MWP

Chapter 09 Climate

Newtown Transmission Gas Pipeline and Associated Above Ground Infrastructure

Gas Networks Ireland

November 2025

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9.1 Introduction

This chapter considers the potential effects on climate arising from the proposed development, as well as considering the effects of climate change on the proposed development. A full description of the proposed development, development lands and all associated project elements is provided in Chapter 02 Description of the Proposed Development of this EIAR. The nature and probability of effects on climate arising from the overall project, as well as the climate change risk assessment (CCRA) and the proposed development's vulnerability to climate change, have been assessed.

Mitigation measures have been provided to prevent significant effects and climate related residual effects associated with the proposed development are also summarised.

9.1.1 Competency of Assessor

The assessment has been prepared by Kieran Barry (BEng, PgDip, CEnv) and reviewed by Olivia Holmes, both of MWP.

Kieran is a Chartered Environmentalist and holds a Degree in Civil and Structural Engineering as well as a Post Graduate Diploma in Environmental Protection. Kieran is an experienced environmental consultant with 9 years' experience working on environmental projects. Kieran works on a variety of infrastructure projects conducting environmental assessments and supporting the delivery of a number of environmental deliverables including Environmental Impact Assessment (EIA) Screening Reports, feasibility and constraints studies, route option assessments and Environmental Impact Assessment Reports (EIAR), including Climate EIAR Chapters.

This assessment has been reviewed by Olivia Holmes. Olivia is a Chartered Engineer and Chartered Environmental Practitioner with over twenty years' experience in Environmental Engineering focussing primarily on Environmental Impact Assessment (EIA), Appropriate Assessment (AA) and planning. She has prepared and reviewed a number of chapters for EIARs over her career, for a broad range of projects.

9.2 Methodology

9.2.1 Guidelines Relevant to Discipline

The assessment has been prepared in accordance with the *Guidelines on the Information to be contained in Environmental Impact Assessment Reports* (EPA, 2022), in addition to international standards and guidelines relating to the assessment of Greenhouse Gas (GHG) emissions and associated climatic impact. References to legislation include amendments thereto. These are summarised below:

- DECC (2024) National Adaptation Framework 2024;
- DCCAE (2025) Climate Action Plan 2025;
- Department of Transport, Tourism and Sport (DTTAS) (2019) Transport – Climate Change Sectoral Adaption Plan;
- Climate Action and Low Carbon Development (Amendment) Act 2021;

- PE-ENV-01104 *Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (TII, 2022a)*
- IEMA EIA Guide to: Climate Change Resilience and Adaptation (IEMA, 2020);
- IEMA Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA, 2017);
- Fingal County Council Climate Change Action Plan 2019-2024;
- Fingal County Council Development Plan 2023-2029;
- European Commission (EC) (2014) 2030 Climate and Energy Policy Framework;
- UKHA (2019) Design Manual for Roads and Bridges: A 114 – Climate;
- European Green Deal (EC, 2022);
- Kyoto Protocol (United Nations Framework Convention on Climate Change (United Nations Framework Convention on Climate Change (UNFCC), 1997);
- Paris Agreement (UNFCC, 2015);
- Summary of Global Climate Action at COP 28 (UNFCC, 2023); and
- Summary of Global Climate Action at COP 29 (UNFCC, 2024).

9.2.1.1 Climate Agreements and Policies

Ireland is party to both the United Nations Framework Convention on Climate Change (UNFCC) and the Kyoto Protocol. The Paris Agreement, which entered into force in 2016, is an important milestone in terms of international climate change agreements and includes an aim of limiting global temperature increases to no more than 2^{o}C above pre-industrial levels with efforts to limit this rise to 1.5^{o}C. The aim is to limit global GHG emissions to 40 gigatonnes as soon as possible whilst acknowledging that peaking of GHG emissions will take longer for developing countries. Contributions to GHG emissions will take longer for developing countries. Contributions to GHG emissions will be based on Intended Nationally Determined Contributions (INDCs) which will form the foundation for climate action post 2020. Significant process was also made in the Paris Agreement on elevating adaption onto the same level as action to cut and curb emissions.

In order to meet the commitments under the Paris Agreement, the EU enacted *Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013 (the Regulation).* The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30% respectively, by 2030 compared to 2005. Ireland's obligation under the Regulation is a 30% reduction in non-ETS greenhouse gas emissions by 2030 relative to its 2005 levels.

In 2015, the Climate Action and Low Carbon Development Act 2015 (No.46 of 2015) (Government of Ireland, 2015) was enacted (The Act). The purpose of the Act was to enable Ireland '*to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050*' (3.(1) of No.46 of 2015). This is referred to in the Act as the 'national transition objective'. The Act made provision for, inter alia, a national adaptation framework. In addition, the Act provided for the establishment of the Climate Change Advisory Council with the function to advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations.

The first Climate Action Plan (CAP) was published by the Irish Government in June 2019 (Government of Ireland, 2019a). The Climate Action Plan 2019 outlined the current status across key sectors including Electricity,

Transport, Built Environment, Industry and Agriculture and outlined the various broadside measures required for each sector to achieve ambitious decarbonisation targets. The 2019 CAP also detailed the required governance arrangements for implementation including carbon-proofing of policies establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The Government published second Climate Action Plan in November 2021. The plan contains similar elements as the 2019 CAP and aims to set out how Ireland can reduce our greenhouse gas emissions by 51% by 2030 (compared to 2018 levels) which is in line with the EU ambitions, and a longer-term goal of achieving net-zero emissions no later than 2050. The 2021 CAP outlines that emissions from the Built Environment Sector must be reduced to 5 – 5 $MtCO_2e$ by 2030 in order to meet our climate targets. This will require further measures in addition to those committed to in the 2019 CAP. This will include phasing out the use of fossil fuels for the space and water heating of buildings, improving the fabric and energy of our buildings, and promoting the use of lower carbon alternatives in construction.

Following on from Ireland declaring a climate and biodiversity emergency in May 2019 and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government approved the publication of the General Scheme for the Climate Action (Amendment) Bill 2019 in December 2019 followed by the publication of the Climate Action and Low Carbon Development (Amendment) Act 2021 (No.32 of 2021) (hereafter referred to as the 2021 Climate Act) in July 2021 (Government of Ireland, 2021b). The 2021 Climate Act was prepared for the purposes of giving effect to the core objectives stated within the CAP.

The purpose of the 2021 Climate Act was to provide for the approval of plans *'for the purpose of pursuing the transition to a climate resilient, biodiversity rich and climate neutral economy by no later than the end of the year 2050'. The 2021 Climate Act also aimed to 'provide for carbon budgets and a decarbonisation target range for certain sectors of the economy'*. The 2021 Climate Act defines the carbon budget as *'the total amount of greenhouse gas emissions that permitted during the budget period'*. The 2021 Climate Act removes any reference to a national mitigation plan and instead refers to both the Climate Action Plan, as published in 2019, and a series of National Long Term Climate Action Strategies.

