BOHERBOY LRD

Climate Change Impact Assessment Report

Evara Developments Ltd. and Kelland Homes Ltd.

Report no.: 1.0, Rev. **1.0**

Date: 05/12/2025

DOCUMENT CONTROL SHEET

Client	Evara Developments Ltd. and Kelland Homes Ltd.
Project Title	Proposed Large-Scale Residential Development at Boherboy, Co. Dublin
Document Title	Climate Change Impact Assessment Report

Rev.	Status	Author(s)	Reviewed by	Approved by	Issue Date
01	Draft	Ross O'Dwyer *Consultant*	Aoife Grogan Senior Consultant	Aoife Grogan Senior Consultant	05/12/2025
02	Draft				

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1 INTRODUCTION

DNV has been commissioned to produce a Climate Change Impact Assessment Report (CCIA) on behalf of Evara Developments Ltd. and Kelland Homes Ltd for a Proposed Large-Scale Residential Development on lands at Saggart Co. Dublin (hereafter referred to as the Proposed Development). A full project description is in included in Section 1.1 of this report.

1.1 Quality Assurance and Competency of Experts

This Change Impact Assessment (CCIA) Report has been prepared by Ross O'Dwyer, Environmental Consultant at DNV. Ross holds a B.Sc. Hons in Environmental Science and Health and a PhD in Environmental Chemistry (both from Dublin City University). Ross specialises in the areas of water quality, air quality, climate change, and sustainability; and has provided technical input to a diverse range of projects in this context. Ross has experience in preparing CCIAs for both commercial and residential developments in response to national and local authority requirements.

1.2 Methodology

In accordance with South Dublin County Council (SDCC) planning requirements, the Report will assess the impact of climate change on the Proposed Development and ensure that the policies and objectives produced and implemented by the local authority in relation to climate change and climate change protection measures, particularly in relation to drainage design, as set out within the South Dublin County Council Development Plan 2022-2028 (SD CDP), have been incorporated into the Proposed Development design.

South Dublin County Council (SDCC) Climate Change Pre-Planning Guidance document recommends that all planning applications for major developments should clearly and fully address climate change risks and adaptation measures. The relevant policies and objectives of the guidance have also been carefully considered in the context of associated UN Sustainable Development Goals (SDGs), and their incorporation into the Proposed Development design.

This assessment has been undertaken in accordance with Regulation (EU) 2020/852 of the European Parliament and of the Council (the 'Taxonomy Regulation'), Commission Delegated Regulation (EU) 2021/2139 (the 'Supplementing Regulation'), and 'Technical Annex B: Climate Change Risk Assessment' of the 'Local Authorities Climate Action Planning Guidelines' and provides a qualitative Climate Change Risk Assessment ('CCRA'). A qualitative CCRA supports the identification and prioritisation of potential future climate risks for more detailed analysis and provides a broad understanding of where adaptation actions could be required.

The physical climate risks which may affect the performance of the Proposed Development during its expected lifetime have been identified through a climate risk screening. Climate projections across the existing range of future scenarios have been examined, along with the Proposed Development location, to gain an understanding of the future risks that climate change may have on the Proposed Development. The vulnerability of the Proposed Development to these risks has been subsequently assessed taking account of relevant adaptation and mitigation measures which have been incorporated into the Development design.

This Report provides information to support the relevant public body in carrying out its functions in a manner consistent with national climate plans and strategies (such as the National Climate Action Plan 2025) and furthering the achievement of the national climate objective as set out under Section 15 of the Climate Action and Low Carbon Development Act 2015, as amended in 2021. Under the Act each local authority is required to prepare a local authority climate action plan for its administrative area. The plans are consistent with the most recent climate action plan and national adaptation framework. The plans are to address, and integrate, mitigation of greenhouse gases, climate change adaptation and strengthened alignment with national climate policy, delivering effective local climate action. The current CCIA report should be reviewed alongside the relevant and current Local Authority Climate Action plan to ensure alignment with relevant objectives and targets.

1.3 Scope and Limitations

This report assesses the impact of climate change on the Proposed Development (physical climate risks, vulnerability and adaptation measures) following Annex II, Section 7.1 of Commission Delegated Regulation (EU) 2021/2139 as a methodological framework only. It does not assess the impact of the development on climate (i.e., embodied/operational greenhouse gas emissions), which is addressed separately in Chapter 9 (Climate) of the Environmental Impact Assessment Report. This report has not been prepared for the purpose of assessing compliance with the EU Taxonomy Regulation. Accordingly, it does not make any determination regarding 'Do No Significant Harm' or other Taxonomy criteria for environmental objectives beyond adaptation.

1.4 Project Description

Kelland Homes Ltd. and Evara Developments Ltd. wish to apply for permission for a Large-scale Residential Development (LRD) on a site located at Boherboy, Saggart, County Dublin. To the immediate north of the site is the Carrigmore residential estate, to the west are agricultural lands and a single dwelling, to the east is the Corbally residential estate and Carrigmore Park, while to the south is the Boherboy Road.

The proposed development consists of 611 no. dwellings, comprised of 306 no. 2, 3, 4 & 4-5 bed, 2 & 3 storey, detached, semi-detached & terraced houses, 133 no. 1, 2 & 3 bed duplex units in 12 no. 2-3 storey blocks, and 172 no. 1, 2 & 3 bed apartments in 5 no. buildings ranging in height from 4-5 & 5 storeys. The proposed development also includes a 2-storey crèche (c.630m²).

Access to the development will by via one no. new vehicular access point from the Boherboy Road, along with new vehicular connections to adjoining developments at Corbally Heath to the east and Carrigmore Green to the north. Ten no. houses in the south-east part of the site will be accessed from Corbally Glade to the east. The proposed development includes for pedestrian and cyclist connections throughout the proposed development and accesses into adjoining lands at Carrigmore Park, Corbally Heath and Corbally Glade to the east and Carrigmore Green to the north.

Private amenity space for the residential units is provided in the form of rear gardens for houses and ground floor terraces / upper floor balconies for apartments and duplex units. The

proposed development provides for a total of c. 2.3Ha of public open space, and c. 4,750sq.m of communal open space associated with proposed development.

The proposed development provides for (i) all associated site development works above and below ground, including surface water attenuation & an underground foul sewerage pumping station at the northern end of the site, (ii) public open spaces (c. 2.3Ha), (iii) communal open spaces (c. 4,750sq.m), (iv) hard & soft landscaping and boundary treatments, (v) surface car parking (861 no. car parking spaces), (vi) bicycle parking (711 no. bicycle parking spaces), (vii) bin & bicycle storage, (viii) diversion of all existing overhead ESB lines underground, (ix) public lighting, and (x), plant / PV panels (M&E), utility services & 8 no. ESB sub-stations, all on an overall application site area of c.18.7Hha. In accordance with the South Dublin County Development Plan (2022-2028), an area of c.1.03Ha within the site is reserved as a future school site.

1.5 Legislative and Strategic Context

1.5.1 The EU Taxonomy Framework

Regulation (EU) 2020/852 of the European Parliament and of the Council (the 'Taxonomy Regulation') establishes the criteria for determining whether an economic activity qualifies as environmentally sustainable for the purposes of establishing the degree to which an investment is environmentally sustainable. Commission Delegated Regulation (EU) 2021/2139[1] (the 'Supplementing Regulation') establishes the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives.

The technical screening criteria as outlined within the Supplementing Regulation have been adopted for the purpose of this assessment.

The Supplementing Regulation establishes the technical screening criteria specific to certain economic activities. The Proposed Development, located at Boherboy, Saggart, Co. Dublin consists of the construction of a Large-Scale Residential Development. Therefore, in accordance with Annex II, Section 7.1, of the Supplementing Regulation, the relevant technical screening criteria for the Proposed Development are set out under the "Construction of new buildings".

Annex II Section 7.1 of the Supplementing Regulation sets out the relevant technical screening criteria for the project to make a *'Substantial Contribution to Climate Change Adaptation'.* These technical screening criteria have been adopted in the current assessment to conduct a

[1] Commission Delegated Regulation (EU) of 4.6.2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives.

climate risk and vulnerability assessment and determine the adaptive capacity of the Proposed Development. [2]

Table 1-1 overleaf details the criteria for *"Substantial Contribution to Climate Change Adaptation"* and the associated sections of this Report in which these criteria have been addressed.

[2] These criteria have been adopted for assessment purposes only and do not suggest that the Proposed Development qualifies as an 'environmentally sustainable' economic activity under the Taxonomy Regulation.

Table 1-1: Substantial Contribution to Climate Change Adaptation Screening Criteria

Substantial Contribution to Climate Change Adaptation Screening Criteria[3]	Relevant Section of this Report
The economic activity has implemented physical and non-physical solutions ('**adaptation solutions**') that substantially reduce the most important physical climate risks that are material to that activity.	See Section 4 of this report for Climate Risk and Vulnerability Assessment.
The physical climate risks that are material to the activity have been identified from those listed in Appendix A to this Annex by performing a robust **climate risk and vulnerability assessment** with the following steps: a) screening of the activity to identify which physical climate risks from the list in Appendix A to this Annex may affect the performance of the economic activity during its expected lifetime; b) where the activity is assessed to be at risk from one or more of the physical climate risks listed in Appendix A to this Annex, a climate risk and vulnerability assessment to assess the materiality of the physical climate risks on the economic activity; c) an assessment of adaptation solutions that can reduce the identified physical climate risk. The climate risk and vulnerability assessment is proportionate to the scale of the activity and its expected lifespan, such that: a) for activities with an expected lifespan of less than 10 years, the assessment is performed, at least by using climate projections at the smallest appropriate scale; b) for all other activities, the assessment is performed using the highest available resolution, state-of-the-art climate projections across the existing range of future scenarios consistent with the expected lifetime of the activity, including, at least, 10 to 30 year climate projections scenarios for major investments.	See Section 2 of this report for Climate Change Projections. See Section 3 of this Report for Climate Risk Screening. See Section 4 of this report for Climate Risk and Vulnerability Assessment.
The **climate projections** and assessment of impacts are based on best practice and available guidance and take into account the state-of-the-art science for vulnerability and risk analysis and related methodologies in line with the most recent Intergovernmental Panel on Climate Change (IPCC) reports, scientific peer-reviewed publications and open source or paying models.	See Section 2 of this report for Climate Change Projections.

[3] as set out in Annex II, Section 7.1 of the Supplementing Regulation.

Substantial Contribution to Climate Change Adaptation Screening Criteria[3]	Relevant Section of this Report
The **adaptation solutions** implemented: a) do not adversely affect the adaptation efforts or the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities; b) favour nature-based solutions or rely on blue or green infrastructure to the extent possible; c) are consistent with local, sectoral, regional or national adaptation plans and strategies; d) are monitored and measured against pre-defined indicators and remedial action is considered where those indicators are not met; e) where the solution implemented is physical and consists in an activity for which technical screening criteria have been specified in this Annex, the solution complies with the do no significant harm technical screening criteria for that activity.	See Section 4 of this report for Climate Risk and Vulnerability Assessment. See Section 5 of this report for South Dublin County Development Plan 2022-2028: Relevant Policies and Objectives This report has not been prepared for the purposes of assessing compliance with the Taxonomy Regulation and therefore does not demonstrate compliance with the relevant criteria for Do No Significant Harm as they relate to the remaining five environmental objectives.

1.5.2 IPCC Sixth Assessment Reports (AR6)

The Intergovernmental Panel on Climate Change (IPCC) was set up in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) to assess the science related to climate change so that government organisations at all levels would have a scientific basis from which to make decisions regarding climate change. The IPCC assessments of scientific research relating to climate change is written and reviewed by leading scientists worldwide, and then reviewed by experts in their field to ensure the reports reflect the full range of views in the scientific community. The IPCC reports undergo multiple rounds of drafting and review to ensure they are comprehensive and objective and produced in an open and transparent way.

The role of the Intergovernmental Panel on Climate Change (IPCC) is to critically assess the scientific, technical and socio-economic information relevant to understanding the physical science and impacts of human-induced climate change and natural variations, including the risks, opportunities and options for adaptation and mitigation.

The most up to date IPCC report is the Sixth Assessment Report (AR6)[4], which comprises of three Working Group Reports and a Synthesis Report, three Special Reports, and a refinement to its latest Methodology Report; these are as follows:

- **The Working Group I (WGI)** contribution to the Sixth Assessment Report, *Climate Change 2021*: *The Physical Science Basis* was released on 9 August 2021.
- **The Working Group II** contribution, *Climate Change 2022: Impacts, Adaptation and Vulnerability* was released on 28 February 2022.
- **The Working Group III** contribution, C*limate Change 2022: Mitigation of Climate Change* was released on 4 April 2022.
- Special Report 1: *Global Warming of 1.5 ºC* (SR15, October 2018)
- Special Report 2: *Climate Change and Land* (SRCCL, August 2019)
- Special Report 3: *Ocean and Cryosphere in a Changing Climate* (SROCC, September 2019)
- The **AR6 Synthesis Report** integrates the three Working Group reports as well as the findings from the three cross-Working Group Special Reports prepared during this assessment cycle.

AR6 has adopted a unified framework of climate risk, supported by an increased focus in WGI on low-likelihood, high impact outcomes. Systematic risk framing is intended to aid the formulation of effective responses to the challenges posed by current and future climatic changes and to better inform risk assessment and decision-making. AR6 also makes use of the ‘storylines’ approach, which contributes to building a robust and comprehensive picture of climate information, allows for a more flexible consideration and communication of risk, and can explicitly address low-likelihood, high-impact outcomes.

[4] Intergovernmental Panel on Climate Change (2022) Sixth Assessment Report (AR6).

The climatic impact-driver (CID) framework adopted in Chapter 12 of IPCC AR6 WGI allows for assessment of changing climate conditions that are relevant for regional impacts and for risk assessment.

The scientific findings summarised here underpin the climate projections and risk assessments applied to the Proposed Development in Sections 2 and 3 of this Report.

1.5.3 South Dublin County Council Planning Requirements

1.5.3.1 22 South Dublin County Council Climate Change Pre-Planning Guidance

The SDCC Climate Change Pre-Planning Guidance document emphasises the role that planning authorities play in both limiting the causes of climate change (mitigation) and adjusting to the impacts (adaptation). The document defines climate change vulnerability as the risk of adverse effects, which involves three concepts:

- **Exposure** to hazard (such as increased rainfall);
- **Sensitivity** to hazards (such as the number of people located in flood risk areas);
- **Capacity** to adapt to hazards (for example, measures to protect against flooding).

The document further suggests that adaptation measures are best planned in advance and can be classified as follows:

1. **Grey Measures** which include technological or engineering solutions, including largescale infrastructural changes – such as defences against flooding or improving road surface material to withstand higher temperatures;
2. **Green Measures** which refer to nature or ecosystem-based solutions such as reinforcing natural defences such as wetlands, maintaining and restoring healthy ecosystems and removing man-made obstacles;
3. **Soft Measures** or non-structural approaches involve the design and application of policies and procedures to promote behavioural shift s such as individuals using less water or energy.

Emphasis is also placed on the importance of engaging relevant stakeholders in the adaptation process, particularly landowners and developers. Climate impacts transcend local authority boundaries and have a wide range of social, environmental, and economic implications. The document highlights the ability to begin understanding our level of vulnerability to projected climate changes by looking at the impacts of past climate-related events; however, it is important to recognise that this is a starting point and not a foretelling of future impacts. Therefore, new impacts will arise and should be anticipated and accounted for in adaptation planning.

Accordingly, the document recommends that all planning applications for major developments should clearly and fully address climate change risks. It suggests that proposals fully identify and assess a range of adaptation options to take advantage of any opportunities and bring any anticipated negative impacts of climate change to an acceptable level.

Therefore, in accordance with the SDCC Climate Change Pre-Planning Guidance document, this Report will assess the impact of climate change on the Proposed Development and ensure that the policies and objectives produced and implemented by SDCC in relation to climate change and climate change adaptation measures, as set out within the South Dublin County Development Plan 2022-2028 (SD CDP), have been incorporated into the Proposed Development design to reduce climate change risks.

The risk assessment methodology and findings within the SD CAP have been considered in Section 3 of this report.

1.5.3.2 South Dublin County Council Climate Action Plan 2024-2029

In 2024, SDCC adopted the South Dublin County Council Climate Action Plan 2024– 2029 (SD CAP). The Action Plan is the climate adaptation and mitigation strategy for the County. Included in the actions set out in the SD CAP is the requirement to prepare a climate change chapter in the County Development Plan that addresses both climate change mitigation and adaptation.

The SD CAP features a range of actions across five key areas: Energy and Buildings, Transport, Flood Resilience, Nature-Based Solutions, Circular Economy and Resource Management and Community Engagement (See Figure 1-1). These six key areas collectively address the four targets of the plan:

- A 50% improvement in the Council's energy efficiency by 2030;
- A 51% reduction in the Councils' greenhouse gas emissions by 2030;
- To make Dublin a climate resilient region, by reducing the impacts of future climate change-related events;
- To actively engage and inform citizens on climate action.

The plan concentrates on the two approaches required to tackle climate change. The first, mitigation, consists of actions that will reduce current and future GHG emissions; examples of these include reductions in energy use, switching to renewable energy sources and carbon sequestration. The second approach, adaptation, consists of actions that will reduce the impacts that are already happening now from our changing climate and those that are projected to happen in the future. These include flood alleviation, increased resilience of infrastructure and emergency response planning.

Mitigation and adaptation actions in the SD CAP are based on both the current situation as defined in the baselines, the future risk projections, and the remit of the Dublin Local Authorities.

