S. 37

File With _____

CORRESPONDENCE FORM

Appeal No: ABP 318180-23

M _____

Please treat correspondence received on 21/6/24 as follows:

1. Update database with new agent for Applicant/Appellant _____	
2. Acknowledge with BP 23	1. RETURN TO SENDER with BP _____
3. Keep copy of Board's Letter ☐	2. Keep Envelope: ☐
	3. Keep Copy of Board's letter ☐

Amendments/Comments
Applicant's response to S131 rec'd by Post
Case Narrative
Task 389745-24 BP 23 to Applicant HD
Please send Email to helpdesk to inform you will drop up USB to scan

4. Attach to file	RETURN TO EO ☑
(a) R/S ☐ (d) Screening ☐	James Sweeney
(b) GIS Processing ☐ (e) Inspectorate ☐	
(c) Processing ☐	

	Plans Date Stamped ☐
	Date Stamped Filled in ☐
EO: Karen Hickey	AA: Fadima Khatipov
Date: 24/6/24	Date: 24/06/24

S. 37

File With ______________

SECTION 131 FORM

Appeal NO:_ABP 318180-23 **Defer Re O/H** ☐

Having considered the contents of the submission dated/ received 21/6/24

from

Applicant I recommend that section 131 of the Planning and Development Act, 2000

~~be~~/not be invoked at this stage for the following reason(s):. no new issues

E.O.: ______________ **Date:** 26/6/24

For further consideration by SEO/SAO

Section 131 not to be invoked at this stage. ☐

Section 131 to be invoked – allow 2/4 weeks for reply. ☐

S.E.O.: ______________ **Date:** ______________

S.A.O: ______________ **Date:** ______________

M ______________

Please prepare BP ______________ **- Section 131 notice enclosing a copy of the attached submission**

to: ______________ **Task No:** ______________

Allow 2/3/4weeks – BP ______________

EO: ______________ **Date:** ______________

AA: ______________ **Date:** ______________

JSA John Spain Associates
Planning & Development Consultants
Chartered Town Planners

39 Fitzwilliam Place,
Dublin 2
D02 ND61

www.jsaplanning.ie

Tel 01 662 5803
info@johnspainassociates.com

The Secretary,
An Bord Pleanála,
64 Marlbourough Street,
Dublin 1.

Date: 21 June, 2024
Our Ref: LW/ MF JN 22058

Dear Sir/ Madam,

RE: RESPONSE TO AN BORD PLEANÁLA UNDER SECTION 131 OF THE PLANNING AND DEVELOPMENT ACT IN RESPECT TO THE PROPOSED DEVELOPMENT COMPRISING THE CONSTRUCTION OF THREE NEW DATA CENTRE BUILDINGS (BULDING E, F, AND G) AND ASSOCIATED WORKS ON LANDS AT CRUISERATH ROAD, DUBLIN 15.

FINGAL COUNTY COUNCIL REG. REF.: FW22A/0308

AN BORD PLEANÁLA REF.: PL06F.318180

INTRODUCTION

On behalf of the applicant, Universal Developers LLC, which has its registered office at 251 Little Falls Drive, Wilmington, New Castle County, Delaware, 19808, USA, we, John Spain Associates, 39 Fitzwilliam Place, Dublin 2, hereby submit a response to a request under section 131 of the Planning and Development Act 2000, as amended, to make further submissions in relation to the above-referenced appeal.

This response is submitted to the Board in advance of the deadline provided in the Board's correspondence (5:30pm on the 24th of June 2024).

The Board's correspondence (dated the 4th of June 2024) enclosed a submission made by one of the third party appellants, Mr Colin Doyle of 12 Cottage Gardens, Ennis, Co. Clare, dated the 28th of May 2024 (referred to hereafter as 'the Colin Doyle further Submission).

A copy of the Board's correspondence and the Colin Doyle Further Submission are enclosed as **Appendix 1** to this document for ease of reference.

This planning response to the Colin Doyle further Submission is supported by a detailed response prepared by AWN Consulting, which is included as **Appendix 2** to this document.

Additionally, in order to fully and robustly respond to the grounds set out in the Colin Doyle further Submission (which relate to recent developments in Climate Action Plan objectives and associated EPA projections), to assist the Board's consideration and determination of the current appeals, and to take account of additional developments in policy arising since the applicant's submission in response to third party appeals, the following documents are included as appendices to this document:

- **Appendix 3** prepared by AWN Consulting and John Spain Associates comprises an updated statement on the consistency of the proposed development with section 15(1) of the Climate Action and Low Carbon Development Act 2015, as amended, having regard to the adoption of the 2024 Climate Action Plan and the publication of Ireland's second statutory National Adaptation Framework (NAF), which was published on the 5th of June 2024.
- **Appendix 4** prepared by AWN Consulting comprises an environmental technical note on cumulative impacts of the proposed development in combination with a development (primarily consisting of a Biopharmaceutical Development and Manufacturing Building) on adjacent lands to the east (under Fingal Reg. Ref.: FW23A/0342), the application for which was subject to a final grant of permission on the 20th of February 2024. Appendix 4 also includes additional further detail on the cumulative assessment in respect of any renewable energy project which would be subject to a CPPA and the proposed development that was submitted with the Response to the Appeal dated 6 November 2023.
- **Appendix 5** prepared by AWN Consulting comprises an environmental technical note which sets out the manner in which the Environmental Impact Assessment Report for the Proposed Development and the response to third party appeals have taken into account the uncertainty in line with the relevant guidance.

These additional appendices are directly related to the assessment of climate impact, secondary impacts, and uncertainty as referred to in the Colin Doyle Further Submission and are submitted to assist the Board in their consideration of the appeals.

RESPONSE

As set out above, this summary response is informed by the accompanying technical response provided by AWN Consulting (Appendix 2).

The Colin Doyle Further Submission focuses on a report published by the EPA in May 2024 titled Ireland's Greenhouse Gas Emissions Projections 2023-2050. The EPA report provides *"an assessment of Ireland's total projected greenhouse gas (GHG) emissions from 2023 to 2050, using the latest inventory data for 2022 as the starting point. The focus of the assessment is out to 2030 given current national and EU 2030 climate targets."*

Exceedance of Sectoral Emissions Ceiling and Projected Renewables Delivery

The Colin Doyle Further Submission states that the EPA report notes a predicted exceedance of the Sectoral Emission Ceiling threshold for the electricity sector of 0.9MtGHG over the period to 2030.

The Colin Doyle Further Submission argues that the EPA report has taken account of all renewable electricity projected to be delivered under the 2024 Climate Action Plan (CAP24),

and that the report projections therefore encompass any project in respect of which the applicant might enter into a Corporate Power Purchase Agreement (CPPA).

As set out within the AWN Consulting Response (Appendix 2), the EPA report predicts emissions based on two scenarios as follows:

1. A scenario which takes account of measures committed to by the Government which were in place by the end of 2022.
2. A scenario which takes account of additional measures committed to by the Government under subsequent Climate Action Plans, which have not yet been implemented.

Additionally, AWN Consulting set out that the EPA report has excluded some measures set out in CAP24 to deliver additional renewable energy, or assumed that those measures are not achieved in full or are delayed beyond 2030.

As set in Section 4 of the AWN Environmental Response, which formed Appendix 3 of the previously submitted appeal response, the development itself will not make achievement of adherence to the Sectoral Emissions Ceilings (or the objectives of CAP24) more challenging, regardless of whether any renewable energy development that would be subject of a CPPA in support of the proposed development has been factored into the EPA report.

This is due to the fact that the new load added to the electricity system in respect of this particular development will be supported by new renewable energy generation which will be subject of a CPPA in line with the Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy and the Government's CPPA Roadmap, which is identified as an appropriate mitigation measure against the secondary GHG emissions associated with the proposed development (in line with the IEMA 2022 Guidance).

Hence, the argument put forward in the Colin Doyle Further Submission (i.e. that the EPA report has taken into account any renewable project in respect of which a CPPA might be entered into) is a moot point.

Whether or not the wider economy and other developments (i.e. apart from the proposed development) can ultimately comply with the Sectoral Emissions Ceiling targets is immaterial to the Board's decision on the current application, given that the new load added to the system as a result of the proposed development will be supported by new renewable energy pursuant to a CPPA, and the development itself is therefore clearly in accordance with the emissions reduction targets of the Sectoral Emissions Ceilings and the policies of CAP24 and the Government Statement on Data Centres.

Balance of New Development and Renewables

The Colin Doyle Further Submission goes on to contend that "*a balance will not be achieved between the electricity demands of new developments and the supply of renewable electricity up to 2030*". For this proposed development a balance between development and renewable generation will be achieved as a result of the proposed development being supported by new renewable energy pursuant to a CPPA.

Firstly, as set out previously in the submitted Appeal Response, and detailed in the appended AWN Response document (Appendix 2), on the contrary to the above argument, the applicant is committed to engaging in a CPPA for new renewable generation in line with the Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy and the Government's CPPA Roadmap. Thus, the proposed development itself, supported by a

CPPA, will clearly achieve a 'balance' between additional electricity demand from this new development, and the supply of renewable electricity.

Additionally, Mr Doyle's argument is clearly seen to be without merit if it is followed to its logical conclusion. Were this argument to succeed, it would follow that any new development proposal requiring electricity to operate, irrespective of whether the additional electricity was offset by a CPPA, could not be granted permission. This is clearly not a tenable position.

The proposed form of development, which is subject to a commitment to engage in CPPAs at the planning stage, is unusual (compared to other types of development, including other types of large energy user development) in that a commitment to provisioning new renewable energy generation has been made at planning application stage. Condition 13 attached to the Fingal County Council decision to grant permission included a requirement for the applicant to enter into such a CPPA, and a condition of this nature is acceptable and welcomed by the applicant. As such, this development goes beyond many other forms of development which have been approved without a commitment to enter into a CCPA.

The proposed development is therefore fully aligned with Government policy in this regard and will not be detrimental to the achievement of the Sectoral Emission Ceilings targets or result in an imbalance between new development and the supply of renewable electricity up to 2030 as claimed in the Colin Doyle Further Submission.

Predicted GHG Emissions

Additionally, the Colin Doyle Further Submission states that the applicant has indicated that the development would result in GHG emissions of 499,213t (0.5Mt GHG) over the second carbon budged period of 2026-2030. On this basis, the Colin Doyle Further Submission argues that granting permission for the proposed development would permit these emissions to occur and therefore would not be consistent with the national climate objectives.

With regard to the above claim, Mr Doyle appears to have misinterpreted the assessment and conclusions provided as part of the previously submitted appeal response (Appendix 3 to the previously submitted response).

The GHG emissions figures quoted in the Colin Doyle Further Submission are those which were predicted prior to mitigation (i.e. in the absence of a CPPA).

In fact, as set out within the AWN response (Appendix 2 to this document), the proposed development entails a commitment to a CPPA which is a recommended project specific 'substitution' mitigation measure as per the IEMA 2020 and 2022 guidance, and that will see the 'prior to mitigation' GHG emissions quoted by Mr Doyle mitigated in the 'with mitigation' scenario committed to by the applicant. This is set out in detail under Section 4 of the AWN Environmental response, which was Appendix 3 to the submitted appeal response.

Therefore, it is inherently incorrect to claim that a grant of permission for the proposed development would "*permit these emissions to occur*" and this argument is without any merit or basis in the documentation submitted, as the emissions referred to were those which were projected prior to mitigation. As outlined above, the development must be operated on the basis of the CPPA and these emissions will be mitigated by the CPPA.

2040 Predictions

Finally, the Colin Doyle Further Submission argues that GHG emissions from the electricity sector are predicted by the EPA to remain at 2.8 MtGHG by 2040, and that this undermines any claim that zero carbon electricity could be achieved in that timeframe.

With regard to this argument, we refer to the accompanying AWN response document (Appendix 2), which sets out the following:

"The electricity from the national grid, used to power the Proposed Development, will be supported by new renewable energy pursuant to a CPPA, and the development itself is therefore clearly in accordance with the aim of achieving the emissions reduction targets of the Sectoral Emissions Ceilings and the policies of CAP24 and the Government Statement on Data Centres. The continued use of CPPAs and the operation of the facility within the EU ETS will ensure that GHG emissions from the facility will be fully mitigated throughout its lifetime with the facility having a net zero operational impact in terms of GHG emissions.

CONCLUSION

This response to the request for Further submissions under section 131 of the Act is submitted on behalf of the applicant, Universal Developers LLC. As set out in this response document, and further substantiated by the technical response provided in Appendix 2 (AWN Consulting response), the additional arguments raised by Colin Doyle are without any merit.

The application has demonstrated the compliance of the proposal with national, regional, and local planning policy, and with relevant Government policy including the Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy 2022, including via a strong commitment to engaging in a CPPA in respect of the Proposed Development, which will provide for renewables additionality in line with the Government Statement.

Additionally, as set out within the introduction of this response document, Appendices 3-6 herewith provide additional and updated information in connection with the response to assist the Board in undertaking a comprehensive assessment of the proposed development when determining the third party appeals.

We trust the Board will afford the responses set out herein due consideration in determining the appeals. Should you have any queries or require any further information please do not hesitate to contact the undersigned.

Yours sincerely,

John Spain Assoc.

John Spain Associates

APPENDIX 1 – COPY OF CORRESPONDENCE FROM AN BORD PLEANALA AND COLIN DOYLE FURTHER SUBMISSION

APPENDIX 2 – AWN CONSULTING RESPONSE TO COLIN DOYLE FURTHER SUBMISSION

APPENDIX 3 – UPDATED CONSISTENCY STATEMENT WITH SECTION 15 OF THE CLIMATE ACTION AND LOW CARBON DEVELOPMENT ACT

APPENDIX 4 – AWN CONSULTING NOTE ON CUMULATIVE IMPACT WITH ADJACENT DEVELOPMENT AND RENEWABLE ENERGY PROJECT

APPENDIX 5 – AWN CONSULTING NOTE ON CONSIDERATION OF UNCERTAINTY

APPENDIX 1 – COPY OF CORRESPONDENCE FROM AN BORD PLEANALA AND COLIN DOYLE FURTHER SUBMISSION

Our Case Number: ABP-318180-23

Planning Authority Reference Number: FW22A/0308

Your Reference: Universal Developers LLC

An Bord Pleanála

John Spain Associates
39 Fitzwilliam Place
Dublin 2
D02 ND61

RECEIVED
05 JUN 2024

Date: 04 June 2024

Re: Construction of data centre and associated site works. An Environmental Impact Assessment Report (EIAR) has been submitted to the planning authority with the planning application. Cruiserath Road, Dublin 15.

Dear Sir / Madam,

I have been asked by An Bord Pleanála to refer to the above mentioned appeal.

The Board is of the opinion that, in the particular circumstances of this appeal, it is appropriate in the interests of justice to request you to make submissions or observations in relation to the enclosed submission dated 28th May 2024 received from Colin Doyle.

In accordance with section 131 of the Planning and Development Act, 2000, (as amended), you are requested to make any submissions or observations that you may have in relation to this enclosure **on or before 24 June 2024.** The Board cannot consider comments that are outside the scope of the matter in question. Your submission in response to this notice must be received by the Board not later than **5:30pm on the date specified above.**

If no submission or observation is received before the end of the specified period, the Board will proceed to determine the appeal without further notice to you, in accordance with section 133 of the 2000 Act.

Please quote the above appeal reference number in any further correspondence.

Yours faithfully,

James Sweeney
Executive Officer
Direct Line:

BP70 Registered Post

Teil	**Tel**	(01) 858 8100
Glao Áitiúil	**LoCall**	1800 275 175
Facs	**Fax**	(01) 872 2684
Láithreán Gréasáin	**Website**	www.pleanala.ie
Ríomhphost	**Email**	bord@pleanala.ie

64 Sráid Maoilbhríde
Baile Átha Cliath 1
D01 V902

64 Marlborough Street
Dublin 1
D01 V902

An Bord Pleanála
64 Marlborough Street
Dublin 1, D01 V902

Colin Doyle
12 Cottage Gardens
Ennis
Co. Clare
28th May 2024

Re: ABP 318180 Universal Developers LLC Data Centre Development Cruiserath
Addition to earlier submission concerning EPA Report published May 2024

A chara,

I posted a submission on the above case on 27th May which you will most likely receive this week.

I wish to make a short addition to my submission in light of the recently published GHG projections by the EPA which are a cause for grave concern. I enclose a copy of the EPA report which can be downloaded from the EPA website[1].

The relevant information which I wish to bring to the Board's attention is that the EPA projections to 2030 indicate there will be a significant breach of the legally binding national carbon budgets (p.16), and that emissions from the Electricity Sector are also projected to exceed its sectoral budget. In 2030, the EPA projects emissions of 3.9 MtGHG (p. 23) from the Electricity Sector. This is 0.9 MtGHG in excess of the 2030 target of 3 MtGHG which was planned in the state's Sectoral Emissions Ceilings (September 2022). Consequently the projections indicate significant exceedence of the budget for the Electricity Sector. As the EPA projections are just six years into the future, they are likely to be reliable.

Note also, that a CPPA entered into by the proposed development would not make the projected exceedence go away. The EPA has already factored in all renewable electricity projections in CAP 24, which have supporting implementation measures and which can be achieved by 2030 (p.7). The projected renewable electricity would therefore already encompass whatever CPPA could conceivable be arranged by the applicant.

One could reasonably conclude that a balance <u>will not be</u> achieved between the electricity demands of new developments and the supply of renewable electricity up to 2030. If it were the case that a balance would be achieved then there would be a projected compliance with the Sectoral Budget which is not the case.

[1] https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/irelands-greenhouse-gas-emissions-projections-2023-2050.php

According to data provided by the applicant[2] the proposed development would result in GHG emissions of 499,213 t GHG (0.5 Mt GHG) over the second carbon budget period 2026-2030. This would add to emissions in the Electricity Sector, which are already projected to be in excess of budget. A decision to grant permission would permit these emissions to occur and therefore would not be consistent with the national climate objectives.

I trust that the Board will take the above facts into account in performing its functions in accordance with section 15 of the Climate Act 2015/21.

The EPA has also prepared projections beyond 2030, and these are available as a spreadsheet on the EPA website. While projecting to 2040 clearly involves uncertainties, it is the most robust estimate available at present to inform policymakers and competent authorities. In its response documents the applicant repeatedly referred to the possibility of achievement of zero carbon electricity by 2040 (as opposed to 2050 in national plans). In view of the EPA projection, this claim must be dismissed as nonsense. For 2040, emissions from the Electricity sector are projected to be around 2.8 MtGHG, which is a marginal reduction on the projection for 2030, but is still very far from zero carbon. An excerpt from the EPA spreadsheet is reproduced below:

2023-2050 ETS GHG Emissions Projections (kt CO2 eq)	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**
Energy Industries	3734.85	3536.59	3568.41	3908.81	3491.64	3206.66
Public electricity and heat production	3425.48	3227.23	3259.04	3599.44	3212.27	**2897.29**

In balancing the claims of the applicant against the reasoned grounds for my objections I trust that the Board and its competent experts will take account of these recent EPA projections.

Mise le meas,

Colin Doyle

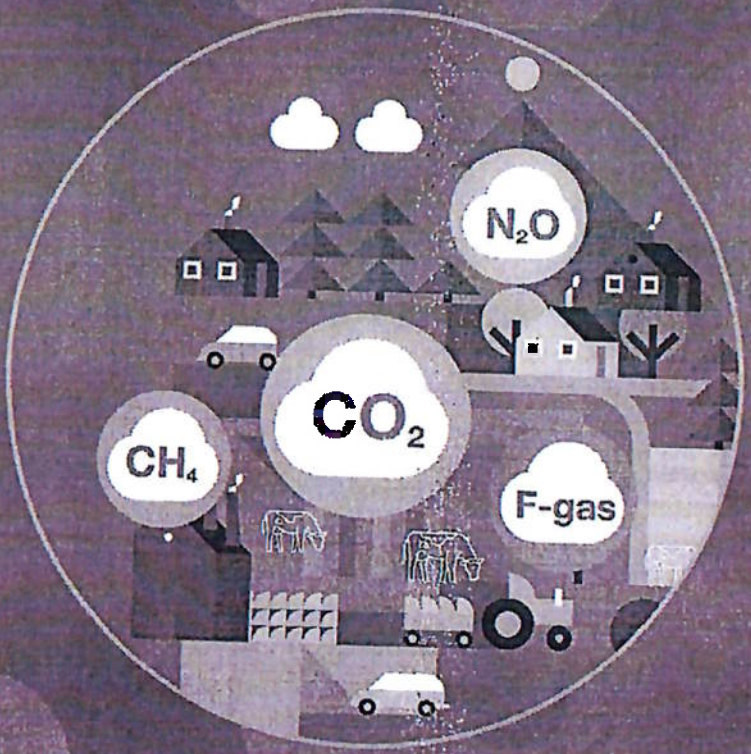
[2] AWN Further Information Response (sum of data for years 2026-2030 in Table 1.8)

epa
Environmental Protection Agency

Ireland's Greenhouse Gas Emissions Projections

2023-2050

May 2024



Contents

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Key Findings

Ireland's Climate Act Ambition	Ireland is not on track to meet the 51 per cent emissions reduction target (by 2030 compared to 2018) based on these projections which include most 2024 Climate Action Plan measures.
Carbon Budgets	The first two carbon budgets (2021-2030), which aim to support achievement of the 51 per cent emissions reduction goal, are projected to be exceeded by a significant margin of between 17 and 27 per cent.
Sectoral Emissions Ceilings	Sectoral emissions ceilings for 2025 and 2030 are projected to be exceeded in almost all cases, including Agriculture, Electricity, Industry and Transport.
EU Targets	Ireland will not meet its non-ETS EU targets of a 42 per cent emissions reduction by 2030 in WAM even with both the ETS and LULUCF flexibilities.
Rate of Change	Emissions in the Planned Additional Measures scenario are projected to be 29 per cent lower in 2030 (compared with 2018) whereas in the Implemented Existing Measures scenario the emissions reduction is projected to be 11 per cent. There has been no improvement in these figures since EPA projections published in 2023.
Implementation Gap	Faster implementation of measures is necessary to meet both National and EU targets. The pace at which planned policies and measures are implemented needs to be accelerated.
Agriculture	Total emissions from the agriculture sector are projected to decrease by between 1 and 18 per cent over the period 2022 to 2030. Savings are projected from a variety of measures including limiting usage and switching to different fertilisers, methane reduction measures and water table management.
Transport	Transport emissions are projected to decrease by 5 to 26 per cent over the period 2022-2030. Measures that are projected to contribute to greater emissions reductions include 945,000 EVs by 2030, a 20 per cent biodiesel blend rate by 2030 and avoid/shift measures such as a 50 per cent increase in daily active travel journeys and a 130 per cent increase in daily public transport journeys.
Electricity Generation	Emissions from the Energy Industries sector are projected to decrease by between 57 and 62 per cent over the period 2022 to 2030. Renewable energy generation at the end of the decade is projected to range from 69 to 80 per cent of electricity generation as a result of a projected rapid expansion in wind energy and other renewables.
Land use, Land use Change and Forestry (LULUCF)	Emissions from the LULUCF sector have been revised significantly to reflect new science. Total emissions from the LULUCF sector are projected to increase over the period 2022 to 2030. It is unlikely with the currently planned measures that the target set under the EU LULUCF Regulation and included in Climate Action Plan 2024 will be met.

1 Introduction

The Environmental Protection Agency (EPA) is the Competent Authority with responsibility for developing, preparing and publishing projections of greenhouse gas emissions for Ireland. The EPA produces national greenhouse gas emission projections on an annual basis. These projections are compiled in line with European Union (EU) guidelines to meet EU reporting obligations[1]. At a national level this assessment informs policy and the monitoring and reporting of Ireland's climate action performance to Government under the Climate Action and Low Carbon Development Act (Amendment) 2021[2] and to the public as outlined in the Climate Action Plan 2024[3]. It also provides an assessment of Ireland's progress towards achieving its EU emission reduction targets for 2030 as set out under the Effort Sharing Regulation[4].

This report provides an assessment of Ireland's total projected greenhouse gas (GHG) emissions from 2023 to 2050, using the latest inventory data for 2022 as the starting point[5]. The focus of the assessment is out to 2030 given current national and EU 2030 climate targets. Extended projections out to 2050 are provided in the Appendix and as a separate download accompanying this report.

Preparing the EPA projections involves compiling and processing key data such as economic projections (fuel prices, carbon tax prices and modified Gross National Income), energy projections (projected fuel use in households, industry, services, transport and agriculture), developments in the agriculture and land use sectors and projected emissions from industrial products.

1 Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action.

2 Climate Action and Low Carbon Development (Amendment) Act 2021 (irishstatutebook.ie).

3 https://www.gov.ie/en/publication/79659-climate-action-plan-2024/

4 Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement.

5 https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/irelands-final-greenhouse-gas-emissions-1990-2022.php

1.1 National and EU targets

Ireland's Climate Action and Low Carbon Development Act (Amendment) 2021 (Climate Act) set a target for a 51% reduction in emissions by 2030 compared to 2018. The national climate objective differs from the EU objective as it includes the LULUCF sector. LULUCF stands for Land Use Land Use Change and Forestry, and it includes both greenhouse gas emissions and removals associated with activities on land. The Climate Action Plan 2024 sets out a programme of policies and measures that aim to achieve significant progress towards the Climate Act objectives.

The Climate Act established carbon budgets[6] to support achievement of Ireland's 2050 climate neutral ambition. A carbon budget represents the total amount of emissions that may be released during an agreed five-year period and, to date, three five-year budgets have been determined (2021-25, 2026-30, 2031-35). In July 2022 sectoral emissions ceilings[7] were approved by Government for each sector of the economy to ensure each sector stays within the limits of the agreed carbon budgets. The sectors include agriculture, buildings, electricity, industry, transport and LULUCF and different ceilings apply to each sector.

Ireland's latest 2030 target under the EU's Effort Sharing Regulation (ESR) is to limit its greenhouse gas emissions by at least 42% by 2030[8]. This target was set in April 2023 upon amendment of the ESR[9]. The 42% reduction defines the trajectory with binding annual emission limits over the period to 2030. New binding annual emission limits for the 42% reduction have been set for 2021 to 2025 only[10] with limits for 2026-2030 to be set in 2025.

Under the ESR two flexibilities may be utilised to allow for a fair and cost-efficient achievement of the target. These flexibilities are the use of EU Emissions Trading System[11] allowances and credit from action undertaken in the Land use, Land use Change and Forestry (LULUCF) sector[12].

Ireland's projected emissions trajectory 2023-2050 is set out in the following sections of this report. Each section of the report outlines our analysis and assessment with reference to the prescribed base year, targets and timeframes specified in the associated National or EU legislative context, outlined above.

6 https://www.gov.ie/en/publication/9af1b-carbon-budgets/

7 https://www.gov.ie/en/publication/76864-sectoral-emissions-ceilings/

8 https://climate.ec.europa.eu/eu-action/effort-sharing-member-states-emission-targets/effort-sharing-2021-2030-targets-and-flexibilities_en

9 Regulation (EU) 2023/857 amending Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement, and Regulation (EU) 2018/1999.

10 Commission Implementing Decision (EU) 2023/... of 28 June 2023 amending Implementing Decision (EU) 2020/2126 to revise Member States' annual emission allocations for the period from 2023 to 2030 (europa.eu).

11 https://ec.europa.eu/clima/eu-action/eu-emissions-trading-system-eu-ets_en

12 https://climate.ec.europa.eu/eu-action/effort-sharing-member-states-emission-targets/effort-sharing-2021-2030-targets-and-flexibilities_en

2 Approach

2.1 Projected Scenarios

As described in the Introduction the EPA has produced the projected greenhouse gas emissions for 2023 to 2050 using two scenarios: *With Existing Measures* (WEM) and the more ambitious *With Additional Measures* (WAM).

Our analysis in this report focuses on projected emissions as far as 2030 as most current policies and measures are focused on this period. The full projection out to 2050 is available as a separate download accompanying this report [13].