The most recent published Climate Action Plan is CAP 2025. It is the third statutory update to the plan since the Climate Action and Low Carbon Development (Amendment) Act 2021 was signed into law, committing Ireland to reducing greenhouse gas emissions by 51% by 2030 (relative to 2018 levels) and achieving climate neutrality by 2050.

CAP25 reaffirms the CAP 24 target for the production of 5.7 TWh per annum of biomethane by 2030 and outlines the first steps in the production of green hydrogen (the National Hydrogen Strategy describes these in greater detail, and over a longer timeframe). CAP24 highlights the important role of decarbonised gases, stating that *"decarbonised gases such as green hydrogen and biomethane can provide a decarbonisation pathway for reducing emissions arising from medium and high-temperature processes"* and reaffirms the *"need to diversify our renewable electricity generation and increase our gas-fired generation capacity"*.

9.2.2 Gas Networks Ireland

In relation to the proposed development, Gas Networks Ireland (GNI) is a statutory body whose primary function is to own, operate and maintain the national gas transmission and distribution system in Ireland. It has a statutory obligation pursuant to Section 10A(2) of the Gas Act 1976 to enter into binding agreements for access to that system, subject to certain terms, conditions and exceptions, in particular the requirement to comply with a CRU-approved connection policy in that regard.

GNI entered into such agreements in respect of which the proposed development is required to deliver under those agreements its obligations under Irish and EU law on access to the gas system.

GNI is a public body for the purposes of the Climate Action and Low Carbon Development Act 2015, as amended. GNI considers that the consenting and construction of the proposed development is consistent with the most recent approved Climate Action Plan (the Climate Action Plan 2025) and its obligations under the Climate Action and Low Carbon Development Act 2015, as amended.

As mentioned above, CAP25 focuses on the expansion of biomethane production to support the decarbonisation of the heat sector and achieve climate targets. CAP 2025 also supports the direction taken by Gas Networks Ireland's Pathway to a Net Zero Carbon Network, which sets a long-term roadmap toward fully decarbonising the gas grid by 2045, shifting to 100% renewable gas composed of biomethane and green hydrogen.

GNI published *Pathway to Net Zero Carbon Network* in 2024, outlining how the national gas network can transport 100% renewable gas by 2045, thereby playing an essential role in transitioning Ireland to a carbon-neutral economy. GNI's decarbonisation pathway, consistent with current energy and climate action policy, focuses on ultimate network repurposing to transport only renewable gases. By the end of the period, the existing national gas network will split into two distinct renewable gas networks, biomethane and hydrogen.

Delivery of CAP25 targets will be important milestones for GNI on its pathway to decarbonisation and this has helped inform its ongoing engagement, via the public consultation process and as members of Chapter Working Groups. GNI will measure the success of its engagements on the delivery of these decarbonised gas targets, and the incorporation of further biomethane and green hydrogen production targets in future iterations of the Climate Action Plan.

National Hydrogen Strategy

The full and timely implementation of Ireland's National Hydrogen Strategy will be vital in helping Gas Networks Ireland realise this vision. The Strategy highlights the importance of creating a national hydrogen network and goes on to state that "where feasible, repurposing existing natural gas pipeline infrastructure to hydrogen is favourable".

GNI is a member of the Government's Interdepartmental Hydrogen Working Group and expects to be assigned ownership of some actions within the Strategy, including the development of a plan for transitioning the gas network to hydrogen overtime. GNI will measure the success of its engagements on the Strategy on the delivery of these actions, the overall delivery of the Strategy, and the full decarbonisation of our network by 2045.

CAP25 sets a specific target for the use of decarbonised gases to reduce industrial emissions including those from Large Energy Users. It also highlights the importance of decarbonised gases (biomethane and green hydrogen) in Ireland's energy transition.

Ireland's Long-term Strategy on Greenhouse Gas Emissions Reduction 2024

Ireland's Long-term Strategy on Greenhouse Gas Emissions Reduction[1] was published in July 2024. The Strategy outlines the approach to achieving climate neutrality by 2050 and beyond. Section 8 of the Strategy includes information on Pathways to Climate Neutrality by Sector, including the electricity sector which gas networks fall under. This section focuses primarily on electricity generation rather than gas. It references the current GHG emissions within the electricity sector and the need to decarbonise the electricity sector, primarily through the use of renewable forms of generation which will in turn allow for the decarbonisation of other sectors such as transport and industry. Section 8 of the Strategy states "Zero-emissions gas will also be required in a climate neutral pathway in order to support the intermittency of wind and solar generation." Reference is also made to the potential for green-hydrogen as a strategy to deliver zero emissions electricity and decarbonising the grid. As

[1] Department of the Environment, Climate and Communications (2024) ad1847e4-b9d7-4643-a01b-04ce9586e121.pdf

mentioned above, GNI has developed its Pathway to a Net Zero Carbon Network, which outlines how the national gas network can transport 100% renewable gas by 2045, thereby playing an essential role in transitioning the electricity sector to climate neutrality in line with the points set out in the Long-term Strategy on Greenhouse Gas Emissions Reduction.

National Adaptation Framework 2024

The second National Adaptation Framework (NAF) (DECC, 2024) was published in June 2024 in line with the five-year requirement of the 2015 Climate and Low Carbon Development Act (as amended). The plan provides a whole of government and society approach to climate adaptation in Ireland to reduce Irelands vulnerability to climate change risks including extreme weather events, flooding, drought, loss of biodiversity, sea level rise and increased temperatures.

In the NAF Section 3.5.4 Role of the Commercial Semi-State Sector, it states: "*The Commercial Semi-State Sector has a role to play in supporting the delivery of an enabling environment for adaptation and resilience through, for example, safeguarding its own operations and services as well as supporting the wider implementation of adaptation actions".*

In addition, Appendix 7 of the NAF outlines the sectoral impacts and opportunities of climate change. In relation to electricity and gas networks the following potential impacts are identified:

"Water shortages and drought may affect the availability of cooling at conventional power plants.

- Changes in rainfall distribution could reduce hydro power generation during certain seasons, while increasing the role of hydro stations in flood alleviation
- Floods may damage electricity and gas transmission systems, and coastal erosion could impact infrastructure.
- Increased wind variability may require backup generation or storage, and strong winds may lead to turbine shutdown or damage."

Climate change impacts are also considered in further detail within the sectoral adaptation plans. Under the NAF a number of government departments are required to prepare sectoral adaptation plans in relation to the priority areas they are responsible for. The first round of plans was produced in 2019. The Electricity & Gas Networks Sector Climate Change Adaptation Plan 2 is of relevance in relation to the Overall Proposed Development. Biomethane is referenced in Section 1.13 which states that generation using biomethane is available regardless of weather conditions, which makes it beneficial in adapting to climate change. Section 1.21 *Gas* references the role of Gas Networks Ireland and their responsibilities regarding the resilience of the gas infrastructure to climate change.

9.2.3 Climate Assessment Significance Criteria

The climate assessment is divided into two distinct sections – a greenhouse gas assessment (GHGA) and a climate change risk assessment (CCRA).

