10. CLIMATE

10.1 Introduction

10.1.1 Background & Objectives

This chapter of the rEIAR describes and assesses the residual direct and indirect climate impacts of peat extraction activities and all ancillary works, at the Application Site. The climate impact assessments have been prepared for the Peat Extraction Phase, the Current Phase and the Remedial Phase of the Project. The baseline environment has been prepared with reference to published climate data from the Environmental Protection Agency (EPA) and Met Éireann. For the purposes of this assessment, while the activities assessed have occurred over the past decades, beginning in 1988 and continuing to present day, impacts have been assessed against the most recently published climate guidance and policies which are likely more stringent than historical policies from previous years. Therefore, if it can be determined that, based on the most recent standards, no significant effects occurred as a result of the Project, then it is unlikely that significant impacts occurred based on historical standards.

10.1.2 Statement of Authority

This chapter of the rEIAR has been prepared by the following staff of AWN Consulting Ltd:

Ciara Nolan

Ciara Nolan (Senior Air Quality Consultant) holds a BSc (Eng) in Energy Systems Engineering from University College Dublin and has also completed an MSc in Applied Environmental Science at UCD. She is a Member of the Institute of Air Quality Management (MIAQM) and the Institute of Environmental Science (MIEnvSc). Ciara has over 7 years of experience in the field of air quality consultancy. She has prepared the air quality and climate EIAR chapters for a range of developments including wind energy, industrial, pharmaceutical, data centre, residential and commercial.

10.1.3 Project Description

A full description of the Project is provided in Chapter 4. A brief summary pertaining to Climate for the Project Phases, as detailed in Section 4.2.1 in Chapter 4, is provided in the following sections.

10.1.3.1 Peat Extraction Phase: July 1988-June 2020

Site preparation works including the implementation of drainage channels commenced at the Application Site in 1948. This was followed by industrial peat extraction activities and all ancillary works which continued across four of the five bogs over the following decades. The majority of the Application Site was drained by 1988 and peat extraction activities and all ancillary works were active across much of the Application Site at that point. From 2003 onwards, peat extraction activities and all ancillary works was limited to Ballivor, Carranstown and Bracklin Bogs before ceasing completely in June of 2020. The loss of carbon sink potential of the land was the primary impact to climate as a result of the peat extraction activities and all ancillary works.

10.1.3.2 Current Phase: June 2020 to present day

Peat extraction ceased at the Application Site in June 2020. During the Current Phase, the activity on the Application Site is much reduced with respect to the Peat Extraction Phase. On site activities are limited to removal of the existing peat stockpiles from Bracklin, Carranstown and Ballivor Bogs and transportation off site which was completed in 2023. As peat extraction activities and all ancillary works

has ceased on the Application Site, there are no further carbon losses and associated climate impacts as a result of the Current Phase.

10.1.3.3 Remedial Phase

It is a requirement of 'Condition 10 Cutaway Bog Rehabilitation' of the EPA Licence that following decommissioning of use of all or part of their bogs, Bord na Móna (i.e., the Applicant), prepares (to the satisfaction of the EPA) and implements a Cutaway Bog Decommissioning and Rehabilitation Plan – see Appendix 4-2 for details.

There will be minimal use of diggers to assist in drain blocking activities, however, due to the short-term duration of the drain blocking activities and the low volume of machinery involved (likely 1 no. digger and 1 no. tractor per bog) impacts from exhaust emissions will be imperceptible. Ecologists and site managers will visit the Application Site regularly for monitoring purposes. There is no requirement for climate criteria for the remedial phase. The rewetting of the bogs will aid in restoring the carbon store function and promote the carbon sink potential of the land.

10.2 Methodology

10.2.1 EPA Description of Effects

The significance of effects of peat extraction activities and all ancillary works will be described in accordance with the EPA guidance document *Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR), May 2022.* Details of the methodology for describing the significant of the effects are provided in Chapter 1 – Introduction.

The effects associated with the peat extraction activities and all ancillary works are described with respect to the EPA guidance in the relevant sections of this chapter.

10.2.2 Assessment Criteria

10.2.2.1 Relevant Climate Guidelines, Policies and Legislation

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

The key duty imposed on planning authorities by Section 15 of the Climate Action and Low Carbon Development Act 2015 (as amended) is:

"1) A relevant body [a planning authority] 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."

The first Climate Action Plan (CAP) was published by the Irish Government in June 2019 (Government of Ireland, 2019). The CAP 2019 outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture. It also outlined the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. CAP 2019 detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The Government published the second CAP in November 2021 (Government of Ireland, 2021a) and a third update in December 2022 (Government of Ireland, 2022) with an Annex of Action published in March 2023 (CAP23). A fourth revision of the CAP was published in December 2023 – CAP24 (DECC, 2023a).

CAP24 is the second plan to be prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021, and following the introduction, in 2022, of economy-wide carbon budgets and sectoral emissions ceilings. The plan follows on from CAP23 with the implementation of the carbon budgets and sectoral emissions ceilings and sets out a roadmap for taking decisive action reach net zero no later than 2050, as committed to in the Programme for Government. CAP24 sets out how Ireland can accelerate the actions that are required to respond to the climate crisis, putting climate solutions at the centre of Ireland's social and economic development.

CAP24 states that rehabilitation of peatlands and development of amenity and tourism opportunities will continue and the plan outlines the following action in relation to meeting the required level of emissions reduction in relation to peatlands:

- Action JM/24/4 Support the restoration and rehabilitation of degraded peatlands.

The EU's Recovery and Resilience Facility, through the National Recovery and Resilience Programme, is investing up to €108 million in the Enhanced Decommissioning, Rehabilitation and Restoration Scheme (EDRRS) to rehabilitate 33,000 ha of peatlands over 82 no. Bord na Móna bogs, previously used for peat extraction activities and all ancillary works, for energy generation.