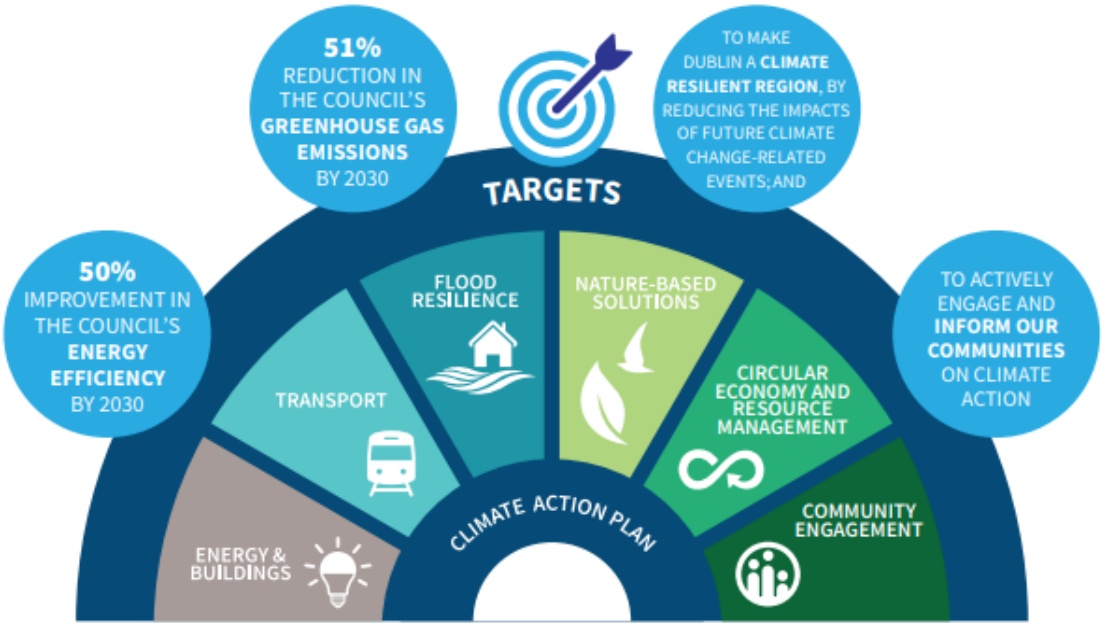

Figure 1-1 The Six Key Action Areas of the CAP (Source SD CD CAP)

1.5.3.3 South Dublin County Development Plan (SD CDP) 2022-2028

The SD CDP sets out the policy objectives and the overall strategy for the proper planning and sustainable development of the County over the plan period from 2022 to 2028.

The 'layered' format of the Plan aims to facilitate a holistic approach to ensuring Climate Action is at the forefront of all future development within the County, with policies and objectives in each chapter crafted in a manner which contributes significantly towards addressing climate change and reducing the County's carbon emissions in a meaningful and tangible way[6]. These overarching climate action principles align closely with the key action areas of the SD CCAP; namely:

- Energy and Buildings;
- Transport;
- Flood Resilience;
- Resource Management;
- Nature-Based Solutions.

These issues have been identified as being of particular significance in helping to achieve sustainable planning outcomes which will ultimately help to deliver a low carbon and a climate resilient County. To ensure the above provisions have been implemented successfully throughout the Plan, specific 'Climate Positive Objectives' have been highlighted in each chapter. A Climate Action Audit is also included at the end of each Chapter providing an overview of the potential sources of greenhouse gas emissions alongside measures implemented to address such potential climate impacts.

Relevant policies and objectives and their incorporation into the Proposed Development design have been taken into account in Section 6 of this report.

The Strategic Vision of the Development Plan is as follows:

'*In 2028 South Dublin will be a place that our communities are proud of, that our businesses can thrive in and that will help us to live greener and healthier lives"*

.Whilst Climate Change policies and mitigation measures are set out at a National and International level, Local Authorities have a central role in the implementation of these policies and in promoting behavioural and attitude change towards climate change.

One of the key objectives contained within the plan is to 'support the transition to a low carbon economy and lead on climate action'. Climate change is a cross-cutting theme of the Plan; and climate change and climate action audits feature in each chapter.

The 'layered' format of the Plan aims to facilitate a holistic approach to ensuring Climate Action is at the forefront of all future development within the County, with policies and objectives in each chapter crafted in a manner which contributes significantly towards addressing climate change and reducing the County's carbon emissions in a meaningful and tangible way.

Relevant policy objectives as outlined within the SD CDP 2022-2028 and their incorporation into the Proposed Development design have been considered in Section 5 of this report.

1.5.4 Climate Action and Low Carbon Development Act

The Climate Action and Low Carbon Development Act 2015 (the principal act) set national climate policy on a statutory footing for the first time in Ireland, with the target of pursuing the transition to a low-carbon, climate-resilient, and environmentally sustainable economy by 2050. The principal act was subsequently amended by the Climate Action and Low Carbon Development (Amendment) Act 2021 (the '2021 Act') which sets Ireland on a legally binding path to net-Zero emissions no later than 2050, and to a 51% reduction in emissions by the end of this decade.

The 2021 Act provides a legally binding framework with clear targets and commitments set in law, and ensures the necessary structures and processes are embedded on a statutory basis to ensure Ireland achieves its national, EU and international climate goals and obligations in the near and long term.

The 2021 Act also introduces a requirement for each local authority to prepare a Climate Action Plan, which will include both mitigation and adaptation measures and be updated every five years. Local authority Development Plans will also align with their Climate Action Plan.

Furthermore, Public Bodies are obliged to perform their functions in a manner which is consistent with national climate plans and strategies and furthering the achievement of the national climate objective; this is set out under Section 15 of the Climate Action and Low Carbon Development Act 2015, as amended in 2021:

"Duties of certain bodies

> ***15.*** *(1) A relevant body shall, in so far as practicable, perform its functions in a manner consistent with—*
>
> *(a) the most recent approved climate action plan,*
>
> *(b) the most recent approved national long term climate action strategy,*
>
> *(c) the most recent approved national adaptation framework and approved sectoral adaptation plans,*
>
> *(d) the furtherance of the national climate objective, and*
>
> *(e) the objective of mitigating greenhouse gas emissions and adapting to the effects of climate change in the State."*

This CCIA Report has been prepared having regard to the most recent national Climate Action Plan (CAP25) and the National Adaptation Framework (2024), in line with the duty under Section 15 of the Climate Action and Low Carbon Development Act 2015 (as amended). In addition, the assessment aligns with the South Dublin County Council Climate Change Pre-Planning Guidance, the South Dublin County Council Climate Action Plan 2024–2029 and the South Dublin County Development Plan 2022–2028, which implement national climate policy at local level. While consistency with the SDCC CAP supports the delivery of national objectives, it is acknowledged that Section 15 compliance is assessed by reference to national plans and strategies. This report therefore demonstrates consistency, so far as practicable, with the national CAP and NAF, and evidences how local adaptation measures embedded in the Proposed Development contribute to those objectives.

Consistency with national climate objectives, as required under Section 15, is demonstrated through the adaptation-focused risk assessment and mitigation measures presented in Sections 3 and 4 of this Report.

1.5.5 National Adaptation Framework (NAF)

Ireland's statutory National Adaptation Framework (NAF) was published in June 2024 and was developed under the Climate Action and Low Carbon Development Act 2015. The NAF sets out the national strategy to reduce the vulnerability of the country to the negative effects of climate change and to avail of positive impacts.

The NAF builds on the work already carried out under the National Climate Change Adaptation Framework (NCCAF, 2012). The NAF outlines a whole of government and society approach to climate adaptation in Ireland. It also aims to improve the enabling environment for adaptation through ongoing engagement with civil society, the private sector, and the research community.

Under the NAF, several government departments are required to prepare sectoral adaptation plans in relation to the priority areas that they are responsible for, which is to be reviewed once every five years. Local authorities are required to prepare local adaptation strategies. The NAF also aims to ensure ongoing engagement with civil society, the private sector, and the research community.

The NAF's emphasis on proactive adaptation is implemented through the climate risk and vulnerability assessment in Sections 3 and 4 of this Report.

1.5.6 Climate Action Plan 2025

Climate Action Plan 2025 (CAP25) (Government approval 15 April 2025) is the third statutory annual update under the Climate Act 2021. It refines actions to deliver Ireland's economy-wide carbon budgets and sectoral emissions ceilings to 2030 and charts the pathway to climate neutrality by 2050. CAP25 builds on CAP24, with a focused Annex of Actions for 2025, and cross-cutting measures in energy, buildings, transport, enterprise, land use and the adaptation agenda.

Greenhouse gas mitigation measures are addressed separately in the application, within Chapter 9 (Climate) of the EIAR. The adaptation elements of CAP25 and the 2024 National Adaptation Framework (NAF) underpin this CCIA's approach: identifying material physical risks, integrating SuDS/finished floor levels/drainage resilience, and lifecycle maintenance to ensure performance under future climate risks. On that basis, and so far as is practicable for a residential scheme, this Report demonstrates that the development is consistent with CAP25's adaptation objectives and the 2024 NAF.

The Proposed Development's alignment with CAP25 is demonstrated in Sections 3 and 4, where site-specific climate risks are assessed and adaptation measures are detailed in line with the adaptation objectives of the national plan.

1.5.7 Sustainable Development Goals

The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by all United Nations Member States in 2015 as a universal call to action to end poverty, protect the planet, and ensure that all people enjoy peace and prosperity. The 17 SDGs are integrated—that is, they recognise that action in one area will affect outcomes in others, and that development must balance social, economic, and environmental sustainability. The creativity, knowhow, technology and financial resources from all of society is necessary to achieve the SDGs in every context. At its heart, the SDGs are about global partnership for this call to action. No matter how large or small, and regardless of their industry, all companies can contribute to the SDGs through their sustainability and corporate social responsibility strategies, policies, and processes.

Figure 1-2: UN Sustainable Development Goals

Ireland has published a Sustainable Development Goals National Implementation Plan 2022-2024 to provide a whole-of-government approach to implementing these goals. Sustainable development, climate change and equity are intrinsically intertwined. Climate change impacts can be linked in one way or another to all 17 of the UN Sustainable Development Goals (SDGs). Climate action that considers co-impacts across other SDGs can increase efficiency, reduce costs and support early and ambitious climate action.

This CCIA report focuses primarily on the climate impacts of mitigation and adaptation actions, with identified actions aligning with the objectives of the following SDGs.

Table 1-2: Relevant SDGs

SDG	Goal	Description
	Ensure availability and sustainable management of water and sanitation for all.	Support efforts to achieve universal access to safe and affordable drinking water and sanitation for all.
	Ensure access to affordable, reliable, sustainable, and modern energy for all.	Support efforts to increase the share of renewable energy in the global energy mix; and, to promote investment in clean energy research, technology and infrastructure.
	Make cities and human settlements inclusive, safe, resilient, and sustainable.	Support efforts to enhance inclusive and sustainable urbanisation, and efforts to protect and safeguard the world's cultural and natural heritage. Ensure access for all to basic services including transport and water services.

SDG	Goal	Description
	Ensure sustainable consumption and production patterns.	Support efforts to achieve the environmentally sound management of all wastes throughout their life cycle, to significantly reduce their release to air, water, and soil, and to substantially reduce waste generation through prevention, reduction, recycling, and reuse.
	Take urgent action to combat climate change and its impacts.	Support efforts to strengthen resilience and adaptive capacity to climate-related hazards and natural disasters, and to integrate climate change measures into company policies, strategy, and planning.
	Conserve and sustainably use the oceans, seas, and marine resources for sustainable development.	Support efforts to prevent and significantly reduce marine pollution of all kinds.
	Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.	Support efforts to ensure the conservation and sustainable use of terrestrial and inland freshwater ecosystems, efforts to halt deforestation and combat desertification, efforts to ensure the conservation of mountain ecosystems and reduce the degradation of natural habitats, and efforts to halt the loss of biodiversity and protect and prevent the extinction of threatened species

The SDGs referenced here are advanced through the practical design responses outlined in Sections 3 and 4 of this Report. In Section 5 of this Report, the relevant policy objectives of the SDCC CDP have been carefully considered in the context of the above-listed SDGs, and their incorporation into the Proposed Development design.

1.5.8 Nature

The close relationship between climate and nature emphasises the need for coordinated action that addresses both. While it remains beyond the scope of the current CCIA report, we reiterate our recommendation to consider the impacts of climate and nature in tandem, rather than separately.

Ireland's 4th National Biodiversity Action Plan (NBAP) sets the national biodiversity agenda for the period 2023-2030 and aims to deliver the transformative changes required to the ways in which we value and protect nature. Ireland's planning system has an important role in safeguarding biodiversity by ensuring that new development is sustainable and does not have a negative impact on the environment. The Irish NBAP underscores that there are opportunities to deliver for biodiversity in the assessment of new planning applications, as well as the application of best-practice principles for urban design and landscape management, such as green infrastructure and nature-based solutions.

The NBAP will continue to implement actions within the framework of five strategic objectives, while addressing new and emerging issues:

- Objective 1 - Adopt a Whole of Government, Whole of Society Approach to Biodiversity
- Objective 2 - Meet Urgent Conservation and Restoration Needs
- Objective 3 - Secure Nature's Contribution to People
- Objective 4 - Enhance the Evidence Base for Action on Biodiversity
- Objective 5 - Strengthen Ireland's Contribution to International Biodiversity Initiatives

Local Biodiversity Action Plans (LBAP) further support the objectives of the NBAP and so should also be consulted to identify biodiversity objectives, targets and guidelines for the lifecycle of the proposed development.

Nature acts as a vital regulator of climate, while climate change threatens biodiversity and ecosystem health. To combat these challenges effectively, climate action must integrate efforts to conserve and restore natural ecosystems. By doing so, we can mitigate climate change impacts and protect biodiversity, ensuring a more resilient and sustainable future.

In June 2024, the EU Council formally adopted the Nature Restoration Law. Under the Nature Restoration Law, EU member states will need to restore at least 30% of habitats in poor condition by 2030, 60% by 2040, and 90% by 2050. The regulation sets out specific requirements for different types of ecosystems, including agricultural land, forests, and urban ecosystems. Increasing forest birds' population and making sure there is no net loss on urban green spaces and tree canopy cover until end of 2030 are also key measures of this new law. The regulation will now be published in the EU's Official Journal and enter into force. It will become directly applicable in all member states and specific targets for each sector are likely.

2 CLIMATE CHANGE PROJECTIONS

The Supplementing Regulation establishes the Technical Screening Criteria specific to certain economic activities. Annex II, Section 7.1 of the Supplementing Regulation ('the construction of new buildings') includes specific requirements relating to climate projections:

2. The climate risk and vulnerability assessment is proportionate to the scale of the activity and its expected lifespan, such that:

(a) for activities with an expected lifespan of less than 10 years, the assessment is performed, at least by using climate projections at the smallest appropriate scale;

(b) for all other activities, the assessment is performed using the highest available resolution, state-of-the-art climate projections across the existing range of future scenarios consistent with the expected lifetime of the activity, including, at least, 10-to-30-year climate projections scenarios for major investment.

3. The climate projections and assessment of impacts are based on best practice and available guidance and take into account the state-of-the-art science for vulnerability and risk analysis and related methodologies in line with the most recent Intergovernmental Panel on Climate Change reports, scientific peer-reviewed publications and open source or paying models.

The current assessment has utilised climate projections from IPCC AR6 WGI and the IPCC WGI online Interactive Atlas for Northern Europe; and *Climate Ireland* Climate Change Projection Maps[5] in combination with EPA Research Report No. 339[6]. Due to the expected lifespan of the Proposed Development, climate projections have been provided for mid-term and long-term periods (2041–2060, 2041-2070, and 2081–2100).

A new set of illustrative scenarios have been developed by the IPCC AR6 WGI which cover the range of possible future developments of anthropogenic drivers of climate change found in literature, derived from the Shared Socio-economic Pathways (SSPs). Concentration trajectories known as Representative Concentration Pathways (RCPs) were utilised in EPA Research Report No.339. These RCPs were considered by the IPCC in their Fifth Assessment Report (AR5). For this study, intermediate (SSP2-4.5 and RCP4.5) and very high (SSP5-8.5 and RCP8.5) GHG emissions scenarios were utilised in both the medium and long-term periods; this is considered a conservative assumption of future GHG emission paths. These scenarios are detailed in the following Sections.

All "climate-related hazards" have been classified as either "chronic" or "acute". Chronic effects are gradual slow onset developments (e.g., long term rise in mean annual air temperature); whereas acute effects are rapidly developing climate extremes and/or increased variability (e.g., heatwaves).

[5] Climate Ireland - Climate Change Projection Maps.

[6] P. Nolan and J. Flanagan (2020) High-Resolution Climate Projections for Ireland – a Multi-model Ensemble Approach. EPA Research Report No. 339.

2.1 Overview of Climate Modelling

With increasing atmospheric greenhouse gas concentrations driving changes in all aspects of the climate system, climate change is representing an urgent and potentially irreversible threat to human societies globally. Accurate climate projections are a key scientific input for national policymakers when planning for, and adapting to, the challenges posed by climate change.

Climate projections are produced using climate models, which have been developed by scientists over recent decades and are capable of simulating Earth's past, present, and future climate. Global Climate Models (GCMs) are used to model the global impacts on Earth's climate of increasing greenhouse gas concentrations in the atmosphere at a resolution of ~50km or coarser. Regional Climate Models (RCMs) are used to capture key small-scale atmospheric features on the scale of 1-10km, such as local convection and wind gusts. Multi-model ensembles are often used in climate prediction studies to quantify associated model uncertainty.

RCMs utilise the output of GCMs and model regional climates at higher spatial resolutions; this process is known as dynamic downscaling. This approach allows key climate variables to be modelled more precisely, including precipitation; near-surface temperature; and the number and intensity of low-pressure systems. Low pressure systems are the primary driver of precipitation and wind affecting the country; therefore, the added value of RCMs in the modelling of low-pressure systems is of particular importance for Ireland.