- Greenhouse Gas Emissions Assessment (GHGA) - Quantifies the GHG emissions from a project over its lifetime. The assessment compares these emissions to relevant carbon budgets, targets and policy to contextualise magnitude.
- Climate Change Risk Assessment (CCRA) – Identifies the impact of a changing climate on a project and receiving environment. The assessment considers a projects vulnerability to climate change and identifies adaptation measures to increase project resilience.

The significance criteria for each assessment are described below.

9.2.3.1 Significance Criteria for Greenhouse Gas Assessment

The Transport Infrastructure Ireland (TII) guidance document entitled PE-ENV-01104 *Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (TII, 2022a)* outlines a recommended approach for determining the significance of both the construction and operational phases of a development.

The significance of GHG effects set out in PE-ENV-01104 (TII, 2022a) is based on IEMA guidance (IEMA, 2022), which is consistent with the terminology contained within Figure 3.4 of the EPA Guidelines (EPA, 2022).

The 2022 IEMA Guidance (IEMA, 2022) sets out the following principles for significance:

- 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.

Determining the significance of effects is a two-stage process that involves defining the magnitude of the impacts and the sensitivity of the receptors (i.e. Ireland's National GHG targets or National Climate Objective). In relation to climate, there is no project specific assessment criteria, but the project will be assessed against the recommended TII significance determination. This takes account of any embedded or committed mitigation measures that form part of the design which should be considered.

TII (TII 2022a) states that professional judgement must be taken into account when contextualising and assessing the significance of a project's GHG impact. In line with IEMA Guidance (IEMA, 2022), TII state that the crux of assessing significance is:

"*not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*"

Significance is determined using the criteria outlined in Table 9-1 (derived from Table 6.7 of PE-ENV- 01104 (TII 2022a)) along with consideration of the following two factors:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

Table 9-1: Significance Criteria for GHGA

Likelihood Category	Significance Level	Description
Significant Adverse	Major Adverse	• The project's GHG impacts are not mitigated. • The project has not complied with do-minimum standards set through regulation, nor provided reductions required by local or national policies; and • No meaningful absolute contribution to Ireland's trajectory towards net zero.
	Moderate Adverse	• The project's GHG impacts are partially mitigated. • The project has partially complied with do-minimum standards set through regulation, and have fully complied with local or national policies; or • Falls short of full contribution to Ireland's trajectory towards net zero.
Not significant	Minor Adverse	• The projects GHG impacts are mitigated through 'good practice' measures. • The project has complied with existing and emerging policy requirements; and • Fully in line to achieve Ireland's trajectory towards net zero.
	Negligible	• The projects GHG impacts are mitigated beyond design standards. • The project has gone well beyond existing and emerging policy requirements; and • Well 'ahead of the curve' for Ireland's trajectory towards net zero.
Beneficial	Beneficial	• The projects net GHG impacts are below zero and it causes a reduction in atmosphere GHG concentration. • The project has gone well beyond existing and emerging policy requirements; and • Well 'ahead of the curve' for Ireland's trajectory towards net zero, provides a positive climate impact.

Ireland's carbon budgets can also be used to contextualise the magnitude of GHG emissions from the proposed development (TII, 2022a). The approach is based on comparing the net proposed development GHG emissions to the relevant carbon budgets. The aim of the carbon budget , is to ensure we are on a trajectory to meet the National Climate Objective of Net Zero by 2050.

9.2.3.2 Significance Criteria for CCRA

The CCRA involves an initial screening assessment to determine the vulnerability of the proposed development to various climate hazards. The vulnerability is determined by combining the sensitivity and the exposure of the proposed development to various climate hazards.

Vulnerability = Sensitivity x Exposure

The vulnerability assessment takes any proposed mitigation into account. Table 9-2 details the vulnerability matrix; vulnerabilities are scored on a high, medium and low scale.

TII guidance (TII, 2022a) and the EU technical guidance (European Commission, 2021a) note that if all vulnerabilities are ranked as low in a justified manner, no detailed climate risk assessment may be needed. Therefore, the impact from climate change on the proposed development can be considered to be not significant.

However, where residual medium or high vulnerabilities exist the assessment may need to be progressed to a detailed climate change risk assessment and further mitigation implemented to reduce risks. According to the TII guidance (TII, 2022a), an assessment of construction phase CCRA impacts is only required if a detailed CCRA is required.

Table 9-2: Climate Vulnerability Matrix

		Exposure		
		High (3)	Medium (2)	Low (1)
Sensitivity	High (3)	9- High	6- High	3 – Medium
	Medium (2)	6 – High	4 – Medium	2 – Low
	Low (1)	3 – Medium	2 – Low	1 – Low

9.2.4 Construction Phase

9.2.4.1 Greenhouse Gas Assessment

As per the EU guidance document *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* (European Commission, 2013) the climate baseline is first established with reference to EPA data on annual GHG emissions (see Section 9.3.1). The impact of the proposed development on climate is determined in relation to this baseline. As per the IEMA guidance (2022) where expected emissions will not increase by over 1% compared with the baseline scenario then no further assessment is required as there is no potential for significant impacts to climate.

PE-ENV-01104 (TII, 2022a) recommends the calculation of the construction stage embodied carbon using the TII Online Carbon Tool (TII, 2022b). Embodied carbon refers to the sum of the carbon needed to produce a good or service. It incorporates the energy needed in the mining or processing of raw materials, the manufacturing of products and the delivery of these products to site. The TII Online Carbon Tool (TII, 2022b) has been commissioned by TII to assess GHG emissions associated with road or rail projects using Ireland-specific emission factors and data. While the proposed development is not specifically a road or rail project, this methodology can be applied to provide a high-level assessment of embodied carbon prior to the detailed design stage.

The TII Carbon Tool (TII, 2022b) uses emission factors from recognised sources including the Civil Engineering Standard Method of Measurement (CESSM) Carbon and Price Book database (CESSM, 2013). The carbon emissions are calculated by multiplying the emission factor by the quantity of the material that will be used over the entire construction/maintenance phase. The outputs are expressed in terms of tCO_2e (tonnes of carbon dioxide equivalent).

Information on the material quantities, site activities, land clearance, waste product and construction traffic were provided by Fingleton White and were used to determine an estimate of the GHG emissions associated with the development. These details have been used in this assessment to provide an estimate of the GHGs associated with the proposed development

9.2.5 Traffic Emissions

9.2.5.1 Construction and Operational Phase

Emissions from road traffic associated with the proposed development have the potential to emit carbon dioxide (CO_2) which will impact climate.

The TII guidance Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-0110 (TII,2022b), states that road links meeting one or more of the following criteria can be defined as being "affected" by a proposed development and should be included in the local air quality assessment, and also the climate assessment:

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- Daily average speed change by 10 kph or more;
- Peak hour speed change by 20 kph or more;
- A change in road alignment by 5m or greater.

While the guidance is specific to infrastructure projects, the approach can be applied to any development that causes a change in traffic.