Key metrics to 2030 highlighted by CAP24 to deliver abatement in wetlands are as follows:

1. *35,900 ha of peatlands to be rehabilitated as part of Bord na Móna EDRRS and LIFE People and Peatlands, and*
2. *30,000 ha of additional exploited peatlands rehabilitated.*

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

The purpose of the 2021 Climate Act is to provide for the approval of plans '*for the purpose of pursuing the transition to a climate resilient, biodiversity rich and climate neutral economy by no later than the end of the year 2050*'. The 2021 Climate Act will also '*provide for carbon budgets and a decarbonisation target range for certain sectors of the economy*'. The 2021 Climate Act defines the carbon budget as '*the total amount of greenhouse gas emissions that are permitted during the budget period*'. The 2021 Climate Act removes any reference to a national mitigation plan and instead refers to

both the Climate Action Plan, as published in 2019, and a series of National Long Term Climate Action Strategies. In addition, the Minister for the Environment, Climate and Communications will request each local authority to make a 'local authority climate action plan' lasting five years and to specify the mitigation measures and the adaptation measures to be adopted by the local authority.

In relation to carbon budgets, the Climate Action and Low Carbon Development (Amendment) Act states '*a carbon budget, consistent with furthering the achievement of the national climate objective, shall be proposed by the Climate Change Advisory Council, finalised by the Minister and approved by the Government for the period of 5 years commencing on the 1 January 2021 and ending on 31 December 2025 and for each subsequent period of 5 years (in this Act referred to as a 'budget period')*'. The carbon budget is to be produced for 3 sequential budget periods, as shown in Table 10-1. The carbon budget can be revised where new obligations are imposed under the law of the European Union or international agreements or where there are significant developments in scientific knowledge in relation to climate change. In relation to the sectoral emissions ceiling, the Minister for the Environment, Climate and Communications will prepare and submit to government the maximum amount of Greenhouse Gas (GHG) emissions that are permitted in different sectors of the economy during a budget period and different ceilings may apply to different sectors. The sectorial emission ceilings for 2030 were published July in 2022 and are shown in Table 10-2. The Application Site would likely fall under the heading of LULUCF (Land Use, Land Use Change, and Forestry), this does not yet have an allocated emissions ceiling.

Table 10-1 5-Year Carbon Budgets 2021-2025, 2026-2030 and 2031-2035

Budget Period	Carbon Budget	Reduction Required
2021-2025	295 Mt CO_2e	Reduction in emissions of 4.8% per annum for the first budget period.
2026-2030	200 Mt CO_2e	Reduction in emissions of 8.3% per annum for the second budget period.
2031-2035	151 Mt CO_2e	Reduction in emissions of 3.5% per annum for the third provisional budget.

Table 10-2 Sectoral Emission Ceilings 2030

Sector	Baseline (Mt CO_2e)	Carbon Budgets (Mt CO_2e)		2030 Emissions (Mt CO_2e)	Indicative Emissions % Reduction in Final Year of 2025- 2030 Period (Compared to 2018)
	2018	2021-2025	2026-2030		
Electricity	10	40	20	3	75
Transport	12	54	37	6	50
Built Environment - Residential	7	29	23	4	40
Built Environment - Commercial	2	7	5	1	45
Industry	7	30	24	4	35
Agriculture	23	106	96	17.25	25
Other (F-gases, waste, petroleum refining)	2	9	8	1	50
Land Use, Land-use Change and Forestry (LULUCF)	5	Reflecting the continued volatility for LULUCF baseline emissions to 2030 and beyond, CAP24 puts in place ambitious activity targets for the sector reflecting an EU-type approach.			
Total	**68**				
Unallocated Savings	-	-	26	-5.25	-

Sector	Baseline (Mt CO_{2e})	Carbon Budgets (Mt CO_{2e})		2030 Emissions (Mt CO_{2e})	Indicative Emissions % Reduction in Final Year of 2025- 2030 Period (Compared to 2018)
	2018	2021-2025	2026-2030		
Legally Binding Carbon Budgets and 2030 Emission Reduction Targets	-	295	200	-	51

The quantity of carbon released from natural cycles through the earth's atmosphere, waters, soils and biota is much greater than the quantity added by anthropogenic GHG sources. However, the focus of the UNFCCC and the IPCC when setting emissions targets is on anthropogenic emissions because it is these emissions that have the potential to alter the climate by disrupting the natural balances in carbon's biogeochemical cycle and altering the atmosphere's heat-trapping ability. The carbon from biogenic sources such as pristine peatland was originally removed from the atmosphere by photosynthesis, and under natural conditions, it would eventually cycle back to the atmosphere as CO_2 due to degradation processes. Thus, these sources of carbon are not considered anthropogenic sources and do not contribute to emission totals considered in the Kyoto Protocol or EU 20-20-20 targets (IPCC 2006). The altering of the natural balances in carbon's biogeochemical cycle by removing the peat, dewatering, milling and burning of the peat as an energy source is considered an anthropogenic emission.

10.2.2.2 Carbon and Peatlands

A research project undertaken for the Applicant by the Forest Ecosystem Research Group, UCD (Wilson & Farrell, 2007) entitled "CARBAL - *Carbon Gas Balances in Industrial Cutaway Peatlands In Ireland*" investigated the carbon balance in industrial cutover peatlands, where carbon balance was defined as follows:

"Carbon balance: The difference between the amount of C sequestered by the vegetation and that released during autotrophic and heterotrophic respiration, Methane (CH_4) emissions and losses of Diesel Oxidation Catalyst (DOC). Positive values indicate that the ecosystem is a net Carbon (C) sink and negative values indicate ecosystem is a net C source."

The report investigated the post-industrial use of cutover bog with the main options being commercial afforestation, natural regeneration and wetland creation. The report notes that pristine peatlands act as a long-term CO_2 sink due to the persistently high-water table which creates conditions whereby the amount of CO_2 fixed by the peatland vegetation during photosynthesis (P_G) is greater than that released during ecosystem respiration (R_{TOT}) and the net ecosystem exchange (NEE) define as the difference between uptake and release ($P_G - R_{TOT}$) is positive (Wilson & Farrell, 2007).

The report also notes that pristine peatlands are also a significant source of atmospheric CH_4 accounting for around 23% of global emissions. Again, the position of the water table is important with a decrease in CH_4 emissions associated with a lower water table. For pristine peat, plant mediated transport is the most important pathway for CH_4 movement from the anoxic peat to the atmosphere accounting for between 50-97% of total CH_4 transported (Wilson & Farrell, 2007).