Future greenhouse gas concentrations in the atmosphere are also uncertain. To model possible future climate change, varying greenhouse gas concentrations over time are needed as a GCM input. The core set of SSP scenarios used in the AR6 WGI report cover a broad range of emissions pathways, including new low-emissions pathways. They start in 2015 and include scenarios with high and very high greenhouse gas (GHG) emissions (SSP3-7.0 and SSP5-8.5) and CO_2 emissions that roughly double from current levels by 2100 and 2050, respectively; scenarios with intermediate GHG emissions (SSP2-4.5) and CO_2 emissions remaining around current levels until the middle of the century; and scenarios with very low and low GHG emissions and CO_2 emissions declining to net zero around or after 2050, followed by varying levels of net negative CO_2 emissions (SSP1-1.9, SSP1-2.6).

Concentration trajectories known as Representative Concentration Pathways (RCPs) were utilised in EPA Research Report No.339. These RCPs were considered by the IPCC in their Fifth Assessment Report (AR5) and include the following four scenarios: RCP2.6, RCP4.5, RCP6 and RCP8.5. For the EPA study, two RCPs were chosen, RCP4.5 and RCP8.5. RCP4.5 is considered an intermediate scenario, while RCP8.5 is considered to be representative of a potential worst-case scenario. RCP scenarios are also utilised in the TRANSLATE dataset. TRANSLATE incorporates this EPA data and also uses AR5 (RCP) scenarios. This is the only available climate projection data for Ireland which has been developed for policy makers, and is steered by DECC, the EPA, Met Eireann, and the LA CAROs.

Figure 2-1 illustrates the future annual emissions of CO_2 and of a subset of key non-CO_2 drivers, across the latest five illustrative scenarios developed by the IPCC:

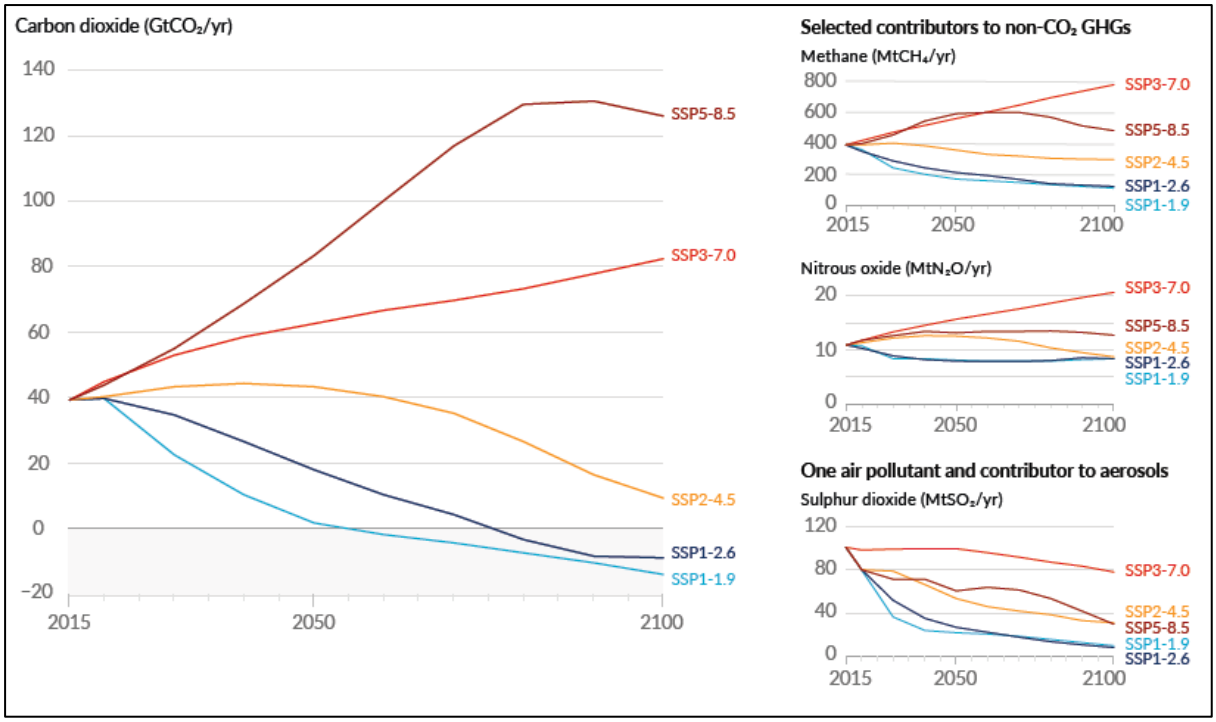

Figure 2-1: Future annual emissions of CO_2 (left) and of a subset of key non-CO_2 drivers (right), across five illustrative scenarios (source: adapted from IPCC AR6 WGI Summary for Policy Makers)

Figure 2-2 illustrates the global surface temperature change relative to 1850-1900 under each scenario:

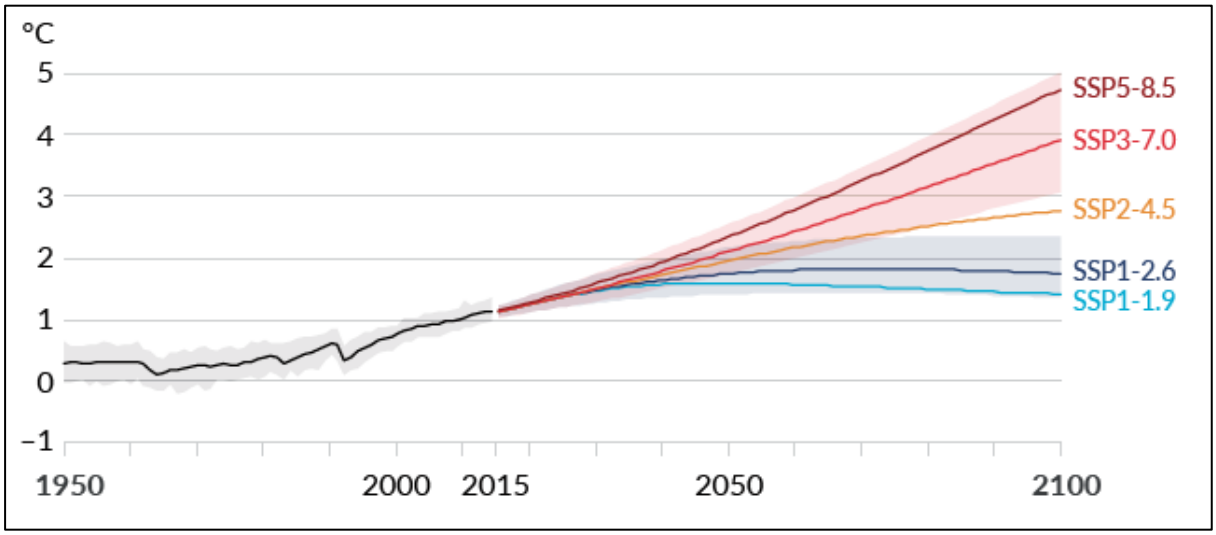

Figure 2-2: global surface temperature change relative to 1850-1900 (source: adapted from IPCC AR6 WGI Summary for Policy Makers)

2.2 IPCC AR6 WGI Regional Climate Projections

IPCC AR6 WGI assesses the current evidence on the physical science of climate change, evaluating knowledge gained from observations, reanalyses, paleoclimate archives and climate model simulations, as well as physical, chemical, and biological climate processes.

The WGI contribution to AR6 is focused on physical and biogeochemical climate science information, with particular emphasis on regional climate changes.

According to IPCC AR6 WGI, sustained changes have been documented in all major elements of the climate system, including the atmosphere, land, cryosphere, biosphere and ocean. Multiple lines of evidence indicate the unprecedented nature of recent largescale climatic changes in the context of all human history. The key findings of the WGI contribution to AR6 are as follows:

- It is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred;

- Global surface temperature will continue to increase until at least mid-century under all emissions scenarios considered. Global warming of 1.5°C and 2°C will be exceeded during the 21st century unless deep reductions in CO_2 and other greenhouse gas emissions occur in the coming decades;

- Observed increases in well-mixed greenhouse gas (GHG) concentrations since around 1750 are unequivocally caused by human activities;

- Each of the last four decades has been successively warmer than any decade that preceded it since 1850;

- The likely range of total human-caused global surface temperature increase from 1850–1900 to 2010–2019 is 0.8°C to 1.3°C, with a best estimate of 1.07°C;

- Globally averaged precipitation over land has likely increased since 1950, with a faster rate of increase since the 1980s;

- It is virtually certain that the global upper ocean (0–700 m) has warmed since the 1970s and extremely likely that human influence is the main driver;

- Global mean sea level increased by 0.20 [0.15 to 0.25] m between 1901 and 2018. The average rate of sea level rise was 1.3 [0.6 to 2.1] mm/year between 1901 and 1971, increasing to 1.9 [0.8 to 2.9] mm/year between 1971 and 2006, and further increasing to 3.7 [3.2 to 4.2] mm/year between 2006 and 2018.

Key model intercomparisons supporting AR6 include the Coupled Model Intercomparison Project Phase 6 (CMIP6) and the Coordinated Regional Climate Downscaling Experiment (CORDEX), for global and regional models respectively. Results using CMIP Phase 5 (CMIP5) simulations are also assessed. Since AR5, large ensemble simulations, where individual models perform multiple simulations with the same climate forcings, are increasingly used to inform understanding of the relative roles of internal variability and forced change in the climate system, especially on regional scales. The broader availability of ensemble model simulations has contributed to better estimations of uncertainty in projections of future change.

Chapter 12 of IPCC AR6 WGI and the online Interactive Atlas have been utilised in this assessment to summarise climate projections and conduct a detailed inspection of projected changes in climate for the region of the Proposed Development. Chapter 12 of IPCC AR6 WGI provides a comprehensive, region-specific assessment of changing climatic conditions that may be hazardous or favourable for various sectors. The online Interactive Atlas is an online tool that complements the WGI Report by providing flexible temporal and spatial analyses of trends and changes in key atmospheric and oceanic variables, extreme indices and climatic impact-drivers (CIDs), as obtained from several global and regional observational and model simulated datasets used in the report. The Interactive Atlas presents detailed projected global and regional climate changes at near-, mid- and long-term periods, 2021–2040, 2041–2060 and 2081–2100, respectively, for a range of emissions scenarios. Within the Interactive Atlas, spatially aggregated regional information is provided for different predefined sets of regions:

- The sub-continental AR6 WGI reference regions;
- WG II continental regions;
- Monsoon regions;
- Major river basins;
- Small-island regions;
- Ocean biological activity regions.

Under the sub-continental AR6 WGI reference regions, Europe is divided into four climatic regions: Northern Europe (NEU), Western and Central Europe (WCE), Eastern Europe (EEU) and Mediterranean (MED). Ireland is part of NEU, therefore aggregated climate information for this region has been derived for this assessment and is summarised in the following Table 2-1.

The IPCC AR6 WGI describe “climate related hazards” as Climatic Impact Drivers (CID). CIDs are defined by the IPCC as physical climate system conditions (e.g., means, events, extremes) that can be directly connected with having impacts on human or ecological systems. This terminology has been retained in this assessment.

In the following Table 2-1, a summary of projections for NEU has been provided for each CID along with detailed climate projection data, sourced using the WGI online Interactive Atlas. The detailed projections provide the median and 25th to 75th percentile range for each variable under the intermediate (SSP2-4.5) and very high (SSP5-8.5) GHG emissions scenarios in both the medium and long-term periods. In some cases, Atlas data was not available for certain variables; IPCC AR6 WGI summary findings were used to supplement Atlas data in this case.

Table 2-1: Climate Projections for Northern Europe (Data Source: IPCC AR6 & IPCC WGI online Interactive Atlas)

IPCC Climate Impact Driver Category	IPCC Climate Impact Driver (CID) / Climate-related hazard	IPCC AR6 Summary Findings[7]	IPCC WGI Interactive Atlas Data[8] (SSP2-4.5 Scenario)[9]	IPCC WGI Interactive Atlas Data[10] (SSP5-8.5 Scenario)[11]
Heat and Cold	Temperature Projections (Chronic)	Since AR5, studies have confirmed that the mean warming trend in Europe is increasing. Irrespective of the scenario, it is virtually certain that warming will continue in Europe, and there is high confidence[12] that the observed increase in heat extremes is due to human activities. All temperature trends are very likely to continue for a global warming level (GWL) of 1.5°C or 2°C and 3°C.	**Increase in mean temperature in Medium Term (2041-2060):** Median: +1.5ºC P25-P75: +1.2ºC to +1.9ºC **Increase in mean temperature in Long Term (2081-2100):** Median: +2.4ºC P25-P75: +1.8ºC to +3.0ºC	**Increase in mean temperature in Medium Term (2041-2060):** Median: +2.0ºC P25-P75: +1.5ºC to +2.5ºC **Increase in mean temperature in Long Term (2081-2100):** Median: +4.4ºC P25-P75: +3.6ºC to +5.5ºC
	Heatwave (Acute)	The frequency of heatwaves observed in Europe has very likely increased in recent decades due to human-induced change in atmospheric composition. It is very likely that the frequency of heatwaves will increase during the 21st century regardless of the emissions scenario in each European region, and for 1.5°C and 2°C GWLs.	**Increase in number of days with a maximum temperature above 35ºC in Medium Term (2041-2060):** Median: 0.1 P25-P75: 0 to 0.1 **Increase in number of days with a maximum temperature above 35ºC in Long Term (2081-2100):**	**Increase in number of days with a maximum temperature above 35ºC in Medium Term (2041-2060):** Median: 0.1 P25-P75: 0 to 0.1 **Increase in number of days with a maximum temperature above 35ºC in Long Term (2081-2100):**

[7] Working Group I contribution to the Sixth Assessment Report, Climate Change 2021: The Physical Science Basis. Chapter 12: Climate Change Information for Regional Impact and for Risk Assessment.

[8] IPCC WGI online Interactive Atlas Parameters: Model projection CMIP6; SSP2-2.4 Scenario; Annual; Relative to 1995-2014 Baseline.

[9] This is a "middle of the road" scenario. CO_2 emissions hover around current levels before starting to fall mid-century, but do not reach net-zero by 2100.

[10] IPCC WGI online Interactive Atlas Parameters: Model projection CMIP6; SSP5-8.5 Scenario; Annual; Relative to 1995-2014 Baseline.

[11] This represents the high end of the range of future pathways. CO_2 emissions triple by 2075.

12 Confidence is a qualitative measure of the validity of a finding, based on the type, amount, quality and consistency of evidence (e.g., data, mechanistic understanding, theory, models, expert judgment) and the degree of agreement.

IPCC Climate Impact Driver Category	IPCC Climate Impact Driver (CID) / Climate-related hazard	IPCC AR6 Summary Findings[7]	IPCC WGI Interactive Atlas Data[8] (SSP2-4.5 Scenario)[9]	IPCC WGI Interactive Atlas Data[10] (SSP5-8.5 Scenario)[11]
			Median: 0.1 P25-P75: 0 to 0.2	Median: 0.5 P25-P75: 0.1 to 0.7
	Frost days (Acute)	The frequency of frost days will very likely decrease for all scenarios and all time-horizons with consequences for agriculture and forests. A simple heating degree day index, characterizing heating demand, shows a large observed decreasing trend for winter heating energy demand in Europe. This trend is very likely to continue through the 21st century, with decreases in the range of 20–30% for Northern Europe.	**Decrease in number of frost days in Medium Term (2041-2060):** Median: -19.8 P25-P75: -28.5 to -12.5 **Decrease in number of frost days in Long Term (2081-2100):** Median: -32.6 P25-P75: -39.2 to -26.4	**Decrease in number of frost days in Medium Term (2041-2060):** Median: -27.6 P25-P75: -35.3 to -20.9 **Decrease in number of frost days in Long Term (2081-2100):** Median: -57 P25-P75: -64.5 to -46.8
Wet and Dry	Precipitation (Chronic)	Precipitation has generally increased in northern Europe. It is very likely that precipitation will increase in Northern Europe in December, January, and February under all climate scenarios except RCP2.6[13]/SSP1-2.6 and for both mid- and end-century periods.	**Increase in total precipitation in Medium Term (2041-2060):** Median: 3.3% P25-P75: 1.8% to 4.9% **Increase in total precipitation in Long Term (2081-2100):** Median: 4.9% P25-P75: 2.3% to 7.6%	**Increase in total precipitation in Medium Term (2041-2060):** Median: 4.6% P25-P75: 2.5% to 7.1% **Increase in total precipitation in Long Term (2081-2100):** Median: 10.3% P25-P75: 7.8% to 13.7%
	River Flood Heavy Precipitation and Pluvial Flood (Acute)		**Increase in maximum 1-day precipitation amount in Medium Term (2041-2060):** Median: 5.9% P25-P75: 4.0% to 7.8%	**Increase in maximum 1-day precipitation amount in Medium Term (2041-2060):** Median: 8.3% P25-P75: 6.0% to 9.5%

[13] RCP 2.6 is a "very stringent" pathway. RCP 2.6 is likely to keep global temperature rise below 2°C by 2100.