These emissions projections consider projected activity data provided by a number of key data providers including:

- Outputs from an integrated energy, economy and environment model called I3E[14] provided by the Economic and Social Research Institute (ESRI). The economic growth projections from I3E were benchmarked against the Horizon Scanning projections prepared by the Department of Finance in 2023[15];
- Energy projections provided by the Sustainable Energy Authority of Ireland (SEAI). Anticipated progress in the implementation of energy related policies and measures was determined by EPA in discussion with SEAI and the relevant Government Departments;
- Agricultural projections provided by Teagasc (Agriculture and Food Development Authority) which are aligned with University of Missouri Food and Agricultural Policy Research Institute (FAPRI) Projections (January 2024) for medium-term developments in EU and World agricultural commodity markets[16]. Teagasc assume that agricultural policy continues as currently implemented and the Trade and Cooperation (Brexit) Agreement (TCA) reached between the EU and the UK governs UK-EU trade for the period to 2033. Furthermore, the analysis assumes a lack of new bilateral trade agreements between the EU, UK and other countries. Determination of anticipated progress in the implementation of Agriculture related policies and measures was determined by the EPA in discussion with the Department of Agriculture, Food and the Marine (DAFM) and Teagasc.

Both scenarios use fuel prices from the European Commission recommended harmonised trajectories (see Appendix for details). The prices were chosen to reflect the likelihood of near-term sustained higher prices and intensified uncertainty around longer-term future fuel prices.

Projected emissions data is calculated for the following gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and fluorinated-gases and reported as carbon dioxide equivalent[17] (CO_2 eq). Emissions are classified into nine sectors: Energy Industries, Transport, Agriculture, Residential, Manufacturing Combustion, Commercial & Public Services, Industrial Processes, Waste and F-Gases[18].

13 The data is available at www.epa.ie/publications and https://reportnet.europa.eu/

14 https://www.esri.ie/current-research/the-i3e-model

15 https://www.gov.ie/en/publication/c31bc-horizon-scanning-calibrating-medium-to-long-term-economic-projections/

16 Agricultural Economics - Teagasc | Agriculture and Food Development Authority

17 Carbon dioxide equivalent (CO_2 eq) is a metric measure used to compare the emissions from various greenhouse gases on the basis of their global-warming potential (GWP), by converting amounts of other gases to the equivalent amount of carbon dioxide with the same GWP. Global-warming potentials in this report are as laid out in the Intergovernmental Panel on Climate Change's (IPPC's) fifth assessment report (AR5).

18 F-gases are hydrofluorocarbons (HFCs), perflurocarbons (PFCs), sulphur hexafluoride (SF_6), and nitrogen trifluoride (NF_3).

Explainer: EPA projections scenarios, what do they mean?

With Existing Measures (WEM)

The WEM scenario is a projection of future emissions based on the measures currently implemented and actions committed to by Government. To become part of the WEM scenario a policy or measure must be in place by the end of 2022 (the latest inventory year) and, in parallel, the resources and/or legislation already in place or committed to by Government Departments or Agencies. For example, the WEM scenario includes a measure where the Carbon tax increases annually and reaches €100 per tonne by 2030. This policy is considered to be implemented because annual carbon tax increases have been committed to in legislation (Finance Act 2020). In contrast, the WEM does not include the Avoid/Shift measures envisaged for the Transport sector as these measures were first introduced in Climate Action Plan 2023, after the end of the latest inventory year.

With Additional Measures (WAM)

The WAM scenario is the projection of future emissions based on the measures outlined in the latest Government plans at the time Projections are compiled. This includes all policies and measures included in the WEM scenario, plus those included in Government plans but not yet implemented. For example, the WAM scenario includes the target of 945,000 Electric Vehicles on the road by 2030 in the Climate Action Plan 2024.

2.2 Excluded Policies and Measures

In so far as possible, the policies and measures contained in the Climate Action Plan 2024 are included in these projections. However, as detailed below, there are a number of exceptions where policies and measures were not included as the EPA could not see an implementation pathway to merit their inclusion at this point in time.

Electricity

Policies and Measures up to 2030

- The target of 80% share from renewable electricity by 2030 is projected. Onshore wind of 7.2 GW, offshore wind of 3.5 GW and solar PV of 6 GW was required to achieve this level of renewable electricity. This compares with 9 GW onshore wind, 5 GW offshore wind and 8 GW of solar PV from CAP 2024.
- The full 2GW target for new flexible gas fired generation is not modelled. However, Eirgrid data[19] was used to produce an adjusted trajectory yielding new gas fired generation of 1.4 GW by 2030.

Policies and Measures post-2030

- 2 GW offshore wind for green hydrogen use in industry post-2030 (as outlined in Chapter 12 of the Climate Action Plan 2024) is not currently included.

Transport

Policies and Measures up to 2030

- Climate Action Plan 2023 introduced an Avoid/Shift policy to achieve an abatement of 2.09 Mt CO_2 eq by 2030. This policy remains in Climate Action Plan 2024 and encompasses a range of behavioural change and sustainable transport measures that were modelled by the National Transport Authority. One of these modelled measures relating to price increases in petrol and diesel out to 2030 has no supporting policy and is not included in the EPA projections.

19 https://cms.eirgrid.ie/sites/default/files/publications/19035-EirGrid-Generation-Capacity-Statement-Combined-2023-V5-Jan-2024.pdf

Enterprise, Built Environment and Public Sector

Policies and Measures up to 2030

- Measures aimed at achieving emissions savings from a decrease in embodied carbon in construction materials (1.0 Mt CO_2 abatement by 2030) are not currently modelled.
- The Climate Action Plan 2024 target of a 70-75% share in renewable heat in industry has no pathway to implementation outlined in the Plan and is not specifically modelled.

Policies and Measures post-2030

- Post-2030 Emissions reductions associated with Carbon Capture and Storage.

Agriculture

Measures up to 2030

- Diversification measures in Agriculture with savings by 2030 of 1.5 Mt CO_2 eq: Further information is needed to model an implementation pathway for these measures as they imply a reduction in herd numbers which impacts quantification of all of the other proposed measures.

Overall

- Climate Action Plan 2023 identified unallocated emissions savings of up to 26 Mt CO_2 eq in the second carbon budget period from 2026 to 2030. These savings are not modelled in these projections. It is noted that the Climate Action Plan 2024 addresses the issue of unallocated emissions savings and identifies five themes that could deliver savings.
- Further Measures post-2030 detailed in the electricity, industry, built environment, transport and agriculture sectors where no specific measures or emissions savings have been identified are not modelled.

These savings combined are estimated to provide a conservative additional abatement of 8.75 Mt CO_2 eq in 2030, based on the modelling used to prepare the Climate Action Plan 2024.

2.3 Reference/Base Years in the Report

Ireland's EU and national legislative commitments have different levels of emissions reduction requirements, base years and timeframes for achievement.

The EU Effort Sharing Regulation (ESR) requires a 42% reduction of emissions compared to 2005 levels by 2030, this is discussed in Section 3.

The Climate Act 2021 has specified 2018 as the base year from which a 51% emission reduction is to be achieved by 2030. The percentage changes referred to in Section 4 refer to the period 2018 to 2030.

The sectoral analysis in Section 5 uses the latest inventory year (2022) as a base year for projections to align with the current EU projections reporting requirements.

Each section of the report outlines the EPA's assessment with reference to the targets and base year specified in the associated legislation or reporting frameworks being discussed.

3 Projected Performance against European Targets

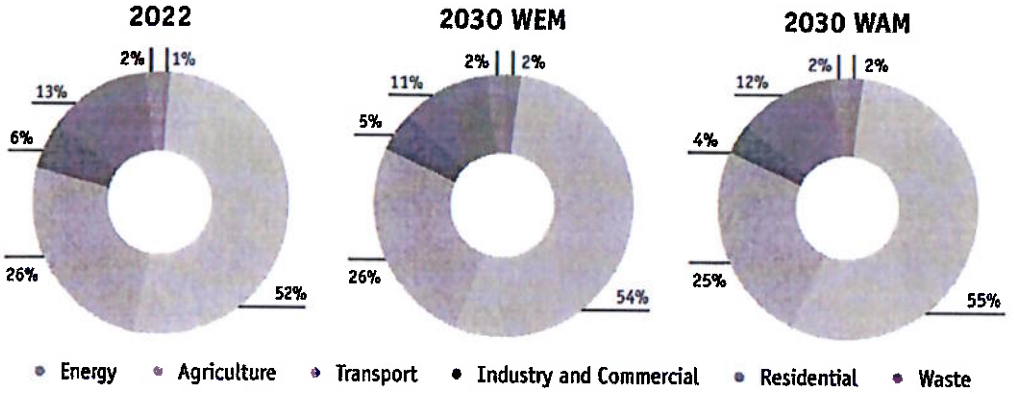
Ireland's 2030 target under the EU's Effort Sharing Regulation (ESR) is to deliver a 42% reduction of emissions compared to 2005 levels by 2030. This target was set in April 2023 upon amendment of the ESR. The ESR includes sectors outside the scope of the EU Emissions Trading System (EU-ETS) such as Agriculture, Transport, Residential, Public/Commercial Services and Waste and is also referred to an "non-ETS".

The latest EPA projections show that currently implemented policies and measures (WEM) will achieve a reduction of 9% on 2005 levels by 2030, significantly short of the 42% reduction target and also lower than the 10% reduction projected in last year's report[20].

If policies and measures in the higher ambition (WAM) scenario are implemented, EPA projections show that Ireland can achieve a reduction of 25% by 2030, still short of the 42% reduction target and also lower than the 30% reduction projected in last year's estimates.

The ESR sectors are shown in Figure 1 below. The Projections show that Agriculture and Transport emissions form the majority of ESR emissions. Combined they represent 78% and 80% of emissions in 2022 (latest inventory data) and 2030, respectively.

Figure 1: Sectoral share of Effort Sharing Regulation greenhouse gas emissions in 2022 and projected sectoral share in 2030 under the WEM and WAM scenarios



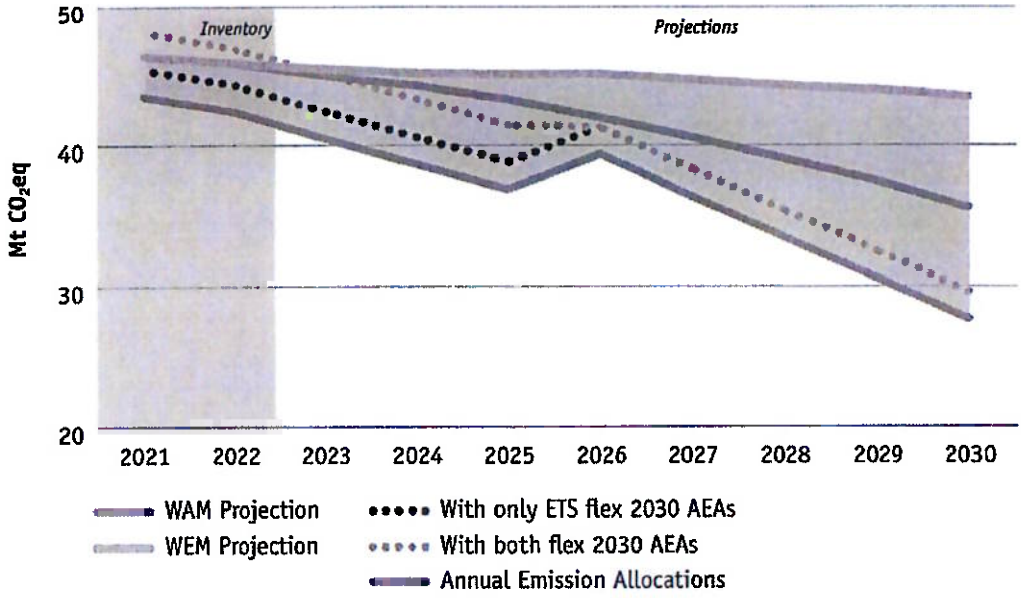
Targets for 2030 under the ESR include binding annual limits per member state known as "Annual Emission Allocations" (AEAs). The AEAs required updating to reflect the 42% reduction target set in 2023. To-date new AEAs have been implemented for 2021 to 2025[21] only. Limits for 2026-2030 have been estimated as per the methodology in the 2023 amendment of the Effort Sharing Regulation[22]. The projected Annual Emission Allocations (AEAs) under the Effort Sharing Regulation for the period 2021-2030 are shown in Figure 2.

20 https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/irelands-greenhouse-gas-emissions-projections-2022-2040.php

21 Commission Implementing Decision (EU) 2023/... of 28 June 2023 amending Implementing Decision (EU) 2020/2126 to revise Member States' annual emission allocations for the period from 2023 to 2030 (europa.eu)

22 Regulation (EU) 2023/857 amending Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement, and Regulation (EU) 2018/1999

Figure 2: Projected emissions and Annual Emission Allocations (AEAs) under the Effort Sharing Regulation for the period 2021-2030



Under the WEM scenario, the projections indicate that Ireland will cumulatively exceed its ESR 2021-2030 emissions allocation of 369.4 Mt CO_2 eq by 80.3 Mt CO_2 eq without the use of flexibilities. Under the WAM scenario, the projections indicate that Ireland will cumulatively exceed the ESR 2021-2030 emissions allocation by 50.1 Mt CO_2 eq without the use of flexibilities.

The ESR provides two flexibilities (EU-ETS and LULUCF)[23] to allow for a fair and cost-efficient achievement of the targets. The ETS flexibility available to Ireland for 2021 to 2030 is a maximum of 19.1 Mt CO_2 eq (or 1.91 Mt CO_2 eq annually).

The revised LULUCF Regulation (2023)[24] incorporates new rules around LULUCF flexibilities for the period 2021-2025 and 2026-2030. There is a high degree of uncertainty relating to the availability of the LULUCF flexibility and, if available, the quantity of flexibility in each budgetary period.

23 Use of EU-ETS allowances and credit from action undertaken in the Land use, Land use Change and Forestry (LULUCF) sector

24 https://eur-lex.europa.eu/eli/reg/2023/839/oj?eliuri=eli:reg:2023:839:oj, Article 7 (1) (a) and (aa)

This uncertainty is primarily due to the availability of the LULUCF flexibility being dependent on the EU collectively achieving its LULUCF target of a 310 Mt CO_2 eq reduction by 2030[25]. If this EU-wide target is not achieved, based on a compliance check to be completed in 2032, then the LULUCF flexibility will not be available to Ireland.

In the interim, based on latest LULUCF inventory[5] and projections data, the maximum amount of LULUCF flexibility now projected to be available is 13.4 Mt CO_2eq in the first 5-year period (or 2.68 Mt CO_2 eq per annum), with no flexibility available in the second 5-year period (Figure 2).

EPA projections show that use of the EU-ETS flexibility alone will not bring Ireland into compliance under the ESR (Figure 2). When the ETS flexibility is applied projections indicate that Ireland will cumulatively exceed the ESR 2021-2030 emissions allocation by 31.1 Mt CO_2 eq even with implementation of policies and measures in the WAM scenario.

When both ETS and LULUCF flexibilities are applied, the projections still indicate that Ireland will cumulatively exceed the ESR 2021-2030 emissions allocation by 17.7 Mt CO_2 eq even with implementation of policies and measures in the WAM scenario.

To achieve the ESR target without the use of flexibilities, Ireland's ESR emissions must reach 27.7 Mt CO_2 eq by 2030. The latest projections show that under the WAM scenario, Ireland's ESR emissions will be 35.6 Mt CO_2 eq in 2030; under the WEM scenario Ireland's ESR emissions will be 43.5 Mt CO_2 eq in 2030. Including the use of flexibilities, Ireland's ESR emissions are projected to be 33.7 Mt CO_2 eq in 2030 under the WAM scenario and 41.6 Mt CO_2 eq in 2030 under the WEM scenario.

25 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02018R0841-20230511

4 Projected Performance against National Climate Objective

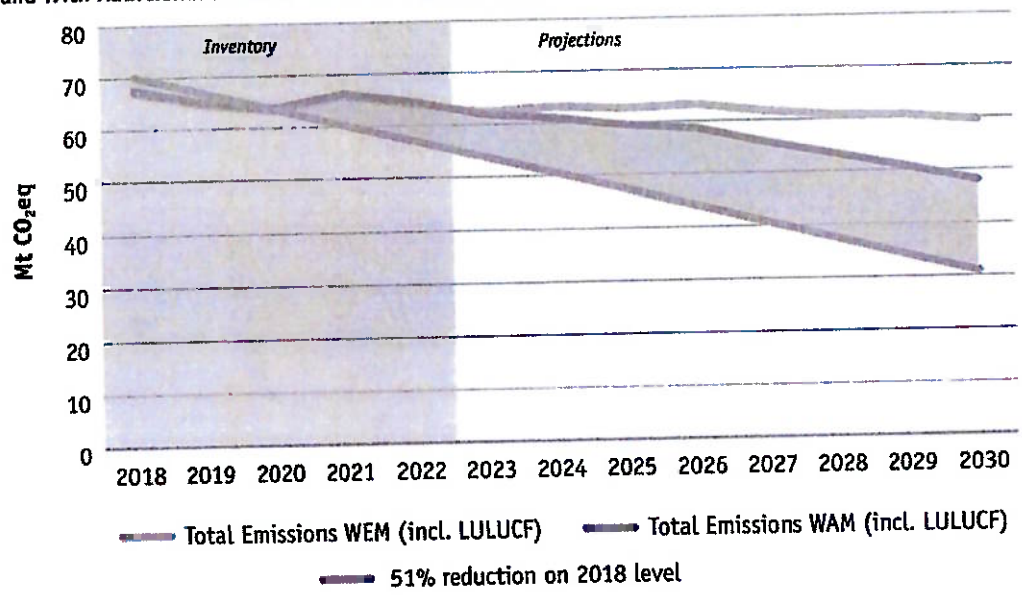
The Climate Action and Low Carbon Development (Amendment) Act 2021 sets a national climate objective of achieving a climate resilient and climate neutral economy by the end of the year 2050. An interim target has been set out to achieve a reduction of 51% in total emissions (including LULUCF) over the period 2018 to 2030.

The projections show that implemented policies and measures in the With Existing Measures (WEM) scenario can only deliver an 11% reduction in greenhouse gas emissions by 2030 compared to the 2018 level. The WAM scenario, including policies and measures from the 2024 Climate Action Plan, is projected to deliver a 29% emissions reduction over the same period.

Both projected scenarios indicate that even with implementation of all climate plans and policies Ireland will not meet the 51% emissions reduction target by 2030. Figure 3 below demonstrates the 'gap' between the WAM scenario projections and the 51% target.

Earlier in the report it was highlighted that approximately 8.75 Mt CO_2 eq of savings in 2030 identified in Climate Action Plan 2024 are not in these projections. If that amount of savings were realised in 2030, the percentage reduction in emissions achieved in total (with LULUCF) would be 42%.

Figure 3: Total Greenhouse Gas Emissions (including LULUCF) under the *With Existing Measures* and *With Additional Measures* scenarios out to the year 2030



4.1 Carbon Budgets

The Climate Action and Low Carbon Development (Amendment) Act 2021 provides for the establishment of carbon budgets to support achieving Ireland's climate ambition. The 51% target is the primary constraint on carbon budgets over the course of the first two budget periods ending on 31 December 2030, relative to 2018. The provisional carbon budget proposed for 2031 to 2035 continues the trajectory towards climate neutrality by 2050[26].

26 https://www.climatecouncil.ie/media/climatechangeadvisorycouncil/Technical%20report%20on%20carbon%20budgets%2025.10.2021.pdf

Three Carbon budgets have been set for the period 2021 to 2030, with a provisional budget proposed for 2031-2035:

- Budget 1 from 2021-2025, 295 Mt CO_2 eq;
- Budget 2 from 2026-2030, 200 Mt CO_2 eq;
- Budget 3 from 2031-2035 (provisional), 151 Mt CO_2 eq.

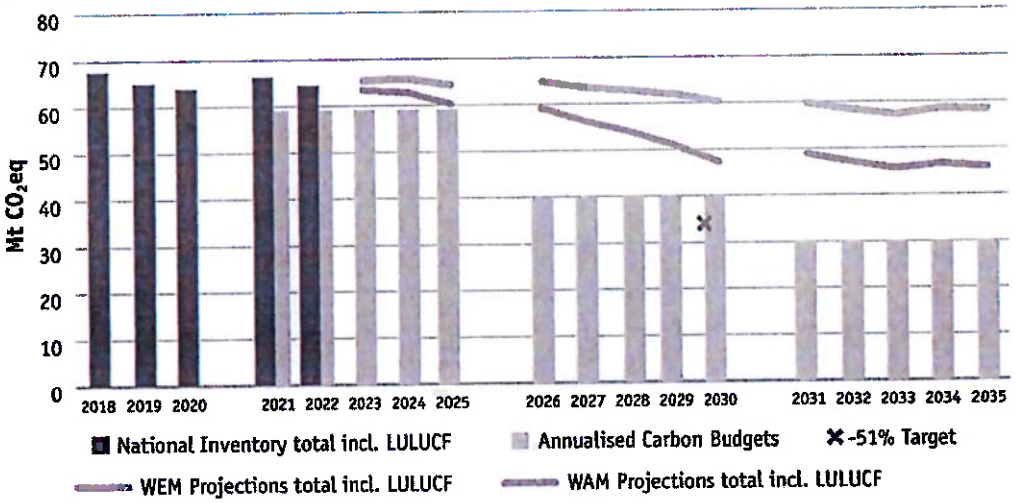
For Budget period 1 the latest EPA projections show that this is projected to be exceeded by 26 Mt CO_2 eq in the WEM scenario and 19 Mt CO_2 eq in the WAM scenario. Based on this assessment, Budget 2 from 2026-2030 is projected to be exceeded by 109 Mt CO_2 eq in the WEM scenario and by 67 Mt CO_2 eq in the WAM scenario. Budget 3 from 2031-2035 is projected to be exceeded by 143 Mt CO_2 eq in the WEM scenario and by 86 Mt CO_2 eq in the WAM scenario.

It is an obligation under the Climate Act that, where the total greenhouse gas emissions for a preceding budget period exceed the carbon budget for that period, the excess greenhouse gas emissions from the preceding budget period is carried forward to the next period. The carbon budget for the next period is then decreased by the amount carried forward.

Using the projections presented for Budget 1 from 2021-2025, Budget 2 from 2026-2030 would decrease by 26 Mt CO_2 eq in the WEM scenario to 174 Mt CO_2 eq, and decrease by 19 Mt CO_2 eq in the WAM scenario to 181 Mt CO_2 eq. With this carryover, Budget 2 is projected to be exceeded by 135 Mt CO_2 eq in the WEM scenario and by 85 Mt CO_2 eq in the WAM scenario. Consequently, far higher emissions reductions will be needed in order to comply with Budget periods 2 and 3.

Figure 4 shows the annualised carbon budgets and the extent to which these budgets are exceeded with the latest projected emissions data, both in the WEM and higher ambition WAM scenarios. For illustrative purposes the budget is split evenly within each period and the budget adjustment based on emissions carryover (as explained above) is not included. As the LULUCF sector is included in the carbon budgeting process, Figure 4 also includes LULUCF emissions and removals.

Figure 4: Annualised carbon budgets (2021-25, 2026-30 and 2031-35) and projected emissions data (Mt CO_2 eq) without potential emissions carry over under the *With Existing Measures* and *With Additional Measures* scenarios



4.2 Sectoral Emissions Ceilings and associated percentage change in emissions

Sectoral emissions ceilings[27] are a mechanism to assist with the achievement of Carbon Budgets and the ambition in the Climate Act 2021. Each sectoral ceiling has an associated percentage target change in emissions per sector (relative to 2018 levels). Sectoral ceilings are legally binding and set out the maximum amount of greenhouse gas emissions permitted in different sectors that align with Governmental responsibility. The sectors do not align exactly with the sectors reported under the EU reporting obligations[28] but can be mapped to them. The Electricity sector, for example, largely maps to the sector the EPA refers to as Energy Industries in reporting to the EU. There is no ceiling set for LULUCF, however the Climate Action Plan 2024 suggests that the target set in the LULUCF Regulations (2023)[29] will be adopted.

Table 1: Assessment of Achievement of Sectoral Percentage Targets under the *With Additional Measures* scenario

Sectors	Emissions 2018 (Mt CO_2 eq)	Projected Emissions 2030 (Mt CO_2 eq)	Percentage Reduction 2030 vs 2018	Target Reduction 2030 vs 2018
Electricity	10.3	3.5	-66%	~-75%
Transport	12.3	8.7	-29%	~-50%
Buildings (Residential)	7.0	4.2	-40%	~-40%
Buildings (Comm and Public)	1.5	0.6	-60%	~-45%
Industry	7.0	5.3	-24%	~-35%
Agriculture	23.2	19.1	-18%	~-25%
Other*	2.1	1.6	-25%	~-50%
LULUCF (no ceiling currently)	4.2	4.9	17%	N/A
Total with LULUCF**	67.6	48.0	-29%	-51%

* Waste, F-gases and Petroleum Refining

**National objective includes LULUCF

In percentage terms, Table 1 shows that in the WAM scenario the percentage reduction is not achieved for electricity, transport, industry, agriculture and other (comprises of waste, fluorinated-gases and petroleum refining). Looking at the overall percentage emissions reduction target of -51% by 2030 compared to 2018, the projections are indicating a significant shortfall with only a 29% reduction achieved.

Table 2 summarises the projected emissions against the Sectoral ceilings in million tonnes of CO_2 equivalent in the WAM scenario. The only sectoral ceilings projected to be achieved in the first budget period (2021-25) are the Buildings (Commercial and Public) sector, and the sector Other. For the second budget period (2026-30), compliance is also being projected only for these sectors.

27 https://www.gov.ie/en/publication/76864-sectoral-emissions-ceilings/

28 REGULATION (EU) 2018/ 1999 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL - of 11 December 2018 - on the Governance of the Energy Union and Climate Action

29 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02018R0841-20230511

Table 2: Assessment of Achievement of Sectoral Ceilings under the *With Additional Measures* Scenario

Sectors	Projected Emissions 2021-2025 (Mt CO_2 eq)	Sectoral Ceiling 2021-2025 (Mt CO_2 eq)	Projected Emissions 2026-2030 (Mt CO_2 eq)	Sectoral Ceiling 2026-2030 (Mt CO_2 eq)
Electricity	41	40	24	20
Transport	58	54	49	37
Buildings (Residential)	30	29	24	23
Buildings (Comm and Public)	7	7	5	5
Industry	33	30	30	24
Agriculture	113	106	100	96
Other*	9	9	8	8
LULUCF (no ceiling currently)	23		25	
Total with LULUCF**	314	295	267	200

* Waste, F-gases and Petroleum Refining

**National objective includes LULUCF

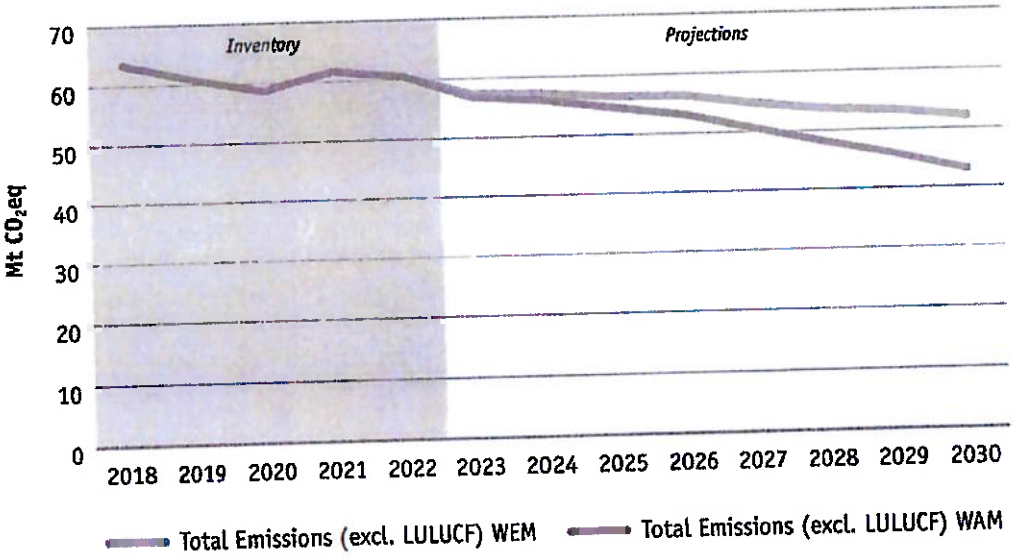
5 Sectoral Assessment of Projections out to 2030

This section aims to show the projected trends in total emissions and sectoral greenhouse gas emissions from the latest inventory year (2022) to 2030. As explained in the introduction the WAM scenario includes Government policies and measures that have not yet moved into implementation phase and it is a more ambitious scenario than the WEM.

The expected trend in total greenhouse gas emissions under both scenarios is shown in Figure 5. The difference between both scenarios is largely attributed to significant emissions reductions in key sectors such as power generation, residential, transport, commercial and public services and agriculture as a result of measures outlined in the Climate Action Plan 2024 and other policy documents such as Ag Climatise[30].