There are no road links that meet or exceed the criteria for further assessment during the operational phase of the proposed development. As a result, a detailed assessment of traffic related carbon dioxide (CO_2) emissions was not conducted.

9.2.6 Operational Phase

9.2.6.1 Climate Change Vulnerability Assessment

The operational phase assessment involves determining the vulnerability of the proposed development to climate change. This involves an analysis of the sensitivity and exposure of the development to climate hazards which together provide a measure of vulnerability.

PE-ENV-01104 (TII, 2022a) states that the CCRA is guided by the principles set out in the overarching best practice guidance documents:

- Technical Guidance on the Climate Proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021a); and
- The Institute of Environmental Management and Assessment, Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (2nd Edition) (IEMA, 2020).

The baseline climate information is provided in Section 9.3.1 and Section 9.3.2.

The initial stage of an assessment is to establish a scope and boundary for the assessment taking into account the following criteria:

- Spatial Boundary: As per PE-ENV-01104 (TII, 2022a), the study area with respect to the GHGA is Ireland's Climate budget. The study area with respect to the CCRA can be considered the project boundary and its assets. The study area will be influenced by current and future baselines (refer to Section 9.3.1 and Section 9.3.2);

- Climate hazards: The outcomes of the climate screening i.e. vulnerability assessment and baseline assessment; and
- Project Receptors: TII state that the project receptors are the asset categories considered in the climate screening. In addition, any critical connecting infrastructure and significant parts of the surrounding environment e.g. water bodies that should be considered as part of the indirect, cumulative and in combination impact assessment should also be considered project receptors.

Technical guidance on the climate proofing of infrastructure in the period 2021-2027 (European Commission, 2021a) outlines an approach for undertaking a climate change risk assessment where there is a potentially significant impact on the proposed development due to climate change. The risk assessment assesses the likelihood and consequence of the impact occurring, leading to the evaluation of the significance of the impact. The role of the climate consultant in assessing the likelihood and impact is often to facilitate the climate change risk assessment process with input from the design team or specific specialists such as hydrology.

First, an initial screening CCRA based on the operational phase is carried out, according to the TII guidance PE-ENV-01104. This is carried out by determining the sensitivity of proposed development assets (i.e. receptors) and their exposure to climate change hazards.

The proposed development asset categories must be assigned a level of sensitivity to climate hazards. PE-ENV-01104 (TII, 2022a) provides the list of asset categories and climate hazards to be considered. The asset categories will vary for development type and need to be determined on a development by development basis.

- Asset Categories: Pavements; drainage; structures; utilities; landscaping; signs; light posts; buildings; and fences.
- Climate Hazards: Flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning and hail; landslides; fog.

The sensitivity is based on a High, Medium or Low Rating with a score of 1 to 3 assigned as per the criteria below:

- High Sensitivity: The climate hazard will or is likely to have a major impact on the asset category. This is a sensitivity of 3.
- Medium Sensitivity: It is possible or likely the climate hazard will have a moderate impact on the asset category. This is a sensitivity score of 2.
- Low Sensitivity: It is possible the climate hazard will have a low or negligible impact on the asset category. This is a sensitivity score of 1.

Once the sensitivities have been identified the exposure analysis is undertaken. The exposure analysis involves determining the level of exposure of each climate hazard at the project location irrespective of the project type. For example, flooding could be a risk if the project location is next to a river in a floodplain. Exposure is assigned a level of High, Medium or Low as per the below criteria:

- High Exposure: It is almost certain or likely this climate hazard will occur at the project location, i.e. might arise once to several times per year. This is an exposure score of 3.
- Medium Exposure: It is possible this climate hazard will occur at the project location, i.e. might arise a number of times in a decade. This is an exposure score of 2.
- Low Exposure: It is unlikely or rare this climate hazard will occur at the project location, i.e. might arise a number of times in a generation or in a lifetime. This is an exposure score of 1.

Once the sensitivity and exposure are categorised, a vulnerability analysis is conducted by multiplying the sensitivity and exposure to calculate the vulnerability, as shown in **Table 9-2**. TII guidance (TII, 2022a) and the EU

technical guidance (European Commission, 2021a) note that if all vulnerabilities are ranked as low in a justified manner, no detailed climate risk assessment may be needed. The impact from climate change on the proposed development can therefore considered to be not significant. However, where residual medium or high vulnerabilities exist the assessment may need to be progressed to a detailed climate change risk assessment and further mitigation implemented to reduce risks.

9.3 Baseline Environment

9.3.1 GHG Baseline

The Environmental Protection Agency (EPA) has published Ireland's Provisional Greenhouse Gas Emissions 1990–2024 (EPA, 2025), providing preliminary estimates of national GHG emissions ahead of the final submission to the EU and UN in 2026. This report offers early insight into annual emissions trends, which are critical for informing both national climate policy and project-level assessments.

In 2024, Ireland's total GHG emissions excluding Land Use, Land Use Change, and Forestry (LULUCF) were 53.75 million tonnes of CO_2 equivalent (Mt CO_2eq), representing a 2.0% decrease from 2023 and marking the second consecutive year below the 1990 baseline. Emissions fell across most sectors, with the notable exception of Transport. The Energy Industries sector recorded a significant decline due to reduced coal, oil, and peat use in electricity generation, partially offset by increased imported electricity.

Despite these reductions, Ireland remains behind the trajectory required to meet the National Climate Ambition of a 51% reduction by 2030. Three carbon budgets, covering the period up to 2035, were approved by the Oireachtas and came into force on 6 April 2022:

- Budget 1 (2021–2025): 295 Mt CO_2eq
- Budget 2 (2026–2030): 200 Mt CO_2eq
- Budget 3 (2031–2035): 151 Mt CO_2eq

The EPA also provides a breakdown of sectoral emission ceilings aligned with the carbon budgets, using 2018 as the baseline:

Table 9-3: Sectoral Emission Ceilings

Sector	2018 Baseline (Mt CO_2eq)	2021–2025 Ceiling (Mt CO_2eq)	2026–2030 Ceiling (Mt CO_2eq)
Electricity	10	40	20
Transport	12	54	37
Built Environment – Residential	7	29	23
Built Environment – Commercial	2	7	5
Industry	7	30	24
Agriculture	233	106	96
Other (F-Gases, Waste, Petroleum refining)	2	9	8
LULUCF	5	-	-

Based on the latest emissions estimates for 2021–2023 and the provisional 2024 totals including LULUCF, Ireland has emitted 243.31 Mt CO_2 eq, equivalent to 82.5% of the first five-year carbon budget. This leaves just 17.5% of the budget available for the remaining year. Achieving compliance with Budget 1 now requires a 10.3% reduction in annual emissions or a 5.96 Mt CO_2 eq reduction in 2025.

Table 9-4 shows change in emissions from 2023 to 2024.