IPCC Climate Impact Driver Category	IPCC Climate Impact Driver (CID) / Climate-related hazard	IPCC AR6 Summary Findings[7]	IPCC WGI Interactive Atlas Data[8] (SSP2-4.5 Scenario)[9]	IPCC WGI Interactive Atlas Data[10] (SSP5-8.5 Scenario)[11]
		There is medium confidence that river floods will decrease in Northern Europe under RCP8.5[14] and low confidence under RCP2.6. Heavy precipitation frequency trends have been detected and attributed to climate change in with high confidence in Northern Europe.	**Increase in maximum 1-day precipitation amount in Long Term (2081-2100):** Median: 10.3% P25-P75: 6.3% to 13.9%	**Increase in maximum 1-day precipitation amount in Long Term (2081-2100):** Median: 20.2% P25-P75: 14.1% to 24.1%
			Increase in maximum 5-day precipitation amount in Medium Term (2041-2060): Median: 4.7% P25-P75: 3.5% to 6.1% **Increase in maximum 5-day precipitation amount in Long Term (2081-2100):** Median: 8.2% P25-P75: 4.7% to 11.2%	**Increase in maximum 5-day precipitation amount in Medium Term (2041-2060):** Median: 6.5% P25-P75: 4.3% to 8.9% **Increase in maximum 5-day precipitation amount in Long Term (2081-2100):** Median: 16.2% P25-P75: 12% to 20.6%
	Drought (Acute)	Higher precipitation that outweighs the effects of increased evapotranspiration is expected to result in a decrease in streamflow drought frequency in Northern Europe. A reduction of drought length and magnitude is projected for Northern Europe.	**Likely increase in number of consecutive dry days in Medium Term (2041-2060):** Median: 0.2 P25-P75: -0.1 to 0.7 **Increase in number of consecutive dry days in Long Term (2081-2100):** Median: 0.6	**Likely increase in number of consecutive dry days in Medium Term (2041-2060):** Median: 0.3 P25-P75: -0.1 to 0.7 **Increase in number of consecutive dry days in Long Term (2081-2100):** Median: 1.4

14 In RCP 8.5 emissions continue to rise throughout the 21st century. This high-emissions scenario is frequently referred to as “business as usual”, suggesting that is a likely outcome if society does not make concerted efforts to cut greenhouse gas emissions.

IPCC Climate Impact Driver Category	IPCC Climate Impact Driver (CID) / Climate-related hazard	IPCC AR6 Summary Findings[7]	IPCC WGI Interactive Atlas Data[8] (SSP2-4.5 Scenario)[9]	IPCC WGI Interactive Atlas Data[10] (SSP5-8.5 Scenario)[11]
			P25-P75: 0.1 to 0.11	P25-P75: 0.6 to 2.1
Wind	Surface Wind Speed (Chronic)	There is medium confidence that mean surface wind speeds have decreased in Europe as in many other areas of the Northern Hemisphere over the past four decades. Under RCP4.5[15] and RCP8.5 scenarios, projections indicate a decrease in mean wind speed in Northern Europe (medium confidence).	**Negligible change in mean surface windspeed in Medium Term (2041-2060):** Median: -0.8% P25-P75: -1.7% to 0.2% **Decrease in mean surface windspeed in Long Term (2081-2100):** Median: -1.9% P25-P75: -2.9% to -1.2%	**Decrease in mean surface windspeed in Medium Term (2041-2060):** Median: -1.1% P25-P75: -1.6% to -0.5% **Decrease in mean surface windspeed Long Term (2081-2100):** Median: -2.8% P25-P75: -4.5% to -1.2%
	Severe Windstorms (Acute)	There are large uncertainties in past evolutions of windstorms and extreme winds in Europe. Extreme near-surface winds have been decreasing in the past decades according to near-surface observations. Strong winds and extratropical storms are projected to have a slightly increasing frequency and amplitude in the future in Northern Europe.	*No atlas data available for severe windstorms.*	
Snow and Ice	Snowfall (Chronic)	Widespread and accelerated declines in snow depth and snow water equivalent have been observed in Europe. There is high confidence that future snow cover extent and seasonal duration will reduce.	**Decrease in snowfall (mm/day) in Medium Term (2041-2060):** Median: -2.8	**Decrease in snowfall (mm/day) in Medium Term (2041-2060):** Median: -3.9

[15] RCP 4.5 is described by the IPCC as an intermediate scenario. Emissions in RCP 4.5 peak around 2040, then decline. It is a scenario of long-term, global emissions of greenhouse gases, short-lived species, and land-use-landcover which stabilizes radiative forcing at 4.5 Watts per meter squared (W m^2, approximately 650 ppm CO_2-equivalent) in the year 2100 without ever exceeding that value.

IPCC Climate Impact Driver Category	IPCC Climate Impact Driver (CID) / Climate-related hazard	IPCC AR6 Summary Findings[7]	IPCC WGI Interactive Atlas Data[8] (SSP2-4.5 Scenario)[9]	IPCC WGI Interactive Atlas Data[10] (SSP5-8.5 Scenario)[11]
			P25-P75: -4.0 to -1.8 **Decrease in snowfall (mm/day) in Long Term (2081-2100):** Median: -4.8 P25-P75: -5.6 to -3.7	P25-P75: -5.0 to -2.6 **Decrease in snowfall (mm/day) in Long Term (2081-2100):** Median: -7.9 P25-P75: -9.6 to -6.2
	Heavy snowfall, ice storms and hail (Acute)	There is low confidence that climate change will affect ice and snow-related episodic hazards (limited evidence).	*No atlas data available for heavy snowfall, ice storms and hail.*	
Coastal and Oceanic	Sea level rise (Acute)	Relative sea level rise is extremely likely to continue in the oceans around Europe.	**Increase in sea level (metres) in Medium Term (2041-2060):** Median: 0.2 P25-P75: 0.1 to 0.3 **Increase in sea level (metres) in Long Term (2081-2100):** Median: 0.4 P25-P75: 0.2 to 0.5	**Increase in sea level (metres) in Medium Term (2041-2060):** Median: 0.2 P25-P75: 0.1 to 0.3 **Increase in sea level (metres) in Long Term (2081-2100):** Median: 0.5 P25-P75: 0.3 to 0.7
	Coastal flooding (Chronic)	Relative sea level rise is extremely likely to continue around Europe, contributing to increased coastal flooding in low-lying areas. The present-day 1-in-100-year extreme total water level (ETWL) is between 2.5 and 5.0 m around the UK. There is high confidence that extreme total water level (ETWL) magnitude and occurrence frequency will increase throughout Europe. Under RCP4.5, the present day 1-in-100-year ETWL is projected to have median return periods of between 1-in-20-years and	*No atlas data available for coastal flooding.*	

IPCC Climate Impact Driver Category	IPCC Climate Impact Driver (CID) / Climate-related hazard	IPCC AR6 Summary Findings[7]	IPCC WGI Interactive Atlas Data[8] (SSP2-4.5 Scenario)[9]	IPCC WGI Interactive Atlas Data[10] (SSP5-8.5 Scenario)[11]
		1-in-50-years by 2050 and between 1-in-5-years and 1-in-20-years by 2100.		
Other	Compound events	One typical compound event that is observed in the European area is compound flooding due to the combination of extreme sea level events and extreme precipitation events associated with high levels of runoff. Under RCP8.5, the probability of these events is projected to increase along northern European coasts, with the percentage of coastline now experiencing such events at least once every 6 years increasing by between 3% and 11% by the end of the 21st century. Compound events of dry and hot summers have increased in Europe. The probability of such compound events has increased across much of Europe between 1950–1979 and 1984–2013. Compound hot and dry extremes are projected to increase in Europe by mid-century for the Special Report on Emission Scenarios (SRES) A1B and RCP8.5 scenarios.	*No atlas data available for compound events.*	

2.3 Other Relevant Scientific Based Climate Predictions

2.3.1 TRANSLATE: One Climate Resource for Ireland

The TRANSLATE project is a Met Éireann lead initiative to standardise future climate projections for Ireland and develop climate services that meet the climate information needs of decision makers. It is a collaborative effort led by climate researchers from University of Galway – Irish Centre for High End Computing (ICHEC), and University College Cork – SFI Research Centre for Energy, Climate and Marine (MaREI), supported by Met Éireann climatologists.

TRANSLATE focuses on reviewing existing climate models to produce a national set of standardised climate projections. Climate services are then developed from these standardised climate projections to aid climate risk decision making across multiple sectors (for example, transport, energy, water). Climate services can be described as a set of services that communicate climate science data/information into products (for example, indices, risk assessments, uncertainty estimates) tailored to meet climate sensitive decision makers.

TRANSLATE's outputs are produced using a selection of internationally reviewed and accepted models from both CORDEX and high-resolution regional projections produced by ICHEC. Together they demonstrate a range of possible futures for Ireland based on assumptions of global human activity resulting in "least", "more" or "most" climate change. Historical climate data is evaluated against the observational record and corrected to remove any model bias. This correction is then applied to all future data. This allows information to be presented on how the variables change (difference) as well as actual values (absolute).

2.3.1.1 Climate Ireland – Climate Change Projection Maps

Climate Ireland is Ireland’s national adaptation platform and is provided by the Environmental Protection Agency as part of the EPA's climate adaptation work.

The Climate Change Projection Maps viewer has been developed to understand current and projected future climate conditions for Ireland. Observed Climate Information is based on TRANSLATE and Climate Change Projections are based on TRANSLATE along with EPA Research Report No. 339[16] for some variables.

The Climate Data Explorer provides three types of climate information:

- Observed Climate Information: average historical climate data on variables including temperature and precipitation for the period 1976-2005.
- Climate Change Projections (standardised and bias-corrected): future projections of changes for variables such as temperature and precipitation for a selection of time periods, scenarios and global warming levels (from Met Éireann's TRANSLATE project - O'Brien and Nolan (2023)).

[16] P. Nolan and J. Flanagan (2020) High-Resolution Climate Projections for Ireland – a Multi-model Ensemble Approach. EPA Research Report No. 339.

- Climate Change Projections (non-standardised): future projections of changes for variables such as snowfall, driving rain and wind energy for the period 2041-2060 (these projections come from Nolan and Flanagan (2020) and are compared to 1981-2000, rather than the TRANSLATE parameters). As further results come from standardised projects these maps will be replaced.

2.3.1.2 EPA Climate Projections

The EPA's Research Report on Climate Projections for Ireland (Research Report No. 339)[17] employs regional climate modelling to assess the impacts of a warming climate on the 21st-century climate of Ireland. Regional climate models (RCMs) take the outputs from global climate models (GCMs) to produce more refined projections of the potential local and regional impacts of climate change. The RCM simulations were run at high spatial resolution (3.8km and 4km) which allowed for a more realistic representation of important physical processes and enabling a more accurate evaluation of the local impacts of climate change across Ireland.

A multi-model ensemble approach was employed in the study to address the issue of uncertainty. Through the ensemble approach, the uncertainty in the projections can be partly quantified, thus providing a measure of confidence in the projections. Different RCMs were used to downscale outputs from a number of different CMIP5 (Coupled Model Intercomparison Project – Phase 5) GCMs.

Simulations were run for the reference period 1981–2000 and the future period 2041–2060. Differences between the two periods provide a measure of climate change. To account for the uncertainty in future greenhouse gas emissions and changing land use, and how the world will come together to respond to the challenge of climate change, the future climate was simulated under both the Representative Concentration Pathway 4.5 (RCP4.5) and RCP8.5 scenarios. The climate projections of EPA Research Report No. 339 are in broad agreement with previous research, which adds a measure of confidence to the projections.

2.3.2 Ireland's Changing Climate

Ireland's climate is changing in line with global trends, with a temperature increase of, on average, 0.8°C compared with 1900. By the middle of this century (2041 – 2060) the average annual temperatures are projected to increase by between 1–1.2℃ and 1.3–1.6℃ depending on the emissions trajectory. The number of warm days is expected to increase and heat waves are expected to occur more frequently.

The mean annual temperature for Ireland has experienced an overall increase of 0.9°C over the last 120 years with fifteen of the top 20 warmest years on record having occurred since 1990.

There has been a decrease in the number of frost days (temperatures below 0°C) and a shortening of the frost season duration. In contrast, there has been an increase in the number

[17] P. Nolan and J. Flanagan (2020) High-Resolution Climate Projections for Ireland – a Multi-model Ensemble Approach. EPA Research Report No. 339.

of warm days (temperature > 20°C). This is in line with trends evident for the rest of Western Europe.

For Ireland, satellite observations indicate that sea levels around Ireland have increased by approximately 2-3 mm per year since the 1990s.

When compared with an annual average rainfall of 1186mm in the period 1961-1990, the thirty-year period 1990-2019 shows a 70mm or almost 7% increase in rainfall. The last decade from 2006 - 2015 has been the wettest period in the period 1711- 2016 and there is evidence of an increasing trend in winter rainfall and a decreasing trend in summer rainfall. This information is derived from the latest 30-year averages from Met Eireann (1991-2019). 30-years is the standard reference period as established by the world meteorological organisation, and data is only required to be updated every 10-years.

Other climate change indicators, as detailed in Met Eireann's Annual Climate Statement (2024) include:

- The average annual air temperature for Ireland in 2024 *(using the Island of Ireland dataset*)* was 10.72 °C, which is 1.17°C above the 1961-1990 long-term average (LTA) or 0.55°C above the most recent 1991-2020 LTA.
- This makes 2024 the fourth warmest year on record, 0.49 °C cooler than 2023, the warmest year on record.
- The five warmest years on record are 2023, 2022, 2007, 2024 and 1945. Seven of the top ten warmest years have occurred since 2005.
- The coldest year on record was in 1919 with 8.73 °C, of the top ten coldest years – none have occurred since 2000.
- Provisionally, 2024 rainfall was the 41st driest or 44th wettest since 1941.

The climate projections for the next century indicate that observed climate trends will continue and intensify over the coming decades. Predicted impacts include:

- Changes in wind speeds and storm tracks;
- Increased likelihood of river and coastal flooding;
- Changes in distribution of plant and animal species and in the phenology (the timing of lifecycle events) of native species;
- Water stress for crops, pressure on water supply and adverse impacts on water quality;
- Negative impacts on human health and wellbeing.

Adaptation refers to actions taken to reduce vulnerability and exposure to climate change impacts. The more we reduce global emissions, the less adaptation to the consequences of climate change will be required. However, some impacts are already unavoidable.

The following Table 2-2 provides a summary of climate projections for Ireland and specific climate model simulations for South Dublin County Council using a combination of the *Climate Ireland* Climate Change Projection Maps[18] and EPA Research Report No. 339[19]. For the purposes of this report, the climate variables observed have been determined as "climate-related hazards" and have been grouped according to the IPCC CID Categories.

Climate projections were obtained for the future periods 2041-2060 and 2041-2070. The reference periods have been set at 1976-2005 and 1980-2000. Differences between the reference periods and future periods provide a measure of climate change. The climate scenarios utilised in the assessment are RCP4.5 and RCP8.5.

[18] Climate Ireland - Climate Change Projection Maps.

[19] P. Nolan and J. Flanagan (2020) High-Resolution Climate Projections for Ireland – a Multi-model Ensemble Approach. EPA Research Report No. 339.

Table 2-2: Climate Projections for Ireland and South Dublin (Data Source: Climate Ireland Climate Change Projection Maps)

IPCC Climate Impact Driver Category	Climate-related Hazard	Summary of Projections for Ireland[20]	Climate Model Simulations for South Dublin[21] (RCP4.5 Scenario)	Climate Model Simulations for South Dublin[22] (RCP8.5 Scenario)
Heat and Cold	Temperature Projections (Chronic) (Reference period 1976-2005; Future period: 2041-2070)	Mid-century mean annual temperatures are projected to increase by 0.6–1.7°C and 1.1–1.9°C for the RCP4.5 and RCP8.5 scenarios, respectively. Temperature projections show a clear west-to-east gradient, with the largest increases in the east.	Mean annual temperature change: +1.3°C Greatest seasonal change in Autumn with an expected increase of +1.6°C	Mean annual temperature change: +1.7°C Greatest seasonal change in Autumn with an expected increase of +2.2°C
	Surface Humidity (Chronic) (Reference Period 1981-2000; Future period: 2041-2060)	Specific humidity [22] is projected to increase substantially (≈10%) for all seasons by the middle of the century. Relative humidity [23] is projected to increase slightly (or show ≈0% change) for all seasons except summer. For summer, relative humidity is expected to decrease in the south-east and increase in the north-west (both RCP scenarios).	Annual mean change in specific humidity: +8.5% Relative humidity is projected to decrease slightly or show ≈0% change.	Annual mean change in specific humidity: +11.5% Relative humidity is projected to increase slightly (0.3%) or show ≈0% change.
	Heatwave[24] (Acute) (Reference period 1976-2005; Future period: 2041-2070)	The large projected increase in high summer temperatures suggests an increase in the number of heatwave events by the middle of the century. The changes range from -0.05 to 0.21 for the RCP4.5 scenario and from 0.04 to 0.28	Change in daily max temperature: +1.2°C Change in the number of heatwave events: +0.2	Change in daily max temperature: +1.7°C Change in the number of heatwave events: +0.4

[20] P. Nolan and J. Flanagan (2020) High-Resolution Climate Projections for Ireland – a Multi-model Ensemble Approach. EPA Research Report No. 339.
[21] Simulations were run for the reference period 1981–2000 and the future period 2041–2070.
[22] Specific humidity is the amount of water vapour in the atmosphere calculated as the ratio of the mass of water vapour to the total mass of the air parcel.
[23] Relative humidity is the ratio of the amount of water vapour present in the air to the greatest amount possible at the same temperature.