In relation to harvested peatlands, CO_2 dynamics undergo significant changes when a peatland is exploited for its fuel resource. Drainage ditches, to facilitate industrial extraction of peat, lower the water table and reduce the moisture content of the peat from approximately 95% to 80%. The removal of the acrotelm layer at the surface and associated vegetation to facilitate the harvesting of peat leads to the removal of the C sequestering capability of the system. This transforms the peatland into a significant source of CO_2. However, the installation of drainage ditches and the removal of the vegetation layer at the surface results in reduced or zero CH_4 emissions (or even a CH_4 sink) due to the increased oxic zone as the water table is lowered and due to the absence of easily degraded C substrate previously provided by the peatland vegetation and the conduit for CH_4 that is provided by aerenchymatic plants (Wilson & Farrell, 2007).

The report also reviewed some studies that found that it was possible to return the C sink function in a relatively short period of time following the cessation of harvesting provided the water table was maintained close to the surface to minimise losses of CO_2 from degradation of the residual peat and the recolonization of the bare peat substrate occurred quickly. The report also found that rewetting and the return of vegetation also resulted in renewed emissions of CH_4 albeit at much lower levels than reported for nearby pristine peatlands (Wilson & Farrell, 2007).

The wetland creation study (Wilson & Farrell, 2007), based on the creation of a 60ha lake, found that the annual CO_2-C balance (tCO_2-C ha^{-1} yr^{-1}) was negative for all microsites (i.e. a source of C). In relative to CH_4 fluxes, emissions were highest in summer periods due to higher soil temperatures and increased supply of substrates with lower winter levels due to a higher water table. However, recolonization by vegetation is recognised as an essential first step on the road to long term C accumulation in terms of C fixation (photosynthesis). The study concludes that maintaining the water table close to the surface is essential as aerobic decomposition occurs up to 10,000 times faster than anaerobic decomposition. In addition, a high-water table has the dual effect of reducing CO_2 emissions and will also promote recolonization by appropriate wetland vegetation and, over time, may lead to the return of the CO_2 sink function. The study also notes that the long-term objective for wetland creation, with regard to the annual C balance, is to reach a point where the losses of CH_4 are offset by CO_2 uptake (Wilson & Farrell, 2007).

Research in Ireland (Wilson et al, 2015) has investigated a range of both industrial and domestic Irish bogs, in order to determine country-specific emission factors. The results of the study indicated that the emission factors ranged from 1.7 (±0.47) and 1.64 (±0.44) t CO_2-C ha^{-1} yr^{-1} for the industrial and domestic sites respectively which is considerably lower than the Tier 1 EF in the IPCC 2013 Wetlands Supplement. The study found that the variation in emission factors was largely controlled by differences in soil temperature between the sites. Ireland has a temperate, oceanic climate, resulting in mild winters and cool summers.

10.2.3 Assessment Methodology

The following methodology has been employed in order to calculate the carbon emissions associated with peat extraction activities and all ancillary works from 1988 – June 2020, in order to present a precautionary scenario, the full 1988 year has been utilised for these calculations rather than for a 6-month period (i.e from July 1988 to December 1988). All calculations in relation to carbon emissions have been undertaken by the Applicant (see Appendix 10-1).

Peat extracted and exported off site

The Applicant's production records describe annual sales of peat from the bogs over the production period. With an average moisture content of 53.8%[1] and assuming a carbon content in peat of 49%[2] the annual average amount of carbon lost from the extraction of peat is then estimated at:

(1-0.538) × 0.49 × annual tonnage = Exported peat tCO_2-eq yr^{-1}

Emissions to atmosphere

For estimation of the total emission of greenhouse gases, the following information in Table 10-3 from Evans et al. (2017) is utilised.

1 As measured by customers of Lorry sales between 2012 and 2019.
2 Wilson et al. (2013) p.12

Table 10-3 Emission factors for extractive peatlands from Evans et al. (2017) (Table 4.1, pp. 39 therein). All values given as tCO_2-eq $ha^{-1}yr^{-1}$.

	Direct CO_2 (Evans et al. 2017)	CO_2 from DOC (IPCC 2014)	CO_2 from POC (Evans et al. 2016)	Direct CH_4 (Evans et al. 2017)	CH_4 from ditches (IPCC 2014)	N_2O Direct (Evans 2017) + Indirect (IPCC 2006)
Industrial Extraction	6.44	1.14	5.00	0.20	0.68	0.38
Domestic Extraction	4.73	1.14	0.89	0.20	0.68	0.27

(a) Direct CO_2 from production areas

The production areas of across the Application Site are determined during each production period.

The estimated average annual amount of direct CO_2 atmospheric emissions is therefore:

Total Production area (ha)×6.44 = Total emitted Carbon tCO_2-eq yr^{-1}

(b) Methane (CH_4) from drains/ditches

The total combined length of drainage ditches in the peat extraction areas of the Application Site was estimated. For the purposes of the calculation, it is assumed that each drain is a consistent 1m in width, The total emission arising from the drains is calculated as:

(Overall Length of Drain x Width of drains) (ha) x 0.68 = Carbon emission tCO_2-eq ha-$1yr^{-1}$

(c) Methane from Production areas

The average annual amount of direct methane CH_4 from the milled peat extraction areas is determined based on the peat extraction areas:

Total Production Area (ha) ×0.2 = Carbon emission tCO_2-eq yr^{-1}

(d) Surface Runoff

The emission rates for Dissolved Organic Carbon (DOC) and Particulate Organic Carbon (POC) were combined into an overall emission rate of 6.14 tCO_2-eq ha^{-1} yr^{-1}. The total estimated carbon lost through runoff was determined as follows:

Total Production Area (ha) ×6.14 = Carbon emission tCO_2-eq yr^{-1}

(e) Transport

Between 2009 and 2020 the annual average amount of DERV diesel used by Bord na Móna vehicles at the Application Site was 64,161 litres. The average annual quantity of agricultural diesel used was 121,701 litres. Using conversion factors for "Gasoil/Diesel" provided by SEAI[3] (43,308 MJ/t, 1,183 L/t, 7.33×10^{-5} tCO_2/MJ) the annual average amount of CO_2 generated by Bord na Móna machinery at Application Site during this period was 498.8 tCO_2 yr^{-1}. This figure was utilised along with the average

3 https://www.seai.ie/data-and-insights/seai-statistics/conversion-factors/

tonnes of peat harvested during the same period (58,415tonnes) to establish a ratio of 0.00853 tCO_2/tonne of peat harvested. This ratio was then applied to the historical tonnages of peat extracted. The resulting carbon emission is calculated as follows:

Annual Peat Extracted (Tonnes)x0.00853 tCO_2/tonne = Carbon emission tCO_2-eq yr^{-1}

This is a conservative assessment as some of the machinery used to harvest sod peat were powered by a local electrical network (Baggers).

