	<input checked="" type="checkbox"/> Yes
Supports lobbying transparency by complying with all federal and state lobbying disclosure and reporting requirements and publishing policy positions	<input checked="" type="checkbox"/> Yes

*According to the organisation's questionnaire response, NRMCA "engages in research, promotion and policy advocacy that supports the goals of reducing carbon emissions associated with concrete production and the aspiration to deliver carbon neutral concrete. NRMCA is working closely with the Portland Cement Association in the development and deployment of the cement and concrete industry's Roadmap to Carbon Neutrality."



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