IPCC Climate Impact Driver Category	Climate-related Hazard	Summary of Projections for Ireland[20]	Climate Model Simulations for South Dublin[21] (RCP4.5 Scenario)	Climate Model Simulations for South Dublin[22] (RCP8.5 Scenario)
		for the RCP8.5 scenario. A sustained increase in the daily maximum temperature is associated with heatwaves.		
	Frost and Ice days (Acute) (Reference period 1976-2005; Future period: 2041-2070)	The large projected decrease in cold nights implies a decrease in the number of frost and ice days by the middle of the century. The number of frost days (days when the minimum temperature is <0°C) is projected to decrease by 22.09 to 8.84 under the RCP 4.5 scenario and 27.75 to 15.50 under the RCP 8.5 scenario. The number of ice days (days when the maximum temperature is <0°C) is projected to decrease by 0.36 to 0.10 in the RCP 4.5 scenario and 0.36 to 0.20 in the RCP 8.5 scenario.	The number of frost days is projected to decrease by -25. No projected change in the number of ice days.	The number of frost days is projected to decrease by -30. No projected change in the number of ice days.
Wet and Dry	Precipitation (Chronic) (Reference period 1976-2005; Future period: 2041-2070)	Substantial decreases in precipitation are projected for the summer months, with reductions up to -8.68% for the majority of the country (90th percentile) for the RCP 4.5 scenario and -15.62% for the RCP 8.5 scenario. South Dublin, however, indicates a change of 2% to 4% and 4% to 6% in the RCP 4.5 and RCP 8.5 scenarios, respectively. Other seasons, and over the full year, show small projected changes in precipitation with an average 2.86% and 4.81% increase over the whole country in the RCP4.5 and RCP8.5 scenarios, respectively. However, the mid-	Percentage increase in annual mean rainfall: +3% to +5% Percentage increase in spring rainfall: +2% to +5% Percentage change in summer rainfall: 0% to -2% Percentage increase in autumn rainfall: +3% Percentage increase in winter rainfall: +5% to +8%	Percentage increase in annual mean rainfall: +4% to +7% Percentage increase in spring rainfall: +4% to +5% Percentage decrease in summer rainfall: 0% to -4% Percentage increase in autumn rainfall: +7% Percentage increase in winter rainfall: +12% to +18%

IPCC Climate Impact Driver Category	Climate-related Hazard	Summary of Projections for Ireland[20]	Climate Model Simulations for South Dublin[21] (RCP4.5 Scenario)	Climate Model Simulations for South Dublin[22] (RCP8.5 Scenario)
		century precipitation climate is expected to become more variable with substantial projected increases in both dry periods and heavy precipitation events. The uncertainty of the mean precipitation projections may be partly attributed to the projected increase in the variability of the future Irish precipitation climate, resulting in an increase in both dry periods and heavy rainfall events.		
	Heavy Precipitation Events (Acute) (Reference period 1976-2005; Future period: 2041-2070)	Changes in the occurrence of heavy rainfall events are of particular importance because of the link with flooding. The projections indicate a decrease in the annual number of wet days[25] for the RCP4.5 (mean value -2.42%) and RCP8.5 (mean value -2.61%) scenarios. There is a projected increase in the annual number of very wet days[26], with mean values of 0.54% and 0.74% for the RCP4.5 and RCP8.5 scenarios, respectively.	Projected (percentage) decrease in the annual number of wet days: -1% to -2.5% *(It is noted that regional details are not reliable because of a large variability in the ensembles).*	Projected (percentage) decrease in the annual number of wet days: -1% to -2% *(It is noted that regional details are not reliable because of a large variability in the ensembles).*
			Projected increase in the annual number of very wet days: +1 *(It is noted that regional details are not reliable because of a large variability in the ensembles).*	Projected increase in the annual number of very wet days: +1.5 *(It is noted that regional details are not reliable because of a large variability in the ensembles).*

[25] A “wet day” is defined as one on which the daily precipitation amount is greater than 20mm.
[26] A “very wet day” is defined as one on which the daily precipitation is greater than 30mm.

IPCC Climate Impact Driver Category	Climate-related Hazard	Summary of Projections for Ireland[20]	Climate Model Simulations for South Dublin[21] (RCP4.5 Scenario)	Climate Model Simulations for South Dublin[22] (RCP8.5 Scenario)
	Dry Periods (Acute) (Reference Period 1981-2000; Future period: 2041-2060)	To quantify the potential impact of climate change on future drought events, the change in the number of dry periods[27] was analysed. The projections indicate an increase in the annual number of dry periods for the RCP4.5 and RCP8.5 scenarios (mean value ≈16% for both RCPs). The projected increases in dry periods are largest for summer, with "likely" values of +11% and +48% for the RCP4.5 and RCP8.5 scenarios, respectively.	Percentage increase in the number of annual dry periods: 15% to 20% Percentage increase in the number of summer dry periods: 15% to 30%	Percentage increase in the number of annual dry periods: 12% to 18% Percentage increase in the number of annual dry periods: 20% to 30%
Wind	Wind Speed and Sea Level Pressure (Chronic) (Reference Period 1981-2000; Future period: 2041-2060)	Mid-century mean 10-m wind speeds are projected to decrease for all seasons. The decreases are largest for summer months under the RCP8.5 scenario. The summer reductions in 10-m wind speed range from 0.3% to 3.4% for the RCP4.5 scenario and from 2% to 5.4% for the RCP8.5 scenario. Annual average mean sea level pressure (MSLP) is projected to increase by the middle of the century for both the RCP4.5 (mean value 1.4hPa) and RCP8.5 scenarios (mean value 1.2hPa). There exists a clear south-east to north-west gradient in the projections, with the largest increases in the north. The projected increases in MSLP are some of many possible factors that could contribute to the projections of	Percentage change in annual mean 10-m wind speed: -2% Change in annual average mean sea level pressure: +1.38 to +1.4 hPa	Percentage change in annual mean 10-m wind speed: -2% to -2.5% Change in annual average mean sea level pressure: +1.2 hPa

[27] A dry period is defined as at least 5 consecutive days on which the daily precipitation is less than 1mm.

IPCC Climate Impact Driver Category	Climate-related Hazard	Summary of Projections for Ireland[20]	Climate Model Simulations for South Dublin[21] (RCP4.5 Scenario)	Climate Model Simulations for South Dublin[22] (RCP8.5 Scenario)
		decreases in wind speed and wind power and increases in dry periods and heatwave events.		
	Storm Track Projections[28] (Acute) (Reference Period 1981-2000; Future period: 2041-2060)	Projections show a reduction of ≈10% in the numbers of less intense storms affecting Ireland and suggest an eastward extension of the more severe windstorms over Ireland and the UK from the middle of the century. It should be noted that because extreme storms are rare events, the storm projections should be considered with a level of caution.		
Snow and Ice	Snowfall (Chronic) (Reference Period 1981-2000; Future period: 2041-2060)	Annual snowfall is projected to decrease substantially by the middle of the century for the RCP4.5 (mean value 52%) and RCP8.5 scenarios (mean value 63%). The largest decreases are noted over low-lying regions. Averaged over the whole country, the "likely" decreases in mid-century snowfall are 51% and 60% for the RCP4.5 and RCP8.5 scenarios, respectively.	Percentage decrease in mean annual snowfall: -55%	Percentage decrease in mean annual snowfall: -65% to -70%

[28] Given the large societal impacts of extreme storms, there is considerable interest in the potential impact of climate change on extreme cyclonic activity in the North Atlantic. Windstorms and associated high wind speeds are a major source of natural hazard risk for Ireland and many countries across Europe.

IPCC Climate Impact Driver Category	Climate-related Hazard	Summary of Projections for Ireland[20]	Climate Model Simulations for South Dublin[21] (RCP4.5 Scenario)	Climate Model Simulations for South Dublin[22] (RCP8.5 Scenario)
Other (Energy Impacts)	Heating degree days[29] (Reference period 1976-2005; Future period: 2041-2070)	The projected change in heating degree days (HDDs) shows that by the middle of the century there will be a greatly reduced requirement for heating in Ireland, with HDDs projected to decrease by 12–17% and 15–21% for the RCP4.5 and RCP8.5 scenarios, respectively. A clear north-to-south gradient is evident for both RCP scenarios, with the largest decreases in the south. Averaged over the whole country, the expected decreases in HDDs are 14% and 18% for the RCP4.5 and RCP8.5 scenarios, respectively.	Percentage decrease in mean annual in HDD: -15% to -20%	Percentage decrease in mean annual in HDD: -20% to -23%
	Cooling degree days[30] (Reference Period 1981-2000; Future period: 2041-2060)	The projections show that cooling degree days (CDDs) are expected to slightly increase, particularly over the east and midlands, suggesting a small increase in air conditioning requirements by the middle of the century. However, the amounts are small compared with HDDs and therefore have a negligible effect on the projected changes in the total energy demand		

[29] A degree day, an estimate of accumulated heat, is defined as the deviation (°C) from a base temperature value. Heating degree days (HDDs) are used by power companies and consumers to estimate the amount of energy required for residential or commercial space heating during the cold season.

[30] Cooling degree days (CDDs) are used to estimate the amount of air conditioning usage during the warm season.

IPCC Climate Impact Driver Category	Climate-related Hazard	Summary of Projections for Ireland[20]	Climate Model Simulations for South Dublin[21] (RCP4.5 Scenario)	Climate Model Simulations for South Dublin[22] (RCP8.5 Scenario)
	Solar photovoltaic (PV) power (Reference Period 1981-2000; Future period: 2041-2060)	To assess the impacts of climate change on solar power in Ireland, projections of solar photovoltaic (PV) power were analysed. Results show an expected small decrease in PV by the middle of the century ranging from ≈0 to 4%. The largest decreases are noted in the north of the country and for the RCP8.5 scenario.	Percentage decrease in mean annual in PV: -1% to -2%	Percentage decrease in mean annual in PV: -2% to -3%

3 CLIMATE RISK SCREENING

3.1 Technical Screening Criteria Requirements

For the purposes of the assessment, the methodology outlined in Regulation (EU) 2020/852 of the European Parliament and of the Council (the 'Taxonomy Regulation') and Commission Delegated Regulation (EU) 2021/2139[31] (the 'Supplementing Regulation') for a Climate Risk and Vulnerability Assessment has been adopted.

The 'Supplementing Regulation' establishes the Technical Screening Criteria for '*Substantial contribution to climate change adaptation'* specific to certain economic activities. Annex II, Section 7.1 (2) of the Supplementing Regulation sets out the following criteria for assessing risk on the 'Construction of new buildings' (the Proposed Development at Boherboy, Saggart, Co. Dublin consists of the construction of a large-scale residential development):

2. *The physical climate risks that are material to the activity have been identified from those listed in Appendix A to this Annex by performing a robust climate risk and vulnerability assessment with the following steps:*

    a. *screening of the activity to identify which physical climate risks from the list in Appendix A to this Annex may affect the performance of the economic activity during its expected lifetime;*

    b. *where the activity is assessed to be at risk from one or more of the physical climate risks listed in Appendix A to this Annex, a climate risk and vulnerability assessment to assess the materiality of the physical climate risks on the economic activity;*

    c. *an assessment of adaptation solutions that can reduce the identified physical climate risk.*

The first step of the climate risk and vulnerability assessment, as set out in Annex II, Section 7.1 (2) (a) of the Supplementing Regulation (and provided above), is the screening of the activity to identify which physical climate risks from the list in Appendix A of Annex II of the Supplementing Regulation may affect the performance of the economic activity during its expected lifetime. These physical climate risks are provided in Table 3-1.

[31] Commission Delegated Regulation (EU) of 4.6.2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives.

Table 3-1: Classification of climate related hazards (Source: Appendix A of Annex II of the Commission Delegated Regulation 2021/2139[32])

	Temperature-related	Wind-related	Water-related	Solid mass-related
Chronic	Changing temperature (air, freshwater, marine water)	Changing wind patterns	Changing precipitation patterns and types (rain, hail, snow/ice)	Coastal erosion
	Heat stress		Precipitation or hydrologi-cal variability	Soil degradation
	Temperature variability		Ocean acidification	Soil erosion
	Permafrost thawing		Saline intrusion	Solifluction
			Sea level rise	
			Water stress	
Acute	Heat wave	Cyclone, hurricane, typhoon	Drought	Avalanche
	Cold wave/frost	Storm (including blizzards, dust and sandstorms)	Heavy precipitation (rain, hail, snow/ice)	Landslide
	Wildfire	Tornado	Flood (coastal, fluvial, pluvial, ground water)	Subsidence
			Glacial lake outburst	

The climate risk screening primarily considers the location of the Proposed Development; this allows certain climate-related hazards to be initially excluded from the screening assessment based on location. Climate projections for the area of the Proposed Development along with risk levels as determined by the IPCC AR6 WGI and SDCC CAP are then utilised to determine the climate risks which are material to the Proposed Development. Climate risks that are material to the Proposed Development are then subsequently identified from those listed in Table 3-1.

3.2 Risk Identification

3.2.1 Project Site Location

The subject site extends to approximately 18.6Ha. The site is located to the north of Boherboy Road, approximately 2km south-west of Tallaght Town Centre, 1km east of Saggart, 700m south-west of Citywest Shopping Centre and 1.6km south of the N7.

The site is bounded by residential dwellings to the north and east. The areas to the west and south are predominantly undeveloped, agricultural lands. Three streams cross the site in a north south direction. These are the Corbally Stream, the Cooldown Stream and the Coldwater Stream. There are also a number of hedgerows running both around the edges of the site as

[32] Appendix 2 of this report contains a copy of Appendix A of Annex II of the Supplementing Regulation.

well as through the site itself. The site falls steeply from south (approx. 155 AOD) to north (approx. 117.5 AOD).

The site of the Proposed Development consists of open fields used for agriculture. To the immediate north of the site is the Carrigmore residential estate, to the west are agricultural lands and a single dwelling, to the east is the Corbally residential estate and Carrigmore Park while to the south is the Boherboy Road.

A Flood Risk Assessment (FRA)[33] has been carried out for the Proposed Development which considers the potential flood mechanisms at the Site. This Report has been considered for the purposes of the CCIA in order to determine overall flood risk at the site, and the adequacy of proposed measures.

As an inland site upstream of tidal influences and possible wave action, the Site is not subject to coastal flood risk. Tidal flood sources have therefore been screened out of the FRA.

Evidence of flood risk was found at the Site from fluvial sources (i.e. from the overtopping of rivers and streams, in this case the Corbally Stream which flows along the eastern and northern perimeters of the Site). The proposed development was found to have the potential to displace fluvial floodplain storage, thereby increasing flood-risk elsewhere. To prevent this, the proposed development includes compensatory storage, designed in accordance with the Guidelines, to offset the displaced floodplain storage.

The finished levels of the proposed development that are considered to be water-vulnerable, i.e. buildings, roads, parking areas, footways cycleways and other paved areas were found to lie outside flood risk zones in the post-development scenario and so the proposed development is not considered to be at risk of flooding. The freeboard between the potential top water level of the 1% AEP flood event and the lowest proposed site road or floor level far exceeds the minimum recommended dimensions as set out in the Guidelines.

According to the FRA, groundwater flooding has not been recorded in OPW PFRA for the area, and no groundwater strikes within 2km of existing ground level were encountered during SI (On this basis groundwater flood risk is screened out.

Based on a review of the Proposed Development Site location, the following potential climate-related hazards, as listed in Table 3-1, can be excluded from the screening assessment:

- **Sea level rise:**

  - Due to the elevation of the Site and its position above sea level, it is not expected to be affected by sea level rise.[34]

- **Temperature-related:** permafrost thawing; wildfire.

  - The Site is located close to an urban setting; therefore, highly unlikely to be affected by wildfires. Permafrost is not relevant to the Irish climate.

[33] Refer to Flood Risk Assessment, Kilgallen & Partners Consulting Engineers, 2025.
[34] Climate Central - Coastal Risk Screening Tool

- **Wind-related:** tornado.

- It is possible that thunderstorms with conditions favourable for tornado events and warmer, unstable weather attributed to climate change may be linked. On average, Ireland experiences ten tornadoes per year although many of these are weak and often occur without being noticed. There have been more reports of tornadoes in Ireland in recent years, some of which have caused considerable damage to buildings and local infrastructure. This may indicate that the risk of more powerful tornadoes in Ireland is rising, however there currently lacks tangible evidence on this subject. Therefore, tornado is currently excluded as a material risk.

- **Solid mass-related:** soil degradation; soil erosion; solifluction; avalanche; landslide; subsidence**.**

- In relation to soil degradation and soil erosion, there will be unavoidable loss of in—situ soil and subsoil from the Proposed Development Site to achieve the required formation levels for the Proposed Development including building foundations, roads, drainage, and other infrastructure. All excavated soil and subsoil material will be reused on Site for engineering fill and landscaping, subject to suitability testing, as much as practicable.

- Due to the location and topography of the Site, solifluction has been excluded in the long-term.

- According to the Landslide Susceptibility Map developed by Geological Survey Ireland (GSI), the Proposed Development Site is considered Low in terms of landslide susceptibility.[35]

- Avalanches are not considered relevant based on Ireland's historical and future projected climate.

3.2.2 IPCC AR6 WGI Climate Impact Drivers and Confidence in Future Changes for Northern Europe and Ireland

The IPCC WGI has developed an Interactive Atlas to demonstrate Climatic impact-drivers (CIDs) predictions across the globe. CIDs are physical climate system conditions (e.g., means, events, extremes) that affect an element of society or ecosystems. Depending on system tolerance, CIDs and their changes can be detrimental, beneficial, neutral, or a mixture of each across interacting system elements and regions. CID types include heat and cold, wet and dry, wind, snow and ice, coastal and open ocean.

Chapter 12 of IPCC AR6 WGI surveys the links between CIDs and affected sectors and provides a matrix of CIDs for regional sectors that are rated based on their potential impact and risk relevance. Impacts, risks, and opportunities are rarely attributable to a single CID index or threshold, but climate shifts that push conditions outside of expected conditions and

[35] Geological Survey Ireland - Landslide Susceptibility Map

beyond tolerance levels are indicative of impact, risk or benefit given vulnerability and exposure. Focus is on direct sectoral connections of a CID rather than cascading or secondary effects. Within each sector there is a multitude of specific sectoral systems that may be affected by CID increases and decreases, with consequences further distinguished by region, background climate and socio-economic or ecological context of the affected asset.

The Proposed Development falls within the sector of the “Built Environment” as per IPCC AR6 WGI. Therefore, CIDs and their associated impact/risk relevance for the Built Environment have been provided in Table 3-2:

Table 3-2: Impacts and Risk Relevance for the "Built Environment”.