This is described in more detail for each sector throughout this section.

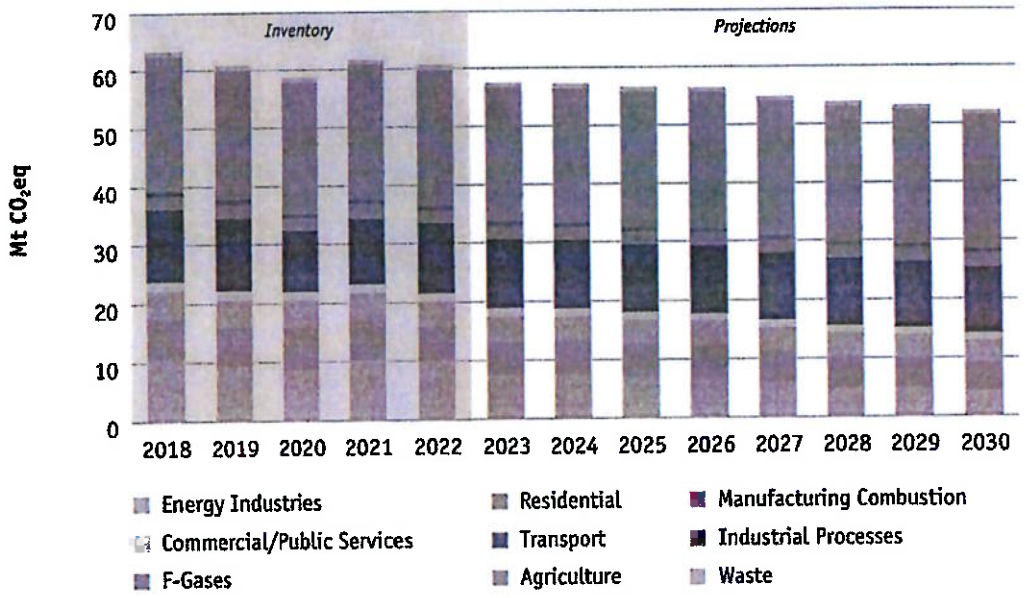
Figure 5: Total Greenhouse Gas Emissions (excluding LULUCF) under the *With Existing Measures* and *With Additional Measures* scenarios out to 2030



Total emissions by sector throughout the projected time-period under the WEM scenario is shown in Figure 6. In Figure 7 emissions in 2022 are compared with projected emissions in 2030 by sectoral share in both the WEM and WAM scenarios. Both Figures show that in 2022 three key sectors have the largest share of emissions: agriculture, energy industries and transport.

30 https://www.gov.ie/en/publication/07fbe-ag-climatise-a-roadmap-towards-climate-neutrality/

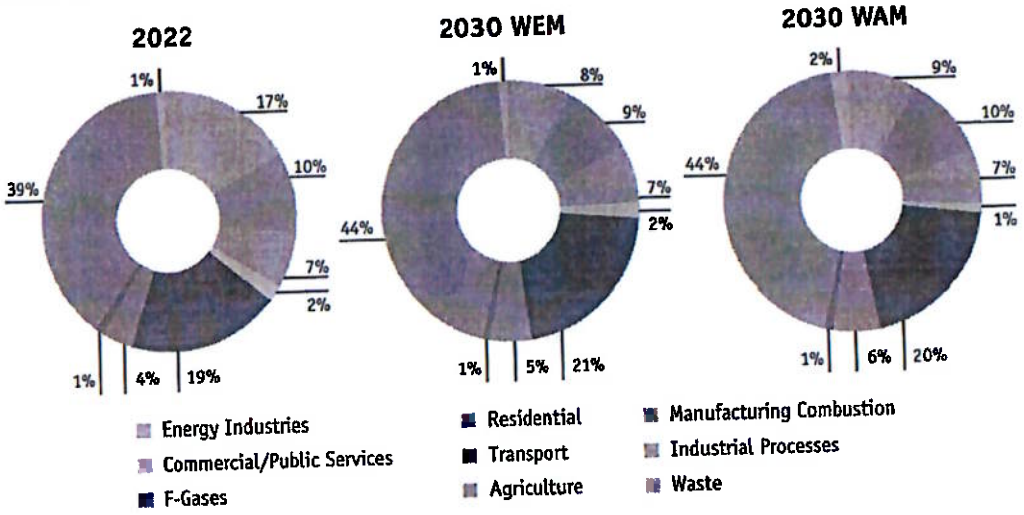
Figure 6: Total Greenhouse Gas Emissions Projections (excluding LULUCF) by sector out to the year 2030 under the WEM scenario



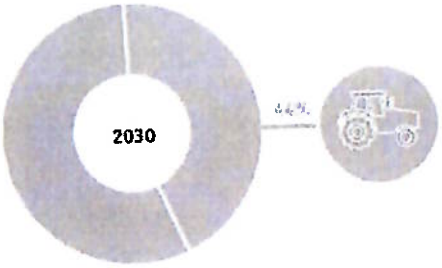
The agriculture and transport sectors remain the largest contributors of emissions in 2030 in both the WEM and WAM scenarios as a consequence of other sectors of the economy projected to decarbonise faster. Under the WEM scenario, emissions from agriculture and transport are projected to decrease by 1% and 5%, respectively. When we look at the more ambitious WAM scenario, agriculture and transport are projected to decrease by 18% and 26% respectively over the period 2022 to 2030.

The share of total emissions coming from the energy industries sector (mainly power generation) are projected to decline from 17% in 2022 to 8% in 2030 in the WEM scenario and to 9% in the WAM scenario. This reflects the projected ongoing phase out of coal, oil and gas usage in power generation, implementation of Ireland's renewable power generation production targets and increased electricity interconnection capacity.

Figure 7: Greenhouse Gas Emissions by sector share in 2022 (excluding LULUCF) and Projected Greenhouse Gas Emissions by sector share under the WEM and WAM scenario in 2030



5.1 Agriculture



Agriculture sector emissions arise from enteric fermentation (methane emissions arising from digestive process in livestock), manure management and nitrogen and urea application to soils. In addition, fuel combustion from agriculture, forestry and fishing is included. This sector contributed 39% of Ireland's total emissions in 2022 and is projected to rise to 44% by 2030 (in the WEM scenario). The WEM and WAM projections from 2023 to 2030 are described below and the projected trajectory for both scenarios is shown in Figure 8.

The data underpinning the agriculture projections are based on an updated analysis undertaken by Teagasc of the projected animal populations, crop areas and fertiliser use which are aligned with University of Missouri Food and Agricultural Policy Research Institute (FAPRI[31]) Projections (January 2024) for medium term developments in EU and World agricultural commodity markets. Measures from AgClimatise, Nitrates Action Plan, Teagasc MACC, and Climate Action Plan 2024 are included.

With Existing Measures scenario

Total emissions from agriculture (including fuel used in agriculture, forestry and fishing) are projected to decrease by only 1% over the period 2022-2030 from 23.4 to 23.1 Mt CO_2 eq under the WEM scenario (see Figure 8). The WEM scenario assumes that those measures for which there is legislative levers in place prior to the end of 2022 are included in the scenario. These include:

- The Nitrates Action Programme[32] includes actions on these measures such that all slurries on Nitrates derogation farms are required to be spread with Low Emission Spreading technologies (LESS). Current evidence shows that the use of LESS has penetrated to non-derogation farms. Therefore, the target

31 Agricultural Economics - Teagasc | Agriculture and Food Development Authority

32 https://assets.gov.ie/218449/f1a6725a-6269-442b-bff1-2730fe2dc06c.pdf

of 90% of slurries spread by LESS by 2027 as per AgClimatise is applied. Use of low emission slurry spreading for pigs has moved from planned (WAM) to implemented (WEM) and is 100% from 01/01/2023 as per the Nitrates Action Plan.

- The target for lime application of 2 Mt per annum by 2030 is reached (AgClimatise), including enhanced nutrient use efficiency as a result.
- Inhibited urea fertiliser use remains at current levels.

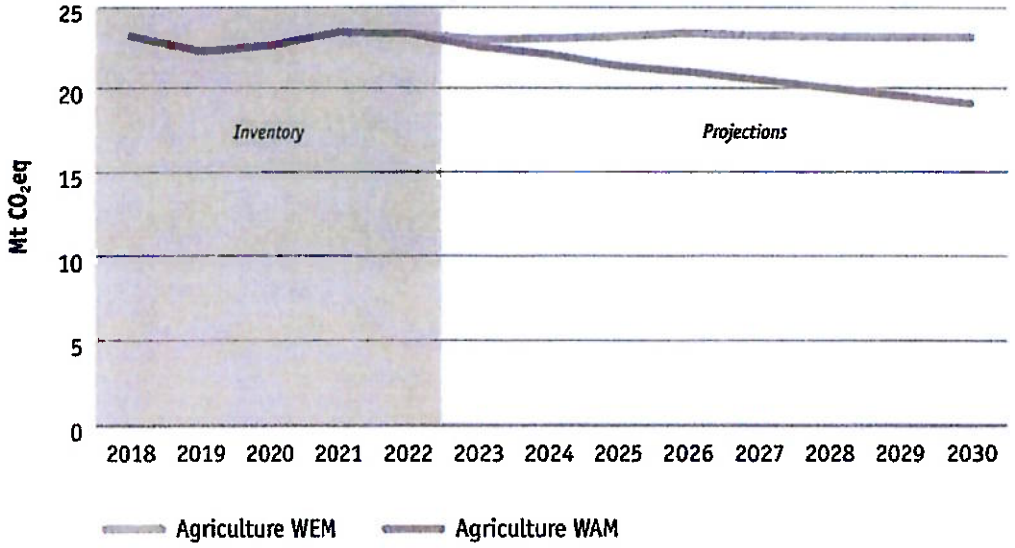
With Additional Measures scenario

Under the WAM scenario emissions are projected to decrease to 19.1 Mt CO_2 eq by 2030 which is an 18% reduction over the period 2022 to 2030. The WAM scenario assumes the WEM measures plus the measures outlined in Climate Action Plan 2024, the Teagasc GHG MACC, AgClimatise and Teagasc NH3 MACC are in place, these include:

- Reduction in crude protein in pig diets;
- All slurry stores (cattle and pig) to be covered by 2027;
- Drying of poultry manure;
- Further 1% reduction in the crude protein content of Dairy cow concentrates during grazing season;
- Increased adoption of protected urea, 80-90% uptake of protected urea on grassland farms by 2025 and 90-100% uptake by 2030;
- Limit sales of straight urea to 20,000 t per annum from 2025;
- Target fertiliser sales ceilings at 330 kt N by 2025 and 300 kt N by 2030;
- Methane reduction measures including slurry additives to reduce methane emissions, reduced slaughter age for beef cattle, reduced age to first calving, feed additives (cattle), dairy economic breeding index (EBI) optimization;
- Water Table Management (peat soils) to include 80kha of water table manipulation;
- 75kha of spring crops to have cover crops applied.

As detailed in Section 2, diversification measures in Agriculture with savings of 1.5 Mt CO_2 eq by 2030 are not included in the WAM scenario. Further information is needed to model an implementation pathway for these measures as they imply a reduction in herd numbers which will affect the quantification of all of the other proposed measures.

Figure 8: Greenhouse Gas Emissions Projections from the Agriculture Sector under the *With Existing Measures* and *With Additional Measures* scenarios out to 2030

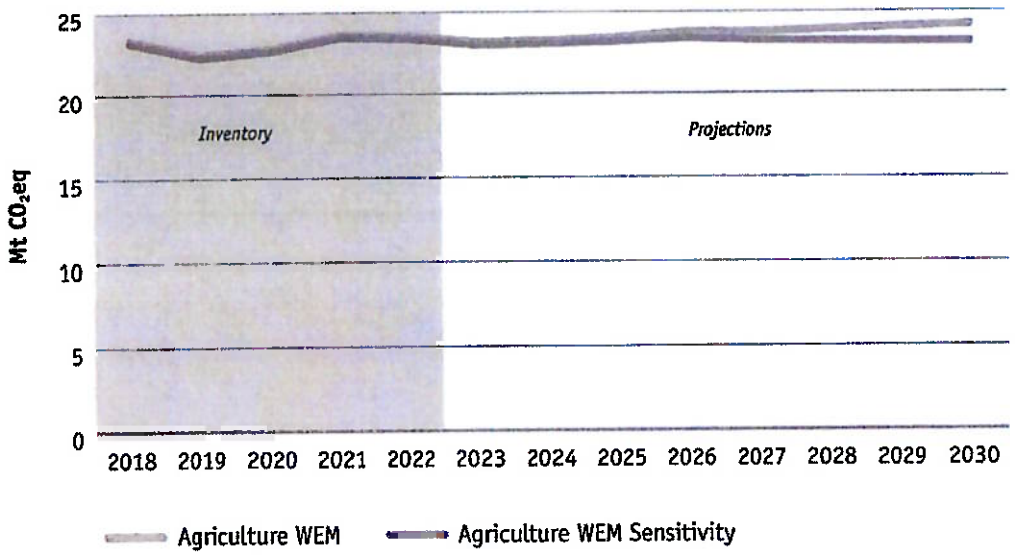


Sensitivity Analysis

A sensitivity analysis of the With Existing Measures emissions scenario has been undertaken for the agriculture emissions projections based on alternative projected activity data that assumes stronger growth in agricultural activity levels. The resulting alternative scenario is presented in Figure 9 alongside the WEM scenario. It shows that stronger growth would likely lead to higher emissions over the projected period.

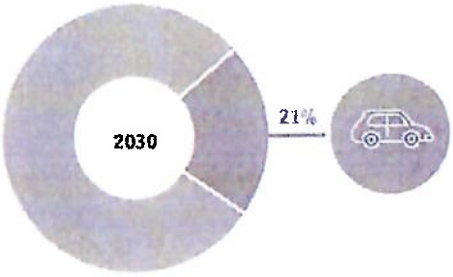
The sensitivity scenario examines the consequences of continued strong growth in the dairy herd accompanied by beef cow herd that is projected to contract at a slower rate than the rate of decline observed since the end of the milk quota regime in 2015. Under this sensitivity scenario, with stronger milk prices, Irish dairy cow numbers are projected to increase. Dairy cow numbers in 2030, under the sensitivity scenario, are projected to reach 1.743 million. This represents an 11% increase relative to 2022.

Figure 9: Sensitivity assessment of the Agriculture Sector under the *With Existing Measures* scenario out to 2030



5.2 Transport

The main source of emissions from the transport sector is road transport. Freight transport energy demand is strongly influenced by the level of commercial activity in the economy. Personal transport energy demand is significantly influenced by both the level of employment as well as the oil price. This sector also includes combustion of fuel used in rail, navigation, domestic aviation and pipeline gas transport. This sector is projected to contribute to 21% of Ireland's total emissions by 2030 in the WEM scenario.



The main policy instruments impacting transport emissions are the electrification of the vehicle fleet, an increase in the mix of renewable fuels in petrol and diesel at the pumps and 'avoid and shift' measures as detailed in Climate Action Plan 2024. Both WEM and WAM have differing levels of ambition in terms of the electric vehicle and biofuel targets. Increased ambition in terms of avoiding transport emissions and moving to sustainable transport is included in the WAM scenario only.

The latest projections indicate that the share of total road transport CO_2 emissions from Heavy Duty Vehicles (HDVs) and Light Goods Vehicles (LGVs) is projected to increase from approximately 43% in 2022 to 52% by 2030, and 87% by 2050 in the WAM. This is as a result of continued projected growth in demand for freight transport services as well as faster reduction of emissions from passenger cars.

With Existing Measures scenario

Under the WEM scenario, transport emissions are projected to decrease by 5% over the period 2022-2030 from 11.8 to 11.2 Mt CO_2 eq (see Figure 10). Measures included in the WEM scenario are:

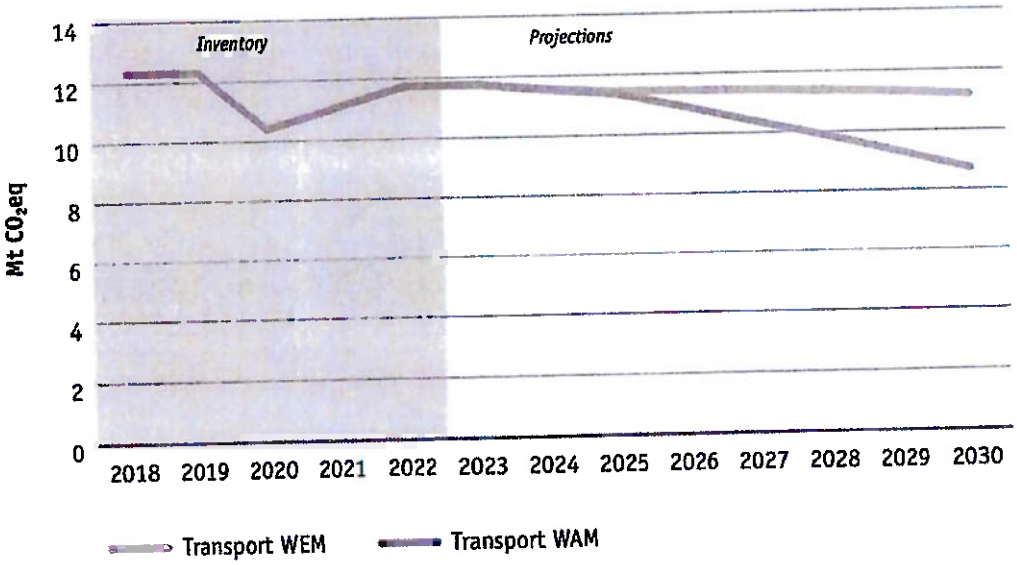
- A 10% blend for petrol and a 12% blend for diesel at the pumps by 2025 is assumed and blends remain at this level until 2030.
- For uptake of Electric Vehicles, the WEM scenario assumes approximately 693,000 electric vehicles on the road by 2030. This includes approximately 430,000 passenger battery electric vehicles and 263,000 passenger plug-in hybrid electric commercial vehicles.

With Additional Measures scenario

Under the WAM scenario, transport emissions are projected to decrease by 26% over the period 2022 to 2030 from 11.8 to 8.7 Mt CO_2 eq (see Figure 10). Measures in the WAM scenario include:

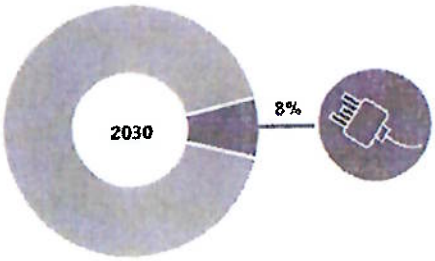
- It is assumed that incremental blend increases will occur reaching a 10% blend for petrol and a 20% blend for diesel at the pumps by 2030 as detailed in Climate Action Plan 2024;
- Uptake of electric vehicles up to 945,000 by 2030, as a result of the implementation of the Climate Action Plan 2024. This includes over 845,000 private electric vehicles.
- This scenario also includes a reduction in total vehicle kilometers to be achieved by behavioural and sustainable transport measures outlined in the Climate Action Plan 2024, such as a 50% increase in daily active travel journeys and a 130% increase in daily public transport journeys. As noted in Section 2, one of the modelled measures relating to fuel price increase as part of this behavioural change approach has no supporting policy and is not included in the EPA projections.

Figure 10 Greenhouse Gas Emissions Projections from the Transport Sector under the *With Existing Measures* and *With Additional Measures* scenarios out to 2030



The extent of the projected impact of ambitious additional policies and measures in the Climate Action Plan 2024 over the period can be seen in Figure 10, as well as the significant impact of COVID restrictions on transport emissions in 2020 and the rebound in 2021 and 2022.

5.3 Energy Industries



The majority of emissions within Energy Industries come from power generation and are largely regulated under the EU Emissions Trading Scheme (EU-ETS). In addition, emissions from the manufacture of solid fuels, petroleum refining (also largely included within EU-ETS) and fugitive emissions are included. This sector contributed 17% of Ireland's total emissions in 2022 and is projected to reduce to 8% in 2030 (in the WEM scenario). The projected trend in emissions from energy industries is shown in Figure 11.

Decarbonisation of power generation is a key measure in the Energy Industries sector, with the use of peat in power generation ceased in 2023 and the use of coal at Moneypoint to be phased out at the end of 2025. The majority of Ireland's non-renewable energy generation is projected to come from natural gas by 2030.

Preliminary analysis shows that there was a significant drop of almost 24% in emissions from electricity generation between 2022 and 2023. This was caused by a reduction in fossil fuel usage and an increase in net imports from interconnectors from 1% in 2022 to 9% in 2023 based on the first nine months of both years[33]. This step change in interconnector behaviour is set to increase into the near future but there is uncertainty in the longer term as importation of electricity from other countries outside the EU will require a carbon price to be paid under the EU's Carbon Border Adjustment Mechanism[34]. A Government Policy on Interconnection[35] was published in July 2023 and policy levers on interconnection are included in the WEM and WAM projections scenarios described below.

With Existing Measures scenario

Under the WEM scenario, emissions from the energy industries sector are projected to decrease by 57% from 10.1 to 4.4 Mt CO_2 eq over the period 2022 to 2030 (Figure 11). Measures in the WEM scenario include:

- Ireland reaching 69% of renewable electricity share by 2030. Renewable electricity generation capacity is dominated by wind and solar sources;
- In terms of inter-connection, the WEM scenario has the Greenlink 500 MW interconnector to the UK coming on stream in January 2025 and the Celtic 700 MW interconnector to France on stream in January 2027. The scenario also includes an increase in capacity of the existing North-South Interconnector to 1,350 MW from 2026;
- New 1.3 GW of net gas-fired generation capacity added by 2030.

With Additional Measures scenario

Under the WAM scenario, emissions from the energy industries sector are projected to decrease by 62% from 10.1 to 3.9 Mt CO_2 eq over the period 2022 to 2030 (Figure 11). In addition to the WEM measures, the WAM scenario includes:

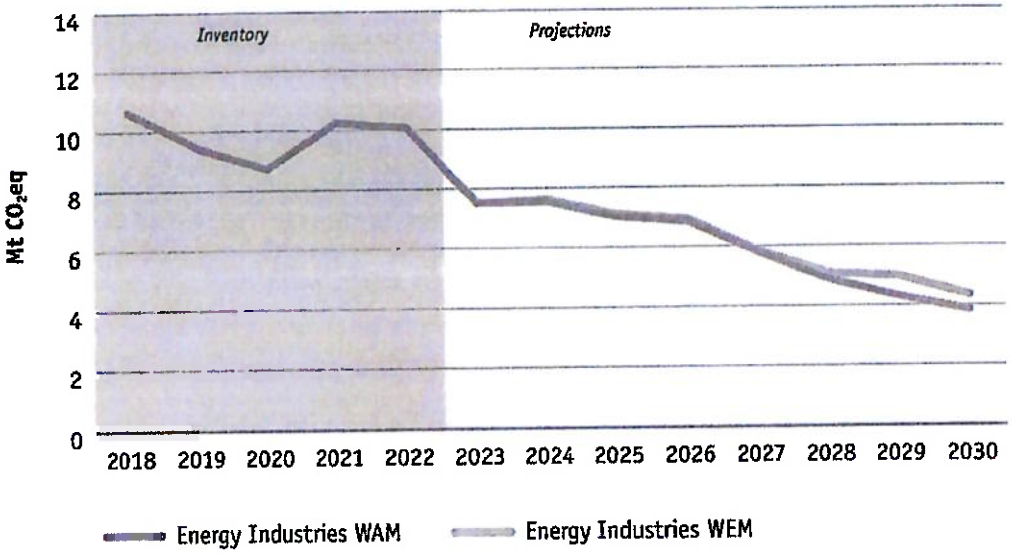
- A renewable electricity share of 80% by 2030 (as set out in the Climate Action Plan 2024), mainly a result of further and rapid expansion in wind and solar energy;
- Production of up to 5.7 TWh of Biomethane by 2030;
- Additional interconnection LirIC (700 MW) between Northern Ireland and Scotland, and MARES Connect (750 MW) between Ireland and Wales.

33 https://www.seai.ie/publications/Energy-in-Ireland-2023.pdf

34 EU Carbon Border Adjustment Mechanism | Environmental Protection Agency (epa.ie)

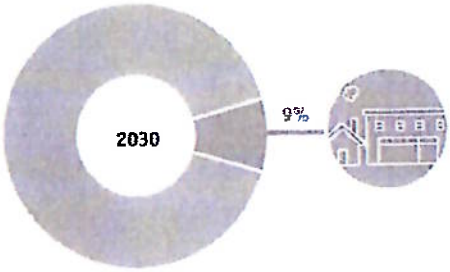
35 gov - National Policy Statement on Electricity Interconnection 2023 (www.gov.ie)

Figure 11: Greenhouse Gas Emissions Projections from the Energy Industries Sector under the *With Existing Measures* and *With Additional Measures* scenarios out to 2030



5.4 Residential

Emissions from the Residential Sector arise from fuel combustion for domestic space and hot water heating such as natural gas, oil, coal and peat. Residential energy demand is influenced by the weather and fuel prices. This sector contributed 10% of Ireland's total emissions in 2022. By 2030 emissions from the residential sector are projected to reduce to 9% of Ireland's total emissions (in the *With Existing Measures* scenario). The WEM and WAM projections for residential emissions are described below.



With Existing Measures scenario

Under the WEM scenario, emissions from the residential sector are projected to decrease by 15% between 2022 and 2030 from 5.8 to 4.9 Mt CO_2 eq (Figure 12).

The *With Existing Measures* scenario assumes the following:

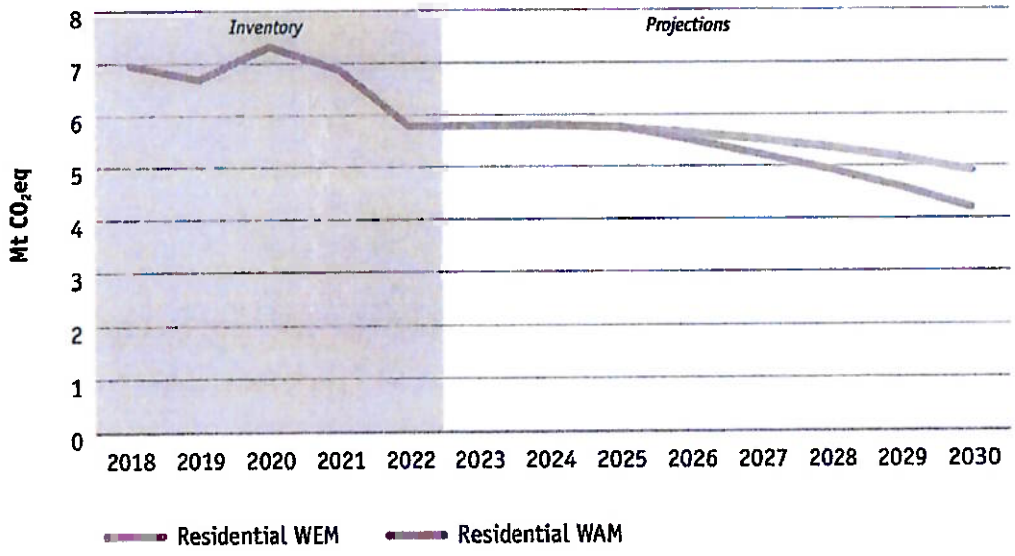
- Domestic heat pump uptake based on grant rates as of February 2022 (funded by National Development Plan 2021-2030 allocation) and, an 'effective' ban on oil boilers (from 2022) and gas boilers (from 2025) in new dwellings;
- Implementation of a range of residential energy efficiency programmes in line with the National Development Plan and the impact of building regulations. These programmes provide funding for renewable heating systems, attic and wall insulation and other energy efficiency upgrades for private households and communities;
- Expected completion of two district heating schemes currently under development with a combined capacity of 0.075 TWh by 2030.