Table 9-4: Ireland's Provisional Greenhouse Gas Emissions for 2023 and 2024 by Sector

Mt CO2eq	2023	2024	% Change
Agriculture	20.754	20.408	-1.7%
Transport	11.791	11.652	-1.2%
Energy Industries	7.869	7.157	-8.9%
Residential	5.350	5.615	+4.9%
Manufacturing Combustion	4.143	4.143	-0.3%
Industrial Processes	2.155	1.880	-12.8%
F-Gases	0.566	0.581	+2.7%
Commercial Services	0.713	0.771	+8.2%
Public Services	0.669	0.721	+7.7%
Waste	0.843	0.837	-0.7%
LULUCF	3.895	3.895*	0.0%
Total excluding LULUCF	**54.845**	**53.752**	-2.0%
Total including LULUCF	**58.740**	**57.646**	-1.9%

Note 1: Reproduced from Latest emissions data (EPA, 2025)

* LULUCF data for 2024 Provisional Inventory are 2023 Final Inventory estimates; these will be updated for the 1990-2024 Final Inventory published in 2026

For the purpose of this assessment, the predicted GHG emissions from the construction phase of the gas pipeline and AGI will be measured against the Industrial Processes sector emissions from the national inventory, as this captures fuel combustion, material production, and plant operation activities. Similarly, the predicted GHG emissions from the operational phase will be compared against the Energy Industries sector emissions, reflecting the ongoing fuel combustion, methane venting, and electricity use associated with pipeline operation and AGI facilities. This approach ensures consistency with national reporting categories and allows a clear benchmark for evaluating the project's potential contribution to overall emissions.

9.3.2 Climate Baseline

Changes in Ireland's climate are expected to evolve over time in line with global trends including increasing temperatures, changes in precipitation patterns, and changes in the variability and intensity of storms. This has resulted in flooding events, sea level rise and sea surging events.

The main observed and projected changes in Irelands climate parameters (National Adaption Framework, 2024) are summarised in Table 9-5 and Table 9-6.

Representative Concentration Pathways (RCPs), referenced in Table 9-5 and Table 9-6, refer to various scenarios that describe different 21st century pathways of GHG emissions and atmospheric concentrations, air pollutant emissions and land use.

TII's Guidance document PE-ENV-01104 (TII, 2022a) states that for future climate change a moderate to high Representative Concentration Pathways (RCP) should be adopted. RPC4.5 is considered moderate while RPC8.5 is considered high. Representative Concentration Pathways (RCPs) describe different 21st century pathways of GHG emissions depending on the level of climate mitigation action undertaken.

Table 9-5: Observed Climate Change Trends in Ireland

Parameter	Observed
Temperature	• Ireland's temperature has varied in line with global trends with annual average surface air temperature increasing 1.01°C over the last 120 years and 0.7°C when comparing the period 1991-2020 to 1961-1990. The frequency of warm years has increased from the late 1980s to present – with fifteen of the top 20 warmest years on record occurring since 1990.
Precipitation	• Increased annual precipitation of 7% has been recorded between the period 1991-2020 compared to 1961-1990. The decade 2011-2020 has been the wettest on record. Evidence suggests a trend towards increased winter rainfall and decreased summer rainfall.
Wind Speed and Storms	• Increasing wave heights over the last 70 years in the North Atlantic with winter season trends of increases up to 20 cm per decade, along with a northward displacement of storm tracks.
Sea Level and Sea Surface Temperature	• Satellite observations indicate the sea level around the coast of Ireland has increased by approximately 2-3mm per year since the 1990s. • Average sea temperature has risen with measurements at Malin Head showing an increase in average sea temperatures of 0.47°C over the last 10 years when compared to the period 1981-2010. Ocean acidity has also increased between 1991 and 2013.

Table 9-6: Projected Changes in Irelands Climate

Parameter	Projected Change
Temperature	• Ireland's climate is projected to warm incrementally across all future scenarios. Mid-century (2041-2070) annual mean temperatures are projected to increase by 1.08°C (0.59 to 1.72°C – 10th and 90th percentiles) for RCP4.5 and 1.52°C (1.14 to 1.93°C) for RCP8.5. End of century (2071-2100) annual mean temperatures show increases of 1.48°C (1.05 to 2.19°C) under RCP 4.5 and 2.71° (1.96 to 3.34°C) under RCP8.5. • The number of summer days (number of days when daily maximum temperature is >25°C) are projected to increase. By mid-century, RCP4.5 projects an increase of 2.97 (0.86 to 5.34) more summer days, while RCP8.5 shows an increase of 4.74 (2.46 to 6.70) more summer days. By end of century, larger increases of 4.08 (1.36 to 6.47) and 11.03 (6.48 to 16.83) are evident for RCP4.5 and 8.5 respectively. • In a national context, the average number of frost days (days when the minimum temperature is below 0°C) are projected to decrease by 16.18 (-22.09 to -8.84) days by mid-century for RCP4.5 and by 21.75 (-27.75 to -15.50) under RCP8.5. The end of century period sees a larger decrease in frost days, with a reduction of 21.10 (-27.20 to -14.99) and 31.42 (-36.95 to -24.71) under RCP4.5 and 8.5 respectively in comparison to the baseline. • The number of icing days (days when maximum temperature is lower than 0°=C) is projected to decrease. -0.24 (-.36 to -0.10) days change from the baseline for RCP4.5 by mid-century, and -0.30 (-0.36 to -0.20) in RCP 8.5. For end of century, the change from the baseline goes to -0.30 (-0.36 to -0.19) -0.36 (-0.37 to -0.33) days for RCP4.5 and 8.5 respectively.
Precipitation	• Precipitation projections are more variable than temperature variables. Projected changes in summer precipitation by mid-century -1.79% (-12.54 to 8.68%) and 5.51% (-15.62% to 4.85%) for RCP4.5 and 8.5 respectively. End of century projections indicate changes of -1.97% (-12.86 to 6.82%) of precipitation for RCP4.5 and -7.28% (-2.76 to 6.57%) for RCP8.5 during the summer months. On an annual basis, end of century projections under RCP4.5 indicate changes in precipitation of 5.04% (0.3 to 9.87%) in reference to the baseline and 8.92% (1.21 to 15.96%) for RCP8.5

Parameter	Projected Change
	• Projections for heavy precipitation events are expected to increase annually with the number of days above 20mm increasing by 1.15 (0.06 to 2.44) days by mid-century for RCP4.5 and 1.69 (0.62 to 2.87) under RCP8.5.
Wind Speed and Storms	• Mean 10-m wind speeds are project to decrease for all seasons by mid-century. The decreases are largest for summer months under the very high GHG emissions scenario (RCP8.5). The summer reductions in 10-m wind speed range from 0.3% to 3.4% for the intermediate GHG emissions scenario (RCP4.5) and from 2% to 5.4% for the very high GHG emissions scenario (RCP8.5).
Sea Level and Sea Surface Temperature	• Projections of sea level rise varies substantially around the coast of Ireland. Areas of the extreme southwest are likely to experience the largest increases in sea level at a rate of 3.3-4.8 mm per year and areas of the northeast coast are likely to experience sea level rise at a rate of 2.2-3.7 mm per year. Due to a limited understanding of some of the important effects driving sea level rise to a best estimate of future upper bound for sea level rise cannot be provided with confidence. • The seas around Ireland are project to continue to warm. Projected changes for the Irish Sea indicate a warming for all seasons with the highest in Autumn and lowest in Spring. Due to a limited number of climate model projections, projected changes remain uncertain.