Category	CIDs	Impacts and Risk Relevance
HEAT AND COLD	Mean air temperature	High
	Extreme heat	High
	Cold spell	Low/moderate
	Frost	None/low confidence
WET AND DRY	Mean precipitation	None/low confidence
	River flood	High
	Heavy precipitation and pluvial flood	High
	Landslide	Low/moderate
	Aridity	None/low confidence
	Hydrological drought	None/low confidence
	Agricultural and ecological drought	Low/moderate
	Fire weather	Low/moderate
WIND	Mean wind speed	None/low confidence
	Severe windstorm	High
	Tropical cyclone	High
	Sand and dust storm	Low/moderate
SNOW AND ICE	Snow, glacier and ice sheet	None/low confidence
	Permafrost	Low/moderate
	Lake, river and sea ice	None/low confidence
	Heavy snowfall and ice storm	Low/moderate
	Hail	Low/moderate
	Snow avalanche	Low/moderate
COASTAL AND OCEANIC	Relative sea level	High
	Coastal flood	High
	Coastal erosion	High
	Marine heatwave	None/low confidence
	Ocean acidity	None/low confidence
OTHER	Air pollution weather	None/low confidence
	Atmospheric CO_2 at surface	None/low confidence
	Radiation at surface	Low/moderate

The CIDs, and confidence in future changes of climate for Northern Europe are demonstrated in Table 3-3:

Table 3-3: IPCC WGI Interactive Atlas: Regional synthesis Climate Change Predictions for Northern Europe

Category	CIDs	Future Changes	
HEAT AND COLD	Mean surface temperature	High confidence of increase	△
	Extreme heat	High confidence of increase	△
	Cold spell	High confidence of decrease	▽
	Frost	High confidence of decrease	▽
WET AND DRY	Mean precipitation	High confidence of increase	△
	River flood	Medium confidence of decrease	▽
	Heavy precipitation and pluvial flood	High confidence of increase	△
	Landslide	Low confidence in direction of change	—
	Aridity	High confidence of decrease	▽
	Hydrological drought	Low confidence in direction of change	—
	Agricultural and ecological drought	Low confidence in direction of change	—
	Fire weather	Low confidence in direction of change	—
WIND	Mean wind speed	Medium confidence of decrease	▽
	Severe windstorm	Medium confidence of increase	△
	Tropical cyclone	Not relevant	⊠
	Sand and dust storm	Not relevant	⊠
SNOW AND ICE	Snow, glacier and ice sheet	High confidence of decrease	▽
	Permafrost	High confidence of decrease	▽
	Lake, river and sea ice	High confidence of decrease	▽
	Heavy snowfall and ice storm	Low confidence in direction of change	—
	Hail	Low confidence in direction of change	—
	Snow avalanche	Low confidence in direction of change	—
COASTAL AND OCEANIC	Relative sea level	High confidence of increase	△
	Coastal flood	High confidence of increase	△
	Coastal erosion	High confidence of increase	△
	Marine heatwave	High confidence of increase	△
	Ocean acidity	High confidence of increase	△
OTHER	Air pollution weather	Low confidence in direction of change	—
	Atmospheric CO_2 at surface	High confidence of increase	△
	Radiation at surface	Medium confidence of decrease	▽

The Proposed Development is located in Boherboy, Saggart Co.Dublin The CIDs and predicted changes in future climate for South Dublin are presented in Table 3-4 below, as adapted from the findings in Table 2-2 of this Report:

Table 3-4: Climate Change Predictions for South Dublin (based on Climate Ireland Climate Change Projection Maps)

Category	CIDs	Future Changes
HEAT AND COLD	Mean surface temperature	Predicted increase
	Extreme heat	Predicted increase
	Cold spell	Predicted decrease
	Frost	Predicted decrease

Category	CIDs	Future Changes
WET AND DRY	Mean precipitation	Predicted increase
	River flood	Predicted increase
	Heavy precipitation and pluvial flood	Predicted increase
	Hydrological drought	Predicted increase
	Agricultural and ecological drought	Predicted increase
WIND	Mean wind speed	Predicted decrease
	Severe windstorm	Predicted increase
SNOW AND ICE	Snow, glacier and ice sheet	Predicted decrease
	Heavy snowfall and ice storm	Predicted decrease
COASTAL AND OCEANIC	Relative sea level	Predicted increase
ENERGY IMPACTS (OTHER)	Heating degree days	Predicted decrease
	Cooling degree days	Predicted increase
	Solar photovoltaic (PV) power	Predicted decrease

3.2.3 South Dublin County Council Climate Action Plan (2024-2029) Risk Statement

South Dublin County Council undertook a climate change risk assessment as part of the SDCC CAP 2024-2029. The purpose of the climate change risk assessment is to better understand the current risks that South Dublin faces and provide a view on the potential frequency and impact of future climate events.

Climate hazards include extreme weather events and periods of climate variability. Figure 3-1 provides an illustration of extreme weather events in South Dublin (1982 – 2023).

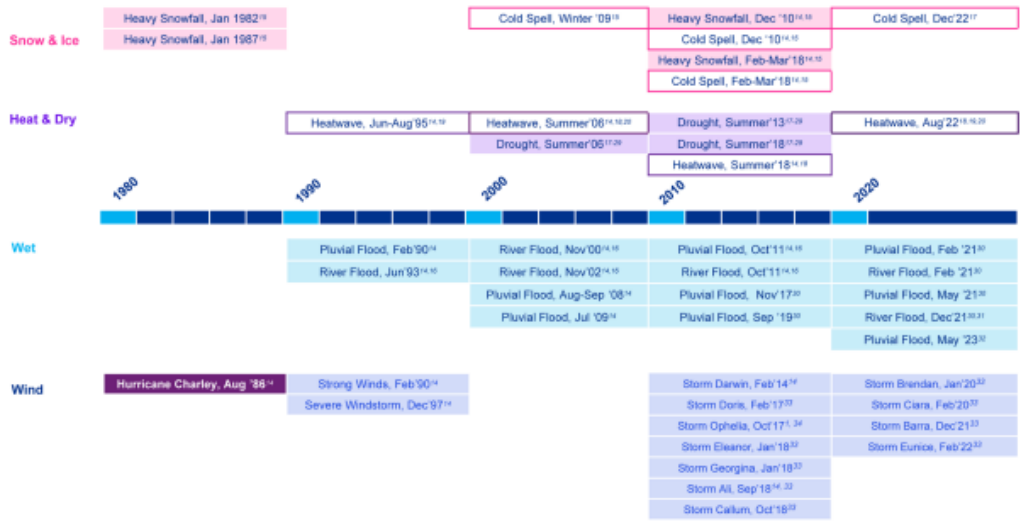

Figure 3-1: Illustration of Extreme Weather Events in South Dublin (1982-2023) (Source: SDCC CAP)

The assessment identified severe windstorms, river flooding and pluvial flooding as posing the highest levels of risk for South Dublin in the current period. Heatwave, drought, cold spell and heavy snowfall have also impacted South Dublin, but less frequently and hence are a lower risk. Groundwater flooding was noted to occur on a rare basis with a negligible level of impact identified for South Dublin.

The following Table 3-5 describes the future projected changes to climate hazard risk for South Dublin, as set out within the SDCC CAP.

Table 3-5: Future Projected Changes to Climate Hazard Risk for South Dublin (Source: SDCC CAP)

Climate Hazard	Change Projections	Summary	Future Frequency
Droughts & Heatwaves	Summer rainfall is expected to reduce in the future when compared with the baseline period of 1981 to 2000, in both the medium and very high emissions scenarios contributing to potential drought conditions. Projections indicate an overall increase in average temperature of between 1.2 and 1.6°C for South Dublin relative to the 1981-2000 period. Under a high emission scenario, projections indicate that heatwaves will become more frequent by mid-century	These are emerging and increasing risks	Frequent & common
Windstorms	Projections of storms are subject to a high level of uncertainty. By midcentury, projections indicate that average wind speed will remain similar to those currently experienced. There is limited evidence of a potential increase in the frequency of more intense storms which are currently rare events. However, more research is needed to confirm this increase	This is an increasing risk	Very Frequent

Climate Hazard	Change Projections	Summary	Future Frequency
Extreme Cold Heavy Snowfall	As a consequence of the increasing temperatures, a decrease in the number of frost days and ice days in the 2041-2060 future period is projected when compared with the baseline period of 1981 to 2000, for both the RCP4.5 and RCP8.5 scenario. The annual snowfall in the region is projected to decrease substantially by the middle of the century for the medium and very high emissions scenarios	These are decreasing risks	Occasional & Rare
River and Pluvial Floods	Projections indicate an increase in the frequency of heavy rainfall days (days with precipitation >30mm) for South Dublin with some areas projected to see an increase of up to 16.5%. This will likely result in an increased frequency of of associated river (fluvial) and pluvial flooding	Likely risks	Very Frequent
Groundwater flood	Projections of changes in groundwater flooding are currently not available, therefore there is uncertainty in the change in groundwater flooding frequency that can be expected	Uncertain	Rare

3.2.4 Identified Climate Risks

The CIDs, and confidence in future changes of climate for Northern Europe, as presented in IPCC AR6 WGI, have been taken into consideration along with the location of the Proposed Development, projected changes in climate for Ireland, and future climate risk levels as determined within the SD CAP, in order to determine what risks are material to the Proposed Development.

Based on these findings, as presented in Table 3-2 to Table 3-5, the following Table 3-6 indicates the CIDs of relevance to the Proposed Development. Only CIDs which have been assigned as low/moderate or high in IPCC AR6 WGI findings for the “Built Environment” have been included here; anything that has been assigned none/low confidence has been omitted (aside from hydrological drought which is considered relevant to the site location). This approach ensures that the assessment is based on reliable and robust data. Many of these CIDs that have been omitted due to ‘none/low confidence’ risk relevance are not applicable to the subject site location (as can be seen in table 3-2). The only potentially relevant CIDs which have been omitted are mean precipitation and mean wind speed. Impacts from these will be captured in the assessment of acute hazards such as heavy rainfall or storm winds.

Table 3-6: Climate Risk Screening

Category	CIDs	IPCC Impacts and Risk Relevance to the Built Environment	Predicted Change in CID for Northern Europe and Ireland (South Dublin)	Included in SDCC CAP	Material Risk
HEAT AND COLD	Mean air temperature (chronic)	High	High confidence of increase in Northern Europe. Projections for South Dublin indicate an increase in mean air temperature.	Yes	**Yes**
	Extreme heat (acute)	High	High confidence of increase in Northern Europe. Projections for South Dublin indicate an increase in heatwaves.	Yes	**Yes**
	Cold spell (acute)	Low/moderate	High confidence of decrease in Northern Europe. Projections for South Dublin indicate a decrease in cold spells.	Yes	**No**
WET AND DRY	River flood (acute)	High	Medium confidence of decrease for Northern Europe. Very wet days predicted to increase in South Dublin.	Yes	**Yes**
	Heavy precipitation and pluvial flood (acute)	High	High confidence of increase for Northern Europe. Very wet days predicted to increase in South Dublin.	Yes	**Yes**
	Landslide (acute)	Low/moderate	Low confidence in direction of change. The Proposed Development Site is considered Low in terms of landslide susceptibility.	No	**No**
	Hydrological Drought [36] (acute)	None/low confidence	Low confidence in direction of change for Northern Europe. Number of dry periods expected to increase in South Dublin	Yes	**Yes**

[36] Though this has been assigned as none/low confidence by the IPCC in terms of impacts and risk relevance to the built environment, climate predictions for Ireland indicate an increase in the frequency and duration of droughts. Therefore, this CID has not been omitted from the current risk screening.

Category	CIDs	IPCC Impacts and Risk Relevance to the Built Environment	Predicted Change in CID for Northern Europe and Ireland (South Dublin)	Included in SDCC CAP	Material Risk
	Agricultural and ecological drought (acute)	Low/moderate	Low confidence in direction of change.	No	**No**
	Fire weather (acute)	Low/moderate	Low confidence in direction of change.	No	**No**
WIND	Severe windstorm (acute)	High	Medium confidence of increase in Northern Europe. Increase in windstorms projected for Ireland with level of caution for uncertainty.	Yes	**Yes**
	Tropical cyclone (acute)	High	Not relevant for location.	No	**No**
	Sand and dust storm (acute)	Low/moderate	Not relevant for location.	No	**No**
SNOW AND ICE	Permafrost thawing (chronic)	Low/moderate	Not relevant for location.	No	**No**
	Heavy snowfall and ice storm (acute)	Low/moderate	Low confidence in direction of change for Northern Europe. Projections for South Dublin predict a decrease in snowfall.	Yes	**No**
	Hail (acute)	Low/moderate	Low confidence in direction of change.	No	**No**
	Snow avalanche (acute)	Low/moderate	Not relevant for location.	No	**No**
COASTAL & OCEANIC	Relative sea level (chronic)	High	High confidence of increase in Northern Europe. A 6-7mm rise per year in Dublin Bay was recorded between the years 2000 and 2016.	No	**No**
	Coastal flood (acute)	High	High confidence of increase in Northern Europe. Due to the location of the site and proximity to the coast, the FRA does not consider coastal flooding to be a risk to the Proposed Development.	No	**No**

Category	CIDs	IPCC Impacts and Risk Relevance to the Built Environment	Predicted Change in CID for Northern Europe and Ireland (South Dublin)	Included in SDCC CAP	Material Risk
	Coastal erosion (chronic)	High	High confidence of increase in Northern Europe. Due to the location of the site and proximity to the coast, coastal erosion is not considered to be a risk to the Proposed Development.	No	**No**
OTHER	Compound flooding	High	The probability of these events is projected to increase along northern European coasts	No	**Yes**

Taking account of the findings presented in Table 3-2 to Table 3-6, the physical climate risks from the list in Appendix A of Annex II of the Supplementing Regulation (as provided in Table 3-1) which may affect the performance of the economic activity during its expected lifetime have been revised in terms of relevancy to the Proposed Development. Table 3-7 presents the physical climate risks which have been deemed relevant to the Proposed Development (highlighted) and those which have been excluded (strikethrough):

Table 3-7: Classification of climate related hazards which are relevant to the Proposed Development

	Temperature-related	Wind-related	Water-related	Solid mass-related
Chronic	Changing temperature (air, freshwater, marine water)	~~Changing wind patterns~~	~~Changing precipitation patterns and types (rain, hail, snow/ice)~~	~~Coastal erosion~~
	~~Heat stress~~		~~Precipitation or hydro-logical variability~~	~~Soil degradation~~
	~~Temperature variability~~		~~Ocean acidification~~	~~Soil erosion~~
	~~Permafrost thawing~~		~~Saline intrusion~~	~~Solifluction~~
			~~Sea level rise~~	
			~~Water stress~~	
Acute	Heat wave	~~Cyclone, hurricane, typhoon~~	Drought	~~Avalanche~~
	~~Cold wave/frost~~	Storm (including blizzards, dust and sandstorms)	Heavy precipitation (rain, hail, snow/ice)	~~Landslide~~
	~~Wildfire~~	~~Tornado~~	Flood (coastal, fluvial, pluvial, ground water)	~~Subsidence~~
			~~Glacial lake outburst~~	

4 CLIMATE RISK AND VULNERABILITY ASSESSMENT

4.1 Technical Screening Criteria Requirements

In accordance with the methodology as outlined in Annex II, Section 7.1 (2) (a) of the Supplementing Regulation, Section 3 of this Report has screened the activity to identify which physical climate risks from the list in Appendix A of Annex II of the Supplementing Regulation may affect the performance of the economic activity during its expected lifetime.

The remaining steps, as set out in Annex II, Section 7.1 (2) of the Supplementing Regulation (and provided above), are to conduct a climate risk and vulnerability assessment to assess the materiality of the physical climate risks on the economic activity and assess the adaptation solutions that can reduce the identified physical climate risk. This has been completed using the IPCC framework on the assessment of risk and is detailed in the following sections.

4.2 Climate Risk and Vulnerability Assessment Framework

The IPCC provides a framework to assess risk. This framework evaluates risks which may emerge due to the overlap of Climate Hazards, Vulnerability, and Exposure[37].

Figure 4-1: IPCC (AR6) Risk Assessment Propeller

[37] IPCC (2022) Working Group II Contribution to the Sixth Assessment Report (AR6), Climate Change 2022: Impacts, Adaptation and Vulnerability.

Section 3 (Climate Risk Screening) identified the following Climate Hazards as posing a potential risk to the Proposed Development:

- Temperature (chronic)
- Temperature (acute)
- Precipitation (acute)
- Drought (acute)
- Wind (acute)
- Compound events (acute)

Table 4-1 below evaluates these Climate Hazards, the risk factors (Exposure), the current sensitivity and adaptive capacity of the development (Vulnerability), and the subsequent risk level. Adaptation solutions that can reduce the identified physical climate risk have been assessed and any further recommendations for additional adaptation and mitigation measures which may improve the Proposed Development's resilience to climate change impacts are also noted and will be applied.

Table 4-1: Risk and Vulnerability Assessment

IPCC CID Category	Climate Hazard	Risk Factor (Exposure)	Current Sensitivity and Adaptive Capacity of Development (Vulnerability)	Risk with Existing Adaptation Measures	Proposed Additional Adaptation/Mitigation Measures
WET AND DRY	**Temperature (chronic)** *Increase in mean annual air temperature* **Temperature** **(acute)** *Increase in frequency and duration of heatwave events*	Increased cooling days for the buildings, extra power usage.	Due to factors such as climate change, population increase, and construction of high-rise buildings there has been an increase in high internal temperatures Landscaping and the use of trees and plants will shade and contribute to the cooling of the air through evapotranspiration[38]. The building services strategy for the development has been considered in terms of Part L Compliance (NZEB)[39]. A number of low energy technologies are being considered for the development. Development will comply with standards as per Building Regulations Near Zero Energy Buildings requirements. The Heating Ventilation Air Conditioning (HVAC) system design has been considered to ensure minimal	Low Risk once existing proposed measures are implemented.	Inspection and maintenance of the PV solar panels and HVAC systems (if implemented) will be carried out periodically and completed in accordance with good practice.

[38] Evapotranspiration is a term used to refer to the combined processes by which water moves from the earth's surface into the atmosphere.

[39] Refer to Energy and Climate Action Statement, BBSC Building Services Consulting Engineers, 2025.