10.2.3.2 Significance Criteria for Climate

The Transport Infrastructure Ireland (TII) guidance document entitled *PE-ENV-01104 Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document* (TII 2022) outlines a recommended approach for determining the significance of a development. The approach is based on comparing the 'Do Something' scenario and the net project GHG emissions (i.e. Do Something – Do Minimum) to the relevant carbon budgets (see Table 10-2). With the publication of the Climate Action Act in 2021, sectoral carbon budgets have been published for comparison with the Net CO_2 project GHG emissions from a project. The significance of GHG effects set out in PE-ENV-01104 (TII, 2022) is based on IEMA guidance (IEMA, 2022) which is consistent with the terminology contained within Figure 3.4 of the EPA's (2022) '*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*'.

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

- When evaluating significance, all new GHG emissions contribute to a negative environmental impact; however, some projects will replace existing development or baseline activity that has a higher GHG profile. The significance of a project's emissions should therefore be based on its net impact over its lifetime, which may be positive, negative or negligible;
- Where GHG emissions cannot be avoided, the goal of the EIA process should be to reduce the project's residual emissions at all stages; and,
- Where GHG emissions remain significant, but cannot be further reduced, approaches to compensate the project's remaining emissions should be considered.

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

TII (TII, 2022) states that professional judgement must be taken into account when contextualising and assessing the significance of a project's GHG impact. In line with IEMA Guidance (IEMA, 2022), TII state that the crux of assessing significance is "*not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero*[4] *by 2050*".

Significance is determined using the criteria outlined in Table 10-4 (derived from Table 6.7 of PE-ENV-01104 (TII, 2022a)) along with consideration of the following two factors:

[4] Net Zero: "*When anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period.*" Net zero is achieved where emissions are first educed in line with a 'science-based' trajectory with any residual emissions neutralised through offsets.

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

Table 10-4 Climate Assessment Significance Criteria

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

10.2.4 Difficulties Encountered

Historical data for climate for the period 1988 – present day was investigated in order to establish the relevant baseline. However, published data for this exact time period was not available for every source and therefore, data from as far back as possible has been used in establishing the baseline.

10.3 Establishment of Baseline (July 1988)

The baseline environment has been established as July 1988 for the purpose of this assessment. Historical data for climate from this time period was investigated in order to establish the relevant baseline. However, published data for this exact time period was not available for every source and therefore, data from as far back as possible has been used in establishing the baseline. 1990 is typically taken as the historical baseline year by countries when reporting GHG emissions under the United Nations Framework Convention on Climate Change (UNFCCC). Detailed emissions inventories for the full period 1988 to present are not available for the purposes of establishing the full climate baseline for this assessment. Data from 1990 can be considered representative of the baseline conditions in July 1988. In order to frame the July 1988 baseline against the current climate context, and historic climate data, trends in GHG emissions for the period 1990 – 2022 have been discussed in the following section.

10.3.1 Greenhouse Gas Emissions and Climate Baseline

Although variation in climate is thought to be a natural process, the rate at which the climate is changing has been accelerated rapidly by human activities. Climate change is one of the most challenging global issues facing us today and is primarily the result of increased levels of GHGs in the atmosphere. These GHGs come primarily from the combustion of fossil fuels in energy use. Moving away from our reliance on coal, oil and other fossil fuel-driven power plants is essential to reduce emissions of GHGs and combat climate change.

For the purposes of this assessment, the definition for GHGs outlined in Council *Directive 2009/28/EC* on the promotion of the use of energy from renewable sources and amending and subsequently repealing *Directives 2001/77/EC* and *2003/30/EC* (European Parliament and Council of Europe 2009) has been used. In *'Annex V, C. Methodology Point 5'* the relevant GHGs are defined as Carbon Dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) which are also the most significant GHGs. Climate is defined as the average weather over a period of time, whilst climate change is a significant change to the average weather. Climate change is a natural phenomenon but in recent years human activities, which have resulted in the release of GHGs, have impacted on the climate (IPCC 2015). The release of anthropogenic GHGs is altering the Earth's atmosphere resulting in a 'Greenhouse Effect'. This effect is causing an increase in the atmosphere's heat trapping abilities resulting in increased average global temperatures over the past number of decades. The release of CO_2 as a result of burning fossil fuels, has been one of the leading factors in the creation of this 'Greenhouse Effect'.

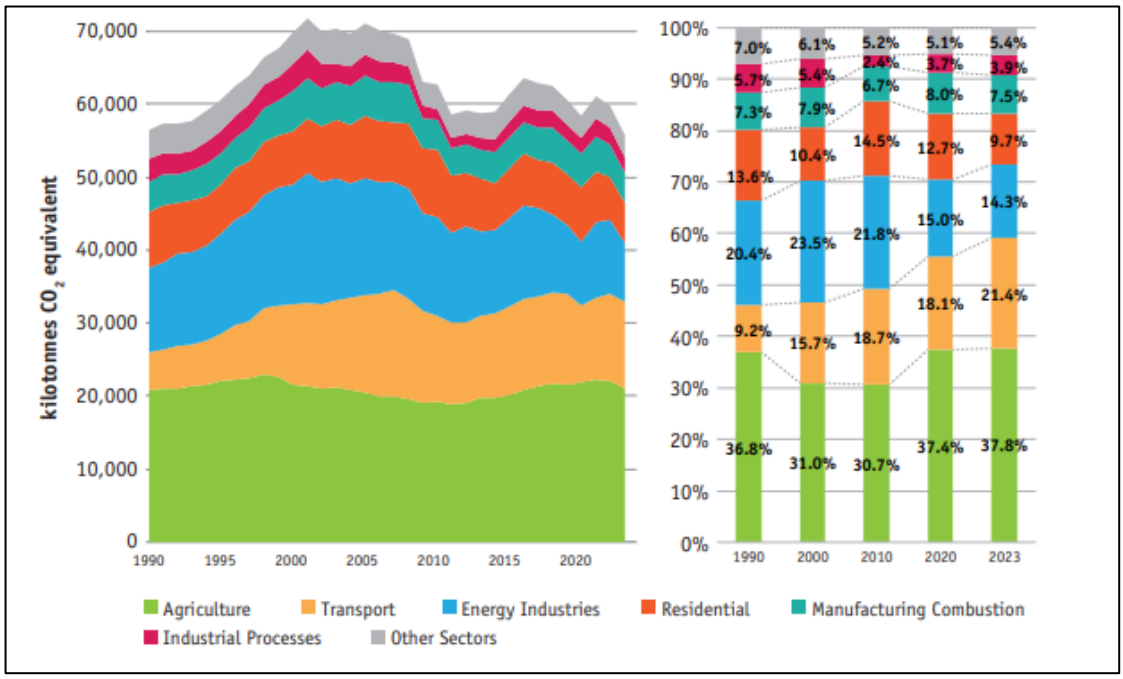
Trends in GHG emissions at a national level are available in annual reports by the EPA. The most recent EPA report entitled '*Ireland's Provisional Greenhouse Gas Emissions 1990 – 2023'*[5] (EPA, 2024) reviews national emissions in 2023 and trends in emissions from 1990.