The EPA's Critical Infrastructure Vulnerability to Climate Change report (EPA, 2021) assesses the future performance of Irelands critical infrastructure when climate is considered. With respect to road infrastructure, fluvial flooding and coastal inundation/coastal flooding are considered the main climate change risks while snowstorm and landslides are considered medium risks. Extreme winds and heatwaves/droughts are considered low risk to road infrastructure.

9.4 Assessment of Impacts and Effects

9.4.1 Construction Phase

9.4.1.1 Greenhouse Gas Assessment

There is the potential for greenhouse gas emissions to atmosphere during the construction of the development. During the construction phase, there will be carbon emissions associated with use of materials such as steel and concrete, as well as energy sources such as electricity for powering machinery and therefore there will be potential for GHG emissions during the construction stage of the proposed development.

The TII Carbon Tool has been used to calculate the total construction phase GHG emissions. Table 9-7 summarises the embodied carbon associated with site activities.

Table 9-7: Estimated tCO_2e Emissions Generated During Construction

Waste Type	Use	Quantity	Unit	tCO_2e
Mixed Construction and Demolition	Recycled/Recovery	5.6	Tonnes	0.1
Mixed Construction and Demolition	Reuse	0.7	Tonnes	0.1
Mixed Construction and Demolition	Disposal	0.7	Tonnes	.1
Wood or Timber	Reuse off site	2.4	Tonnes	.1

Waste Type	Use	Quantity	Unit	tCO_2e
Wood or Timber	Recycled	3.3	Tonnes	.12
Wood or Timber	Disposal	0.3	Tonnes	.38
Mixed Metals	Reuse	0.1	Tonnes	0.1
Mixed Metals	Recycled	1.5	Tonne	0.1
Mixed Metals	Disposal	0.1	Tonne	0.1
Concrete, Bricks, Tiles, Ceramics	Reuse	0.4	Tonnes	0.1
Concrete, Bricks, Tiles, Ceramics	Recycled	0.9	Tonnes	0.1
Concrete, Bricks, Tiles, Ceramics	Disposal	0.1	Tonnes	0.1
Other (General Office Waste etc)	Recycled	1.20	Tonnes	.1
Other (General Office Waste)	Disposal	0.30	Tonnes	.26
Aggregate and Soil	Disposal	4418	Tonnes	5.55
Aggregate and Soil	Reuse (based on 50 % of excavation backfill)	4418 (assuming 1.5 tonnes/m^3 density for soil)	Tonnes	0
Water Use	Commissioning Works	76000	Litre	0.012
Water Use	Construction works	7920	Litre	.001
Aggregate and Soil	General Excavation	5890	m^3	6.12
Total				**13.54**

As per the IEMA guidance (2022), where expected emissions will not increase by over 1% compared with the baseline scenario then no further assessment is required as there is no potential for significant impacts to climate. The baseline scenario has been determined in **Section 9.3** by reference to Ireland's national GHG emissions for 2024 (EPA, 2025). GHG emissions associated with the Industrial Processes sector were recorded as 1.88 Mt CO_2eq in 2024 (EPA, 2025). GHG emissions associated with the proposed development construction phase will be a small fraction of this and are unlikely to significantly alter the baseline.

The predicted concentrations of CO_2 for the construction phase are 13.54 tonnes CO_2eq which is a small fraction of the latest available Ireland annual GHG emissions of 1.88 Mt CO_2eq and is unlikely to significantly alter the baseline. For the transport distance of waste material to disposal sites, a conservative estimate of 100 km was used for transport distance.

The effects of GHG emissions during the construction stage are **likely** to be **negative**, **not significant**, **temporary**, and **direct**.

9.4.1.2 The Climate Change Risk Assessment

Potential for changes to long-term seasonal averages as a result of climate is not considered to be as significant by the construction years (Q2 2026 and be completed by Q1 2027). A detailed CCRA of the construction phase has been scoped out, on the basis that there are no residual medium or high-risk vulnerabilities to climate change hazards. Therefore, a detailed CCRA is not required (TII, 2022a).

However, consideration will still be given to the project's vulnerability to temporary climate impacts during the construction phase and the contractor will manage the risk of climate change effects such as flooding, warm/cold weather events, storms and include management strategies in risk assessments and method statements, refer to Section 9.5.1.1.

In the absence of mitigation, the effects of climate change on the proposed development during the construction stage is therefore predicted to be **negative**, **not significant**, **temporary** and **direct**.

9.4.2 Operational Phase

9.4.2.1 Greenhouse Gas Assessment

Traffic Emissions

During the operational phase there will be only occasional traffic that visits the site to carry out maintenance works and therefore traffic emissions will be minimal.

The level of traffic during the operational phase does not exceed TII criteria, outlined in **Section 9.2.5.1** and therefore no detailed assessment is required in terms of traffic effects on climate. Therefore, traffic will not be of magnitude to cause a significant impact on climate.

Methane Emissions

As part of the initial commissioning of the gas pipeline, gas venting or purging will be required which will be carried out in line with Safety (SR Series) standard IGEM/SR/22. Methane will be the primary component of the released gas. Methane gas has the potential to impact climate as it is a greenhouse gas with a global warming potential (GWP100) of 28 times that of carbon dioxide (CO_2). However, this gas venting during commissioning will be a once off event and will not involve the release of significant quantities of methane to atmosphere. Due to the small amount of gas to be released and the once-off, short duration of the event this is not predicted to have a significant impact on climate.

Methane emissions from the GNI network which takes place for operational and safety reasons, from 3rd party hits, incomplete combustion and fugitive emissions. Fugitive emissions result from unintentional emissions of natural gas from equipment or components such as pipelines, regulators, valves, flanges, connectors etc., on the gas transportation network.

Leak survey is systematically carried out per the requirements of IS328 during operational phase of GNI pipelines. Any detected leaks above 250ppm are investigated and rectified under GNI standard operating procedures for preventative maintenance. Provided adequate maintenance is carried out at Newtown AGI and BV extension areas, no significant sources of emissions are anticipated at these areas.

The AGI compound has a below ground isolation valve in an access pit and an above ground isolation valve in an access pit and an above ground connection for a PIG (Pipeline Inspection Gauges) launcher. Approximately every 7-10 years, the pipeline will be 'pigged' using an intelligent PIG launched from the AGI in order to monitor the mechanical status of the pipeline itself.