IPCC CID Category	Climate Hazard	Risk Factor (Exposure)	Current Sensitivity and Adaptive Capacity of Development (Vulnerability)	Risk with Existing Adaptation Measures	Proposed Additional Adaptation/Mitigation Measures
			energy requirements in the development. The proposed HVAC systems will be selected based upon their efficiency performance, which has been assessed to ascertain their coefficient performance in terms of heating, cooling, and hot water generation. The passive measures included in the design, such as minimising solar gain (glazing selection), reducing the fabric heat loss through the building envelope by improving the airtightness significantly contributes towards reducing the loads on the active systems within the building. The active measures have been designed to reduce the primary energy consumption through intelligent control and highly efficient plant and equipment. The following passive and active measures are being considered for the development: **1. Building Fabric and Passive Design** **High Insulation Standards**: External walls, roofs, floors, and windows are designed with low U-values (e.g. walls at 0.18 W/m²K), reducing heat transfer and helping maintain indoor comfort during hot spells. **Thermal Bridging**: Thermal bridging at junctions between construction elements and at other locations will be minimised in accordance Paragraphs 1.2.4.2 and 1.2.4.3 within the Technical Guidance Documents Part L limiting unwanted heat gain or loss. **Air Tightness**: Target 2.5 m³/hr/m² or better (0.13 Air Changes Per Hour of infiltration **Passive Solar Consideration**: The layout maximises daylight while managing solar gain to prevent overheating. Glazing is selected to balance light, insulation, and solar control. **2. Lighting and Internal Heat Management**		

IPCC CID Category	Climate Hazard	Risk Factor (Exposure)	Current Sensitivity and Adaptive Capacity of Development (Vulnerability)	Risk with Existing Adaptation Measures	Proposed Additional Adaptation/Mitigation Measures
			LED Lighting: LED fittings are used throughout, which emit less heat than traditional bulbs, reducing internal heat load and the risk of overheating in summer. **3. Ventilation and Indoor Air Quality** **Heat Recovery Ventilation (HRV)**: Each unit includes HRV systems that provide fresh air while recovering heat from exhaust air. This ensures good air quality and reduces humidity, which is important during warmer periods. **4. Renewable and Low-Carbon Energy Systems** **Heat Pumps**: Waste Air-to-water heat pumps are proposed for hot water and space heating. These are efficient in warm weather and can operate on night-rate electricity, reducing peak demand and supporting grid stability. **5. Electric Vehicle (EV) Infrastructure** **EV Charging Strategy**: 10% of total parking spaces will be fitted with EV chargers from the outset, with ducting to all other spaces to allow future expansion. This supports sustainable transport and reduces urban heat and air pollution. **6. Material Choices and Thermal Comfort** **Window Frames**: uPVC frames are preferred over aluminium due to better insulation and lower embodied energy. They also reduce sound transmission and require less maintenance, which is beneficial in coastal environments.		
	Precipitation (acute)	Pressure on drainage systems.	Refer to Site Specific Flood Risk Assessment, Kilgallen & Partners.[40]	Low Risk once existing proposed	No additional measures proposed.

IPCC CID Category	Climate Hazard	Risk Factor (Exposure)	Current Sensitivity and Adaptive Capacity of Development (Vulnerability)	Risk with Existing Adaptation Measures	Proposed Additional Adaptation/Mitigation Measures
	Increase in heavy precipitation and pluvial flood		**Surface Water Drainage Design** The proposed development includes compensatory storage, designed in accordance with the Guidelines, to offset the displaced floodplain storage. Modelling of flood flows in the stream during extreme events found the proposed development will not increase peak water levels during extreme flood events and will not increase flood risk elsewhere. **Catchment Division**: The Site is in the catchment of a tributary stream of the Camac River. It is this stream which flows along the eastern and northern boundary of the Site. The Corbally stream enters the Site at its southeast boundary via a culvert under the Boherboy Road. This stream flows along the eastern boundary of the Site until it meets the northern boundary, whereupon it turns towards the west and flows along the northern boundary before discharging to a culvert at the northwest corner of the Site. **Compensatory Storage**: The proposed development increases available flood plain storage by allowing 1% AEP flooding compensatory storage in a basin in the northwest of the site. **Flow Control**: Hydro-Brake® or similar flow control devices are installed at each outfall to restrict discharge rates and manage stormwater volumes. **Sustainable Urban Drainage Systems (SuDS)** The SuDS strategy is comprehensive and layered, following the GDSDS (Greater Dublin Strategic Drainage Study) guidance:	measures are implemented.	Inspection and maintenance of the drainage systems is carried out periodically and completed in accordance with good practice.. It will be the responsibility of the site management team to ensure the drainage system is maintained. Maintenance and cleaning of gullies, manholes (including catch pits) and all other SuDS features will ensure adequate performance.

IPCC CID Category	Climate Hazard	Risk Factor (Exposure)	Current Sensitivity and Adaptive Capacity of Development (Vulnerability)	Risk with Existing Adaptation Measures	Proposed Additional Adaptation/Mitigation Measures
			A full SuDS treatment train is proposed in accordance with the CIRIA SuDS Manual. The train comprises: • filter drains to the rear of houses; • permeable paving to all private parking areas; • rainwater butts to the rear downpipes of the houses; • filter swales and tree pits where practicable; • use of the existing central dry-ditch as a drainage swale • a bio-retention area; • silt-trap/catchpit manholes; • hydrobrake flow control valves limiting discharge flow to the Qbar greenfield rate; • petrol interceptors upstream of all outfall points; • stone lined voided arch retention storage devices. The incorporation of SuDS elements will provide a sustainable manner in which to disperse surface water from the site, encourage groundwater recharge and provide treatment of run-off and subsequent improvement of discharge quality. Refer to the SSFRA for more detail on the drainage design and each of the above-listed SuDS measures which have been taken into account in the preparation of this document **Design for Climate Resilience** **Stormwater Calculations**: Designed for 1-in-100-year storm events. **Simulation and Modelling**: Extensive hydraulic modelling using FSR methodology **Emergency Access and Flood Management Plan**		

IPCC CID Category	Climate Hazard	Risk Factor (Exposure)	Current Sensitivity and Adaptive Capacity of Development (Vulnerability)	Risk with Existing Adaptation Measures	Proposed Additional Adaptation/Mitigation Measures
			Access to the development will by via one no. new vehicular access point from the Boherboy Road, along with vehicular, pedestrian and cyclist connections to adjoining developments at Corbally Heath and Corbally Glade to the east and Carrigmore Green to the north, and pedestrian/cyclist access into Carrigmore Park to the east.		
	Drought (acute) *Increase in the number of dry periods*	Potential disruption to residential water supply. Increase use of water for the irrigation of the landscaping.	Water supply is on the public water mains, so disruptions should be minimised and mitigated by Irish Water.	Low risk to building. Moderate risk to irrigation of landscaping.	Consider installation of rainwater harvesting.
WIND	**Wind (acute)** Potential increase in the number of windstorms	Potential for damage to infrastructure and telecommunications, and a risk to human health	Suitable exterior materials are proposed for the development. Materials have been selected for their durability and long service life, with consideration given to their performance under environmental stressors such as wind-driven rain and weathering. The report outlines that pitched roofs with concrete tiles, metal cladding, uPVC rainwater systems, and precast concrete elements have been chosen for their resilience, low maintenance requirements, and long lifespans—ranging from 40 to over 80 years. Use of green roofs and traditional roof coverings with robust and proven detailing to roof elements. The design and specification of these components are informed by best practice principles, including regular inspection regimes and maintenance schedules to extend material longevity. While the report does not explicitly reference BS 7543:2015 or its annexes, it aligns with its principles by detailing lifecycle	Low Risk once existing proposed measures are implemented, and landscaping is maintained in place as designed.	No additional measures proposed.

IPCC CID Category	Climate Hazard	Risk Factor (Exposure)	Current Sensitivity and Adaptive Capacity of Development (Vulnerability)	Risk with Existing Adaptation Measures	Proposed Additional Adaptation/Mitigation Measures
			expectations, maintenance strategies, and material performance under climatic conditions.[41] Bins are stored in a secure Bin storage area, which will prevent the risk of causing harm in high winds[42].		
OTHER	**Compound events (acute)** *Increase in the number of compound flooding events*	Increased water runoff and pressure on drainage system	Drainage systems have been designed with ample capacity to store any excess storm water, with separate foul and surface water drainage systems to reduce the rate of run-off to the sewer and further reducing the risk of the sewer surcharging. As detailed in the Drainage and Water Infrastructure Engineering Report, the proposed surface water drainage system for this development has been designed as a SuDS system to treat run-off and remove pollutants to improve quality, restrict outflow and control quantity of run-off.	Low Risk once existing proposed measures are implemented.	No additional measures proposed. Inspection and maintenance of the drainage systems is carried out periodically and completed in accordance with good practice.It will be the responsibility of the site management team to ensure the drainage system is maintained. Maintenance and cleaning of gullies, manholes (including catch pits) and all other SuDS features will ensure adequate performance.

[41] Refer to Building Lifecycle Report, MCORM, 2025.
[42] Refer to Operational Waste Management Plan, DNV, 2025.

4.3 Mitigation and Adaptation Measures

4.3.1 Mitigation Measures

The Proposed Development shall seek to achieve the greatest standards of sustainable construction and design and has incorporated sustainable building design criteria from the outset which support overall climate change mitigation, including the requirement that the Development does not exceed the threshold set for the nearly zero-energy building (NZEB) requirements in national regulation implementing Directive 2010/31/EU.

A number of low energy technologies are being considered for the development, as described within the Energy and Climate Action Statement[43] and Building Lifecycle Report[44]:

Building Fabric and Passive Design

- **High-Performance Envelope**: Walls (0.18 W/m²K), roofs (0.16 W/m²K), floors (0.16 W/m²K), and windows (1.4 W/m²K) are designed to minimize heat loss
- **Air Tightness**: Target of 3 air changes per hour or better, reducing uncontrolled ventilation losses
- **Thermal Bridging**: Minimal bridging factor of 0.05, enhancing overall thermal performance
- **Passive Solar Design**: Optimized window placement for daylighting and solar gain, balanced against overheating risk

Energy Efficiency and NZEB Compliance

- **NZEB Standards**: All units comply with 2021 Part L Regulations, achieving A2/A3 BER ratings
- **DEAP Software v4.2**: Used to demonstrate compliance, showing a 70% reduction in energy use compared to 2005 standards
- **LED Lighting**: Full LED deployment with low energy demand and reduced internal heat gain

Renewable Energy Integration

- **Heat Pumps**: Air-to-water and exhaust air heat pumps proposed for space heating and hot water, leveraging grid decarbonization
- **Photovoltaic (PV) Panels**: Roof-mounted PV arrays to support Part L/NZEB compliance, reducing grid dependency
- **CHP (Combined Heat and Power)**: Considered for district heating, though not viable at current scale; would otherwise reduce grid load and utilize gas efficiently

[43] Refer to Energy and Climate Action Statement, BBSC Building Services Consulting Engineers, 2025.
[44] Refer to Building Lifecycle Report, MCORM Architecture & Urban Design, 2025.

Ventilation and Indoor Air Quality

- **Heat Recovery Ventilation (HRV)**: Mechanical systems to recover heat from exhaust air while ensuring fresh air supply, improving energy efficiency and occupant health

- **Demand-Controlled Ventilation**: Systems with CO_2 sensors and heat recovery to optimize air quality and reduce energy use

Electric Vehicle (EV) Infrastructure

EV Charging Strategy:

- 10% of communal spaces equipped with chargers from the outset.
- Ducting provided to 100% of spaces for future scalability.
- In-curtilage houses pre-wired for future EV charger installation

Sustainable Materials and Lifecycle Planning

- **Durable, Low-Maintenance Materials**: uPVC windows, concrete sills, and metal cladding selected for longevity and reduced embodied carbon

- **Lifecycle Costing**: Building Lifecycle Report includes a Planned Preventative Maintenance (PPM) schedule to ensure long-term sustainability and cost control

Waste Management

The principles of waste management and the circular economy have been incorporated into both the Construction Phase and Operational Phase to ensure that maximum recycling, reuse, and recovery of waste with diversion from landfill, wherever possible, is being achieved. [45]

4.3.2 Adaptation Measures

In relation to climate change adaption, overall, the climate risks for the Proposed Development are low based on the Site location and the incorporated design measures. Nevertheless, the following actions are recommended to ensure that these adaptive design measures, particularly in relation to drainage, are capable of operating as intended:

- Inspection and maintenance of HVAC systems is carried out periodically and completed in accordance with good practice.

- The correct operation and maintenance of the drainage system is necessary to reduce the risk of human or mechanical error causing pluvial flood risk from blockage. Inspection and maintenance of the drainage systems is carried out periodically and completed in accordance with good practice (particularly after every major storm event, the end of winter (to collect winter debris), mid-summer (to collect dust, flowers and grass-type deposits), and after autumn leaf fall). This will ensure that the drainage

[45] Refer to Operational Waste Management Plan, DNV, 2025; and Resource & Waste Management Plan, DNV, 2025.

systems are capable of managing storm runoff during periods of exceptionally high rainfall. A programme of maintenance measures has been detailed in the Engineering Assessment Report. It will be the responsibility of the site management team to ensure the drainage system is maintained. Maintenance and cleaning of gullies, manholes (including catch pits) and all other SuDS features will ensure adequate performance.

- It is expected that regular inspection and maintenance of drainage systems will be an effective measure to ensure that the Proposed Development is not at risk of flooding in the future. A regularly maintained drainage system will ensure that it remains effective and in good working order should a large pluvial storm occur. For storms greater than 100-year level, the development has been designed to provide an overland flood route. Additionally, the floor levels of the buildings are set above the 100-year flood levels. However, to account for a worst-case scenario, it is recommended to conduct a risk assessment, as necessary, when deciding the future location and placement of critical infrastructure.

- Risk relating to all changing climate hazards should be revisited and assessed periodically and in line with emerging studies to ensure that proper mitigation and adaptation measures are in place.

These recommended additional measures have been presented to Evara Developments Ltd. and Kelland Homes Ltd who have accepted them and committed to implementing them.

5 SOUTH DUBLIN COUNTY DEVELOPMENT PLAN 2022-2028: RELEVANT POLICY OBJECTIVES

In accordance with SDCC planning requirements, the preceding sections of this Report have assessed the impact of climate change on the Proposed Development.

The South Dublin County Development Plan 2022-2028 (SD CDP) sets out a number of policies and associated objectives which all contribute towards mitigating and adapting to climate change. The 'layered' format of the Plan aims to facilitate a holistic approach to ensuring Climate Action is at the forefront of all future development within the County, with policies and supporting objectives in each chapter crafted in a manner which contributes significantly towards addressing climate change and reducing the County's carbon emissions in a meaningful and tangible way.

The following Table 6-1 demonstrates that the relevant policies and associated objectives produced and implemented by SDCC in relation to climate change and climate change adaptation measures, as set out within the SD CDP, have been incorporated into the Proposed Development design:

These initiatives not only address local environmental challenges but also advance broader sustainability targets set by the UN. Therefore, each relevant policy objective has also been carefully considered in the context of the UN Sustainable Development Goals (SDGs) as outlined within Table 1-3 of this Report, demonstrating that the relevant mitigative or adaptive action to be included in the Proposed Development also aligns with and contributes to the relevant SDG.

Table 5-1: Relevant Policies for Climate Change and Climate Change Protection Measures adapted from SDC Development Plan 2022-2028

Policy	Description	Relevant Objectives	Proposed Development Considerations	SDG Goals
GREEN INFRASTRUCTURE				
Policy GI1: Overarching	Protect, enhance and further develop a multifunctional GI network, using an ecosystem services approach, protecting, enhancing and further developing the identified interconnected network of parks, open spaces, natural features, protected areas, and rivers and streams that provide a shared space for amenity and recreation, biodiversity protection, water quality, flood management and adaptation to climate change.	GI1 Objective 4	In line with the plan's objective G15, which calls for the completion of a flood risk assessment and the protection of existing biodiversity, ecosystems, and drainage systems, the project will prioritise natural solutions. These will be utilised to enhance Sustainable Urban Drainage Systems (SUDS), including the use of natural water management techniques to mitigate flooding and improve ecological function. This approach will serve as the foundation of the landscape design, ensuring it aligns with both the region's objectives and sustainable environmental practices (Landscape Design Rationale[46])	
Policy GI3: Sustainable Water Management	Protect and enhance the natural, historical, amenity and biodiversity value of the County's watercourses. Require the long-term management and protection of these watercourses as significant elements of the County's and Region's Green Infrastructure		As part of the proposed development a marshland will be translocated to increase its overall size by 80% post development. This wetlands area will be used as flood catchment in extreme weather events and will help water purification. It will also support migratory bird populations [47].	