The EPA reported that GHG emissions in 2023 are 1.2% lower than the historical 1990 baseline for the first time in 33 years. Provisional total national greenhouse gas emissions in 2023 (excluding LULUCF) are estimated to be 55.01 million tonnes carbon dioxide equivalent (Mt CO2eq) which is 6.8% lower (or 4.00 Mt CO2eq) than emissions in 2022 (59.00 Mt CO2eq). The greatest overall increase in emissions is from the Agriculture sector, which accounts for 37.8% of overall emissions (excluding LULUCF); total emissions in this sector were 20.8MtCO2eq, a decrease of 4.6% from 2022. In 2023, Transport sector emissions increased slightly by 0.3% on 2022 and, at 11.8 Mt CO2eq, represent 21.4% of national total emissions. The Energy sector contributed 14.3% of Irelands overall total emissions, however the sector shows a decrease of 21.6% in 2023, the largest annual change in emissions ever recorded for the sector and are now at an all-time low across the 1990 to 2023 timeseries at 7.8 Mt CO2eq. Emissions from the Residential sector have showed a general upward trend in emissions after 1997 due to increased housing stock and growing population. Emissions remained relatively stable over the 2015 to 2019, before peaking in 2020 due to the COVID-19 pandemic. Emissions in 2023 from this sector are 5.35

[5] https://www.epa.ie/publications/monitoring–assessment/climate-change/air-emissions/EPA-Provisional-GHG-Report-Jul24-v6.pdf

MtCO2eq or 9.7% of national total emissions in 2023; 2023 marks the third continuous year of reductions since the start of the COVID-19 pandemic period despite an increasing population.

Figure 10-1 taken from the EPA report (2024) shows the trend in emissions from the largest sectors over the 1990 – 2023 period. It is clear from the EPA report that emissions in 1990, which is representative of the baseline year of 1988, were lower than current GHG emissions in 2023. Therefore, any increase in historical GHG emissions is considered more significant due to the lower baseline levels of GHGs.



Source: Figure 25 EPA (2024) Ireland's Provisional Greenhouse Gas Emissions 1990 - 2023
Figure 10.1 Trend in Emissions for Largest Sectors 1990-2023

In relation to the current climate GHG emissions baseline, and in order to frame the July 1988 Baseline against a current climate context, Ireland's compliance with the EU Effort Sharing Decision (ESD) (EU 2018/842) and the published carbon budgets (Table 10-1), data published in July 2024 (EPA, 2024) predicts that Ireland exceeded (without the use of flexibilities) its 2023 annual limit set under EU's Effort Sharing Decision by 2.27 $MtCO_2e$. Cumulatively from 2021-2023 and after using the ETS flexibility, Ireland is in compliance with the ESR by a net distance to target of 0.15 Mt CO2eq, although in 2023 there is an exceedance of 0.36 Mt CO2eq above its Annual Emissions Allocation with the ETS flexibility. Agriculture and Transport accounted for 76.0% of total ESR emissions in 2023. The sectoral breakdown of 2023 GHG emissions is shown in Table 10-5. The sector with the highest emissions was Agriculture at 48.5% of the total, followed by transport at 27.5%.

Provisional estimates of National greenhouse gas emissions (including LULUCF) in 2023 are 7.8% below 2018, well off the National Climate ambition of a 51% reduction by 2030. The data indicate that from 2021- 2023 Ireland has used 64% (188.4 Mt CO2eq) of the 295 Mt CO2eq Carbon Budget for the five-year period 2021-2025. This leaves 36% of the budget available for the next two years, requiring a substantial 8% annual emissions reduction for 2024 and 2025 to stay within budget.

Table 10-5 Total National GHG Emissions in 2023

Sector	2023 Emissions (Mt CO_2e)	% Total 2023 (including LULUCF)
Agriculture	20.782	34.3%
Transport	11.791	19.5%

Sector	2023 Emissions (Mt CO_2e)	% Total 2023 (including LULUCF)
Energy Industries	7.845	12.9%
Residential	5.346	8.8%
Manufacturing Combustion	4.133	6.8%
Industrial Processes	2.155	3.6%
F-Gases	0.699	1.2%
Commercial Services	0.732	1.2%
Public Services	0.677	1.1%
Waste Note 2	0.846	1.4%
Land Use, Land-use Change and Forestry (LULUCF)	5.614	9.3%
National total excluding LULUFC	**55.007**	**90%**
National total including LULUFC	**60.620**	**100%**

Note 1: Reproduced from Latest emissions data on the EPA website (EPA, 2023)
Note 2: Waste includes emissions from solid waste disposal on land, solid waste treatment (composting and anaerobic digestion), wastewater treatment, waste incineration and open burning of waste.

10.3.2 Meteorological Data

Ireland has a temperate, oceanic climate, resulting in mild winters and cool summers. The Met Éireann weather station at Mullingar, Co. Westmeath is the nearest weather and climate monitoring station to the site that has meteorological data recorded for the 30-year period from 1979-2008. The monitoring station is located approximately 16 km west of the Application Site. Meteorological data recorded at Mullingar over the 30-year period is shown in Table 10-6. The wettest month was October and the driest month on average was April. July was the warmest month with a mean temperature of 15.2° Celsius. This meteorological data can be considered representative of the weather conditions for the July 1988 baseline.