With Additional Measures scenario

Under the WAM scenario, emissions are projected to decrease by 27% between 2022 and 2030 from 5.8 to 4.2 Mt CO_2 eq (Figure 12). This scenario assumes full implementation of the relevant WEM scenario and relevant measures in the Climate Action Plan 2024 (with the exception of biomethane), these include:

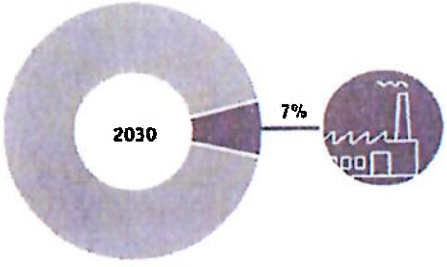
- The installation of 680,000 heat pumps by 2030 (400,000 in existing homes and 280,000 in new homes);
- Residential Energy Efficiency programmes involving upgrades to homes, and retrofits to achieve the cost optimal equivalent of a BER 'B2' rating in 500,000 dwellings by 2030;
- District heating growth to 1.2 TWh in 2030 in the Residential sector. The remaining 1.5 TWh of the full 2.7 TWh outlined in the Climate Action Plan 2024 is allocated to the Commercial and Public Services Sector (see Section 5.6);
- An effective ban on fossil fuel boilers in existing residential buildings after 2031 based on advancing the energy and carbon performance requirements of the Building Regulations as indicated in the Climate Action Plan 2024.

Figure 12: Greenhouse Gas Emissions Projections from the Residential Sector under the *With Existing Measures and With Additional Measures* scenarios out to 2030



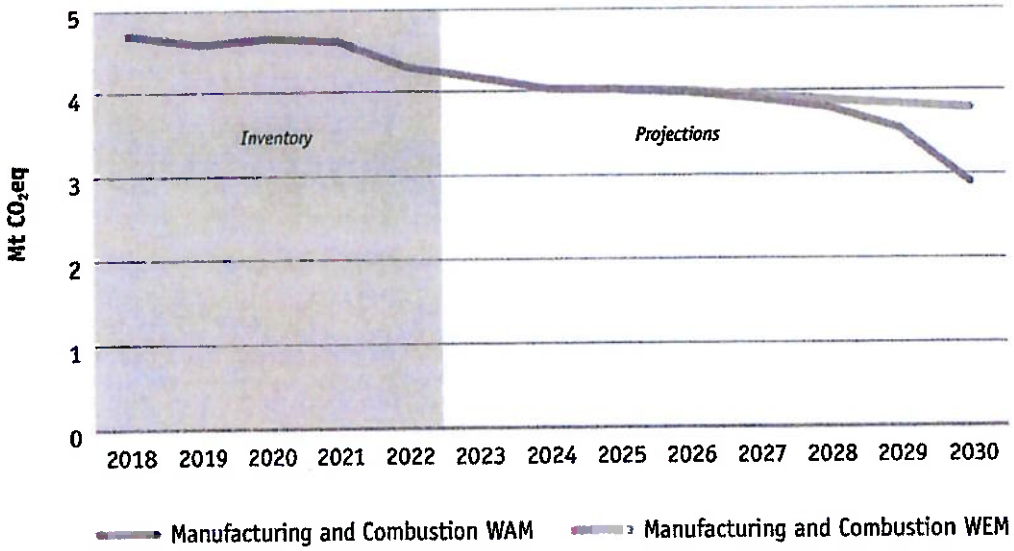
5.5 Manufacturing Combustion

Emissions from this sector arise from fuel combustion used in manufacturing industries in Ireland. It also includes combustion for combined heat and power systems for own-use in these industries. Fuel combustion in manufacturing contributed 7% of Ireland's total emissions in 2022. This is projected to remain the same in 2030 (in the *With Existing Measures* scenario).



The projected trajectory of emissions from the manufacturing combustion sector from 2022 to 2030 is shown in Figure 13. The WEM and WAM projections are described below.

Figure 13: Greenhouse Gas Emissions Projections from the Manufacturing Combustion Sector under the *With Existing Measures* and *With Additional Measures* scenarios out to 2030



With Existing Measures scenario

Under the WEM scenario, emissions from manufacturing combustion are projected to reduce by 12% between 2022 and 2030, from 4.3 to 3.8 Mt CO_2 eq (Figure 13).

This scenario assumes implementation of existing energy efficiency programmes such as SEAI's Large Industry Programme (to maintain strong energy management and environmental protection practices in industry), Accelerated Capital Allowances programme (aims to improve the energy efficiency of Irish companies by encouraging them to purchase energy saving technologies) and the Excellence in Energy Efficiency Design programme (EXEED), a process for energy efficiency design management in businesses.

With Additional Measures scenario

Under the WAM scenario, emissions from manufacturing combustion are projected to decrease by 32% from 4.3 to 2.9 Mt CO_2 eq between 2022 and 2030 (Figure 13). This scenario assumes further roll out of energy efficiency programmes including those listed above. It also includes:

- As indicated in the Climate Action Plan 2024, a total of 5.7 TWh of biomethane use across the heat sector by 2030 (split between Commercial/Public Services and Manufacturing Combustion for these Projections);
- An increase in carbon-neutral heating in low and high temperature heat in Manufacturing and Industry.

5.6 Commercial and Public Services

Emissions from the Commercial and Public Services Sector arise from fuel combustion for space and hot water heating. This sector contributed 2% of Ireland's total emissions in 2022 and is projected to maintain this proportion out to 2030 (in the WEM scenario). The projected trajectory of emissions from the commercial and public services sector from 2022 to 2030 is shown in Figure 14. The WEM and WAM projections are described below.

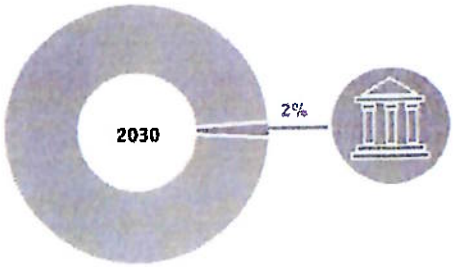
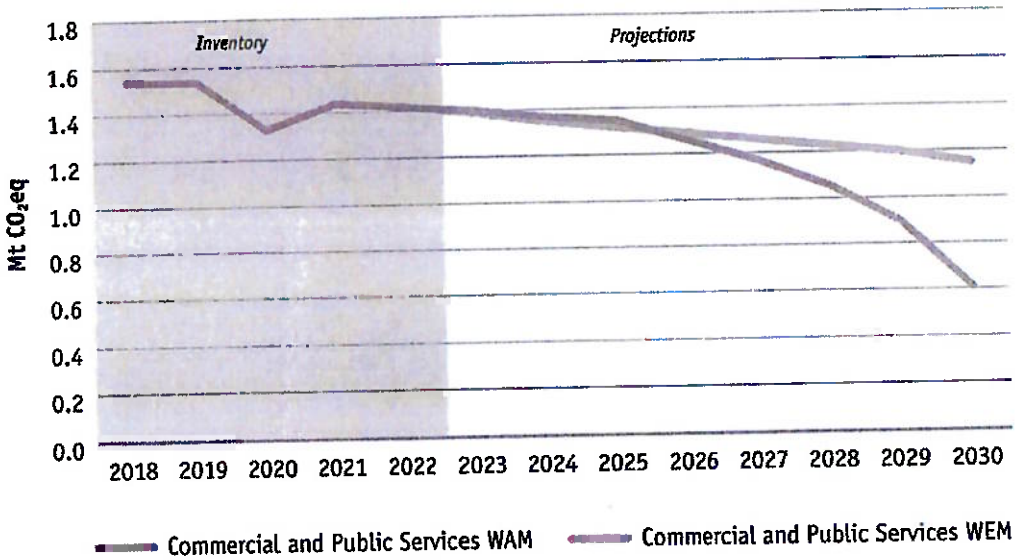


Figure 14: Greenhouse Gas Emissions Projections from the Commercial and Public Services Sector under the *With Existing Measures* and *With Additional Measures* scenarios out to 2030



With Existing Measures scenario

Under the WEM scenario, emissions from the commercial and public services sector are projected to decrease by 19% between 2022 and 2030 from 1.4 to 1.2 Mt CO_2 eq (Figure 14).

- This scenario assumes implementation of a range of energy efficiency programmes including retrofit of public building stock, with a focus on decarbonisation through schemes such as the Support Scheme for Renewable Heat and Public Sector Capital Exemplars.

With Additional Measures scenario

Under the WAM scenario, emissions from the commercial and public services sector are projected to decrease by 57% between 2022 and 2030 from 1.4 to 0.6 Mt CO_2 eq (Figure 14).

- This scenario assumes implementation of a range of energy efficiency programmes including the retrofit of public building stock and commercial buildings with a focus on decarbonisation and the Energy Performance Contract scheme (introduced from 2024 to 2030).
- As indicated in the Climate Action Plan 2024; a total of 5.7 TWh of biomethane use across the heat sector by 2030 (split between Commercial/Public Services and Manufacturing Combustion for these Projections).

- This scenario includes district heating growth to 1.5 TWh in 2030 in the Commercial and Public Services sector. The remaining 1.2 TWh of the full 2.7 TWh outlined in the Climate Action Plan 2023 is allocated to the Residential Sector (see Section 5.4).
- An effective ban on fossil fuel boilers in new non-residential buildings after 2030 based on advancing the energy and carbon performance requirements of the Building Regulations as indicated in the Climate Action Plan 2024.

5.7 Other (Industrial Processes, Waste, F-Gases)

The Industrial Processes and Waste sectors contributed 4% and 1% of Ireland's total emissions in 2022 respectively:

- Emissions from Industrial Processes include process emissions from mineral, chemical, metal industries, non-energy products and solvents. Emissions are projected to increase by 4% between 2022 and 2030 from 2.3 to 2.4 Mt CO_2 eq. The majority of emissions come from the production of cement and lime and the projections are based on growth forecasts from the cement industry in Ireland.
- Waste sector emissions are projected to decrease by 23% between 2022 and 2030 from 0.9 to 0.7 Mt CO_2 eq. The waste sector includes landfill, incineration and open burning of waste, mechanical and biological treatment and wastewater treatment. Emissions are primarily attributable to methane emissions from landfill which reduce over the projected period in line with the projected reduction in waste going to landfill and the age of the waste already placed in them. The amount of landfill gas flared and utilised for energy production is 57% in 2022 and is projected to decrease to 51% in 2030 and 40% by 2050 in line with more recent trends in the latest inventory. Ireland's landfill rate for municipal waste dropped to 16% in 2021, reflecting a steep decline from 80% in 2001 and is on track to comply with the Landfill Directive target of less than 10% of Municipal waste landfilled by 2035.

Fluorinated gases (F-gases) accounted for 1% of Ireland's total national greenhouse gas emissions in 2022. The key sources of fluorinated gas emissions in Ireland are production, use and disposal of equipment containing these fluids (e.g. refrigerators, mobile air conditioning systems, heat pumps and electrical switch-gear).

With Existing Measures scenario

Fluorinated-Gas (F-Gas) emissions are projected to decrease by 17% from 0.74 to 0.61 Mt CO_2 eq between 2022 and 2030 under the With Existing Measures scenario. This is largely due to the move away from mobile air-conditioning systems in vehicles that contain F-Gases with a high global warming potential.

With Additional Measures scenario

Emissions are projected to reduce by 16% between 2022 and 2030 from 0.74 to 0.62 Mt CO_2 eq under the WAM scenario. The results show that in the more ambitious WAM scenario fluorinated-gas emissions are slightly higher than in the WEM scenario by 2030. The reason for this is the different projected uptake rates in heat pumps in each scenario. In the WAM scenario the number of heat pumps being deployed annually is 36% higher than the number in the WEM scenario by 2030. The switch to lower Global Warming Potential gas (R32) in heat pumps and air conditioning units over the projected period in the WAM scenario means that despite this large increase in heat pump numbers, the increase in GHG emissions is small.

5.8 LULUCF

The LULUCF sector is made up of six land use categories (Forest Land, Cropland, Grassland, Wetlands, Settlements, and Other Land) and Harvested Wood Products. These categories are sub-divided into land remaining in the same category (e.g. forest land remaining forest land) and land converted from one category into another (e.g. grassland converted to forest land).

LULUCF historically has not been included in the published national emission totals unless explicitly stated but is reported in submissions to the EU and the United Nations. Its inclusion as a sector in this projections report reflects the inclusion of the LULUCF sector within the scope of Ireland's National climate targets.

In 2022 LULUCF accounted for 6% of total national emissions. Emission estimates across the full time series of this sector are now lower than the values presented in last year's projections report reflecting recalculations made in the sector as a result of new scientific research on emissions from grasslands and wetlands. Details on the recalculations in LULUCF can be found in Chapters 6 and 10 of Ireland's National Inventory Report 2024[36].

In addition, the LULUCF Regulation[24] was amended in 2023 to include specific "net removal" targets for each Member State for the second phase of reporting from 2026-2030. Ireland's binding country-specific target by the end of this second phase is to reduce net LULUCF emissions by 626 kt CO_2 eq, below an average of 2016, 2017 and 2018 emissions for this sector, to reach a currently estimated target of 3.7 Mt CO_2eq. While, compliance with this target in WEM and WAM projections is assessed below, it should be noted that under the LULUCF Regulation the target will be updated with latest data across two compliance checks in 2025 and 2032.

With Existing Measures scenario

Under the WEM scenario, emissions from the LULUCF sector are projected to almost double between 2022 and 2030 with net emissions in 2030 of 7.9 Mt CO_2 eq. This 99.4% increase is largely due to projected forest harvesting given an aging forest estate (Figure 15) and will exceed our current LULUCF Regulation target by 4.2 Mt CO_2eq.

The WEM scenario assumes that measures for which there are legislative levers in place prior to the end of 2022 are included, these are:

- Savings associated with Bord na Móna rewetting/restoration/rehabilitation under the Peatlands Climate Action Scheme (PCAS).
- The WEM scenario also assumes that afforestation rates are consistent with current practice which are 2,000 hectares per annum.

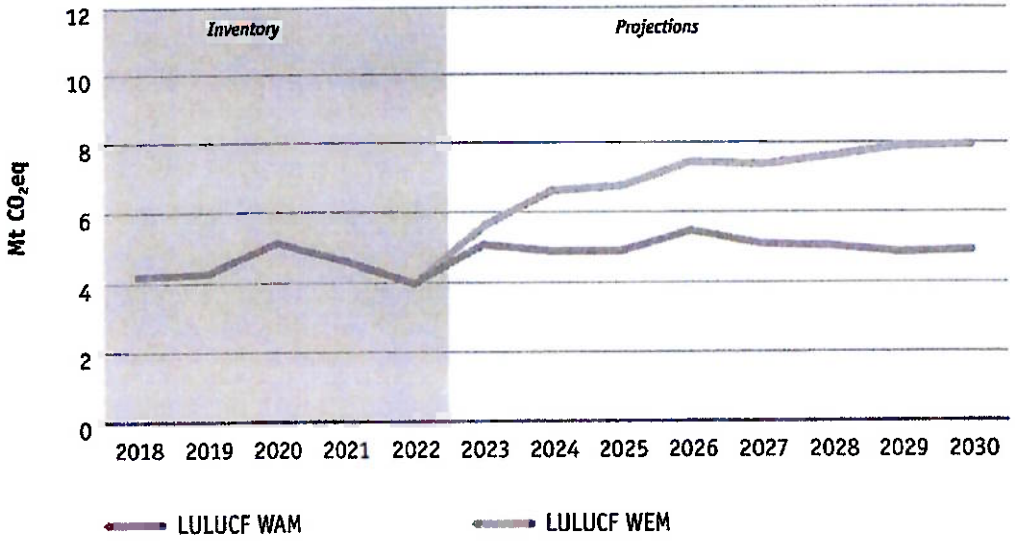
With Additional Measures scenario

Under the WAM scenario, emissions from the LULUCF sector are projected to increase by 23% between 2022 and 2030 with net emissions in 2030 of 4.9 Mt CO_2 eq (Figure 15), exceeding our current LULUCF Regulation target by 1.35 Mt CO_2 eq. The WAM scenario assumes that the measures outlined in the Climate Action Plan 2024 are implemented, including:

- Afforestation rates increased to 8,000 hectares per annum from 2026-2030;
- Water table management on 80,000 hectares of grassland on drained organic soils and improved management of 750,000 hectares grassland on mineral soils;
- Use of cover crops and straw incorporation on cropland;
- Additional wetlands rewetted, restored, and rehabilitated over and above those included in PCAS.

36 https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/irelands-national-inventory-submissions-2024.php

Figure 15: Greenhouse Gas Emissions Projections from the LULUCF Sector under the *With Existing Measures* and *With Additional Measures* scenarios out to 2030



Appendix – Underlying Assumptions and Additional Data

Sectoral Breakdown

Ireland's Greenhouse Gas Emission Sectors are categorised as the following for analysis:

1. Energy Industries (electricity generation, waste to energy incineration, oil refining, briquetting manufacture and fugitive emissions);
2. Residential (combustion for domestic space and hot water heating);
3. Manufacturing Combustion (combustion for Manufacturing industries in EU-ETS and ESR);
4. Commercial and Public Services (combustion for Commercial and Public Services space and hot water heating);
5. Transport (combustion of fuel used in road, rail, navigation, domestic aviation and pipeline gas transport);
6. Industrial Processes (process emissions from mineral, chemical, metal industries, non-energy products and solvents);
7. F-Gases (gases used in refrigeration, air conditioning and semiconductor manufacture);
8. Agriculture (emissions from fertiliser application, ruminant digestion, manure management, agricultural soils and fuel used in agriculture/forestry/fishing);
9. Waste (emissions from solid waste disposal on land, solid waste treatment (composting), wastewater treatment, waste incineration and open burning of waste);
10. Land Use, Land-use Change and Forestry (LULUCF) covers the following categories; Forest land, Cropland, Grassland, Wetlands, Settlements, Other land and Harvested Wood products.

Scenarios and Input Assumptions

Two emissions projections scenarios are presented which show two potential outlooks to 2050 depending on policy development and implementation. These are called:

- *With Existing Measures*
- *With Additional Measures*

The *With Existing Measures* (WEM) scenario is based primarily on SEAI's Baseline energy projection which incorporates the anticipated impact of policies and measures that were in place (and legislatively provided for) by the end of 2022.

The *With Additional Measures* (WAM) scenario is based primarily on SEAI's energy projection that accounts for implementation of the With Existing Measures scenario as well as planned policies and measures. Energy demand projections underpinning the latest emissions projections were prepared by SEAI in conjunction with the Economic and Social Research Institute (ESRI). The ESRI produce energy demand projections using the I3E model[37] (Ireland Environment, Energy and Economy model). Future international fossil fuel prices are given as input to the I3E model. In the case of the energy related projections described in this document the fuel price assumptions use European Commission recommended harmonised trajectories. A varying carbon tax that increases by €7.50 per annum and reaches €100 per tonne by 2030 and is constant thereafter is used in both scenarios. The recommended EU-ETS carbon prices are based on the EU Reference Scenario. Energy Projections for WEM transport activity are based on projections of private car and goods vehicle activity from the National Transport Authority's (NTA) Reference Case scenario for 2030. Fuel price assumptions are implicit in the NTA Reference Case scenario modelling. For the WAM scenario these projections align with the NTA CAP23 scenario and do not assume any reduction in transport activity due to fuel price changes.

To produce the finalised WEM energy projections, SEAI amends the output of the energy demand produced by ESRI to take account of the expected impact of energy efficiency measures put in place before the end

37 https://www.esri.ie/current-research/the-i3e-model

of 2022 but which are considered too recent to be detectable in any time-series analysis. The WAM energy projections builds on the WEM projections with adjustments made to account for implementation of additional policies and measures outlined in the Climate Action Plan 2024.

Key parameters underlying the macroeconomic outlook and therefore the With Existing Measures and With Additional Measures emission projections scenarios are shown in Table A.1.

Table A.1 Key macroeconomic assumptions underlying the projections out to 2050

	2023	2025	2030	2035	2040	2045	2050
	Average Annual % Growth Rate						
GNI*	-4.4	3.1	3.0	3.2	3.2	3.2	3.3
	2022	2025	2030	2035	2040	2045	2050
Housing Stock ('000)	1,944	1,995	2,165	2,308	2,450	2,590	2,728
Population ('000)	4,962	5,043	5,250	5,466	5,690	5,924	6,166
EUETS: Carbon €/tCO_2	82	82	82	84	87	133	164
Carbon tax €/tCO_2 (WEM Scenario)	48.5	63.5	100	100	100	100	100
Coal €/toe	146	128	130	131	139	146	153
Oil €/toe	442	643	643	643	680	738	824
Gas €/toe	389	554	473	473	473	473	494
Peat €/MWh	25	25	25	25	25	25	25

* Modified GNI

Progress with Renewable Energy Targets

The following is the expected progress by 2030 in terms of Renewable Energy targets under the *With Existing Measures* Scenario:

- 68.9% renewable electricity (RES-E) share
- 21.7% renewable heat (RES-H) share
- 15.0% renewable transport (RES-T) share
- 31.0% Overall Renewable Energy (RES) share

The following is the expected progress by 2030 in terms of Renewable Energy targets under the *With Additional Measures* Scenario:

- 80.1% renewable electricity (RES-E) share
- 36.6% renewable heat (RES-H) share
- 19.1% renewable transport (RES-T) share
- 42.7% Overall Renewable Energy (RES) share

The above information is based on model input assumptions underpinning the energy projections provided by the SEAI.

The data underpinning the agriculture projections are based on an updated analysis undertaken by Teagasc of the projected animal populations, crop areas and fertiliser use which are aligned with University of Missouri Food and Agricultural Policy Research Institute (FAPRI[38]) Projections (January 2024) for medium term developments in EU and World agricultural commodity markets. Measures from AgClimatise, Nitrates Action Plan, Teagasc MACC, and Climate Action Plan 2024 are included.

38 Agricultural Economics - Teagasc | Agriculture and Food Development Authority

Effort Sharing Regulation and EU Emissions Trading Scheme

The breakdown of historical and projected emissions for the Effort Sharing Regulation (also referred to as the non-ETS) and EU-ETS sectors (Mt CO_2 eq) under the With Existing Measures and With Additional Measures scenarios is shown in Table A.2.

Table A.2: Historical and projected emissions for the non-ETS and ETS sectors (kt CO2 eq) for *With Existing Measures* and *With Additional Measures* scenarios

		Non-ETS sector	ETS sector	Total
Historical	2005	48,816	22,398	71,214
	2010	45,406	17,354	62,760
	2015	44,606	16,841	61,448
	2020	45,436	13,310	58,746
	2021	46,418	15,337	61,755
	2022	45,898	14,707	60,605
Projected		*With Existing Measures scenario*		
	2023	45,466	11,928	57,394
	2025	45,070	11,473	56,544
	2030	43,467	8,701	52,168
	2035	39,988	8,713	48,701
	2040	37,011	7,915	44,926
	2045	35,348	8,093	43,441
	2050	34,918	7,730	42,648
		With Additional Measures scenario		
	2023	45,031	11,928	56,959
	2025	43,267	11,390	54,657
	2030	35,559	7,540	43,099
	2035	31,450	7,406	38,856
	2040	28,241	6,079	34,320
	2045	27,057	5,832	32,889
	2050	26,760	5,400	32,160

Projections by Gas in the WEM and WAM Scenarios

Figure A1: Share of emissions by gas (excluding LULUCF) in 2022 and projected share of emissions by gas in 2030 under the WEM and WAM scenarios

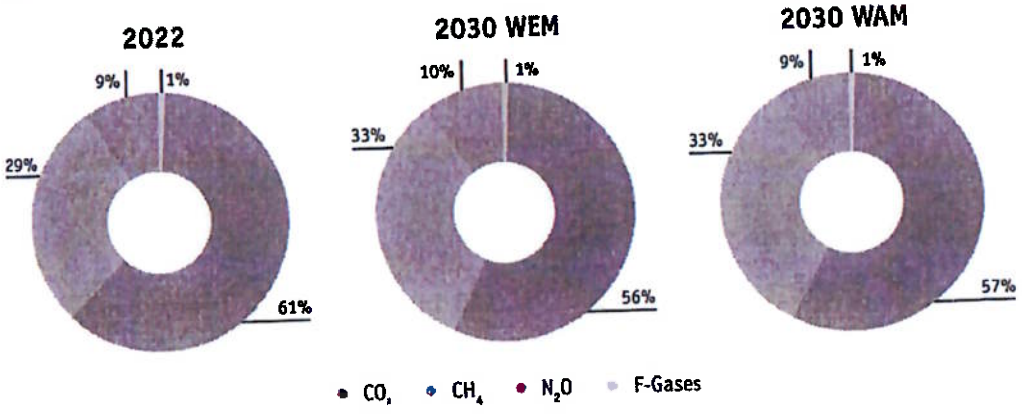
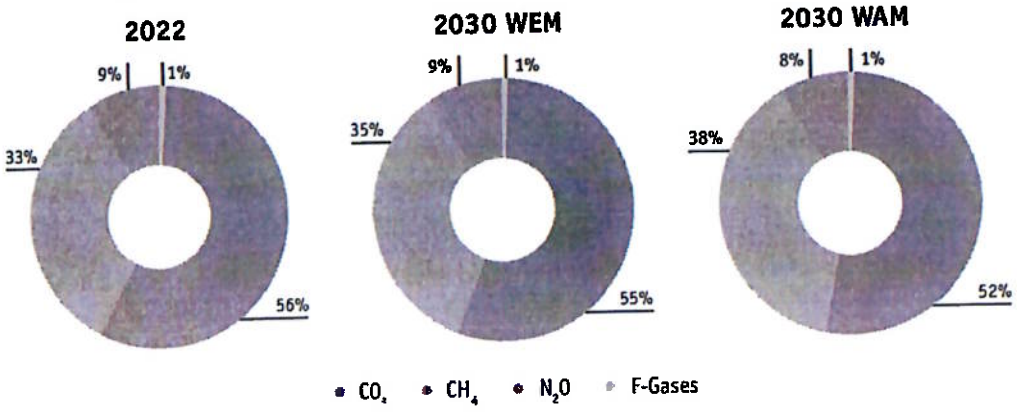
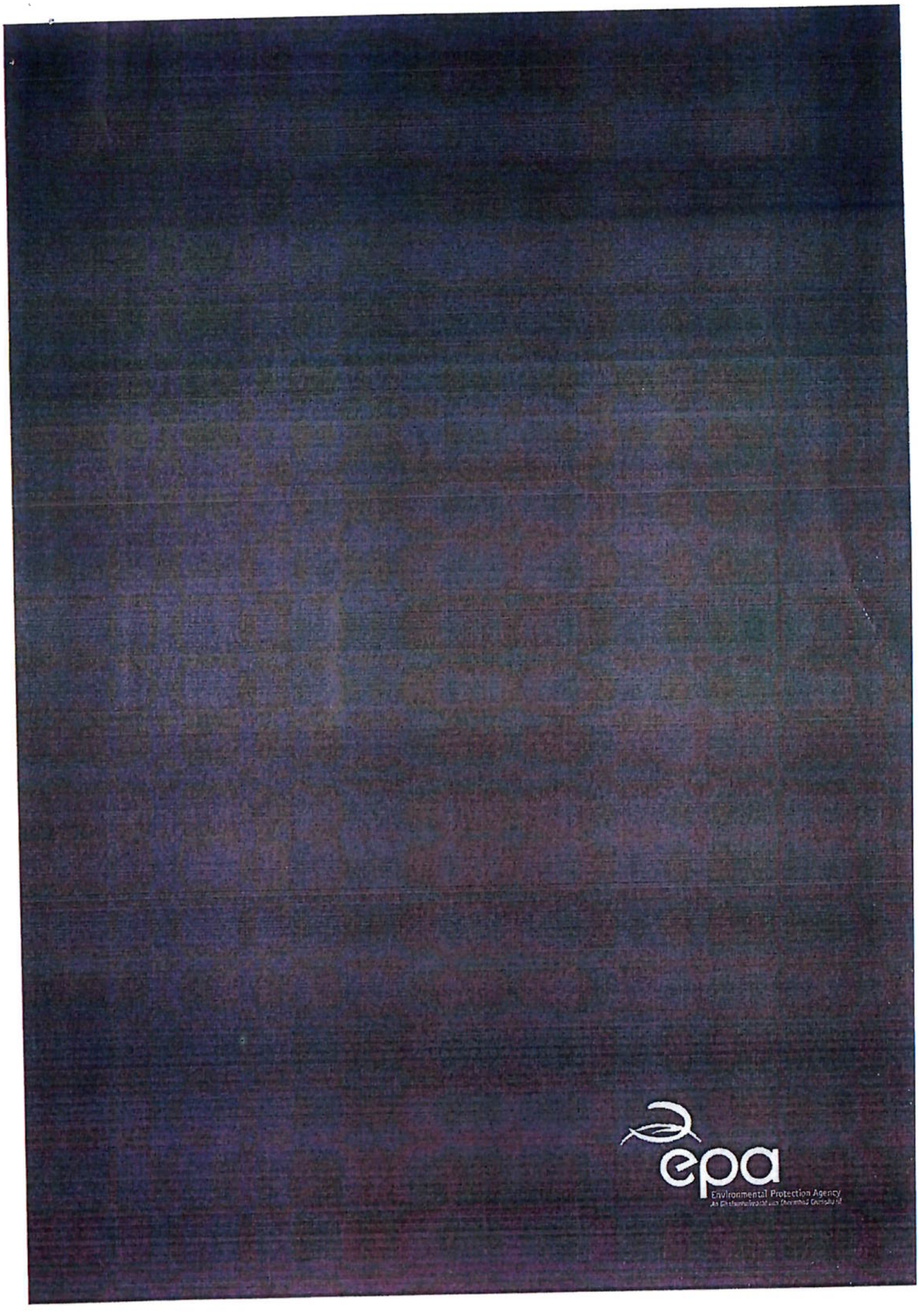


Figure A2: Share of emissions by gas (including LULUCF) in 2022 and projected share of emissions by gas in 2030 under the WEM and WAM scenarios



Models Used

Further details on the models used for preparing the energy projections (i.e. I3E, Plexos Integrated Energy Model, SEAI National Energy Modelling Framework, SEAI BioHeat Model) are included in the 2024 submission made under Article 18 of Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action. This is available in relevant 2023 submission folders at the following link: **https://reportnet.europa.eu/public/dataflows**


epa
Environmental Protection Agency

APPENDIX 2 – AWN CONSULTING RESPONSE TO COLIN DOYLE FURTHER SUBMISSION

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TECHNICAL NOTE

Project	**DUB098/108/601**
Subject	**Response To Submission From Colin Doyle**
Author	**Dr. Edward Porter**
Date	**21/04/2024**
Ref.	**EP/227501.0284AT03**

The enclosed technical note is a response to the issues raised in relation to the submission to An Bord Pleanála dated 28th May 2024 from Colin Doyle.