Comparison to GHG Emissions from Energy Industries Sector

For the purposes of this assessment, operational GHG emissions (methane and traffic emissions) from the proposed development are considered within the context of the Energy Industries sector, which emitted 7.869 Mt CO_2eq in 2023 and 7.157 Mt CO_2eq in 2024. The operational emissions from the AGI, BV extensions, and pipeline are considered negligible relative to the national Energy Industries latest projected annual emissions for

2024 as well as sectoral (Electricity) emission ceilings for 2021-2025 (40 Mt CO_2eq) and 2026-2030 (20 Mt CO_2 eq). Therefore, the operational phase GHG emissions is not expected to have a significant negative impact on climate.

The proposed development operational gas infrastructure methane emissions (commissioning/maintenance) and traffic GHG emissions are predicted to be **negative**, **imperceptible** and **temporary (occurring occasionally)** effect on climate.

Overall Effect from GHG Emissions on Climate during Operational Phase

While the proposed development will generate only minor GHG emissions during construction and operation, it forms part of a strategic pathway that will displace carbon-intensive energy sources in the future. Gas Networks Ireland (GNI), as the statutory owner and operator of the national gas network, has a legally mandated role in maintaining and operating the transmission and distribution system in line with Irish and EU law, including obligations under the Climate Action and Low Carbon Development Act 2015 and the Climate Action Plan 2025 (CAP25).

CAP25 emphasises the expansion of biomethane production and the transition toward a decarbonised heat sector, supporting Ireland's broader climate targets. The proposed development contributes directly to this pathway by upgrading and extending the gas network infrastructure, ensuring it can accommodate renewable gases such as biomethane and green hydrogen. According to GNI's Pathway to a Net Zero Carbon Network (2024), the national gas network is projected to transport 100% renewable gas by 2045. Delivery of the proposed development is therefore a necessary step toward achieving this goal.

By enabling the integration of renewable gases, the proposed development will replace fossil fuel-based heating and energy systems, resulting in a net reduction in carbon emissions over the medium and long term. This positive contribution aligns with national decarbonisation objectives and represents a **positive**, **slight**, and **long-term** effect on climate, supporting Ireland's transition to a carbon-neutral economy.

9.4.2.2 Climate Change on the Proposed Development

In order to determine the vulnerability of the proposed development to climate change the sensitivity and exposure of the development to various climate hazards must first be determined. The following climate hazards have been considered in the context of the proposed development: flooding, extreme heat, extreme cold, drought, extreme wind, lightning, hail, landslides and fog.

The sensitivity of the proposed development to the climate hazards is assessed irrespective of the project location. **Table 9-2** details the sensitivity of the proposed development on a scale of high (3), medium (2) and low (1). Once the sensitivity has been established the exposure of the proposed development to each of the climate hazards is determined, this is the likelihood of the climate hazard occurring at the project location and is also scored on a scale of high (3), medium (2) and low (1). The product of the sensitivity and exposure is then used to determine the overall vulnerability of the proposed development to each of the climate hazards as per **Table 9-2**. The results of the vulnerability assessment are detailed in **Table 9-8**.

Flooding

A flood risk assessment has been carried out and is included in **Appendix 6-1** of this **EIAR**. There is no record of previous flooding occurring at the proposed development site.

The flood risk assessment has identified that the site is within Flood Zone C as defined in the Flood Risk Management Guidelines and is an appropriate area for the proposed development. The flood risk assessment

determined that the proposed development will not have an adverse impact on flooding elsewhere and that the risk to the site would be low.

Thus, the vulnerability of the proposed development to flooding during the operational phase is of low.

Extreme Wind, Fog, Lightning & Hail

In terms of extreme weather, the EPA report *'Research of regional climate model projections for Ireland'* is predicting a reduction in storms and wind intensity by mid-century. Much of the proposed development is below ground. Above ground infrastructure is designed to withstand high winds should they occur. Hail and fog are not predicted to significantly affect the proposed development infrastructure.

Wildfires

In relation to wildfires, the *Think Hazard!*[2] tool developed by the Global Facility for Disaster Reduction and Recovery (GFDRR, 2025), indicates that the wildfire hazard is classified as low for the Dublin area. This means that there is between a 4% to 10% chance of experiencing weather that may cause disruptions and low but tangible risk of life and property loss in any given year. Future climate modelling indicates that there could be an increase in the weather conditions which are favourable to fire conditions, these include increases in temperature and prolonged dry periods. However, due to the project location in a built-up, suburban area, the risk of wildfire is significantly lessened and it can be concluded that the proposed development is of low vulnerability to wildfires.

Landslides

The Geological Society of Ireland (GSI) landslide susceptibility mapping database (GSI, 2025) was reviewed to determine the risk from landslides at the proposed development. There have not been any historical landslide events in the vicinity of the proposed development and the area is of low susceptibility to future landslides. Therefore, landslides are not a risk for the proposed development site.

Extreme Temperatures (Heat & Cold) & Drought

As outlined in **Table 9-7**, at mid-century (2041-2070) annual mean temperatures are projected to increase by 1.08°C (0.59 to 1.72°C – 10th and 90th percentiles) for RCP4.5 and 1.52°C (1.14 to 1.93°C) for RCP8.5. End of century (2071-2100) annual mean temperatures show increases of 1.48°C (1.05 to 2.19°C) under RCP 4.5 and 2.71°C (1.96 to 3.34°C) under RCP8.5.

Increased temperatures have the potential to cause the temperature of construction materials such asphalt/bitumen, concrete and steel to increase however most of the proposed development is underground and therefore not affected. Furthermore, based on an increase of 0.59 to 1.72°C for RCP4.5 and 1.14 to 1.93°C for RCP8.5, it is considered that the impact of increased temperatures on proposed development will not be significant.

Vulnerability to low temperatures is considered low because or adaptation features of design such as insulation, and underground storage. The gas infrastructure is not sensitive to drought.

Thus, the vulnerability of the proposed development to extreme temperatures and drought is low.

Summary

Overall, it was concluded that the proposed development has at most low vulnerability to the identified climate hazards, therefore no detailed risk assessment is required.

[2] https://thinkhazard.org/en/report/1587-ireland-dublin/WF

Table 9-8: Climate Change Vulnerability Assessment

Climate Hazard	Sensitivity	Exposure	Vulnerability
Flooding	1 (Low)	2 (Medium)	2 (Low)
Extreme Heat	1 (Low)	2 (Medium)	2 (Low)
Extreme Cold	1 (Low)	2 (Medium)	2 (Low)
Wildfire	1 (Low)	1 (Low)	1 (Low)
Drought	1 (Low)	1 (Low)	1 (Low)
Extreme Wind	1 (Low)	1 (Low)	1 (Low)
Lighting & Hail	1 (Low)	1 (Low)	1 (Low)
Landslides	1 (Low)	1 (Low)	1 (Low)
Fog	1 (Low)	1 (Low)	1 (Low)

There are no significant risks to the proposed development as a result of climate change. The significance of the impacts to the proposed development as a result of climate change are **negative**, **not significant** and **long-term**.