Table 10-6 Data from Met Éireann Weather Station at Mullingar 1979– 2008: Monthly and Annual Mean and Extreme Values

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
TEMPERATURE (degrees Celsius)													
mean daily max	7.4	7.9	9.8	12.1	14.9	17.3	19.2	18.9	16.7	13.2	9.9	7.9	12.9
mean daily min	1.5	1.5	2.8	4.1	6.3	9.2	11.1	10.8	8.9	6.2	3.5	2.2	5.7
mean temperature	4.5	4.7	6.3	8.1	10.6	13.2	15.2	14.8	12.8	9.7	6.7	5.0	9.3
absolute max.	13.8	15.4	19.1	21.6	25.0	28.3	29.7	29.1	25.0	20.1	17.3	14.6	29.7
min. maximum	-3.2	-0.6	1.4	4.1	0.0	10.1	10.9	11.4	10.6	6.3	2.7	-1.7	-3.2
max. minimum	11.6	11.5	11.5	12.5	12.7	15.3	17.4	18.0	16.8	15.4	12.5	12.4	18.0
absolute min.	-14.9	-6.6	-8.0	-4.4	-2.6	0.2	3.8	2.1	0.0	-4.4	-6.9	-12.4	-14.9
mean num. of days with air frost	9.9	8.9	5.5	3.1	0.4	0.0	0.0	0.0	0.0	1.5	5.4	8.2	43.0
mean num. of days with ground frost	17.9	16.2	14.0	10.8	5.1	0.8	0.0	0.1	1.7	6.3	12.1	15.4	100.4
mean 5cm soil	3.3	3.3	5.0	8.1	11.8	14.8	16.3	15.5	12.8	8.9	5.7	4.1	9.1
mean 10cm soil	3.7	3.7	5.1	7.6	11.0	14.1	15.8	15.2	12.8	9.3	6.2	4.5	9.1
mean 20cm soil	4.3	4.4	5.8	8.1	11.4	14.3	16.1	15.8	13.7	10.3	7.2	5.2	9.7
RELATIVE HUMIDITY (%)													
mean at 0900UTC	90.8	89.8	87.6	81.9	78.3	79.7	82.1	84.8	87.6	89.9	91.7	91.8	86.3
mean at 1500UTC	83.4	77.8	72.8	68.1	67.1	69.1	69.9	70.6	72.1	77.0	82.2	85.9	74.7

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
SUNSHINE (hours)													
mean daily duration	1.8	2.5	3.2	4.9	5.8	5.0	4.6	4.6	3.9	3.2	2.2	1.6	3.6
greatest daily duration	8.2	9.9	10.9	13.6	15.4	15.9	15.3	14.4	12.2	10.1	8.6	7.3	15.9
mean num. of days with no sun	10.3	7.2	5.3	2.9	1.9	2.2	1.8	1.9	3.3	5.7	8.4	11.0	62.0
RAINFALL (mm)													
mean monthly total	91.7	72.0	78.3	62.1	68.7	70.5	61.8	80.8	73.8	102.1	82.4	97.1	941.3
greatest daily total	30.3	24.7	29.5	27.6	26.1	52.9	26.6	58.2	42.1	48.8	43.7	38.8	58.2
mean num. of days with >= 0.2mm	19	17	20	15	16	16	16	17	17	19	18	19	209
mean num. of days with >= 1.0mm	15	13	15	11	12	11	11	13	12	14	13	14	154
mean num. of days with >= 5.0mm	6	5	5	4	5	4	3	5	4	6	6	7	60
WIND (knots)													
mean monthly speed	9.0	9.1	9.1	7.7	7.3	6.7	6.4	6.3	6.7	7.5	7.8	8.3	7.6
max. gust	67	71	59	56	58	48	48	50	51	59	62	73	58.5
max. mean 10-minute speed	38	36	36	30	34	26	27	28	32	36	32	39	32.8
mean num. of days with gales	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.8
WEATHER (mean no. of days with)													

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
snow or sleet	5.0	4.4	3.5	1.6	0.2	0.0	0.0	0.0	0.0	0.0	0.4	2.7	17.8
snow lying at 0900UTC	2.7	0.9	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0	5.7
hail	0.6	0.9	2.0	2.0	1.1	0.2	0.1	0.1	0.1	0.5	0.2	0.3	8.1
thunder	0.1	0.2	0.2	0.3	0.9	0.9	1.2	0.8	0.1	0.1	0.1	0.1	4.9
fog	3.4	3.0	2.4	2.0	1.8	1.3	1.9	2.9	4.0	4.1	4.1	4.3	35.1

10.4 Likely Significant Effects and Associated Mitigation Measures

10.4.1 Do-Nothing Option

As outlined in the EPA Guidelines (May 2022), the description of 'Do-Nothing Effects' relates to the environment as it would be in the future should the project not be carried out. As discussed in Section 3.2.1 in Chapter 3, the assessment period of this rEIAR commenced in 1988, a time at which peat extraction activities and all ancillary works was already well-established at the Application Site. In the context of this rEIAR, the Project has been ongoing since the baseline assessment year of 1988. As outlined in Section 3.2.1 in Chapter 3, peat extraction activities and all ancillary works commenced at the Application Site in 1948 with the installation of drainage.

The 'Do-Nothing' option is defined as the Project (as described in Section 4.2 of Chapter 4) having ceased at the Application Site in 1988.

In the event of the cessation of the Project at the Application Site in 1988, it is assumed that those lands which by that point had not been subject to the installation of drainage and peat extraction activities and all ancillary works would have remained as a relatively intact raised bog with varying raised bog habitats (such as bog woodland, fen, sphagnum mosses).

A 'Do-Nothing' option that could be considered is that peat extraction activities and all ancillary works ceased at the Application Site in 1988 and did not continue beyond that point. On this basis, it would be assumed that the peat extraction activities and all ancillary works ceased and that the bog lands were allowed to naturally revegetate with scrub and bog woodland more widespread across the site as is evident from areas of the Application Site which have been out of production for long periods of time.

Subsequently. other land-use practices may also have taken place on the Application Site such as agricultural or commercial forestry, or other commercial or non-commercial uses. Alternative land uses are discussed in Chapter 3 – Alternatives. Under this 'Do-Nothing' option, the IPC licence and associated ongoing decommissioning and planned rehabilitation would not have occurred. However, in the context of the following:

- The legislative mandate given to Bord Na Móna in the form of the Turf Development Act 1946 9as amended) to acquire and develop peatlands;
- The uncertainty in the planning status of the activity did not arise until 2019 and was not evident in 1988.