The submission from Colin Doyle focusses on the recently published EPA Report entitled "*Ireland's Greenhouse Gas Emissions Projections - 2023-2050*" (EPA, May 2024). This response to the submission discusses the Proposed Development in the context of the relevant Carbon Budgets and the Electricity Sectoral Emission Ceilings, as outlined in Figure 4 and Table 1, respectively, of the EPA Report (EPA, May 2024) and in the context of Section 15 of the *Climate Action and Low Carbon Development (Amendment) Act 2021*.

Kind regards

Dr. Edward Porter
AWN Consulting

Response To Submission From Colin Doyle Dated 28th May 2024

Introduction

1. Chapter 9 of the Environmental Impact Assessment (EIAR) undertook a detailed assessment of the predicted climatic impact of the Proposed Development and of the Overall Project (i.e. the Proposed Development and existing / permitted / potential future development on the wider landholding) in the context of the EU ETS (Emission Trading System). The Addendum to Chapter 9 submitted as part of the further information response built on Chapter 9 of the EIAR and was updated to incorporate the new IEMA Guidance - *Assessing Greenhouse Gas Emissions and Evaluating their Significance 2nd Edition* (IEMA, 2022). The Addendum also framed the impact of the Proposed Development and Overall Project in the context of the Sectoral Emission Ceilings. The addendum confirmed, as outlined in Section 7.2.4 of the addendum, that through a series of measures including project replacement, a reduction in residual emissions through best practice and the implementation of a series of adaptive design measures, the net impact of the Proposed Development and the Overall Project is not significant. Given that the use of electricity to power the facility will achieve net zero by 2050 and the commitment to offset all interim fossil fuel derived GHG emissions by the purchase of Corporate Power Purchase Agreements (CPPAs) the predicted impact to climate is deemed to be indirect, long-term, negative and minor adverse.
2. This technical note is a response to the issues raised in relation to the submission to An Bord Pleanála dated 28th May 2024 from Colin Doyle in which he raises some concerns in the context of the recently published EPA Report entitled "*Ireland's Greenhouse Gas Emissions Projections - 2023-2050*" (EPA, May 2024). This technical note is a discussion of the climate assessment in in the context of the relevant Carbon Budgets and the Electricity Sectoral Emission Ceilings, as outlined in Figure 4 and Table 1, respectively, of the EPA Report (EPA, May 2024) and in the context of Section 15 of the Climate Action and Low Carbon Development (Amendment) Act 2021. The impact of the proposed development and associated proposed mitigation is also discussed using the relevant IEMA guidance (IEMA, 2022), *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* (European Commission, 2013) and Environmental Impact Assessment of Projects, Guidance on the preparation of the Environmental Impact Assessment (European Commission, 2017).

Ireland's Greenhouse Gas Emissions Projections 2023 - 2050

3. The EPA Report[1] entitled "*Ireland's Greenhouse Gas Emissions Projections - 2023-2050*" (EPA, May 2024) outlined two scenarios to project into the future:

    - With Existing Measures (WEM) - a projection of future emissions based on currently implemented measures and actions committed by Government which are in place by the end of 2022.
    - With Additional Measures (WAM) - a projection of future emissions based on currently implemented measures and actions committed by Government including all WEM measures plus those included in Government plans but not yet implemented.

4. The EPA Report suggests that the 2021 – 2025 and 2026 – 2030 carbon budgets will be difficult to comply with, with the EPA Report stating:

[1] https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/irelands-greenhouse-gas-emissions-projections-2023-2050.php

"For Budget period 1 the latest EPA projections show that this is projected to be exceeded by 26 Mt CO_{2eq} in the WEM scenario and 19 Mt CO_{2eq} in the WAM scenario. Based on this assessment, Budget 2 from 2026-2030 is projected to be exceeded by 109 Mt CO_{2eq} in the WEM scenario and by 67 Mt CO_{2eq} in the WAM scenario. Budget 3 from 2031-2035 is projected to be exceeded by 143 Mt CO_{2eq} in the WEM scenario and by 86 Mt CO_{2eq} in the WAM scenario." (Page 13, EPA, 2024)

Likewise the report suggests that the 2021 – 2025 and 2026 – 2030 sectoral emission ceilings (including the electricity sector) may also be challenging.

5. In relation to electricity, the 2018 emissions from this sector amounted to 10.3 Mt CO_{2eq}. The sectoral emission ceiling target for 2030 is a 75% reduction relative to 2018 which amounts to a target of 3.5 Mt CO_{2eq} in 2030. The current projection from the EPA, based on the WAM scenario, is that there will be a 66% reduction between 2018 and 2030 (EPA, 2024).

6. As shown in Table 1, for the first sectoral emission ceiling period between 2021 – 2025 the projected emissions from electricity are likely be very close to target (41 Mt CO_{2eq} vs 40 Mt CO_{2eq}). This period has a much lower degree of uncertainty associated with it than any future period.

Sector	Project Emissions 2021 – 2025 (Mt CO_{2eq})	Sectoral Ceiling 2021 – 2025 (Mt CO_{2eq})	Project Emissions 2026 – 2030 (Mt CO_{2eq})	Sectoral Ceiling 2026 – 2030 (Mt CO_{2eq})
Electricity	41	40	24	20

Table 1 Projected Emissions vs Sectoral Ceiling 2021-2025 and 2026-2030 (EPA, 2024) Based on the WAM Scenario

7. For the second sectoral emission ceiling period between 2026 – 2030, the projected emissions from electricity are predicted to fall short of target (24 Mt CO_{2eq} vs 20 Mt CO_{2eq}). However, by its nature, this period up to 2030 will have a higher degree of uncertainty associated with this prediction than the period 2021 - 2025.

8. Furthermore, in relation to electricity, it should be noted that there are number of measures which have been excluded from the EPA projection (EPA, 2024) including:

   - CAP24 has projected 9 GW onshore wind, 5 GW offshore wind and 8 GW solar PV by 2030 whilst the EPA has assumed in their projections that, by 2030, there will be 7.2 GW onshore wind, 3.5 GW offshore wind and 6 GW solar PV.
   - The EPA assumed new gas fired generation of 1.4GW by 2030 compared to 2 GW in CAP24.
   - The CAP24 policy of 2 GW offshore wind for green hydrogen post-2030 is also not included in the EPA projections.

9. Although the EPA has excluded these measures for the following reason, as stated in the report:

   "there are a number of exceptions where policies and measures were not included as the EPA could not see an implementation pathway to merit their inclusion at this point in time". (EPA, 2024)

   it is possible that subsequent EPA projection reports will include them prior to 2030 on the basis that an implementation pathway becomes apparent.

10. Thus, in projecting forward to 2030 when compliance with the electricity emission ceiling for the period 2026 – 2030 is determined, there is a range of possible GHG projections depending on whether some or all of the proposed measured included in CAP24 are implemented in a timely manner.

11. There are also several governmental strategies currently being developed which will be published over the next few years which will have a direct bearing on the trajectory towards net zero GHG emissions in Ireland. For example, in May 2024, "*Ireland's National Biomethane Strategy*" (DAFM / DECC, 2024) was published which charts a detailed pathway towards producing 5.7 TWh of biomethane by 2030 and which forms part of the WAM scenario in the EPA Report (EPA, 2024).

12. The EPA (EPA, 2024) also notes in relation to possible future measures which could help to reduce emissions but have not been included in the analysis, including for the period post-2030 – 2050:

    "Overall

    - *Climate Action Plan 2023 identified unallocated emissions savings of up to 26 Mt CO_{2eq} in the second carbon budget period from 2026 to 2030. These savings are not modelled in these projections. It is noted that the Climate Action Plan 2024 addresses the issue of unallocated emissions savings and identifies five themes that could deliver savings.*

    - *Further Measures post-2030 detailed in the electricity, industry, built environment, transport and agriculture sectors where no specific measures or emissions savings have been identified are not modelled.*

    These savings combined are estimated to provide a conservative additional abatement of 8.75 Mt CO_{2eq} in 2030, based on the modelling used to prepare the Climate Action Plan 2024" (EPA, 2024 (page 8))."

    Thus, these measures will help to bridge the gap between the emission shortfall highlighted in Paragraph 4 above between the projected emissions in 2030 and the 2030 Carbon Budget target.

13. Projecting further ahead to the period post-2030 to 2050 will lead to greater uncertainty in GHG emissions particularly in circumstances where future technologies and strategies will likely become apparent, but which currently have not been taken into account.

14. The Government in CAP24 has recently reiterated their commitment to the goal of achieving net-zero GHG emissions by 2050:

    "Under the Climate Action and Low Carbon Development (Amendment) Act 2021, Ireland's national climate objective requires the State to pursue and achieve, by no later than the end of the year 2050, the transition to a climate-resilient, biodiversity-rich, environmentally sustainable and climate-neutral economy."

Proposed Development Mitigation Measures

15. As detailed in "*Appendix 3 – Technical Response to Third Part Appeals*" (Dated November 2023), AWS are committed to implementing a range of mitigation measures which will be applied in line with "*best practice*" as outlined in IEMA (IEMA, 2022).

16. The following mitigations have been qualitatively assessed as mitigations to GHG emissions as outlined in the in "*Appendix 3 – Technical Response to Third Part Appeals*" (Dated November 2023):

- The Proposed Development is designed to fully comply with the Climate Neutral Data Centre Pact as outlined on Page 24 of the Appeal. The Proposed Development has an annualised design Power Usage Effectiveness (PUE) of 1.12 and has a design water usage effectiveness (WUE) of 0.075 L/kWh as compared to the 0.4 L/kWh set under the Climate Neutral Data Centre Pact. PUE is the most commonly used metric to determine the energy efficiency of a data centre. Data centres need a range of auxiliary services, including cooling, to support the main 'work' of the IT systems, PUE measures the size of this 'overhead' energy used as a ratio to the energy used to power the computing equipment. Since PUE is a ratio, the closer the number is to 1.0, the more energy efficient the data centre. A survey of European data centres by 451 Research found "*European enterprises cited on average a PUE of 2.1* [2] as compared to a PUE of 1.3 set by the Climate Neutral Data Centre Pact and an annualised design PUE of 1.12 for the Proposed Development.
- AWS signed a supply agreement in March 2023 with Certa to supply renewable HVO to their Dublin operations including the existing permitted development and the Proposed Development. AWS's supply agreement with Certa means that the backup generators for the Proposed Development will be supplied with HVO from the date of commissioning along with any subsequent refills due to generator use. In fact, all refills of AWS's existing generators in Dublin have been with HVO since October 2022
- A PV array is proposed on each building E and F and will consist of 285 PV modules, each of 300Wp, yielding a total peak power generated of 85.5kWp to match the lighting and IT electrical power requirements during the peak summer months for the administration & office of each building.
- A rainwater harvesting system will be used to ensure non-potable process water for cooling needs for the operational development are met with no reliance on the public water mains. The proposed buildings are designed to harvest rainwater for up to 100% of the annual process water requirements and includes 2170m^3 of onsite water storage designed to maximise the storage and utilisation of rainwater, significantly reducing the annual water demand from the local supply.
- Facilitating district heating to a local user for heat or a future heat network – the Proposed Development incorporates design provisions to facilitate district heating including heat distribution pipework up to the site boundary.
- Internal lighting shall be provided by highly efficient, low energy LED luminaires combined with presence detection controls or local switching where appropriate.
- The external lighting will make use of high efficiency, low energy LED luminaires. The lighting design has been optimized to reduce glare, spillage or other light nuisance to adjacent sites and/or public road.
- The data storage rooms are supplied with fresh air which is sufficient to cool the space for the majority of the annual running hours. For a small number of hours during the peak cooling season, adiabatic cooling is required. The system utilises fans to supply air directly from outside to the data storage rooms. The air is warmed as it passes across the IT servers located in the data storage rooms, and subject to external ambient conditions, the air is either recirculated or returned to atmosphere.

[2] 451 Research - Improving datacenter efficiency in Europe - the role of PUE

- The mechanical system has various modes of operation to provide efficient and reliable cooling to the data processing area. The mechanical system is monitored and controlled by an electronic building management system (BMS). The system monitors conditions and responds to reduce fan speeds and pump speed to maintain the operating point at the minimum necessary to meet the data storage room environmental conditions.
- All air supply and extract systems serving the data storage rooms are provided with high efficiency direct drive fans. The EC direct drive fan is the most efficient fan solution available to facilitate demand control.

Corporate Power Purchase Agreements (CPPA) As Offsets

17. As set out in the JSA Response To Third Party Appeals document (dated November 2023), under Amazon's publicly available Renewable Energy Methodology[3], Amazon works with energy companies around the globe to develop **new** renewable projects dedicated to serving their load, which is aligned with the CPPA Roadmap which states: "*Additionality and Avoiding Greenwashing: If CPPAs simply purchase certificates from projects that would have existed anyway, especially those that have already been funded under schemes supported by the PSO levy (REFIT schemes or the RESS), they may not contribute to additional decarbonisation, which would not achieve the benefits of such contracts for all electricity users and harm public trust. CPPAs for **new** non-subsidised or repowered projects should be prioritised.*" [Emphasis added]

18. The CPPA Roadmap itself notes that "*keeping RESS and CPPAs separate leads to clearer additionality for CPPAs*". The stipulation that any CPPA related to the Proposed Development would not be subject to any direct government financial subsidy, consumer, or public subsidy ensures that any renewable development subject to such a CPPA does not benefit from receipt of subsidy under the Renewable Electricity Support Scheme (RESS), in line with the CPPA Roadmap. Condition 13(a) of the Fingal County Council decision captures the requirements set out in the CPPA Roadmap, requiring that:

    "The new renewable energy projects shall not be supported by government, consumer or other public subsidies"

19. The Institute of Environmental Management and Assessment (IEMA) guidance document – *Pathways to Net Zero - Using the IEMA GHG Management Hierarchy* (Nov 2020) revised the IEMA GHG Management Hierarchy as shown in Figure 1 below to include CPPAs under the category of "*substitution*" within the Hierarchy:

[3] https://sustainability.aboutamazon.com/renewable-energy-methodology.pdf

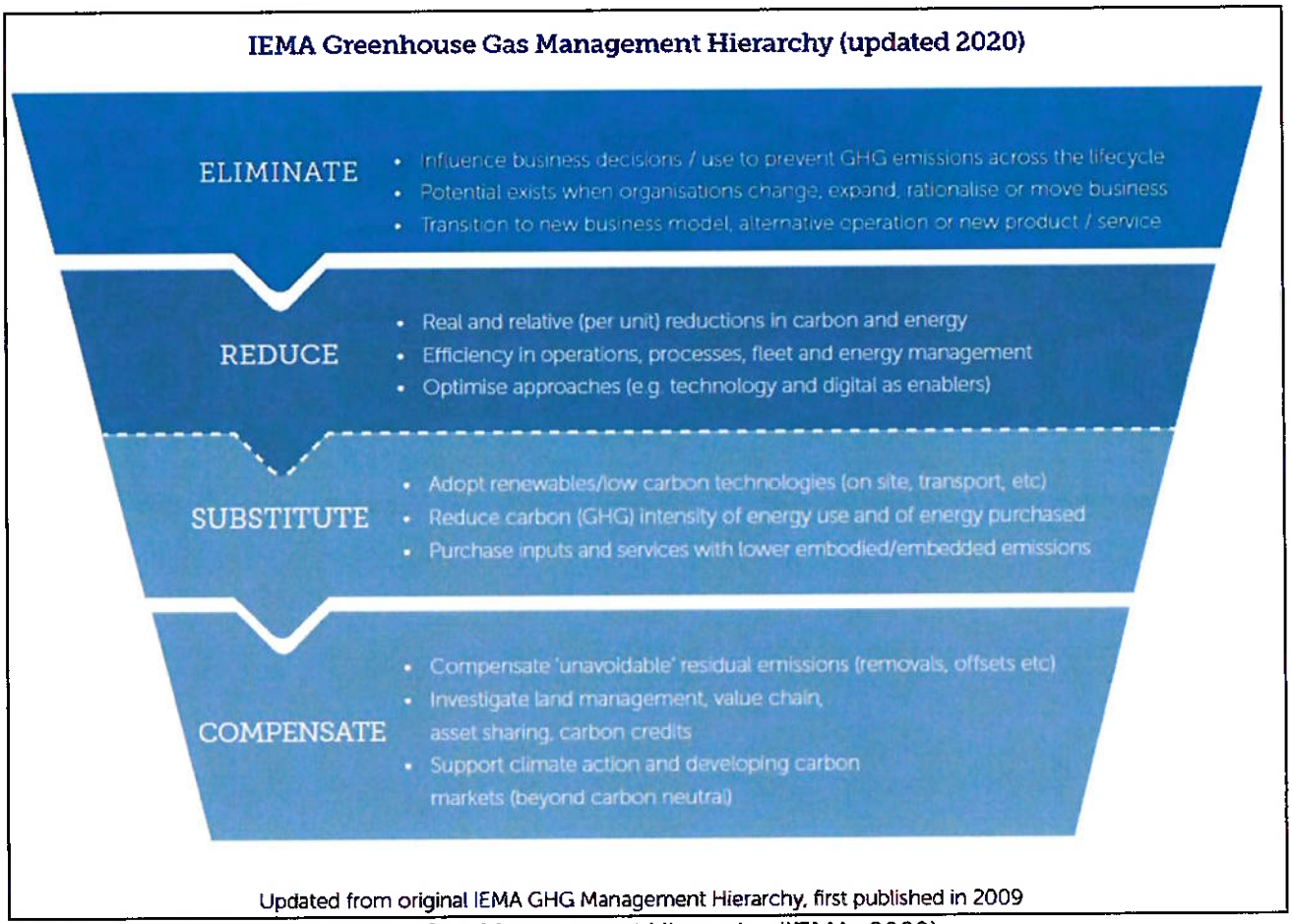

Figure 1 IEMA Greenhouse Gas Management Hierarchy (IEMA, 2020)

20. In relation to the use of CPPAs, the IEMA 2020 guidance states, on Page 5, the following (bold added):

    "Purchased green electricity tariffs (also green gas) are increasingly being considered within net-zero approaches. In earlier versions of the Hierarchy these tariffs only appeared within COMPENSATE. This is still the case for market-based approaches that use certificates where additionality or quality thresholds are poor, or hard to substantiate. The hierarchy does now allow for higher quality energy tariff purchases within the SUBSTITUTE line, reflecting developing practice and some improved purchasing arrangements (e.g. ***higher quality procurement or quasi-investments via power purchase agreements****)."*

21. Thus, CPPAs are now recommended by IEMA (IEMA, 2020) as an appropriate project-specific "*substitution*" mitigation measure alongside measures such as adopting renewable technologies and reducing the carbon intensity of energy used.

22. For further clarity on the position of IEMA regarding CPPAs and mitigation, the *IEMA Assessing Greenhouse Gas Emissions and Evaluating their Significance 2nd Edition* (IEMA, Feb 2022) has recently stated, on Page 9, that:

    "GHG mitigation is best achieved by taking a planned and focused approach following the IEMA GHG management hierarchy principles."

23. When projecting into the future, there is associated uncertainty as to the penetration of renewable energy in the national grid. However, the use of CPPAs can be viewed

as allowing for this inherent uncertainty in future years as the CPPA will match the actual GHG emissions regardless of the quantity of emissions in any one year and the time period in which they occur whilst the operation of both indirect electricity and direct emissions will continue to operate within the ETS which has committed to achieving net zero by 2050. Thus, even if the national renewable targets are not achieved on time, the facility will ensure that the CPPAs match the GHG emissions from the electricity used to power the Proposed Development on an annual basis to ensure the facility remains net-zero in terms of operational GHG emissions.

24. In relation to the ETS, as outlined in 1.2.1 of the Addendum to the EIAR, under Section 13.3.5 EU Emission Trading System, CAP23 states:

"The EU ETS is an important measure for reducing industry GHG emissions. The Fit for 55 proposals for the reformed EU ETS will increase emissions reductions in this sector from the current 43% to 61%, in the period 2005 to 2030. Changes include a steeper annual reduction in the emissions ceiling and reductions in free allowances, alongside the corresponding introduction of a carbon border adjustment mechanism." (2023 CAP, page 155).

Summary

25. In summary, the climatic assessment of the Proposed Development has taken into account best practice in accordance with the relevant guidance (IEMA (2022)) as summarized below:

26. A Corporate Purchase Power Agreement(s) will be entered into, as proposed by Condition 13 of the planning decision from Fingal County Council, which demonstrates that the energy consumed by the development on site is met by new renewable energy generation in line with the Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy (2022). The CPPA will match the actual GHG emissions in terms of quantity of emissions on an annualized basis.

27. The indirect electricity emissions, from the national grid, will come from a range of electricity generating power stations, each of which hold a GHG permit. In addition, the direct emissions from backup generators will be a variation to GHG permit GHG197-02 when in operation. Thus, both indirect and direct GHG emissions will operate within the ETS and thus the GHG emissions associated with the Proposed Development will be in line with CAP24 which stresses the importance of the EU ETS in reducing industry GHG emissions.

28. The electricity from the national grid, used to power the Proposed Development, will be supported by new renewable energy pursuant to a CPPA, and the development itself is therefore clearly in accordance with the aim of achieving the emissions reduction targets of the Sectoral Emissions Ceilings and the policies of CAP24 and the Government Statement on Data Centres. The continued use of CPPAs and the operation of the facility within the EU ETS will ensure that GHG emissions from the facility will be fully mitigated throughout its lifetime with the facility having a net zero operational impact in terms of GHG emissions.

APPENDIX 3 – UPDATED CONSISTENCY STATEMENT WITH SECTION 15 OF THE CLIMATE ACTION AND LOW CARBON DEVELOPMENT ACT

MEMO

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Re:	**Further Information for Appeal - ABP Ref.: PL06F.318180** **Climate and Low Carbon Development Act**
Client:	**Universal Developers LLC**
Date:	**21st June 2024**
JSA Ref:	**22058**

INTRODUCTION

This document has been prepared by John Spain Associates in association with AWN Consulting.

Section 15 of the Climate Action and Low Carbon Development Act 2015, as amended, states the following:

"(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."

The following sections set out in detail the consistency of the proposed development with the foregoing.

THE MOST RECENT APPROVED CLIMATE ACTION PLAN (2024 CLIMATE ACTION PLAN)

The 2024 Climate Action Plan[1] was published on the 20th of December 2023. Climate Action Plan 2024 (CAP24) is the third annual update to Ireland's Climate Action Plan.

The Plan was approved by Government on to the 24th of May 2024, having undergone public consultation, Strategic Environmental Assessment and Appropriate Assessment.

The publication notes that *"Climate Action Plan 2024 builds upon last year's Plan by refining*

[1] Link: https://www.gov.ie/en/publication/79659-climate-action-plan-2024/b

and updating the measures and actions required to deliver the carbon budgets and sectoral emissions ceilings. The Plan provides a roadmap for taking decisive action to halve Ireland's emissions by 2030 and reach net zero by no later than 2050, as committed to in the Climate Action and Low Carbon Development (Amendment) Act 2021.

Table 1: Statements and Policy Provisions of the 2024 Climate Action Plan and the Consistency of the Proposed Development with the Plan

Section of CAP	CAP Statement	Consistency of the Proposed Development
Page 28	Guided by our 2030 and 2050 targets, the programme of carbon budgets and sectoral emissions ceilings introduces more immediate and sector-specific emissions reduction targets that provide a pathway towards the 2030 51% reduction target and the 2050 climate neutrality goal.	The proposed development will not contribute to any exceedance of the sectoral emissions ceiling for the electricity sector, as the proposed development is included under existing electricity demand forecasts, and will bring forward renewables for contracted demand which is already accounted for within CAP 24. In addition, there is no current evidence that there will be an exceedance of the Sectoral Emission Ceiling. The recent DECC publication "*Summary of Analysis to Support Preparation of the Sectoral Emissions Ceilings*" (DECC, 2022) outlines the assumptions which have been used to derive the Sectoral Emission Ceilings. The "proposed scenario" (Figure 2) adopted by DECC takes into account the EirGrid Generation Capacity Statement for 2020-2029 which set out a median overall demand in 2029 of 1,250MVA for Data Centre and Large Industrial User Demand by 2029 (Table 5[2]). With a growth rate of 65-70% in electricity demand by 2030 inherent in the DECC analysis (which includes the Proposed Development), the assessment undertaken for the Sectoral Emission Ceilings has concluded that the 2030 target of 3 Mtonnes of CO_2eq is attainable. The EPA has recently reported that the 2022 energy industries GHG emissions have decreased from 10.26 Mtonnes in 2021 to 10.08 Mtonnes in 2022[3]. Comparing the 2022 reported data to the projected data undertaken for the Sectoral Emission Ceiling in Figure 3 indicates that the actual emissions are similar to the target value in 2022.
Section 2.2, Page 32	Under the Climate Action and Low Carbon Development (Amendment) Act 2021, Ireland's	Please refer to the section of this document relating to achievement of the National Climate Objective under the 2021 Act.