9.5 Mitigation and Monitoring Measures

9.5.1 Mitigation Measures

9.5.1.1 Construction Phase

The following best practice mitigation measures will be applied to reduce GHG emissions during the construction phase of the proposed development:

- Implement waste management plan to minimise construction waste and promote recycling and reuse of materials. Reducing waste reduces the need for new materials to be produced, thus lowering overall GHG emissions;
- Prevent leaving the engines of machines and vehicles running when not in use (idling), to precent unnecessary GHG emissions;
- Maintain machinery and vehicles so that they are running efficiently, thus reducing GHG emissions; and
- Minimise over ordering of materials on site and ensure materials are ordered on correct times for efficient use of materials and prevention of waste.

During construction, the Contractor will be required to mitigate against the effects of climate change on the proposed development:

- The Contractor will be required to mitigate against the effects of climate change on the proposed development such as extreme rainfall / flooding through site risk assessments and method statements;
- The Contractor will also be required to mitigate against the effects of extreme wind / storms, temperature extremes through site risk assessments and method statements;

- All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction; and
- During construction, the Contractor will be required to mitigate against the effects of fog, lighting and hail through site risk assessments and method statements.

9.5.1.2 Operational Phase

There are no significant climate effects predicted during the operational phase of the proposed development and therefore no mitigation measures are required.

9.5.2 Monitoring Measures

9.5.2.1 Construction Phase

There is no monitoring required during the construction stage of the proposed development.

9.5.2.2 Operational Phase

There is no monitoring required during the operational stage of the proposed development.

9.6 Residual Impacts and Effects

There will be no significant climate residual effects from the construction phase or operational phase of the proposed development. Table 9-9 summarises the climate residual effects associated with the proposed development.

Table 9-9: Climate Residual Effects

IMPACT (PRE-MITIGATION)	MITIGATION MEASURES	RESIDUAL EFFECT (POST-MITIGATION)				
		QUALITY OF EFFECT	SIGNIFICANCE	SPATIAL EXTENT	DURATION	OTHER RELEVANT CRITERIA
CONSTRUCTION						
GHG Emissions	See Section 9.5.1.1	Negative	Imperceptible	Extensive/National	Temporary	Direct
Climate Change Effects on Proposed Development		Negative	Imperceptible	Local	Temporary	Direct
OPERATIONAL						
Climate Change Effects on Proposed Development	See Section 9.5.1.2	Negative	Not Significant	Local	Long-Term	Direct
Traffic Emissions		Negative	Imperceptible	Extensive/National	Temporary (occurring occasionally)	Direct
Methane Emissions						
Overall GHG Emissions	No Mitigation Measures Required	Positive	Slight	Extensive/National	Long-Term	Direct

9.7 Cumulative Impacts and Effects

The cumulative effects of the proposed development with the Kilshane Power Station, Proposed 220kV Gas Insulated Switchgear GIS Substation and Underground 220kV Transmission Line Connection to the Existing Cruiserath 220kV Substation are discussed further in the following sections.

9.7.1 Construction Phase

The construction programme for the AGI, block valve (BV) and pipeline works will be determined by the client's phased delivery of works around the roadway network and power station site. The power station development is expected to be delivered over a 20-month period, comprising of six distinct phases.

Given the uncertainty associated with project sequencing, this EIAR assumes that all works, including the 220 kV Transmission Line connection, the proposed gas pipeline, the Kilshane Power Station, the 220 kV GIS Substation and AGI, will be constructed concurrently. Therefore, it was considered prudent to assess the cumulative construction stage impacts of all of these projects.

The environmental report for the GIS and 220kV transmission line determined that construction works would have no significant impacts on climate. The impact was predicted to be short-term, neutral and imperceptible.

A climate assessment carried out as part of the Kilshane Power Station EIAR and an environmental report for the GIS and 220kV transmission line. Both assessments determined that there would be no significant impacts on climate. The climate assessments considered effects on climate from construction of the Kilshane Power Station, GIS and 220kV transmission line to be neutral, short-term and imperceptible, with mitigation applied.

Having considered the above cumulative projects in combination with the proposed development, the cumulative impacts on climate during the construction phase are likely to be neutral, imperceptible, extensive, and short-term.

9.7.2 Operational Phase

The Kilshane Power Station, 220kV Gas Insulated Switchgear (GIS) Substation and grid connection, collectively known as the 'Kilshane Energy Facility' will operate concurrently with the proposed development.

The environmental report for the 220kV GIS Substation was reviewed as part of cumulative assessment determined there were no potential impacts on climate during its operational phase.

Kilshane Energy Limited is an end user of the proposed gas infrastructure development. In terms of the impact of Kilshane Power Station during the operational phase, Kilshane Energy Limited CO_2 emissions are regulated under the European Union – Emissions Trading Scheme ("EU-ETS"). Kilshane Energy Limited, requires a GHG permit from the EPA as relevant competent authority. KEL also requires an IED licence from the EPA as the relevant competent authority and this licence was granted in June 2025 (Ref: P1208-01).

A climate assessment was conducted as part of the Kilshane Power Station EIAR, summarising operational emissions and their effects. The 293 MW natural gas power generation facility is expected to produce CO_2 emissions, but these are not significant relative to Ireland's annual total.

The EIAR climate assessment took account that natural gas emits an average of 202.2 gCO_2 per kWh. At maximum capacity, the plant could therefore generate around 2,515 GWh annually, producing approximately 508,603 tonnes of CO_2 per year, assuming it operates 98% of the time. This "baseload" scenario was considered highly unlikely, occurring only if roughly 75% of other installed power generation were unavailable. In practice, the plant

is forecast to operate much less, with an average of 46 hours per year. Under the realistic scenario, the plant would produce approximately 2,671 tonnes of CO_2 per year which is insignificant in comparison to latest emissions from the Energy Industries sector (7.157 Mt CO_2eq, EPA 2024). Even under both maximum and realistic operation scenarios, it is predicted to replace higher-emission plants, particularly oil-fired units, resulting in an overall reduction in carbon emissions within the Single Electricity Market (SEM).

Even at full capacity, the facility's emissions would represent less than 0.04% of the EU ETS market, showing their minor impact at the EU level. Based on its forecasted operational hours, the plant is expected to reduce CO_2 emissions in the SEM by approximately 10,000 tonnes by 2040. In both operational scenarios, the facility contributes a **long-term**, **slight**, **positive** effect on climate. These findings align with Ireland's wider energy policy under the "With Additional Measures" scenario, which anticipates a 25% reduction in energy sector emissions by 2030, driven by increased renewable generation to around 70%, the phased closure of peat and coal plants, and new interconnectors to the UK and France.

Overall, while the proposed facility will produce CO_2 emissions, these are minor relative to national, sectoral and EU totals. By displacing higher-emitting plants and supporting broader energy transition goals, it is expected to have a small but positive long-term impact on climate.

Considering the Kilshane Energy Facility, the proposed gas infrastructure, and associated operational activities, the cumulative impacts on climate during the operational phase are also assessed as **direct, long-term, positive, and slight**. The combined effect reflects the displacement of higher-emitting generation, minimal operational traffic and methane emissions, and the strategic role of the gas network in supporting Ireland's decarbonisation targets, including CAP25 objectives.

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