Therefore, this 'Do-Nothing' option was not the chosen option. Peat extraction and all ancillary works has occurred at the Application Site from July 1988 onwards. A decision to cease peat extraction activities and all ancillary works at the Application Site was taken in 2020 and the Application Site needs to be considered in the context of regularising (without prejudice) the planning status of the lands to facilitate future development (subject to planning consent as required).

In the event that Substitute Consent is not granted in effect, the "do nothing" represents the current situation as at the date of the application for Substitute Consent. As part of Bord na Móna's statutory obligations under IPC licence requirements, Cutaway Bog Decommissioning and Rehabilitation Plans will continue to be implemented for the Application Site separate and independent of the Substitute Consent application. The implementation of the plans is included in the impact assessment below.

The role of cutaway/cutover peatlands such as the Application Site as a significant potential resource for amenity, tourism, biodiversity enhancement and conservation, improvement in air quality, climate mitigation, energy development and education are part of Bord na Móna's vision for the Application

Site. The regularisation of the planning status of the Application Site is a significant facilitator in ensuring the sustainable use and management of these peatlands. If this does not occur, the opportunity to continue employment and alternative use of the Application Site for the potential resources and activities mentioned above will be significantly restricted.

10.4.2 Peat Extraction Phase (July 1988 - June 2020)

10.4.2.1 Loss of Carbon Sink

Identification and Description of Impact

Lowering the water table increases the oxidation of the peat and in turn causes a rise in CO_2 emissions, this is further increased by the removal of vegetation and exposure of the peat that was present on the Application Site (Holmgren et al 2006) (Waddington & Price 2000). However, lowering of the water table had already occurred at the Application Site prior to 1988. The effects of drainage may also reduce dissolved and particulate organic carbon retention within the peat. Losses of carbon dioxide due to leaching of dissolved and particulate organic carbon are calculated as a proportion of the gaseous losses of carbon from the peat. The degraded bogs will continue to act as sources of these GHG until either they are rewetted/revegetated, the peat is removed, or all the remaining peat has oxidised. As a result of the draining of the bog and the removal of the vegetation, the peatland transformed from a net CO_2 sink to a net CO_2 source (Wilson 2013).

Using the assessment methodology outlined in Section 10.2.3 the CO_2 emissions associated with the peat extraction activities and all ancillary works over the period 1988 – 2020 were calculated. In total 2,703,053 tCO_2 was released over the 1988 – 2020 period (see Appendix 10-1). Over this 33-year period there was on average 81,911 tonnes of CO_2 per annum released from the Application Site. Annually this equates to 0.03% of Ireland's 2021 – 2025 carbon budget of 295 $MtCO_2e$ or 0.05% of Ireland's more stringent 2030 – 2035 carbon budget of 151 $MtCO_2e$ (see Table 10-1).

There was also the potential for GHG emissions associated with vehicles accessing the Application Site, for peat removal and site workers. However, the number of vehicles accessing the Application Site and their associated GHG emissions were not predicted to be significant in relation to Ireland's climate budgets and sectoral emissions ceilings (Table 10-1 and Table 10-2). GHG emissions from vehicles, in general, would have reduced as engine technologies and fuels improved over the 1988 – 2020 period. However, the primary source of GHG emissions throughout the Peat Extraction Phase was the removal of peat and the subsequent loss of carbon sink.

Control Measures

No control measures in relation to climate were implemented during the Peat Extraction Phase.

10.4.3 Current Phase

Identification and Description of Impact

As peat extraction activities and all ancillary works has ceased at the Application Site since June 2020, carbon losses associated with peat removal and the subsequent impact to climate are not relevant to this phase.

Other elements of the Current Phase are the removal of stockpiled peat, which was completed in 2023, and ongoing environmental and ecological monitoring. There is the potential for some minor GHG emissions associated with vehicles accessing the Application Site for removal of stockpiled peat or for monitoring works. However, the number of vehicles accessing the Application Site will be minimal and

GHG emissions associated with these are not predicted to be significant in relation to Ireland's climate budgets and sectoral emissions ceilings (Table 10-1 and Table 10-2). The impact to climate is short-term, negative and imperceptible which is overall not significant.

Control Measures

No control measures in relation to climate and carbon emissions is relevant for the Current Phase.

10.4.4 Remedial Phase

Identification and Description of Impacts

The primary focus of the rehabilitation phase is re-wetting the bogs which will aid in restoring the carbon store function and promote the carbon sink potential of the land. Research by Wilson et al. (2013) has indicated that rehabilitation of peatlands can mitigate the carbon emitted as part of the historic peat extraction activities and all ancillary works. However, the research notes that the carbon sink potential is not equivalent to the original sink potential of undisturbed peatlands. Large volumes of peat in the Application Site had been removed prior to the baseline year of 1988. Therefore, the carbon sink potential of the land in the baseline scenario was significantly less than the undisturbed peatland. As a result, the re-wetting activities of the rehabilitation phase will have a materially beneficial impact in raising the carbon sink potential of the land when compared to the baseline scenario.

The purpose of the Remedial Phase of the Project is in line with a number of key actions and priorities within the Climate Action Plan 2024 in relation to the rehabilitation of peatlands, specifically those within the mid-lands area. With the restoration of the carbon sink potential of the land, albeit, to a lesser extent than the potential prior to the historic removal of the peat, the Application Site will aid in Ireland's trajectory towards net zero by 2050. The impact to climate is considered long-term, neutral and not significant.

Mitigation Measures

There are no mitigation measures in relation to climate for the Remedial Phase.

10.5 Residual Impacts

10.5.1 Peat Extraction Phase: July 1988 - June 2020

The removal of the carbon store of the Application Site and the subsequent release of CO_2 from the peat extraction activities and all ancillary works resulted in a long-term, negative and significant impact to climate. However, it should be noted that the TII guidance (2022) and IEMA guidance (2022) states that the significance of a project should be assessed on the basis of the project as a whole and not from individual phases.

10.5.2 Current Phase (June 2020 – Present Day)

As all peat extraction activities and all ancillary works have ceased since June 2020 carbon losses associated with peat removal and the subsequent impact to climate are not relevant to this phase. Emissions from vehicles accessing the site will be minimal in nature and will result in a short-term, negative and imperceptible impact to climate.

10.5.3 Remedial Phase

Impacts to climate during the Remedial Phase will be short-term, neutral and not significant.