[46] Landscape Design Rationale, Gannon & Associates Landscape Architecture, March 2025

[47] Marsh Translocation Report, Gannon & Associates Landscape Architecture, August 2025

	Network and liaise with relevant Prescribed Bodies where appropriate. Accommodate flood waters as far as possible during extreme flooding events and enhance biodiversity and amenity through the designation of riparian corridors and the application of appropriate restrictions to development within these corridors.		A risk based hydrological and hydrogeological impact assessment for the proposed development concluded that there was no significant impacts on receiving water environment and designated Natura 2000 sites.[48]	
Policy GI4: Sustainable Drainage Systems	Require the provision of Sustainable Drainage Systems (SuDS) in the County and maximise the amenity and biodiversity value of these systems.	GI4 Objective 1 to 5	A comprehensive SuDS treatment train has been applied across the entire development incorporating permeable paving, tree pits, swales, bio-retention areas, rain garden planters, usage of the central open watercourse, green roofs and landscaped detention basins as agreed with the SDCC water services Department [49]	
Policy GI5: Climate Resilience	Strengthen the County's green infrastructure in both urban and rural areas to improve resilience against future shocks and disruptions arising from a changing climate.	GI5 Objective 1 to 8	In line with the plan's objective G15, which calls for the completion of a flood risk assessment and the protection of existing biodiversity, ecosystems, and drainage systems, the project will prioritise natural solutions. These will be utilised to enhance Sustainable Urban Drainage Systems (SUDS), including the use of natural water management techniques to mitigate flooding and improve	

[48] Hydrologocal and Hydrogeological Risk Assessment Report, DNV November 2025

[49] Drainage and Water Infrastructure Engineering Report, Roger Mullarkey & Associates, Consulting Structural and Civil Engineers,2025

			ecological function. This approach will serve as the foundation of the landscape design, ensuring it aligns with both the region's objectives and sustainable environmental practices[50].	
Policy GI6: Human Health and Wellbeing	Improve the accessibility and recreational amenity of the County's GI in order to enhance human health and wellbeing while protecting the natural environment within which the recreation occurs.	GI6 Objective 4	Electrically driven heat pumps shall be employed to ensure zero local emissions[51]. Integration of green infrastructure: Features such as green roofs, sustainable drainage systems (SuDS), and wildlife friendly landscaping contribute to ecological connectivity and multifunctional benefits [50]	 
QUALITY DESIGN AND HEALTHY PLACEMAKING				
Policy QDP1: Successful and Sustainable Neighbourhoods	Support the development of successful and sustainable neighbourhoods that are connected to and provide for a range of local services and facilities.	QDP1 Objective 1, 4	It has been identified there are a wide range and variety of existing facilities in a catchment area of the subject site to support the development. In total, 62 no. social amenities and facilities were identified, consisting of: 8 no. health care providers 6 no. childcare providers	

[50] Landscape Design Rationale, Gannon and Associates ,Landscape Architecture, March 2025
[51] Energy and Climate Action Statement, BBSC, Building Services Consulting Engineers, November 2025

			9 no. primary schools 3 no. post-primary schools 5 no. further education centres 7 no. community facilities 15 no. sports and recreation facilities 10 no. retail facilities Health care, childcare, education, sports and recreation, religious and community facilities are all well-represented in close proximity to the subject site to cater for the existing and future residential population. It is considered that the future population of the development will also benefit from the site's strategic location and transport routes which offer easy accessibility to all parts of the country[52].	
Policy QDP4: Healthy Placemaking	Promote the delivery of neighbourhoods that are attractive, connected, vibrant and well-functioning places to live, work, visit, socialise and invest in.	QDP4 Objective 1	The development proposal and its future population will be adequately supported by existing social and community infrastructure [52]. Access to the development will by via one no. new vehicular access point from the Boherboy Road, along with vehicular, pedestrian and cyclist connections to adjoining developments at Corbally Heath and Corbally Glade to the east and Carrigmore Green to the north, and	

[52] Social Infrastructure Assessment, Armstrong Planning and Development, November 2025.

			pedestrian/cyclist access into Carrigmore Park to the east [53].	
Policy QDP5: Connected Neighbourhoods	Promote short distance neighbourhoods and strive towards the achievement of 10-minute settlements over the lifetime of the Plan, promoting a more compact development form, sustainable movement, and ease of access to services, community facilities, jobs and amenities.	QDP5 Objective 1, 2	There are numerous bus operators providing a bus service locally and within walking distance to the site [53] It is considered that the proposed development is well served by a range of services and facilitates given its location within the development boundary of Ballyfermot and will demonstrate that there is ample provision of existing infrastructure within a proximate distance of the development [52].	
Policy QDP11: Materials, Colours and Textures	Promote high-quality building finishes that are appropriate to context, durable and adhere to the principles of sustainability and energy efficiency.	QDP11 Objective 1, 2, & 3	Sustainable, robust materials, with high slip resistance to be used for paving. Durable and robust equipment. The use of sustainable, high-quality finishes reduces long term maintenance requirements, lowers lifecycle costs, and provides a safe, accessible environment for all users[54]	
HOUSING				

[53] Traffic and Transport Statement ,Pinnacle Consulting Engineers, April 2025
[54] Building Lifecycle Report, MCORM, November 2025

Policy H7: Residential Design and Layout	Promote high quality design and layout in new residential developments to ensure a high-quality living environment for residents, in terms of the standard of individual dwelling units and the overall layout and appearance of the development.	H7 Objective 1, 2, & 3	To create an attractive and varied built environment, along with catering for a wide range of households, the proposed development features a range of housing options, including apartments, duplexes, deep plan houses, and wide front houses, to meet the varied needs and preferences of the residents. The proposed development has five-character areas as part of the design, each one featuring its own design style, diverse unit types, and a combination of materials and finishes. This variety helps to establish a clear "sense of place" as residents and visitors move through the development. As people walk through the residential streets, they will experience changes in the architectural environment, from one area to the next, providing a dynamic and engaging experience[55].	
Policy H10: Internal Residential Accommodation	Ensure that all new housing provides a high standard of accommodation that is flexible and adaptable, to meet the long-term needs of a variety of household types and sizes.	H10 Objective 1, 2, & 3	The Architectural Design Statement [55] details the adaptability and flexibility of the design, and its resource efficiency	
SUSTAINABLE MOVEMENT				

[55] Architectural & Urban Design Statement. MCORM, November 2025

Policy SM1: Overarching – Transport and Movement	Promote ease of movement within, and access to South Dublin County, by integrating sustainable land-use planning with a high-quality sustainable transport and movement network for people and goods.	SM1 Objective 4	The proposed development will connect into Corbally Heath, Corbally Glade, Carrigmore Avenue and Carrigmore Green. These links will provide a significant level of pedestrian, cyclist and public transport permeability to the site to established local amenities such as Citywest Shopping Centre, Citywest Business Campus and local schools [53].	
Policy SM2: Walking and Cycling	Re-balance movement priorities towards sustainable modes of travel by prioritising the development of walking and cycling facilities and encouraging a shift to active travel for people of all ages and abilities, in line with the County targets.	SM2 Objective 1, 2, 3	The existing site benefits from good levels of existing public transport and walking/cycling infrastructure which will assist to encourage sustainable modes of travel for residents and visitors to/from the proposed development[53].	
Policy SM3: Public Transport – General	Promote a significant shift from car-based travel to public transport in line with County targets and facilitate the sustainable development of the County by supporting and guiding national agencies in delivering major improvements to the public transport network.	SM3 Objective 3	A 90-minute public transport journey allows access to areas of employment such as: • Citywest Business Campus • Tallaght • Dublin City Centre • IFCS [53]	
Policy SM6: Traffic and Transport Management	Effectively manage and minimise the impacts of traffic within the County having regard to the need to provide shared road space for different users.	SM6 Objective 3, 8	The development's design supports active travel and sustainable transport consistent with national policies (traffic Chapter EIAR)	

Policy SM7: Car Parking and EV Charging	Implement a balanced approach to the provision of car parking with the aim of using parking as a demand management measure to promote a transition towards more sustainable forms of transportation, while meeting the needs of businesses and communities.	SM7 Objective 5	All car parking spaces assigned to this development shall be provided with EV charger at the rated of 1 per 5 spaces and ducting provided under the ground to allow for future connections.[51] Providing the option of E-car charging points will allow occupants to avail of the ever-improving efficient electric car technologies [54]	
COMMUNITY INFRASTRUCTURE AND OPEN SPACE				
Policy COS2: Social / Community Infrastructure	Support the planned provision of a range of universally accessible and well-connected social, community, cultural and recreational facilities, close to the communities they serve, consistent with RPO 9.14 of the RSES.	COS2 Objective 6	Health care, childcare, education, sports and recreation, religious and community facilities are all well-represented near the subject site to cater for the existing and future residential population. There is an extensive list of sports and recreation-based amenities within the area, in relation to the subject site. The most prominent of these being sports clubs and followed by green / recreational spaces. There are also gyms and an all-weather pitch in the vicinity of the subject site [52].	
ENERGY				

Policy E3: Energy Performance in Existing and New Buildings	Support high levels of energy conservation, energy efficiency and the use of renewable energy sources in new and existing buildings including the retro fitting of energy efficiency measures in the existing building stock in accordance with relevant building regulations, national policy and guidance and the targets of the National and South Dublin Climate Change Action Plans.	E3 Objective 1, 3	Development will comply with standards as per Building Regulations Near Zero Energy Buildings requirements. Technical Guidance Document L- Conservation of Fuel and Energy – Dwellings (2021) to be applied SEAI DEAP current edition to be applied for BER The following technologies shall be employed to meet Part L and or BER requirements •Solar Photovoltaic panel(s) • Air to water electrically powered heat pumps in housing and similar • Electrically powered waste air heat pumps in Apartments and similar • Demand controlled ventilation • All lights to be LED. • Buildings fabric will be to current or better than Part L requirements • Controls to meet Achieving Compliance with Part L • Air Tightness • Thermal bridging to less than 5% of overall heat loss The Proposed Development is expected to obtain a Building Energy Rating (BER) Certificate of A2/A3 [51].	

Policy E4: Electric Vehicles	Promote the delivery of EV charging facilities in accordance with relevant regulations and national and regional policy and guidance.	E4 Objective 1, 2	All car parking spaces assigned to this development shall be provided with EV charger at the rated of 1 per 5 spaces and ducting provided under the ground to allow for future connections.[51]	
Policy E5: Low Carbon District Heating Networks	1. Support the delivery of low carbon district heating networks at appropriate locations across the County and subject to proven feasibility. Support also complementary technologies such as combined cooling, heat and power (CCHP), large scale heat pumps, and renewable energy opportunities, including geothermal energy, energy from waste, biomass and bio-gas; 2. Support the investigation of both deep and shallow geothermal energy sources throughout the County. Deep geothermal projects are particularly suited to areas demonstrating high heat densities; 3. Support the delivery of District Heating Proposals subject to proven feasibility within areas demonstrating heat demand density in excess of 150TJ / km2 (including for the identified areas of Low Carbon District Heating Potential in Tallaght, Clonburris / Grange Castle and	E4 Objective 1, 2, 3, & 5	District heating was not considered as Apartments will be provided with Solar charging via Photovoltaic panels. All houses will be capable of 100% of roof supporting solar panels [51].	

	Clondalkin). Future developments within these areas should connect into existing or confirmed District Heating Systems. Where a District Heating scheme has not been confirmed new development should be designed so that it can connect into such a scheme when one is delivered; 4. Support for low carbon district heating networks is subject to the appropriate environmental assessments bein g undertaken to ensure no significant impact on the wider environment including human health.			
Policy E7: Solar Energy	Promote the development of solar energy infrastructure in the County, including the building of integrated and commercial-scale solar projects subject to a viability assessment and environmental safeguards including the protection of natural or built heritage features, biodiversity and views and prospects.	E7 Objective 1	PV Solar Panels will be considered in order to meet the renewable energy contribution required by Part L of the Building Regulations. These panels convert sunlight into electricity which can be used within the dwelling [54]. All buildings, shall be capable of supporting Solar Photovoltaic panel(s), invertors etc [51]	
Policy E11: Green Infrastructure	Implement the Council's Green Infrastructure Strategy as an essential element of building resilience to climate change whilst ensuring healthy placemaking and delivering on the compact growth approach, in accordance with National and Regional Policy and the National Climate Action Plan.	E11 Objective 1	The Proposed Development has undergone a thorough assessment with respect to climate change adaptation measures, and it has been determined that the measures in place are sufficient to address potential climate-related risks. The strategies incorporated into the design and planning of the development are aligned with current best practices and standards, ensuring resilience against projected climate impacts such as increased	

			temperatures, flooding, and extreme weather events. Refer to Table 4-1 for details on these adaptive measures.	
INFRASTRUCTURE AND ENVIRONMENTAL SERVICES				
Policy IE1: Overarching Policy	Ensure that development occurs within environmental limits, having regard to the requirements of all relevant environmental-legislation and the sustainable management of our natural capital.		In accordance with Appendix D of Annex II, an Environmental Impact Assessment Screening Report has been carried out in accordance with Directive 2011/92/EU and the required mitigation and compensation measures for protecting the environment will be implemented[56]	
Policy IE2: Water Supply and Wastewater	Ensure that water supply and wastewater infrastructure is sufficient to meet the growing needs of the population and to support growth in jobs over the lifetime of the Development Plan facilitating environmental protection and sustainable growth.	IE2 Objective 3, 5, 7, 9, & 10	The proposed water supply for the development is to be made by connecting to an existing 400mm diameter main located in the Boherboy Road (L2008) to the south of the site. 10.4 A single 225mm outside diameter connection has been approved by Uisce Éireann and will supply the proposed development via a 225mm outside diameter watermain with interconnecting 180mm and 110mm diameter looped branch watermains connected to it. Individual houses are to be supplied with a 25mm connection. There is no foul water sewer located on the subject lands. Therefore, it is proposed to service the subject lands by providing a new	

[56] Environmental Impact Assessment Report, DNV, November 2025

			gravity foul sewer across the SDCC park to the northeast of the site connecting into the existing Uisce Éireann (UÉ) foul infrastructure in Verschoyle Green. This has been agreed with Uisce Éireann [49]	
Policy IE3: Surface Water and Groundwater	Manage surface water and protect and enhance ground and surface water quality to meet the requirements of the EU Water Framework Directive.	IE3 Objective 1, 2	The proposed development incorporates robust design and mitigation measures including perimeter drainage, groundwater interception systems, Sustainable Drainage Systems. Thes measures will ensure no significant risk to water quality of WFD status.	
Policy IE4: Flood Risk	Ensure the continued incorporation of Flood Risk Management into the spatial planning of the County, to meet the requirements of the EU Floods Directive and the EU Water Framework Directive and to promote a climate resilient County.	IE4 Objective 1, 2	Flood management is incorporated into the development in the Site-Specific Flood Risk Assessment where the proposed development increases available flood plain storage by allowing 1% AEP flooding compensatory storage in a basin in the northwest of the site.	
Policy IE7: Waste Management	Implement European Union, National and Regional waste and related environmental policy, legislation, guidance and codes of practice to improve management of material resources and wastes.	IE7 Objective 1, 7	All waste will be managed in accordance with the Resource and Waste Management Plan [57]. This includes waste ground or surface water, site clearance waste and waste packaging and construction materials generated during construction activities. The management, storage and removal of soils from the Site will also be carried out in accordance with the RWMP.	

[57] Outline Resource and Waste Management Plan, DNV, November 2025

			The operational waste generated is dealt with in the Operational Waste Management Plan (OWMP). The OWMP ensures that the management of waste during the operational phase of the Proposed Development is undertaken in accordance with current legal and industry standards[58]	

[58] Operational Waste Management Plan, DNV, November 2025

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

To conclude, this Report has demonstrated the potential impacts of climate change on the Proposed Residential Development at Boherboy, Saggart, Co.Dublin through the preparation of a Climate Risk and Vulnerability Assessment, which has incorporated the following:

- Climate projections (EPA and IPCC) across a conservative range of future scenarios have been examined, along with the Proposed Development location, to gain an understanding of the future risks that climate change may have on the Proposed Development;

- Screening of potential climate hazards relevant to the location of the Proposed Development and the projected changes in future climate for this location to determine what hazards pose a material risk;

- Assessment of identified material risks, taking account of relevant adaptation and mitigation measures which have been incorporated into the Development design, in accordance with the IPCC's Climate Risk Framework;

- Provision of recommended additional actions to further reduce the potential risks of identified climate hazards.

This report addresses the requirements for a Climate Change Impact Assessment by evaluating the impact of climate change on the Proposed Development and demonstrating how relevant policies and objectives from the South Dublin County Development Plan 2022–2028 have been incorporated into the design. These policies have been considered alongside the UN Sustainable Development Goals (SDGs), and the Report demonstrates that adaptive measures proposed for the development contribute to achieving the relevant SDGs.

Furthermore, this Report has provided information to support the relevant public body in carrying out its functions in a manner which is consistent with national climate plans and strategies and furthering the achievement of the national climate objective as set out under Section 15 of the Climate Action and Low Carbon Development Act 2015, as amended in 2021. The current CCIA report should be reviewed alongside the National Climate Action Plan (CAP25) and South Dublin County Council Climate Action Plan (2024-2029) to ensure alignment with relevant objectives and targets.

6.2 Recommendations

6.2.1 Climate Risk and Vulnerability

In relation to climate change adaption, overall, the climate risks for the Proposed Development are low based on the Site location and the incorporated design measures. Nevertheless, the following actions are recommended to ensure that these adaptive design measures, particularly in relation to drainage, are capable of operating as intended:

- Inspection and maintenance of HVAC systems is carried out periodically and completed in accordance with good practice.

- The correct operation and maintenance of the drainage system is necessary to reduce the risk of human or mechanical error causing pluvial flood risk from blockage. Inspection and maintenance of the drainage systems is carried out periodically and completed in accordance with good practice (particularly after every major storm event, the end of winter (to collect winter debris), mid-summer (to collect dust, flowers and grass-type deposits), and after autumn leaf fall). This will ensure that the drainage systems are capable of managing storm runoff during periods of exceptionally high rainfall. It will be the responsibility of the site management team to ensure the drainage system is maintained. Maintenance and cleaning of gullies, manholes (including catch pits) and all other SuDS features will ensure adequate performance.

- It is expected that regular inspection and maintenance of drainage systems will be an effective measure to ensure that the Proposed Development is not at risk of flooding in the future. A regularly maintained drainage system will ensure that it remains effective and in good working order should a large pluvial storm occur. For storms greater than 100-year level, the development has been designed to provide an overland flood route. Additionally, the floor levels of the buildings are set above the 100-year flood levels. However, to account for a worst-case scenario, it is recommended to conduct a risk assessment, as necessary, when deciding the future location and placement of critical infrastructure.

- Risk relating to all changing climate hazards should be revisited and assessed periodically and in line with emerging studies to ensure that proper mitigation and adaptation measures are in place.

These recommended additional measures have been presented to Evara Developments Ltd. and Kelland Homes Ltd who have accepted them and committed to implementing them.

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Appendix 1

Site Location and Site Layout

Appendix 2

Appendix A (Classification of climate-related hazards) from Annex II of the Commission Delegated Regulation (EU) 2021/2139.