[2] https://www.eirgridgroup.com/site-files/library/EirGrid/All-Island-Generation-Capacity-Statement-2020-2029.pdf
[3] https://www.epa.ie/our-services/monitoring--assessment/climate-change/ghg/latest-emissions-data/#

	national climate objective requires the State to pursue and achieve, by no later than the end of the year 2050, the transition to a climate-resilient, biodiversity-rich, environmentally sustainable, and climate-neutral economy. The 2021 Act also provides for a reduction of 51% in GHG emissions by 2030, compared to 2018 levels.	
Section 2.3, Page 34	Under the EPA's projections, emissions in the first two carbon budgetary periods (2021- 2025 and 2026-2030) are expected to exceed their limits by a margin of 24%-34%, with the sectoral emissions ceilings for both budgetary periods projected to be exceeded in almost all sectors including: electricity; industry; transport; and agriculture. An overshoot in one carbon budgetary period will require an equivalent reduction in the emissions allowed in the following period, making the level of abatement to be reached in the subsequent period more challenging.	The applicant has committed to engaging in CPPAs (in line with Condition 13 of the FCC decision to grant permission, if applied by the Board), which will provide for renewable energy in line with the requirements of the Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy (2022)
Section 5.4, Pages 48-49	**Electricity:** Corrective actions to accelerate renewable electricity generation and grid flexibility, and manage electricity demand growth, were implemented in 2023. The Offshore Wind Delivery Taskforce is developing a system-wide plan for delivery of Offshore Wind in Ireland, and an Implementation Plan for Future Arrangements for System Services Consultation Paper, and an Interconnection Policy were published. ESB Networks published their platform roadmap for the provision of tools and supports for community participation in flexibility measures that works towards managing electricity demand growth; ` **Industry:** In the industry sector, several strategic initiatives on decarbonisation were taken in 2023. A Green Hydrogen Strategy was introduced and a Green Public Procurement Strategy and Action Plan was published. Additionally, a study was undertaken	• The applicant is committed to entering into a CPPA • The Irish operations of AWS are compliant with Article 8 of the EU Energy Efficiency Directive (EED) which requires large enterprises to be subject to energy audits. In anticipation of future requirements, AWS is currently implementing an ISO 50001 certified Energy Management System for continual energy efficiency improvements in the AWS's Irish operations. (CAP24 states that energy management systems will be mandatory for organisations who use more than 85 TJ of energy per annum. The SEAI's Large Industry Energy Network will support organisations in adopting energy management systems, developing emissions management systems, improving energy performance metrics, and adopting best practice in energy efficiency and emissions reductions)

	looking at shaping policy for the procurement of low carbon cement materials. To address decarbonisation of cement and construction, the Department of Enterprise, Trade and Employment successfully engaged expert services to advance the CAP23 action EN/23/12/a; ` **Built Environment:** Significant efforts were made to advance the decarbonisation of the building sector. The Heat and Built Environment Delivery Taskforce focuses on acceleration of system-wide programme and project delivery for the measures identified. The Energy Efficiency Directive takes the principle of "energy efficiency first" as a key policy requirement for buildings. The impending publication of a National Heat Policy Statement, informed by the National Heat Study, will outline the comprehensive approach to decarbonising the heat sector by the end of 2023. The District Heating Steering Group issued recommendations to enhance district heating. Lastly, the Policy Statement on Geothermal Energy for a Circular Economy further contributed to sustainable building initiatives;	• The proposed development will increase the embodied carbon reduction of concrete to 45% through increased level of GGBS in the concrete mix design. The proposed development will also utilise green steel. Steel is one of the largest contributors of embodied carbon in the structure of AWS data centres. AWS are lowering these emissions by working with steel mills using electric arc furnace production processes. Unlike conventional steel produced from primary materials, coal, and gas, its suppliers are using up to 100% recycled content and are powered by electricity only, reducing embodied carbon up to 70%. (CAP24 outlines a target of a decrease in embodied carbon in construction materials: of 10% embodied carbon for material produced in Ireland in 2025 rising to 30% by 2030). • PUE (power usage effectiveness) is the most commonly used metric to determine the energy efficiency of a data centre. Data centres need a range of auxiliary services, including cooling, to support the main 'work' of the IT systems, PUE measures the size of this 'overhead' energy used as a ratio to the energy used to power the computing equipment. Since PUE is a ratio, the closer the number is to 1.0, the more energy efficient the data centre. A survey of European data centres by 451 Research found "*European enterprises cited on average a PUE of 2.1*"[4] as comparted to a PUE of 1.3 set by the Climate Neutral Data Centre Pact (which is dealt with in further detail within Section 4 of the previously submitted JSA Appeal Response document) and an annualised design PUE of 1.12 for the proposed development. (CAP24 has set a target for the industrial sector of a reduction in fossil fuel demand through energy efficiency: reduce by 7% in 2025 rising to 10% by 2030)

[4] *451 Research - https://www.spglobal.com/marketintelligence/en/news-insights/research/improving-datacenter-efficiency-in-europe-the-role-of-pue*

Section 11.2.2.4, Page 142	In order to meet the targets and objectives of this Climate Action Plan, it is necessary to direct the private sector towards financing the necessary investments. We are taking the lead in developing innovative approaches to financing our decarbonisation objectives and are committed, for example, to rolling out a low-cost residential retrofit loan scheme. To meet the scale of this challenge, the financial sector will also need to bring innovative solutions to the market. Through the commercial State sector and other Public Bodies, we will seek to leverage the significant volumes of private sector capital that is available for well-structured projects, including wind (both onshore and offshore) and solar electricity generation, interconnection, and major transport infrastructure.	As noted above, the applicant has committed to engaging in CPPAs (in line with Condition 13 of the FCC decision to grant permission, if applied by the Board), which will provide for renewable energy in line with the requirements of the Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy (2022) This represents a direct private sector investment in renewable energy in line with this section of the Climate Action Plan.
Section 11.2.3, Page 144 and 145	From a national planning policy perspective, the National Planning Framework (NPF) provides an established means through which to implement and integrate climate change objectives, including adaptation, at national, regional, and local levels, and the transition to a low carbon and climate resilient society. The NPF clearly states that "in addition to legally binding targets agreed at EU level, it is a national objective for Ireland to transition to be a competitive low carbon, economy by the year 2050". The NPF sits at the top of the planning hierarchy and provides the overarching context for the regional and local tiers below it, thereby securing the alignment of policies and objectives as part of the plan-making process, including alignment with the Climate Action Plan. ... The three Regional Spatial and Economic Strategies	The submitted Planning Report and Appeal Response forming part of the application details the compliance of the proposed development with the relevant policies and objectives of the National Planning Framework and the Regional Spatial and Economic Strategy for the Eastern and Midlands Regional Assembly (please refer to Section 5 of the submitted Planning Report for further details)..

	for each Regional Assembly area, sitting at the tier below the NPF, also contain a range of policy objectives in order to ensure emissions can be reduced and targets met, and these feed directly into Development Plans at the more local level. At this level, national and regional climate objectives (including energy) are given effect through specific policies and objectives that reflect the local context. Section 10(2)(n) of our Planning and Development Act, 2000 (as amended) specifically identifies Climate Action (adaptation and mitigation) as a mandatory objective to be included in all Development Plans. Adopted by the elected members of the Local Authority, these plans are subject to a review and evaluation by the Office of the Planning Regulator to ensure consistency with national policy and guidance. The role of Local Authorities in climate action is explored further in chapter 19.	
Section 11.2.4, Page 145 and 146	**Digital Transformation** Harnessing Digital - The Digital Ireland Framework, launched in February 2022, reflects Ireland's ambition to continue to be a digital leader at the heart of European and global digital developments. It is helping to drive the digital transition across our economy and society, and it complements work towards achieving Ireland's climate targets, with our green and digital ambitions re-enforcing each other. The strategy sets out targets, high-level workstreams and deliverables across four dimensions, in line with the EU's Digital Decade 2030: Digital Transformation of Business; Skills; Digital Infrastructure; and the Digitalisation of Public Services.... The Government will also continue to support remote working through its Making Remote Work: National Remote Work Strategy as part of its wider	The proposed development itself comprises data centre development, which is the infrastructure of the digital transition. The Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy (2022) states the following: *"Data centres, along with connectivity and cyber security, are important infrastructure enablers in an open modern economy, facilitating digital transformation of SMEs and associated productivity and competitiveness gains. Data can drive research and innovation and the training of AI systems in areas such as health, transport, agriculture, and the environment. Digital technologies have a vital role to play in enabling decarbonisation including through the gathering and analysis of important data for mitigating and adapting to climate change and protecting and restoring biodiversity and ecosystems. They can also help to unlock carbon emission reductions in hard-to-abate sectors such as buildings, industry, and agriculture - through solutions such as*

	commitment to increased participation in the labour market; more balanced regional development; improved work/ life balance; reduced commuting times; and reduced transport-related carbon emissions.	*aggregated energy system monitoring and management systems, renewables certification and product passports."* *"Data centres represent a core digital infrastructure for both Ireland's and Europe's digital economies and for strengthening Ireland's position as a strategic international location for IT services. This is the infrastructure that lies behind all digital aspects of our social and work lives, including video calling, messaging and apps, retail, banking, travel, media, and public service delivery in areas such as healthcare and welfare. Data centres enable digital economies through hosting critical software and data that allows the world's leading companies to run their businesses, organise their supply chains, pay their staff, and host video conferencing applications. These are the suite of technologies and services that have facilitated the digitalisation of our economy, our work lives and many of the online applications, services and platforms widely used across society. During the pandemic, they enabled business and communities to quickly move to a remote model. Data centres also host and deliver entertainment and content services into homes. More broadly however, data centres are also the means by which Ireland's major technology companies process and store companies' most sensitive and strategic assets. They are also the means by which they are transitioning their businesses to the cloud, making Ireland critical to their global presence. Investments by technology multinationals in large, long-life assets such as data centres further secures the presence of the global technology sector in Ireland."* This highlights the core importance of data centres to supporting the digital transition across all sectors of the economy. Developments such as that which is now proposed enable and facilitate remote working in line with the National Remote Working Strategy, through the delivery of cloud computing capacity and services.
Electricity		

Page 149	The electricity sector continues to face an immense challenge in meeting its requirements under the sectoral emissions ceiling, as the decarbonisation of other sectors, including transport, heating, and industry, relies to a significant degree on electrification. The deployment rates of renewable energy and grid infrastructure required to meet the carbon budget programme for electricity is unprecedented and requires urgent action across all actors to align with the national targets.	The applicant has committed in engaging in CPPAs (in line with Condition 13 of the FCC decision to grant permission, if applied by the Board), which will provide for renewable energy in line with the requirements of the Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy (2022), thereby supporting the transition to renewable electricity sources.
Page 150	Measures and Actions Transformational policies, measures and actions, and societal change are required to increase the deployment of renewable energy generation, strengthen the electricity grid, and meet the demand and flexibility needs required for the challenges of: ` • Increasing renewable generation to supply 80% of demand by 2030 through the accelerated expansion of onshore wind and solar energy generation, developing offshore renewable generation, and delivering additional grid infrastructure • Developing micro- and small-scale generation, as well as community projects, through actions such as grant funding and enabling small-scale production to participate in energy markets • Transforming the flexibility of the electricity system by improving system services and increasing storage capacity	• The applicant has committed in engaging in CPPAs (in line with CAP24 and Condition 13 of the FCC decision to grant permission, if applied by the Board), which will provide for renewable energy in line with the requirements of the Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy (2022). • Amazon is committed to building a sustainable business for its customers and the planet. In 2019, Amazon co-founded The Climate Pledge, a commitment to reach net zero carbon emissions by 2040, 10 years ahead of the Paris Agreement. As part of that commitment, the company is on a path to powering its operations by 100% renewable energy by 2025, five years ahead of its original 2030 target. • Amazon reached 90% renewable energy in 2022. This includes AWS data centres. As of January 2023, Amazon has announced over 400 renewable energy projects representing 20 gigawatts (GW) of clean energy capacity. • In 2022, the electricity consumed in 19 AWS cloud computing regions, including their cloud region in Ireland, was attributable to 100% renewable energy.

	• Developing tools and mechanisms that support demand side flexibility services which leverage smart metering, including market incentives and smart tariffs, reducing/removing regulatory barriers, and focusing on flexibility-ready standards for smart technology Delivery of at least 2 GWs of new flexible gas-fired generation	
Section 12.1.3, Page 154	At a time when the energy system is under severe pressure to ensure security of supply, amid projections of rapid electricity demand growth over the coming decade, the electricity sector has been set one of the smallest carbon budget allocations and the steepest trajectory (-75%) across all sectors. The scale of the challenge to meet the sectoral emissions ceiling is immense and requires policies to be moved from an 'end of decade' target trajectory towards a 'remaining carbon budget' target.	As set out within the application and the appeal response (Section 4), the development is subject of an existing connection agreement and does not represent additional electricity demand growth over and above what is already provided for in the existing executed connection agreement. As set out above, the applicant is also committed to engaging in a CPPA which will support the delivery of new additional renewable generation. With regard to the assessment of the proposed development in the context of the Sectoral Emissions Ceilings, we refer to the Appeal Response provided by AWN, which assesses the proposed development in their context (Section 5 of the AWN document refers).
Section 12.4.1.1, Pages 162 and 163	Accelerate Renewable Electricity Generation • To reach 80% of electricity demand from renewable sources by 2030: • Accelerate the delivery of utility-scale onshore wind, offshore wind, and solar projects through a competitive framework; • Develop non-utility scale generation and community projects through actions such as	A per the above response to Section 12.1.3. .

	grant funding and enabling such projects to participate in energy markets and flexibility schemes; • Target 6 GW of onshore wind and up to 5 GW of solar by 2025; • Target 9 GW of onshore wind, 8 GW of solar, and at least 5 GW of offshore wind by 2030; • All new or repowered renewable electricity generation projects shall implement a Community Benefit Fund equivalent to the RESS requirements of €2/MWh; • Most fundamentally, significant investment is needed in the transmission and distribution systems to maximise the usage of renewable electricity and to reduce constraints and congestion on the system. System Operators and the CRU must ensure the timely investment in, and delivery of, the required electricity network infrastructure, including key priorities such as the North South Interconnector, to meet the targets set out in this, and subsequent, Climate Action Plans; • Deliver a streamlined electricity generation grid connection policy and process, and remove barriers, where possible, for the installation of renewables and flexible technologies reducing the need to build new grid, including hybrid (wind/solar/ storage) connections; • Publish a new Electricity Generation Grid Connection Policy; • Undertake a public consultation on proposed regional renewable electricity targets, including relevant environmental assessments in the upcoming draft National	

	Planning Framework revision; • Provide for greater alignment between local plans and renewable energy targets at national (and regional) levels, taking into account regional targets once established and the revised National Planning Framework; • Publish the Draft Renewable Electricity Spatial Policy Framework White Paper; ` Publish the revised methodology for Local Authorities Renewable Energy Strategies; • Publish Draft Revised Wind Energy Development Guidelines; • Commence drafting of Solar Energy Development Guidelines; • Following finalisation of a Regional Roadmap, Regional Assemblies will publish and implement Regional Renewable Electricity Strategies, enabling a unified methodology for national and regional spatial and capacity targets, identifying areas suitable for renewable electricity deployment at regional and county levels that can inform the statutory planning process; • Following adoption of the Regional Renewable Electricity Strategies, Local Authorities will include a statement within their next Local Authority Climate Action Plan which identifies the methods or processes that will be used to implement the required policy supports to achieve renewable electricity targets; • In line with transposing the revised Renewable Energy Directive, which entered into force in November 2023, ensure that the permit-granting procedure, the planning, construction	

	and operation of renewable energy plants, the connection of such plants to the grid, the related grid itself, and storage assets are presumed as being in the overriding public interest; • Map and designate Renewable Acceleration Areas for onshore renewables as required following transposition of the revised Renewable Energy Directive once the relevant provisions have been transposed into Irish law; • Ensure that Local Authorities, An Bord Pleanála, and the Maritime Area Regulatory Authority have sufficient and appropriate expertise and resources to meet the State's needs in this area; • All relevant public bodies will carry out their functions in a manner which supports the achievement of the renewable electricity targets, including, but not limited to, the use of road and rail infrastructure to provide a route for grid infrastructure where this is the optimal solution; • Deliver the Small-scale Renewable Electricity Support Scheme to support nondomestic renewable electricity generators above 50 kW, and community energy and small and medium-sized enterprises' projects up to 6 MW; • Target 1.6 GW of installed micro-generation capacity (≤ 50 kW) by 2030; ` Production of 2 GW of renewable hydrogen sourced from offshore wind to be in development by 2030, which will help to provide greater certainty for investors, and create the production scales	

	needed to enable greater infrastructure deployment; • Ensure priority EU electricity infrastructure projects, Projects of Common Interest (PCI) will continue to receive prioritisation as provided by the EU TEN-E Regulation, addressing any administrative, market, or regulatory obstacles obstructing the implementation of PCIs to ensure their scheduled execution.	
Section 12.4.1.2, Page 164	**Accelerate Grid Flexibility** • Empower business and households by developing clear public information regarding electricity carbon intensity in real time and promote opportunities to shift demand to times of low carbon intensity; • Delivery of 2 GW of new flexible gas-fired power generation; • Phase out and end the use of coal and peat in electricity generation; • System Operators to transform the flexibility of the electricity system through changes to policies, standards, services, and tools, funded and incentivised through regulatory price controls; • As an urgent priority, establish the investment framework and competitive market arrangements needed to deliver zero carbon system services; • Deliver at least three new electricity transmission grid connections or interconnectors; • Explore further interconnection potential,	• As set out in the Planning Report and Further Information Response (Section 3(a)) as submitted to Fingal County Council, the proposed development does not entail a new request for power, because it has an existing connection agreement. The proposed development will be supplied by the existing transmission system which has been extended via a contestable development to cater for the additional demand foreseen in the connection agreement signed in 2017. The power required for the proposed development does not rely on flexible power generation.

	including hybrid interconnectors; • Publish the Electricity Storage Policy which will support the further deployment of electricity storage in Ireland, including longer term storage; • Increase deployment of medium to long-term storage technologies; • Undertake dispatch reform aimed at improving the efficiency of Transmission System Operators dispatch actions.	
Section 12.4.1.3, Pages 164 and 165	Manage Electricity Demand Growth • The overarching objective of managing electricity demand growth is to ensure, through a combination of energy efficiency and flexible electricity demand, that economic growth can be supported by low-carbon or no-carbon energy demand growth; • Ensure that 15-20% of the electricity system demand is flexible by 2025, increasing to 20-30% by 2030, to reduce the peak demand and shift the demand to times of high renewable output; • Deliver a demand side strategy that facilitates zero carbon demand, incentivises low carbon electricity consumption, and aligns with EU energy efficiency requirements, while facilitating electrification targets; • The demand side strategy should accelerate the rollout of local flexibility markets by the Distribution System Operator, as required to meet renewable electricity and carbon abatement targets, and contain measures to incentivise Large Energy Users to increase the flexibility in their electricity demand;	• As set out above, the proposed development does not entail a new request for power, because it has an existing connection agreement. The proposed development will be supplied by the existing transmission system which has been extended via a contestable development to cater for the additional demand foreseen in the connection agreement signed in 2017. In addition, the energy provided under the connection agreement forms part of the established EirGrid Capacity Forecast.

	• Publish a regulatory decision on dynamic green electricity tariffs; • Enable and encourage domestic customers, businesses, and communities to participate in demand flexibility services; • Enable and encourage customers to participate in wholesale and system services markets as a matter of urgency. Local balancing of flexible demand and renewable generation will contribute to an increase in renewable electricity usage and a reduction in carbon emissions.	
	Industry	
Section 13.3.2.2, Page 184	**Construction -Reduction in Embodied Carbon in Construction Materials** Under the Climate Action Plan, the Sustainable Energy Authority of Ireland (SEAI) are to lead several actions that will improve transparency of the embodied carbon in buildings. These actions entail the development of a national database system comprising building (and other construction) materials, an official embodied carbon calculation methodology with associated software, and a resultant embodied carbon rating system for buildings. Government is working towards the use of best-practice carbon management and reduction practices across our construction sector. In time that will include Lifecycle Global Warming Potential (GWP) assessments of public and private construction practices, ensuring carbon is minimised in the design of projects, the materials used, building practices, and ultimately throughout the lifetime of the building or	• The proposed development will increase the embodied carbon reduction of concrete to 45% through increased level of GGBS in the concrete mix design (with 40% GGBS content proposed as per section 7 of the AWN response document submitted as Appendix 3 to the response to third party appeals). The carbon savings are quantified within the HJL Carbon Report which formed Appendix 4 to the response to third party appeals. The proposed development will also utilise green steel. Steel is one of the largest contributors of embodied carbon in the structure of AWS data centres. AWS are lowering these emissions by working with steel mills using electric arc furnace production processes. Unlike conventional steel produced from primary materials, coal, and gas, its suppliers are using up to 100% recycled content and are powered by electricity only, reducing embodied carbon up to 70%. (CAP24 outlines a target of a decrease in embodied carbon in construction materials: of 10% embodied carbon for material produced in Ireland in 2025 rising to 30% by 2030).

	infrastructure being built. Work is underway on the requisite methodology and ensuring data availability, aligned with the EU approach under the Energy Performance of Buildings Directive and the Construction Product Regulation. However, it will take time to develop the relevant product database, the appropriate oversight mechanisms, and the implementation skills required. Given the urgency of our decarbonisation targets, we need to start where we can make a big impact. The most carbon intensive elements of construction projects are generally concrete (and the cement it contains) and steel. The key component of cement, which is produced in a carbon intensive process, is the clinker. In simple terms we need to reduce the carbon intensity of clinker and the amount of clinker in cement; and to reduce the amount of cement in concrete, and the amount of concrete in how we design and build. New regulations and standards have a potential role to play here.	
Section 13.3.2.4, Page 186	**Construction - Product Reformulation and Alternative Construction Materials** Optimised design and modern methods of construction have the potential to reduce the quantities of concrete used in construction. However, cement will continue to be required in construction and infrastructure. Lower carbon cements will, therefore, make a valuable contribution to decarbonisation in the sector and there are options through reformulation and substitution. Cement products can be reformulated using fillers and alternative binders without compromising its integrity, and this in turn will reduce the clinker content and carbon intensity. In addition, novel cement	As per response above to section 13.2.3.3.

	chemistries are also under development internationally, that may further reduce the requirement for the use of clinker.	
Section 14.4, Page 208	Implement the recommendations of the report of the District Heating Steering Group to supply up to 0.1 TWh of district heating infrastructure to decarbonise heating in commercial and public buildings, including a mandate for public sector bodies to connect to district heating, where possible	To date, AWS's data centre in Tallaght is the first and only data centre in Ireland to supply recycled heat to a District Heating Scheme. The Tallaght District Heating Scheme (T-DHS) was developed by South Dublin County Council (SDCC) in collaboration with Codema - Dublin's Energy Agency. To support the T-DHS, AWS installed heat-collection systems in their Data Centre and are providing recycled heat to the T-DHS free of charge which, when combined with additional heat pump technology operated by Heatworks (an SDCC not-for-project Utility), is sold to end users at low cost. The T-DHS was officially opened by the Minister for the Environment, Climate & Communications and Transport, Eamon Ryan TD on April 6th this year. The T-DHS will initially provide heat to 32,800m2 of public buildings. Customers include SDCC and Technological University Dublin (TU Dublin). Buildings heated by the T-DHS include County Hall, Tallaght County Library, the SDCC Innovation Centre-Work IQ, and 133 affordable apartments, which will connect in early 2025. The university buildings include the main building, the sports-science, health & recreation building, followed by the new catering college (CAET), to be completed in 2024. Specific to the Proposed Development, as stated in the submitted Planning Report (section 7.27 - 7.33), AWS has been actively supporting Codema with the aim of developing district heating proposals to use the Proposed Developments' waste heat. At the time of submission the feasibility report was in its early stages however AWS committed to ensuring that "*the design of the Proposed Development is future proofed to include heat distribution pipework to the site boundary and the spatial requirements to allow heat recovery equipment be installed at a later date - thus allowing AWS to provide recycled heat free of charge should a DHN be*

		implemented in the area." Significant progress has now been made in this respect. In February 2023, an Outline Business Case for the Blanchardstown District Heating Scheme (B-DHS) was prepared by Codema on behalf of Fingal County Council (FCC). A comprehensive 82 page document, the Outline Business Case notes that: *"Fingal County Council (FCC) is proposing to implement the Blanchardstown District Heating Scheme (BDHS). The proposed system seeks to utilise a low temperature waste heat source from a nearby data centre through a large-scale heat pump to supply space heating and hot water to a university campus, public hospital, and a national sports facilities campus in its first delivery phase. The system will also have the capacity to supply other nearby interested customers in the public and private sector in the following phases.* *The results of this analysis show the proposed district heating scheme is the preferred option as it provides more technical and socio-economic benefits than a 'Business as Usual' (BAU) approach and aligns with national and local level objectives.* *The carbon emissions of the existing gas-fired heat supply are reduced by 54% (6,400 tonnes of CO2 per annum) and will continue to reduce as more renewable electricity is available from the grid to power the heat pump.* *The Amazon data centre is the preferred waste heat source as it can meet the heat demand of both Phase 1 and 2 of the BDHS. The energy centre will be located at the Amazon site, and will hold the heat pumps, back-up boilers, and thermal storage units. (subject to a separate consents process).*" AWS remain resolutely committed to supporting the B-DHS and are awaiting next steps from which include signature of a memorandum

		of understanding (MOU) to support the B-DHS move to the next phase of execution.
Page 219-220	District Heating District heating offers significant potential to supply low- and zero-carbon heat to homes, businesses and public buildings from a central source. While the efficiencies of district heating in the heat sector are widely understood and accepted - there are tens of millions of district heating customers across Europe - it remains the case that there is currently one small scale district heating scheme operational in Ireland in Tallaght, with a number of smaller, communal schemes also operational. While the National Heat Study identifies that approximately 50% of the heat demand in Ireland can be met through district heating, such a proliferation will require significant resources to install a pipe trench network of approximately 1,000km along Irish roads to move the heat from central sources of heat to the buildings along the network that will utilise the heat. Significant financial resources will also be required to support such networks, at an estimated overall capital cost of €2.7 billion - €4 billion, with legislative and regulatory systems to underpin the sector to be developed. While the work of the District Heating Steering Group has played a significant role in beginning this process, with Government deciding on a number of actions in July 2023 to develop the sector, it is clear that a significant ramp-up in deployment of district heating networks will continue to be required to 2030 to bring	Please refer to the response in respect of Section 14.4, Page 212 above.

	Ireland in line with the targets for this technology. Among the recommendations of the report of the District Heating Steering Group, published in August 2023 are: • Drafting legislation to underpin the sector, and regulatory provisions to enable customer protections, and licensing and consenting provisions for district heating operators; • Mandating that public sector buildings connect to available district heating networks (where available, and where technically and economically feasible), and that industrial facilities supply waste heat to district heating where the total rated energy input is at least 1 MW; • Providing for a single technical standard that facilitates the growth and strategic interconnectivity of district heating systems and makes provision for State ownership of district heating infrastructure in the longer term; • A centrally-planned approach to development of the district heating sector with, in time, a single State entity or a utility overseeing the development and expansion of networks, providing the skillsets, expertise and knowledge required by project sponsors in the short term; • Predominantly market based district heating systems, with the provision of supports (such as domestic connections to a network) consistent with other decarbonised heat sources.	

	These actions are underway and projects such as the Dublin District Heating Scheme can now envisage, with the momentum at political and policy level, a route to delivery of heat to customers.	
Table 14.9, Page 232	Actions: • BE/24/13 Implement District Heating Steering Group recommendations, as approved by Government in July 2023 • BE/24/14 Develop the planning and permitting frameworks required for the roll out of district heating • BE/24/15 Draft the General Scheme of a Heat Bill to establish a regulatory model for district heating that ensures consumer protection and the delivery of a vibrant district heating industry, and to mandate all Public Sector buildings and facilities to connect to district heating where available and technically and economically feasible	Please refer to the response in respect of Section 14.4, Page 212 above.

THE MOST RECENT APPROVED NATIONAL LONG TERM CLIMATE ACTION STRATEGY (LONG TERM CLIMATE ACTION STRATEGY 2023)

In relation to 15.1(b) of the Act, as outlined in Section 10 of the Addendum to Chapter 9 of the EIAR, the Long-term Climate Action Strategy was published on the 28th April 2023. In relation to electricity, the Government has committed to the full decarbonisation of the electricity system by 2050.

The Long-term Climate Action Strategy outlined the importance of (i) completing the actions in the Climate Action Plan, (ii) greater demand side management, (iii) better annual forecasting for the electricity and gas systems and (iv) security of gas supply infrastructure, particularly in the context of electricity generation.

The indicative pathway outlined in the Strategy for electricity includes:

- Build-out of renewable generation capacity, including onshore wind, offshore wind, and solar PV,
- Deployment of zero emissions gas to manage inter-seasonal variability,
- Upgrade of transmission and distribution networks to support significantly increased electricity demand in 2050.

In terms of electricity, the Long-term Climate Action Strategy states:

"Ireland will continue its efforts to decarbonise the electricity sector by taking advantage of its significant renewable energy resources in a way that is competitive, cost-effective and ensures the security of our electricity supply. By doing this, we will also decrease our dependence on imported fossil fuels. As Ireland decarbonises its energy system, demand for electricity will increase and total demand for natural gas will decrease. Ireland must ensure that its decarbonisation efforts are underpinned by security, and affordability, in how we access and use our energy resources" (DECC, 2023).

In relation to the EU ETS, the Long-term Climate Action Strategy states that:

"*A strong price signal, as part of a reformed EU ETS, including progressively more restrictive rules on how many allowances will be available within the EU ETS, is expected to drive decarbonisation over the coming decade by increasing the cost to firms in the EU ETS of doing nothing to reduce their emissions"* (DECC, 2023).

In relation to data centres, the Long-term Climate Action Strategy states that:

"*Energy demand, including data centres, will be expected to operate within Sectoral Emission Ceilings and further signals will be required to locate demand where existing or future electricity grid is available and close to renewable energy generation. Research and development in energy storage and flexibility (such as a science challenge to industry) will be required to put Ireland on a pathway to net zero-carbon data centres*" (DECC, 2023).