10.6 Significance of Effects

10.6.1 Peat Extraction Phase (July 1988 - June 2020)

The impact to climate is long-term, negative and significant. The re-wetting of the bog will aid in restoring the carbon sink potential of the land. Research by Wilson et al. (2013) has indicated that rehabilitation of peatlands can mitigate the carbon emitted as part of the historic peat extraction activities and all ancillary works.

10.6.2 Current Phase (June 2020 – Present Day)

As peat extraction activities and all ancillary works has ceased at the Application Site, carbon losses associated with peat removal and the subsequent impact to climate are not relevant to this phase. Emissions from vehicles accessing the Application Site will be minimal in nature and will result in a short-term, negative and imperceptible impact to climate which is overall not significant.

10.6.3 Remedial Phase

No significant impacts to climate are predicted for the Remedial Phase. Impacts will be short-term, neutral and not significant.

10.7 Cumulative and In-Combination Effects

The IEMA and TII guidance on which the assessment is based states that "*the identified receptor for the GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable. By presenting the GHG impact of a project in the context of its alignment to Ireland's trajectory of net zero and any sectoral carbon budgets, this assessment will demonstrate the potential for the project to affect Ireland's ability to meet its national carbon reduction target. This assessment approach is considered to be inherently cumulative*".

The GHG emissions associated with the peat extraction activities and all ancillary works and the loss of the carbon sink potential of the land has been carried out in this assessment with the predicted emissions compared with Ireland's climate targets and emissions ceilings.

Cumulative impacts to climate associated with peat extraction activities and all ancillary works for the 1948 – 1987 period include historic removal of peat and the associated loss of the carbon sink potential of the land. The impact to climate as a result of works at the Application Site from 1948 – 1987 are similar to those discussed for the Peat Extraction Phase July 1988 – June 2020. While no detailed calculations in relation to tonnages of carbon have been conducted for the 1948 – 1987 period, it is likely that the impact to climate was long-term, negative and significant. The cumulative impact of the ongoing peat extraction activities and all ancillary works from the commencement of works at the Application Site in 1948 up until the peat extraction activities and all ancillary works ceased in 2020 likely had a long-term, negative and significant impact on climate.

However, it should also be noted that in line with the Applicant's vision to assist in achieving a climate neutral Ireland by 2050, it is intended to utilise the Application Site for both peatland remediation and wind energy infrastructure and to facilitate environmental stabilisation of the Application Site and the

optimisation of climate action benefits. It is proposed to construct the Ballivor Wind Farm development which includes infrastructure on Ballivor, Carranstown, Lisclogher and Bracklin Bogs on part of the Application Site. It is the intention of the Applicant to integrate the peatland remedial measures with the proposed Ballivor Wind Farm. The cumulative impact of providing a carbon sink within the re-wetted peatland and the carbon savings as a result of renewable energy generated by the proposed Ballivor Wind Farm (should it be granted planning permission) would result in a significant, long-term beneficial impact to climate and would assist in nation goal of achieving a climate neutral Ireland by 2050 as set out in the Climate Action and Low Carbon Development (Amendment) Act 2021.

10.8 Conclusion

This chapter of the rEIAR describes and assesses the residual direct and indirect climate impacts of the peat extraction activities and all ancillary works, at the Application Site. The climate impact assessments have been prepared for the Peat Extraction Phase, the Current Phase and the Remedial Phase.

For the purposes of this assessment, while the activities assessed have occurred over the past decades, beginning in July 1988 and continuing to present day, impacts have been assessed against the most recently published climate guidance and policies which are likely more stringent than historical policies from previous years. Therefore, if it can be determined that, based on the most recent standards, no significant effects occurred as a result of the Project, then it is unlikely that significant impacts occurred based on historical standards. The climate impact assessment comprised a quantitative assessment of the carbon emissions as a result of the peat extraction activities and all ancillary works.

Historic climate data was reviewed in reference to Ireland's weather for the surrounding area of the Application Site over the period July 1988 to present day. Climate is defined as the average weather over a period of time, whilst climate change is a significant change to the average weather. Climate change is a natural phenomenon but in recent years human activities, which have resulted in the release of GHGs, have impacted on the climate. Climate change has led to an increase in the frequency of extreme weather conditions such as storms, floods and droughts. Historic National greenhouse gas (GHG) emissions published by the Environmental Protection Agency (EPA) were also reviewed and used to inform the climate baseline assessment. National greenhouse gas (GHG) emissions are required to meet EU specific targets, however Ireland's annual GHG emissions have been in exceedance of these targets thus far.

Peat Extraction Activities (July 1988 – June 2020)

The CO_2 emissions associated with the peat extraction activities and all ancillary works over the period 1988 – 2020 were calculated. On average over this 33-year period there was 81,911 tonnes of CO_2 per annum released from the Application Site. Annually this equates to 0.03% of Ireland's 2021 – 2025 carbon budget of 295 $MtCO_2e$ or 0.05% of Ireland's more stringent 2030 – 2035 carbon budget of 151 $MtCO_2e$. The removal of the carbon store of the Application Site and the subsequent release of CO_2 from the peat extraction activities and all ancillary works resulted in a long-term, negative and significant impact to climate. However, the TII and IEMA guidance states that the significance of a project should be assessed on the basis of the project as a whole and not from individual phases.

Current Phase (June 2020 – Present Day)

As peat extraction activities and all ancillary works has ceased since June 2020, carbon losses associated with peat removal and the subsequent impact to climate are not relevant to this phase.

There is the potential for some minor GHG emissions associated with vehicles accessing the Application Site for removal of stockpiled peat or for monitoring works. However, the number of vehicles accessing the Application Site will be minimal and GHG emissions associated with these are

not predicted to be significant in relation to Ireland's climate budgets and sectoral emissions ceilings. The impact to climate is short-term, negative and imperceptible which is overall not significant.

Remedial Phase

The primary focus of the rehabilitation plans is re-wetting the bogs which will aid in restoring the carbon store function and promote the carbon sink potential of the land. The purpose of the Remedial Phase of the Project is in line with a number of key actions and priorities within CAP24 in relation to the rehabilitation of peatlands, specifically those within the mid-lands area. With the restoration of the carbon sink potential of the land, albeit, to a lesser extent than the potential prior to the historic removal of the peat, the project will aid in Ireland's trajectory towards net zero by 2050.

The impact to climate is considered long-term, neutral and not significant.