The Proposed Development is in line with this strategy as the carbon intensity of the electricity associated with the project, due to commitments in the CAP24, will reduce in line with national policy and in line with EU policy as outlined in the EU Climate Law (EU, 2021) which has outlined a legally binding target to obtain net zero GHG emissions by 2050. Furthermore, the development is located to avail of the existing electricity grid (including infrastructure delivered on site by the applicant), and is subject to an existing connection agreement.

In summary, the Proposed Development is in keeping with the Long-term Climate Action Strategy as the electricity used by the development will reduce in carbon intensity in line with both national and EU policy to reach net zero by 2050. When projecting into the future, there is an associated level of uncertainty in regards to the carbon intensity of the national grid in

future years. The application is however committed to keeping in place CPPAs (as per Condition 13) until the grid is fully decarbonized irrespective of the time period involved. In summary, the applicant is committed to engaging in a CPPA which will support the delivery of new additional renewable generation in line with the Long Term Climate Action Strategy.

THE MOST RECENT APPROVED NATIONAL ADAPTATION FRAMEWORK AND APPROVED SECTORAL ADAPTATION PLANS (NATIONAL ADAPTATION FRAMEWORK 2018)

The 2018 National Adaptation Framework (2018 NAF) (DOCCE, 2018) outlined several actions to help ensure a targeted approach to achieving climate resilience into the future. These include:

- Putting in place revised governance and reporting arrangements,
- Formalising the status of existing guidelines,
- Formalising long term operational support for key sectors,
- Facilitating the establishment of regional local authority climate action offices,
- Increasing awareness around climate adaptation and resilience,
- Integrating climate adaptation into key national plans and policies.

The 2018 NAF further states that in terms of specific actions:

"These actions will need to be underpinned by supporting objectives for the Framework including, assessing key risks and vulnerabilities, developing indicators, better coordination of national research priorities, ongoing reporting at National, EU and international level, increased alignment with strategic emergency planning, and further analysis of the implications of climate change and adaptation for the private sector." (DOCCE, 2018)

The Electricity & Gas Networks Sector Climate Change Adaptation Plan (DOCCE, 2022) identified the key climate impacts for the energy sector as:

- Flooding / changes in precipitation / extreme events,
- Temperature rise,
- Sea level rise,
- Changes in wind energy content.

The updated 2024 National Adaptation Framework (DECC, 2024) builds on the foundations of the existing 2018 NAF and states in regards to the updated 2024 NAF:

"This new NAF introduces a broader set of guiding principles, emphasising the urgency for more intelligent, rapid, and far-reaching adaptation strategies. It advocates for a pathway planning approach, which considers a variety of potential future warming and impact scenarios, to ensure flexible and effective adaptation measures. The 2024 NAF moves towards an outcomes-based strategy to better monitor and evaluate progress in enhancing the resilience of infrastructure, ecosystems, and society at large against climate change. This chapter establishes the context for the new NAF by introducing the concept of climate adaptation and other related concepts and outlining the key progress made since 2018 in national adaptation." (Page 14, DECC, 2024)

The 2024 NAF defines climate resilience as "*the capacity of a system, whether physical, social, or ecological, to absorb and respond to climate change and, by implementing effective adaptation planning and sustainable development (including governance and institutional design), to reduce the negative climate impacts while also taking advantage of any positive outcomes. (NASC, 2018)*". The 2024 NAF further details specifically what a climate resilient Ireland will resemble:

"A climate resilient Ireland will acknowledge and consider climate risk, be proactive and flexible in the face of the impacts of climate change, will be open to innovative climate change solutions while also ensuring the safety and prosperity of our communities and that we look after those most impacted by climate change". (Page 39, DECC, 2024)

In relation to electricity and gas networks, the 2024 NAF outlines the following potential impacts due to climate change (Page 104, DECC, 2024):

Electricity and gas networks	• *Water shortages and drought may affect the availability of cooling at conventional power plants,* • *Changes in rainfall distribution could reduce hydro power generation during certain seasons, while increasing the role of hydro stations in flood alleviation.* • *Floods may damage electricity and gas transmission systems, and coastal erosion could impact infrastructure.* • *Increased wind variability may require backup generation or storage, and strong winds may lead to turbine shutdown or damage.*

The 2024 NAF states the following in regards to the electricity and gas networks sectoral adaptation plan (SAP) scorecard that:

"The electricity regulator and the network companies are mainstreaming adaptation into investment planning and project development financial resources are needed to improve the resilience of vulnerable critical infrastructure. The next Price Review will secure the funding needed for this adaptation work." (Page 114, DECC, 2024)

As outlined in Section 2.3 of the Addendum to Chapter 9 of the EIAR, ensuring the climate resilience of the project was undertaken using the approaches outlined in the *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* (EC, 2013) and *IEMA EIA Guide to Climate Change Resilience and Adaptation* (IEMA, 2020). Both documents outline a methodology for undertaking a risk assessment where there is a potentially significant impact on the project receptors due to climate change. The approach to the assessment is based on the following steps:

- Identify potential climate change risks to a project;
- Assess these risks (potentially prioritising to identify the most severe); and
- Formulate mitigation actions to reduce the impact of the identified risks.

Tables 1.1, 1.2 and 1.3 of the Addendum to Chapter 9 of the EIAR outlined the Likelihood Categories, Measure of Consequence and Significance Matrix respectively based on this approach.

Under Section 5.2.1 "*Impact of Climate Change on the Operational Phase*" of the Addendum to Chapter 9 of the EIAR, it was noted that climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years. Changes in climate may lead to a variety of impacts including:

- Increased average temperatures will lead to a greater requirement for cooling of the data centre leading to greater energy use and associated GHG emissions;

- Increase rainfall will lead to a greater risk of flooding;
- Periods of drought may lead to reduction in water availability.

Section 5.2.1 of the Addendum to Chapter 9 of the EIAR noted that there is:

"the potential for flooding related impacts on site in future years due to climate changes as outlined in Section 3.1 in the absence of mitigation. Chapter 7 (Hydrology) of the EIAR has investigated the likelihood of flooding and has found that there is no current or predicted flood risk (either fluvial, pluvial or coastal) for the site. As outlined in Chapter 7 of the EIAR, the facility will be attenuated with a flow control device, sized to contain a 1-in-100-year storm event and increased by 20% for predicted climate change to limit the surface water discharge from the site during extreme rainfall events.

Thus, in line with the methodology outlined in Table 1.1, Table 1.2 and Table 1.3 of Section 2.3 above, the impacts arising from extreme weather and flooding was assessed to be of low likelihood and with a moderate adverse effect leading to a finding of low risk and thus a non-significant impact."

Thus, the assessment of the Proposed Development has taken into account the relevant national and sectoral adaptation plans and is aligned with them.

FURTHERANCE OF THE NATIONAL CLIMATE OBJECTIVE

The National Climate Objective is defined under section (3)(1) of the Climate Action and Low Carbon Development Act 2015 (as amended by the 2021 amendment Act). The National Climate Objective is as follows:

"The State shall, so as to reduce the extent of further global warming, pursue and achieve, by no later than the end of the year 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy."

The Proposed Development will address residual GHG emissions by way of CPPAs prior to the achievement of net zero electricity by the national grid. As noted by the IEMA 2022 Guidance, in relation to the use of CPPAs the IEMA 2022 guidance states the following (bold added):

"Purchased green electricity tariffs (also green gas) ***are increasingly being considered within net-zero approaches****. In earlier versions of the Hierarchy these tariffs only appeared within COMPENSATE. This is still the case for market-based approaches that use certificates where additionality or quality thresholds are poor, or hard to substantiate. The hierarchy does now allow for higher quality energy tariff purchases within the SUBSTITUTE line, reflecting developing practice and some improved purchasing arrangements (e.g. higher quality procurement or quasi-investments via power purchase agreements)*." (IEMA, 2022)

Thus, the IEMA guidelines have highlighted the usefulness of CPPAs as an appropriate net-zero approach in line with the furtherance of the national climate objective.

The Proposed Development furthers the national climate objective as firstly the Proposed Development and Overall Project will operate within the EU ETS which is the cornerstone of the EU's objective to reduce EU-wide GHG emissions by at least 55% by 2030 (compared to 1990) and to achieve climate neutrality by 2050. As outlined in the EU Climate Law (EU, 2021) under the Item (13): "*The EU ETS is a cornerstone of the Union's climate policy and constitutes its key tool for reducing greenhouse gas emissions in a cost-effective way."* Secondly, the proposed development will replace more carbon intensive IT infrastructure with saving of up to 80% achievable. Thirdly, AWS are committed to offsetting all GHG from the operation of the facility by way of CPPAs in line with best practice (IEMA, 2022).

THE OBJECTIVE OF MITIGATING GREENHOUSE GAS EMISSIONS AND ADAPTING TO THE EFFECTS OF CLIMATE CHANGE IN THE STATE

As outlined in Section 10 of the Addendum to Chapter 9 of the EIAR, in regards to section 15.1(e) the objective of mitigating greenhouse gas emissions, the Proposed Development has the following benefits which will help to mitigate greenhouse gas emissions:

II. The Proposed Development will replace activities which have a higher GHG profile. Data centre facilities represent a significantly more efficient means of data storage when compared to a distributed model of enterprise data storage by individuals and companies (or 'enterprise sites'). A study published in 2020 by Science Magazine, found that while cloud computing productivity has grown globally by 550% between 2010 and 2018, energy consumption rose in tandem during the same period by just 6%, demonstrating the energy efficiency improvements of the industry, most notably by hyperscale data centres.

III. Customers are able to support their own goals to become sustainable by moving to the cloud. The results of a recent study of US enterprise data centres by 451 Research[5] found the Operator's data storage facilities to be 3.6 times more energy efficient than the traditional alternative and achieved an 88% reduction in carbon footprint for workloads that moved from on-premises data storage to the Operator's, helping the Operator's customers to become greener in the cloud.

IV. As outlined in Section 10 of the Addendum to Chapter 9 of the EIAR, a report from the international Energy Agency (IEA) entitled "*Data Centres & Data Transmission Networks*" (IEA, 2021)[6] found that while global internet traffic surged by more than 40% in 2020, this strong growth in demand for data centre services continues to be mostly matched by ongoing efficiency improvements for data centre infrastructure as shown in Figure 9.

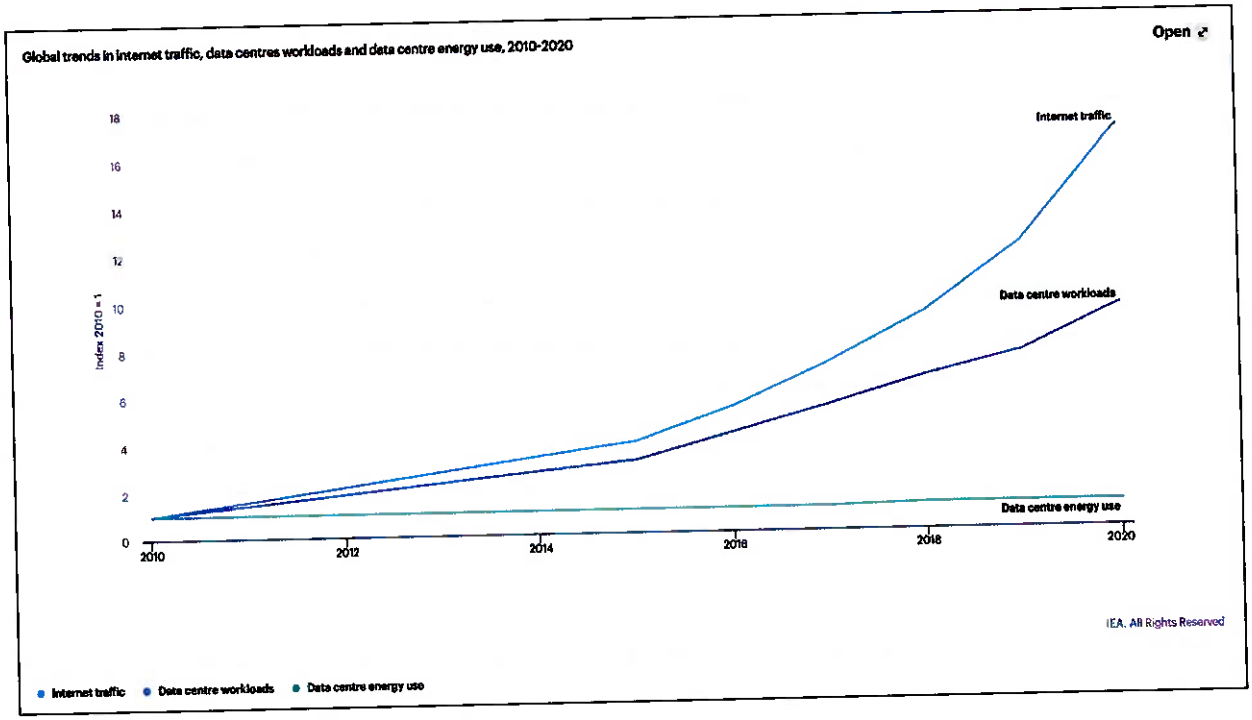

Figure 9 *Global Trends In Internet Traffic, Data Centres Workloads & Data Centre*

[5] https://assets.aboutamazon.com/b0/3e/b0fc6b8a4a85b38ac65a3fbc584c/11061-aws-451research-advisory-bw-cloudefficiency-eu-2021-r5-final-corrected-data.pdf
[6] https://www.iea.org/data-and-statistics/charts/global-trends-in-internet-traffic-data-centres-workloads-and-data-centre-energy-use-2010-2020

Energy Use, 2010 - 2020 (IEA, 2021)

V. A range of design mitigation measures will be employed which is in line with "*best practice*" as outlined in IEMA (IEMA, 2022) including the following as previously outlined in the Addendum to Chapter 9 of the EIAR:

- A PV array proposed on each building E and F will consist of 285 PV modules, each of 300Wp, yielding a total peak power generated of 85.5kWp.
- A rainwater harvesting system will be used to ensure non-potable process water for cooling needs for the operational development are met with no reliance on the public water mains.
- The Proposed Development is designed to fully comply with the Climate Neutral Data Centre Pact. The Proposed Development has an annualised design PUE of 1.12 as compared to the 1.30 set under the Climate Neutral Data Centre Pact. In addition, the Proposed Development has a design WUE of 0.075 L/kWh as compared to the 0.4 L/kWh set under the Climate Neutral Data Centre Pact.
- Internal lighting shall be provided by highly efficient, low energy LED luminaires combined with presence detection controls or local switching where appropriate.
- The Operator has recently signed a supply agreement for renewable diesel (also referred to as hydrotreated vegetable oil or HVO) to their Irish Data Centers. The fuel for the Proposed Development will be renewable diesel.
- The Proposed Development incorporates design provisions to facilitate district heating including heat distribution pipework up to the site boundary. Please refer to Section 4 *Co-Location or Proximity with Future-Proof Energy Supply* of the John Spain Associates response cover letter of this Appeal Response for further detail.

VI. Mitigation Measures will be implemented in line with "*best practice*" as outlined in IEMA (IEMA, 2022) as outlined below:

- A Corporate Purchase Power Agreement(s) will be entered into which demonstrates that the energy consumed by the development on site is met by new renewable energy generation in line with the Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy (2022).
- Amazon is committed to building a sustainable business for its customers and the planet. In 2019, Amazon co-founded The Climate Pledge, a commitment to reach net zero carbon emissions by 2040, 10 years ahead of the Paris Agreement. As part of that commitment, the company is on a path to powering its operations by 100% renewable energy by 2025, five years ahead of its original 2030 target.
- Amazon reached 90% renewable energy in 2022. This includes AWS data centres. As of January 2023, Amazon has announced over 400 renewable energy projects representing 20 gigawatts (GW) of clean energy capacity.
- In 2022, the electricity consumed in 19 AWS cloud computing regions, including their cloud region in Ireland, was attributable to 100% renewable energy.

In terms of "*adapting to the effects of climate change in the State*", this has been addressed under *"(c) the most recent approved national adaptation framework and approved sectoral adaptation plans".*

APPENDIX 4 – AWN CONSULTING NOTE ON CUMULATIVE IMPACT WITH ADJACENT DEVELOPMENT AND RENEWABLE ENERGY PROJECT

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TECHNICAL NOTE ON THE CUMULATIVE ENVIRONMENTAL ASSESSMENT FOR A POTENTIAL DATA CENTRE DEVELOPMENT, CRUISERATH, DUBLIN 15 WITH ADJACENT BIOPHARMACEUTICAL DEVELOPMENT AND CPPA RENEWABLE ENERGY PROJECTS

Technical Report Prepared For

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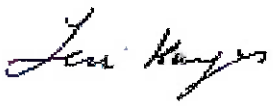
Signature		
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1.0 INTRODUCTION

This technical note has been prepared by AWN Consulting (AWN) to provide technical assistance in the characterisation and assessment of likely significant cumulative effects.

This document is intended to supplement the information already submitted to An Bord Pleanála (ABP) regarding cumulative assessment of effects (including Chapter 16 of the EIAR " Cumulative Effects") for the purposes of ABP carrying out its environmental impact assessment of the Proposed Data Centre Development in Cruiserath, Dublin 15. The EPA Guidance defines cumulative effects as follows:

Cumulative Effects: The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.

This document has been written by Sarah Robertson who is a Senior Environmental Consultant in AWN Consulting providing EIAR management and specialist input to EIAR chapters. Sarah has over ten years' experience working in the environmental field in impact assessment, EIAR management, environmental masterplans, urban planning, waste management, specialist ecological surveys, AA screening and Natura Impact Statements. Sarah holds a BA. Hons (mod Science), MSc. and a Diploma in Environmental Engineering, and has worked in Ireland, the UK, and the USA.

The assessment will cover direct, indirect, secondary, cumulative, short, medium, long-term, permanent, temporary, positive and negative effects. To note, the conclusion on cumulative effects provided in this document is based on the more detailed technical assessments undertaken by experts and provided within the BMS (reference REG. FW23A/0342) and Cruiserath Data Center respective EIARs.

2.0 CUMULATIVE ASSESSMENT WITH BIOPHARMACEUTICAL DEVELOPMENT (REFERENCE REG. FW23A/0342)

On the 11th of January 2024, the Planning and Infrastructure Department of the Fingal County Council granted permission for a Biopharmaceutical development application located at the BMS Cruiserath site, Cruiserath and Goddamendy Townlands, Cruiserath Road, Mulhuddart, Dublin 15, immediately adjacent to the proposed Data Centre site to the east. This development was lodged post completion of the Cruiserath datacenter EIAR and therefore was not considered within the submitted EIAR.

The BMS EIA assessment included assessment of cumulative effects for the BMS development and other permitted and planned development including the Cruiserath proposed Data Center. The conclusions of this cumulative effect report has considered the cumulative assessment undertaken in the BMS EIAR and has accordingly updated the previous assessment of cumulative effect provided in Chapter 16 of the Cruiserath Data Center EIAR.

2.1 Development Description

As per site notice, the BMS development will consist of:

(a) A 2-storey Biopharmaceutical Development and Manufacturing Building sized approximately 11,670 square metres and approximately 15.5 metres high, with roof-mounted plant and equipment, including solar panels.

(b) The refurbishment and extension of the existing 2-storey Laboratory, to include ground-mounted and roof-mounted plant and equipment, including solar panels and an extension to the existing plant room at roof level sized approximately 115 square metres and approximately 9.1 metres high.

(c) A single story pedestrian and materials link sized approximately 420 square metres and approximately 7 metres high from the proposed Production Building to the existing Warehouse.

(d) A single story pedestrian canopy from the proposed production building to the existing administration building, sized approximately 520 square metres and approximately 8.3 metres high.

(e) A single storey pedestrian canopy from the proposed production building to the existing laboratory building, sized approximately 234 square metres and approximately 8.3 metres high.

(f) Provision of new car parking spaces including an additional 185 car parking spaces, including accessible car parking spaces, electric vehicle charging, motorcycle parking, dedicated car-pooling spaces and cycle parking, all accessed from the R121.

(g) Proposed site infrastructure includes bunded tanks, pipe-bridges, sprinkler and water tanks, surface water harvest tanks, docks and yard areas, including associated items of plant and equipment, heat-pumps, underground pumping facilities, internal roads and paths, fencing and site lighting, and the use of the existing BMS site entrances for heavy goods vehicles.

(h) The development includes modifications to the existing internal road network.

(i) Proposed new landscaping includes new landscaped and planted areas, modifications, replacement and reinforcement of the existing landscaping.

(i) Proposed New Signage based at ground level and on the proposed building façade.

(k) The works will include temporary contractor compounds including temporary construction cabins, temporary car parking and the temporary use of existing site entrance road (currently not in use) to the north of the site from the Cruiserath Road, during construction activities.

(l) Proposed new surface water management infrastructure for the site, consisting of Sustainable Drainage features including a detention basin, rainwater harvest cisterns and distribution pipework.

(m) Modifications to existing buildings in the Development and Manufacturing Campus including elevational alterations and modifications to the existing satellite administration, canteen and laboratory buildings to the south of the site, adjacent to the proposed development.

(n) All Associated Site Works.

The proposed development will be built in 2 phases, with phase 2 comprising of approximately half of the proposed administrative floor area and the proposed pedestrian canopies to the existing administration and laboratory buildings.

Surface water drainage for the site will be required to be managed and may or may not require the utlisation of Sustainable Drainage Systems (SuDS) features and also may

or may not require attenuation to accommodate a 1 in 100-year return period design rainfall event plus 20% climate change allowance.

2.2 Undertaken Studies

In order to support the application for the Biopharmaceutical development, BMS has submitted to Fingal County Council a range of studies and documents addressing the potential effects originated from both construction and operational phases of the development. These studies include:

– Environmental Impact Assessment

– Natura Impact Statement

– Archaeological Report

– Aeronautical Assessment Report

– Flood Risk Assessment

– Landscape and Visual Impact Assessment

– Resource and Waste Management Plan

– Glint and Glare Assessment

– Construction Environmental Management Plan (CEMP)

– Traffic and Transport Assessment (TTA)

– Workplace Travel Plan (WTP)

- Climate Action Energy Plan

2.3 EPA Licensing Requirements

The EPA regulates the existing BMS Cruiserath facility through an IE Licence P0552-03, and the new Biopharmaceutical development will operate in accordance with BMS procedures and IE Licence requirements.

3.0 POTENTIAL AND RESIDUAL CUMULATIVE EFFECTS

The below section outlines the potential cumulative effects of the Biopharmaceutical Development granted permission by FCC at the BMS Cruiserath site with respect to the adjacent proposed Data Centre at Cruiserath. The assessment of cumulative effects of BMS Cuiserath with all know permitted or planned development is outlined in the Environmental Impact Assessment submitted as part of the planning application of reference FW23A/0342. This included consideration of the adjacent Data Center proposed development.

3.1 Population and Human Health

The likely cumulative effect of the permitted BMS development with the Proposed Development in conjunction with existing, planned and Permitted Developments on population and human health is assessed under a number of headings below; noise and vibration, air quality, traffic and visual effects. This section considers the cumulative effect in relation to local economy and employment.

Construction Impacts/Commissioning Impacts

As outlined in the Cruiserath Data Center EIAR (Chapter 16) and now taking the BMS development into account, there will be a ***short-term, slight, positive*** cumulative impact on local business activity during the construction phase due to the increased presence of construction workers for the Proposed Development (c 400 for the Proposed Development alone) along with employment on other planned and Permitted Developments using local facilities. The cumulative development will have indirect positive effects on the local economy and employment in terms of construction material manufacture, maintenance contracts, equipment supply and landscaping etc.

Operational Impacts

During operation, the cumulative development will result in an ***imperceptible, positive*** impact as a result of increased employment opportunities (c. 104 for the Proposed Development alone) in the North Blanchardstown area.

3.2 Land, Soils, Geology and Hydrogeology

Construction Impacts/Commissioning Impacts

According to Chapter 5 - Land, Soils, Geology and Hydrogeology of the EIAR submitted for BMS, the potential cumulative effects that may arise with respect to the construction of the BMS development are related to surface water runoff, stockpiled material that may contain silt, contamination of local water sources from accidental spillage and leakage from construction traffic and construction materials. The implementation of mitigation and monitoring measures, however, will ensure the residual cumulative impact of the development is ***neutral, imperceptible*** and ***short-term***.

According to Chapter 6 - Hydrology of the EIAR submitted for BMS, the potential cumulative effects that may arise with respect to the construction of the BMS development are damage to surface water systems and receiving watercourses from surface water run-off containing increased silt levels, discharge of silt-laden water into the surrounding surface water drainage system from stockpile material and contamination of local water sources from accidental spillage and leakage from construction traffic and construction materials. The implementation of mitigation and monitoring measures as well as the compliance of the permitted development with their respective planning conditions, however, will ensure the residual cumulative impact of the development is ***neutral, imperceptible*** and ***short-term.***

Considered the neutral and imperceptible nature of the residual cumulative impacts, it was considered that the BMS Development will not give rise to significant land, soils, geology and hydrogeology impacts during construction in accumulation with the Proposed Data Centre or other permitted or planned developments.

The above conclusions complies with the assessment of cumulative effects given in Chapter 16 of the EIAR for the Proposed Development and it is concluded (including the BMS permitted development) that the cumulative potential for change in soil quality or the natural groundwater regime is considered to be short-term ***neutral and imperceptible.***

3.1 *Operational Impacts*

According to Chapter 5 - Land, Soils, Geology and Hydrogeology of the EIAR submitted for BMS, the potential cumulative effects that may arise with respect to the operations of the BMS development are related to the increased hardstanding areas with localised reduced recharge to ground and increase in surface run-off, increased risk of accidental discharge of hydrocarbons from car parking areas and loss of greenfield area. The implementation of mitigation and monitoring measures as well as the compliance of the permitted development with their respective planning conditions, will ensure there will be minimal cumulative potential. The residual cumulative impact of the BMS development for the operational phase is deemed to be ***neutral, imperceptible*** and ***long-term***.

According to Chapter 6 - Hydrology of the EIAR submitted for BMS, the potential cumulative effects that may arise with respect to the operations of the BMS development are related to the increased hardstanding areas with reduced recharge to ground and increase in surface run-off, increased risk of accidental discharge of hydrocarbons from car parking areas and additional foul discharges. The implementation of mitigation and monitoring measures as well as the compliance of the permitted development with their respective planning conditions, will ensure there will be minimal cumulative potential. The residual cumulative impact of the BMS development for the operational phase is deemed to be ***neutral, imperceptible*** and ***long-term***.

Considered the neutral and imperceptible nature of the residual cumulative impacts, it was considered that the BMS Development will not give rise to significant hydrology impacts during operations in accumulation with the Proposed Data Centre.

Chapter 16 of the EIAR for the Proposed Development stated that during operation, all developments are required to manage groundwater and surface water discharges in accordance with European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 and S.I. 266 of 2016) and (Surface Water) Regulations (S.I. 272 of 2009 and S.I. 77 of 2019). As such, there will be no cumulative impact to water quality. Overall, there will be an increase in hard stand area as a result of cumulative development. However, as the area where recharge to ground is reduced as a result of development is small compared to the overall bedrock aquifer (c. 1,309 km^2 in size), there will be no perceptible cumulative impact on the underlying aquifer resource or groundwater flow regime.

The above conclusion of cumulative effects (including consideration of the BMS permitted development) is unchanged and is considered to be long-term ***neutral and imperceptible.***

3.3 Biodiversity

Construction/Commissioning Impacts

According to Chapter 7 - Biodiversity of the EIAR submitted for BMS, the biodiversity residual impacts for the construction phase of the BMS development are deemed to be ***neutral, imperceptible and long-term.***

Considered the neutral and imperceptible nature of the residual impacts, it was considered that the BMS Development will not give rise to biodiversity impacts during construction in accumulation with the Proposed Data Centre.

Chapter 16 of the EIAR for the Proposed Development concluded there will be **short term, negative, not significant** cumulative impact on local biodiversity due to the loss of existing vegetation (as any remaining greenfield is turned into hardstand as required for development). As there is no source-pathway-receptor linkage, there will be no cumulative impact on any European sites (refer to Chapter 8 and AA screening).

The above conclusion of cumulative effects (including consideration of the BMS permitted development) is unchanged and is considered to be **short term, negative, not significant** cumulative impact on local biodiversity and no *cumulative impact* on any European sites.

Operational Impacts

According to Chapter 7 - Biodiversity of the EIAR submitted for BMS, there will be no negative operational effects from the BMS development with respect to biodiversity and therefore there will be no residual effects.

Considered there will be no residual effects with respect to biodiversity, the BMS Development will not give rise to impacts during operations in accumulation with the Proposed Data Centre.

Chapter 16 of the EIAR for the Proposed Development concluded that with the employment of appropriate landscaping, the cumulative impact is considered to be ***neutral, imperceptible*** and ***long-term effect*** on biodiversity.

The above conclusion of cumulative effects (including consideration of the BMS permitted development) is unchanged and is considered to be ***neutral, imperceptible*** and ***long-term effect*** on biodiversity and no *cumulative impact* on any European sites.

3.4 Air Quality

Construction/Commissioning Impacts

According to Chapter 8 – Air Quality of the EIAR submitted for BMS, during construction stage there is potential for dust impacts to any nearby sensitive receptors in accumulation with the Proposed Data Centre. The implementation of mitigation and monitoring measures as well as the compliance of the permitted development with their respective planning conditions, however, will ensure the residual cumulative impacts on air quality during construction are ***short-term, direct, negative*** and ***imperceptible***.

Considered the imperceptible nature of the residual cumulative impacts, it was considered that the BMS Development will not give rise to significant air quality impacts during construction in accumulation with the Proposed Data Centre.

Chapter 16 of the EIAR for the Proposed Development concluded that based on the phased approach employed for construction at the site (as per Chapter 2 of the EIAR), and the implementation of dust management measures as outlined in the CEMP and Section 9.6.1 of Chapter 9, there is minimal potential for cumulative impact on air quality from simultaneous construction of the nearby Permitted Developments and the indicative future development with the Proposed Development. The mitigation measures that will be put in place during construction of the Proposed Development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values through the suppression of dust emissions. The EU ambient air quality limit values are based on the protection of human health. Therefore, the impact of construction of the Proposed Development will be ***neutral, short-term*** and ***imperceptible*** with respect to air quality and human health.

The above conclusion of cumulative effects (including consideration of the BMS permitted development) is unchanged and is considered to be ***neutral, short-term imperceptible***.

Operational Impacts

According to Chapter 8 – Air Quality of the EIAR submitted for BMS, during operations the potential cumulative effects that may arise from the BMS development are related to operational traffic, and are deemed to be ***long-term, localised, direct, neutral, imperceptible*** and ***non-significant***. No new air emission points are proposed as part of the BMS development, therefore there is no potential for cumulative impacts. The proposed new buildings will not impact dispersion of pollutants from the existing main air emission points on site and compliance with the ambient air quality limit values and assessment levels will be maintained. Cumulative impacts are assessed to be ***long-term, localised*** and ***imperceptible***.

Considered the neutral and imperceptible nature of the residual cumulative impacts, it is considered that the BMS Development will not give rise to significant air quality impacts during operations in accumulation with the Proposed Data Centre.

Chapter 16 of the EIAR for the Proposed Development concluded that the cumulative impacts to air quality during the operational phase of the Proposed Development may occur due to NO_2 emissions from the operation of the back-up generators in addition to NO_2 emissions from existing and Permitted Developments in the vicinity of the Proposed Development site. In terms of the potential for overlap of emission plumes the impact is largely confined to the immediate vicinity of the site and therefore, developments beyond 1 km of the Proposed Development boundary have not been included within the cumulative assessment. This is because there is minimal potential for overlap of emission plumes at increased distances. A review of relevant existing and Permitted Developments was conducted in order to inform the operational phase cumulative air quality assessment. The following developments were included within the cumulative assessment as per Section 9.2.3.1 of Chapter 9 – the IE licenced sites of BMS and Alexion as they are both within 1 km of the Proposed Development and both have licenced emissions of NO_2, the Permitted Developments on the wider site (Building A, B and C) and an indicative future development on the wider site to the north of Building G (Building D has no associated air emissions). No other developments of relevance were identified for inclusion in the cumulative modelling assessment. Emissions and proposed minimum stack heights for the 18 no. back-up diesel generators associated with the potential future Data Centre building were assumed to be the same as those for Buildings F and G for the purpose of the cumulative assessment. Building E has one associated generator and associated emission point. House generators associated with the relevant buildings were also included in the modelling assessment. The NO_2 modelling results at the maximum location at and beyond the site boundary are detailed in Section 9.8.2.1 of Chapter 9. The results indicate that the ambient ground level concentrations are within the relevant air quality standards for NO_2. For the maximum year modelled, emissions from all back-up generators lead to an ambient NO_2 concentration (including background) which is 63% of the maximum ambient 1-hour limit value (measured as a 99.8th percentile) and 83% of the annual limit value at the maximum off-site receptor.

As there are no additional air emissions from the permitted BMS development, and the results of the cumulative impact scenario modelled are in compliance with the relevant ambient air quality limit values at all locations at or beyond the site boundary, the conclusion is unchanged and is a ***long-term, slight, negative*** impact to air quality.

3.5 Climate

3.2 *Construction Impacts*

3.3 According to Chapter 9 – Climate of the EIAR submitted for BMS, 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, the assessment demonstrates the potential for the project to affect Ireland's ability to meet its national carbon reduction target. Therefore, the assessment approach is considered to be inherently cumulative. The impact of the BMS development in relation to GHG emissions is considered ***long-term, minor adverse*** and ***not significant.***

3.4 Considered the not significant nature of the impacts, it was considered that the BMS Development will not give rise to significant Climate impacts during construction in accumulation with the Proposed Data Centre.

3.5 Chapter 16 of the EIAR for the Proposed Development concluded that construction traffic is the primary source of GHG emissions during the construction phase. Construction vehicles and machinery will give rise to CO_2 and N_2O emissions during construction of the Proposed Development. The Institute of Air Quality Management document 'Guidance on the Assessment of Dust from Demolition and Construction' (IAQM, 2014) states that site traffic and plant is unlikely to have a significant impact on climate. There is the potential for the construction phase of the Proposed Development to coincide with the construction of the permitted Buildings B and C and potential future indicative development. However, as the Proposed Development will be constructed on a phased basis over an approximate 5 year period the scale of the construction works will be less than if the entire development were to be constructed simultaneously. In addition, the development of the wider site will also follow a phased approach to construction. It can be concluded that due to the duration and nature of the construction activities, CO_2 and N_2O emissions from construction vehicles and machinery will have a ***short-term, negative*** and ***not significant*** cumulative impact on climate.

3.6 The above conclusion of cumulative effects (including consideration of the BMS permitted development) is unchanged and is considered to be ***short-term, negative*** and ***not significant.***

Operational Impacts

3.7 According to Chapter 9 – Climate of the EIAR submitted for BMS, 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, the assessment demonstrates the potential for the project to affect Ireland's ability to meet its national carbon reduction target. Therefore, the assessment approach is considered to be inherently cumulative. The impact of the BMS development in relation to GHG emissions is considered ***long-term, minor adverse*** and ***not significant.***

3.8 Considered the not significant nature of the impacts, it was considered that the BMS Development will not give rise to significant Climate impacts during operation in accumulation with the Proposed Data Centre.

3.9 Chapter 16 of the EIAR for the Proposed Development concluded that as outlined in Section 9.7.2.3 of Chapter 9, cumulative indirect electricity usage for the overall site including the Proposed Development, Permitted Development and indicative future development would be equivalent to 607,523 tonnes of CO_2eq per year. As the Proposed Development is over 20 MW, a greenhouse gas emission permit will be

required for the facility which will be regulated under the EU-wide Emission Trading Scheme (ETS). Electricity providers form part of the ETS and thus greenhouse gas emissions from these electricity generators are not included when determining compliance with the targeted 42% reduction in the non-ETS sector i.e. electricity associated greenhouse gas emissions will not count towards the Effort Sharing Decision target. Thus, any necessary increase in electricity generation due to data centre demand will have no impact on Ireland's obligation to meet the EU Effort Sharing Decision. On an EU-wide basis, where the ETS market in 2021 was approximately 1,308 million tonnes CO_2eq, the impact of the emissions associated with the Proposed Development in conjunction with the Permitted Developments and future indicative development, will be no more than 0.046% of the total EU-wide ETS market which is imperceptible.

Thus, given that the use of electricity to power the facility will achieve net zero by 2050 and the commitment to offset all interim fossil fuel derived GHG emissions by the purchase of CPPAs the predicted cumulative impact to climate is deemed to be ***indirect***, ***long-term, negative*** and ***slight***.

As per Section 9.7.2.4 of Chapter 9 the Proposed Development in conjunction with the Permitted Developments and future indicative development, will have an estimate peak operational demand 219.7MW per year in total which translates to 1,925 GWh (gigawatt hours) annually. The nitrogen oxide (NO_X) emissions associated with this electricity over the course of one year (i.e. 1,925 GWh based on 219.7MW for 8,760 hours per annum) will equate to 253 tonnes per annum which is 0.37% of the National Emission Ceiling limit for Ireland from 2020 onwards. Similarly, SO_2 emissions associated this electricity over the course of one year (1,925 GWh) will equate to 142 tonnes per annum which is 0.56% of the National Emission Ceiling limit for Ireland from 2020. Additionally, NMVOC emissions associated this electricity over the course of one year (1,925 GWh) will equate to 14 tonnes per annum which is 0.03% of the National Emission Ceiling limit for Ireland from 2020. The indirect NO_X, SO_2 and NMVOC emissions are all below 1% of the relevant National Emission Ceiling limits when considering the cumulative impact of the Proposed Development.

As discussed in Chapter 2 and Section *9.7.2.3* of this EIA Report, the Operator has a commitment to reach net zero carbon emissions by 2040, 10 years ahead of the Paris Agreement. As part of that commitment, the company is on a path to powering its operations by 100% renewable energy by 2025, five years ahead of its original 2030 target. Amazon is continuing to scale its renewable energy investments with a current total of 379 renewable energy projects around the world, marking significant progress on its path to powering 100% of its operations with renewable energy by 2025 - before the proposed Data Centre F & G are due to come into operation. Once fully operational, Amazon's current global renewable energy portfolio will generate 50,000 gigawatt hours (GWh) of clean energy, which is the equivalent amount of electricity needed to power 13.4 million European homes each year.

Amazon has committed to offtake 100% of the power from renewable wind projects in Cork, Donegal, and Galway. In total, these three wind projects are projected to add 229 megawatts of renewable energy to the Irish grid, reducing carbon emissions by 366,000 tonnes of CO_2 each year, and producing enough renewable energy to power 185,000 Irish homes, per annum. These three wind projects will make Amazon the largest single corporate buyer of renewable energy in the country.

Thus, the cumulative NO_X, SO_2 and NMVOC indirect emissions associated with the operation of the Proposed Development, Permitted Developments and indicative

future development are ***indirect***, ***long-term, negative*** and ***slight*** with regards to regional air quality.

The above conclusion of cumulative effects (including consideration of the BMS permitted development) is unchanged and is considered to be ***indirect***, ***long-term, negative*** and ***slight.***

3.6 Noise and Vibration

Construction/Commissioning Impacts

The residual impact of construction noise was considered to be **negative, not significant to moderate and temporary**.

Chapter 16 of the EIAR for the Proposed Development concluded that during the construction phase of the Proposed Development and Permitted Developments, there will be some impact on nearby noise sensitive properties due to noise emissions from site traffic and other activities. During permitting of all developments the planning authority will apply noise and vibration limits and hours of operation to limit noise and vibration to the levels proposed in Section 10.2.4 of the EIAR. Management of noise and vibration in accordance with planning conditions will ensure that the cumulative impact is ***slight, negative*** and ***short term*** in nature.

The above conclusion of cumulative effects (including consideration of the BMS permitted development) is unchanged and is considered to be ***slight, negative*** and ***short term.***

Operational Phase

Consideration was given to operational noise impact accumulation with the Proposed Data Centre in Chapter 10 of the EIAR submitted for BMS. The chapter outlines that both sites share the same closest noise sensitive receptor and classifies the predicted cumulative noise impact as ***negative, slight*** and ***long-term*** for the operational phase.

Considered the slight nature of the impact, it is considered that the BMS Development will not give rise to significant noise impacts during operations in accumulation with the Proposed Data Centre.

Chapter 16 of the EIAR for the Proposed Development has considered the BMS facility (pre the current extension of development) within its baseline noise model. With planning conditions related to noise management and requirement to operate within the limits of the EPA licence, it is considered that the cumulative effects will be unchanged from that which was previously considered, i.e a not significant effect.

The above conclusion of cumulative effect (including consideration of the BMS permitted development) is unchanged and is considered to be ***not signifcant, negative*** and ***long term.***

3.7 Landscape and Visual

Construction Phase

Chapter 16 of the EIAR for the Proposed Development states that during construction, cumulative landscape and visual effects will vary depending on whether projects are constructed at the same time or not. In the case of the permitted BMS development, cumulative effects during construction if implemented at the same time as the Proposed Development will give rise to an intensification of construction activity along

the Cruiserath Road in particular with the additional construction site being secured and enclosed by separate hoarding. Cumulative landscape and visual effects during construction will be ***temporary***, ***moderate*** and ***negative***.

Operation Phase

According to Chapter 11 – Landscape and Visual Impact of the EIAR submitted for BMS, the majority of applications within the vicinity of the BMS site are of a similar industrial nature with the permitted developments of similar scale, or larger. Therefore, it is not considered that the BMS development will have any substantive landscape or visual impacts in-combination with other permitted developments in the vicinity of the site. The likely cumulative effects are deemed to be ***Low-negligible***.

Considered the low-negligible nature of the impact, it is considered that the BMS Development will not give rise to significant Landscape and Visual impacts during construction or operation in accumulation with the Proposed Data Centre. The developments are in fitting with the current zoning for the site and ongoing development of the area.The likely cumulative effects are deemed to be ***imperceptible, neutral*** and ***long term.***

3.8 Cultural Heritage, Architecture and Archaeology

Construction Phase

According to Chapter 12 – Archaeological, Architectural, and Cultural Heritage Impact of the EIAR submitted for BMS, previous development in the wider area has uncovered previously unrecorded archaeology. The academic knowledge gained from the excavation of these features has resulted in a net cumulative ***permanent***, ***significant***, ***positive*** impact.

Considered the nature of the impact, it is considered that the BMS Development give rise to significant positive Archaeological impact during construction in accumulation with the Proposed Data Centre.

Chapter 16 of the EIAR for the Proposed Development stated that no known features of archaeological interest have been identified within the overall landholding as part of this assessment. Considering the academic knowledge gained from the excavation of archaeological features in the wider area, it is concluded that there would be a cumulative ***permanent***, ***significant***, ***positive*** impact.

Operational Impacts

According to Chapter 12 – Archaeological, Architectural, and Cultural Heritage Impact of the EIAR submitted for BMS, during operation there is no potential for cumulative impact as there will be no disturbance to ground.

As concluded in Chapter 16 for the proposed development (and considering the permitted BMS development), the operational phase is not predicted to have any cumulative impact on archaeological, architectural and cultural heritage as there will be no effects on these receptors during operation.

3.9 Material Assets - Traffic

Construction Phase

According to Chapter 13 – Traffic and Transportation of the EIAR submitted for BMS, for a cumulative traffic impact assessment, consideration was given to the trips to and from permitted developments which are granted planning around the BMS development, including the Proposed Data Centre.

The implementation of a Construction Environmental Management Plan (CEMP) and other mitigation measures will ensure there will be no significant residual effects during construction of the BMS development.

As outlined in Chapter 16 of the Proposed Development EIAR, given the temporary nature of the peak construction phase, the overall impact of the construction phase is considered ***short-term***, ***negative*** and ***not significant.***

Operational Impacts

According to Chapter 13 – Traffic and Transportation of the EIAR submitted for BMS, for a cumulative traffic impact assessment, consideration was given to the trips to and from permitted developments which are granted planning around the BMS development, including the Proposed Data Centre.

As no residual impacts are expected followed the implementation of mitigation measures and Workplace Travel Plan as a result of the BMS extension works, and taking account of the modelling undertaken in Chapter 16 of the Proposed Development EIAR, the cumulative impact is concluded to have a long term negative and imperceptible impact on traffic and transportation quantity in the environment.

3.10 Material Assets - Waste

Construction & Operational Phase

Consideration was given to the accumulation of construction impact with the Proposed Data Centre in Chapter 14 – Waste Management of the EIAR submitted for BMS. The chapter outlines that other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate against any potential cumulative effects associated with waste generation and waste management. As such the effects will be ***imperceptible*** and ***neutral*** for both construction and operational phases.

Considered the neutral, imperceptible nature of the impacts, it is considered that the BMS Development will not give rise to significant waste impacts in accumulation with the Proposed Data Centre.

As concluded in Chapter 16 of the EIAR for the Proposed Development, all developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative effects associated with waste generation and waste management. As such it is considered that the cumulative impact will be ***long-term*** and ***imperceptible***.

3.11 Material Assets - Utilities

Construction & Operational Phase

According to Chapter 15 – Material Assets Utilities of the EIAR submitted for BMS, the construction will require site clearance, excavations and levelling which will generate localised requirement for soil removal and/or import, power and water supply and wastewater discharge. Provided standard mitigation measures and that planning conditions are implemented, the cumulative impact will be ***neutral, imperceptible***, and ***short term.***

During operation there will be an increase in requirement for water supply, surface water and foul drainage and electricity capacity. All permitted developments are required to engage with FCC, Uisce Éireann and ESB to ensure that there is sufficient capacity to cater for the increase supply. Based on known current and known future developments there is adequate capacity of supply available within the local environs, the cumulative impacts associated with other material assets will be neutral, not significant, and long term.

Considered the neutral, imperceptible nature of the impacts, it was considered that the BMS Development will not give rise to significant material assets impacts in accumulation with the Proposed Data Centre.

The conclusion given in Chapter 16 of the EIAR for the Proposed Development is unchanged. The location of the Proposed Development within the well-developed area of Cruiserath means that it is well placed to access existing utilities and, therefore, will not have any significant impact and will not impact on capacity for off site development.

The water supply and drainage strategy for the overall landholding was discussed with Fingal County Council (FCC) Water Services and with Irish Water as part of the planning application for Buildings A, B and C as well as during the pre-application consultation (August 11th 2022) for the Proposed Development. Irish Water (IW) have agreed in principal that the water and drainage requirements for the development is feasible (COF dated Oct 19 2022).

The Proposed Development will have an overall maximum operational demand for all three buildings of 73.1MW, with an overall maximum operational demand for permitted, proposed and future indicative masterplan of c. 219.7MW. As described in Chapter 2 and 14, the power requirements for the existing, permitted and Proposed Development will be provided from the existing 220kV GIS substation on site (Building D) located south of proposed Buildings F and G, and to the east of proposed Building E. A connection agreement to supply the existing, permitted and Proposed Developments is in place with EirGrid. EirGrid has accounted for the Proposed Development and the indicative masterplan in the All-Island Generation Capacity Statement 2017-2026 (published April 2017). The existing, permitted, proposed and future indicative development within the overall landholding were included in the 'material enquiry' cohort noted in the Capacity Statement.

The fibre optic cable distribution network installed for the Permitted Developments will be extended for Buildings E, F, G and the future data centre building. Consultation has confirmed that there is sufficient capacity available for these developments.

The cumulative effects associated with material assets will be ***long-term*** and ***not significant***.

4.0 CONCLUSION

Building upon the evidence presented in the Environmental Impact Assessment conducted for the BMS development (now permitted) and adhering to the recommended mitigation strategies and best practices, it can be concluded that, for both construction and operational phases, there will be no significant adverse effects arising in cumulation with the proposed Data Centre at Cruiserath.

5.0 CUMULATIVE ASSESSMENT WITH RENEWABLE ENERGY PROJECT(S)

In the Response to the Appeal dated 6 November 2023, AWN assessed the cumulative effect of the renewable energy (RE) project(s) and the proposed development as follows: "*Based on the nature of the RE project(s), the climate impact of the proposed RE project is likely to be beneficial and contribute to the cumulative impact in a beneficial manner.*" In accordance with the Supreme Court decision in Fitzpatrick v An Bord Pleanála [2019] IESC 23, the test is to *"take into account, as far as practically possible*" in the EIA, future related developments. In that project, the aspects that were cumulatively assessed with such potential future developments were energy uses and climate change.

Based on that test, we included further detail on this cumulative assessment of climate in so far as practically possible. This assessment was also provided in accordance with the following:

> "44. […] it is nevertheless indicative of an approach that requires assessment of the cumulative effects of a proposed development which is either not yet permitted or where an application for permission has not yet been made, where it forms an integral part of the development for which permission has been applied. Another way of putting it is that an assessment of the cumulative effects of the proposed development and a future development is required where there is a functional or legal interdependence between the development for which permission has been applied and the envisaged future development.
>
> 45. The approach in each of O Grianna and Brown is dependent upon a finding of fact made that the specific project for which planning permission was granted was functionally or legally interdependent on a further development not included in the application for planning permission which might have environmental effects and in respect of which no EIA had been carried out. Brown has been distinguished in a number of subsequent English cases where no such interdependence existed, including by the Court of Appeal in Bowen-West v. Secretary of State for Communities and Local Government [2012] EWCA Civ 321, [2012] Env. L.R. 22.
>
> […]
>
> 56. […] As already determined, the EIA is to be conducted of the specific project which is the subject of the planning application and there is no obligation to carry out an EIA of the masterplan. However, to give effect to the purposes of the EIA Directive so that potential effects on the environment be assessed at the earliest possible stage, account must also be taken, when carrying out the EIA of the proposed development, of the future potential phases of the masterplan, as far as practically possible. The purpose of this is inter alia to enable the proposed development and potentially future phases of the masterplan to be designed so as to have least possible impact on the environment. The precise manner in which that is required to be done will

depend upon the individual facts and circumstances of the specific project and the overall masterplan.[…]"

The EPA Guidelines, under the heading "3.5.7 Description of other related projects" also state that the effects of off-site and secondary projects can often be as significant as those of the main project and must not be overlooked, and define secondary projects as "projects that may arise largely because of the existence of the principal project, though they are usually not carried out by the developer of the principal project. These can be very difficult to describe with precision – but can be usefully examined as a series of 'what if' scenarios that can be used as a context for decision-making by the CA."

6.0 CONCLUSION

A cumulative assessment between the proposed development and any renewable energy projects has been carried out by the Applicant within the Response to the Appeal dated 6 November 2023, as far as practically possible.

It is noted that a full cumulative assessment for each individual environmental discipline is not currently possible. The delivery of each of these RE projects is dependent on completion of planning applications and obtaining planning approval. For this reason, is not possible to confirm which RE projects will be available for CPPA purposes, at the time of operation.

Based on the nature of the RE project (s), they will provide energy from a renewable resource and help to achieve national energy and climate change targets. This is a **direct positive long-term** residual effect.

APPENDIX 5 – AWN CONSULTING NOTE ON CONSIDERATION OF UNCERTAINTY

TECHNICAL NOTE

Project	**DUB098/108/601**
Subject	**Review of Uncertainty**
Author	**Dr. Edward Porter / Teri Hayes**
Date	**21/06/2024**
Ref.	**EP/227501.0284AT02**

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This memo is a review of how the assessment of the Proposed Development has taken into account the inherent uncertainty in line with the relevant guidance as follows:

- IEMA Guidance - *Assessing Greenhouse Gas Emissions and Evaluating their Significance 2nd Edition* (IEMA, 2022),
- *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* (EU, 2013),
- *EU Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report*" (EU, 2017).

Kind regards

Dr. Edward Porter
AWN Consulting

Uncertainty In Relation To Climate Assessment

The Coyne judgement sets out a methodology to assess uncertainty as outlined in paragraphs 125 - 127 of the judgment as shown below:

"125. As to "Assessing Significant Effects" the 2013 Guidance [2013 Guidance on Climate Change] states that many assessment approaches used in EIA have the capacity to address climate change. "There are, however, three fundamental issues that you should consider when addressing climate change and biodiversity: the long-term and cumulative nature of effects, complexity of the issues and cause-effect relationships and uncertainty of projections." There follows a consideration of all three issues, the premise of which is that EIA should address them. I would add that this premise must itself be premised on climate change having been scoped into the EIA as a likely significant effect.

126. The 2013 Guidance states that EIA, to properly address climate change, should take into account its complexity (including of causal relationships) and long-term direct and indirect impacts and consequences. EIA should describe the sources of, and characterise the nature of, uncertainty. Judging an impact's magnitude and significance must be context-specific. The contribution of an individual project to GHGs may be insignificant on the global scale but may be significant on the local/regional scale, in terms of its contribution to set GHG-reduction targets.

127. Finally, it is worth noting some of the "bullet points" tabulated in 2013 Guidance as "Critical challenges for addressing climate change ... in EIA":

- *Manage complexity. Consider the complex nature of climate change and biodiversity and the potential of projects to cause cumulative effects.*
- *Be comfortable with uncertainty, because you can never be sure of the future. Use tools such as scenarios (for example, worst-case and best-case scenarios) to help handle the uncertainty inherent in complex systems and imperfect data. Think about risks when it is too difficult to predict impact.*
- *Base your recommendations on the precautionary principle and acknowledge assumptions and the limitations of current knowledge.*
- *Be practical and use your common sense!*

The guidance also states that "considering a range of possible uncertain futures and understanding the uncertainties is part of good EIA practice and permits better and more flexible decisions."

In other words, it is no error to acknowledge and assess uncertainty and risk as best you reasonably can. Error may well lie in ignoring them."

Chapter 9 of the Environmental Impact Assessment (EIAR) undertook a detailed assessment of the predicted climatic impact of the Proposed Development and of the Overall Project (i.e. the Proposed Development and existing / permitted / potential future development on the wider landholding) in the context of the EU ETS (Emission Trading System). The Addendum to Chapter 9 submitted as part of the further information response built on Chapter 9 of the EIAR and was updated to incorporate the new IEMA Guidance - *Assessing Greenhouse Gas Emissions and Evaluating their Significance 2nd Edition* (IEMA, 2022). The Addendum also framed the impact of the Proposed Development and Overall Project in the context of the Sectoral Emission Ceilings. Outlined below is a discussion of the uncertainty of the climate assessment in terms of the climate guidance and methodology, the baseline climatic environment, the impact of the proposed development and proposed mitigation.

Climate Guidance & Methodology And Uncertainty

In terms of climate guidance and methodology, the IEMA Guidelines (IEMA, 2022) are recognised throughout Ireland and the UK as the authoritative guidance body on greenhouse gas (GHG) and climate impact assessment. As IEMA, and in particular IEMA (2022), offers a much more specific and robust assessment of current climate impacts, this guidance document was used in the Response to the 3rd Party Appeals (dated 6th November 2023).

The IEMA Guidelines outlines the approach to uncertainty in predicting climate impact. The IEMA Guidelines recommends that:

"*a relevant, complete, consistent, transparent and accurate assessment of the reasonable worst-case approach must be undertaken despite uncertainties*".

The Guidelines outlines that uncertainty can be determined by:

- Testing upper and lower limits,
- Testing for different inclusions and exclusions,
- Modifying study periods.

Further guidance on uncertainty is available from the EU including the "*Guidance On Integrating Climate Change And Biodiversity Into EIA*" (EU, 2013). This guidance suggests the following approach to uncertainty:

- *"Use tools such as scenarios (for example, worst-case and best-case scenarios) to help handle uncertainty inherent in complex systems and imperfect data",*
- *"Base your recommendations on the precautionary principle and acknowledge assumptions and the limitations of current knowledge",*
- *"Working with uncertainty requires a qualitative approach, as quantitative data are often either unavailable or unreliable in predicting impact",*
- *"The use of scenarios is a response to uncertainty".*

Additional guidance on uncertainty is available from the EU publication "*EU Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report*" (EU, 2017). The guidance suggests the following approach to uncertainty:

- *"Predicting uncertain elements can be challenging, particularly concerning the availability of information, as well as ensuring that the assessment is carried out with reasonable effort",*
- *"Environmental Impact Assessments consider the impacts that climate change may have on the Project itself – and the extent to which the Project will be able to adapt to possible changes in the climate over the course of its lifetime. This aspect of the issue of climate change can be challenging as"...."it involves a considerable degree of uncertainty, given that the actual climate change impacts, especially at local levels, are challenging to predict. To this end, the EIA analysis should take trends and risk assessment into consideration".*

As outlined in Appendix 3 of the Response to the 3rd Party Appeals (dated 6th November 2023), the assessment of the Proposed Development has taken into account the inherent uncertainty of the assessment in line with the relevant guidance (IEMA (2022), EU (2013), EU (2017)) as outlined in Section 4.3."3. *Emission Calculation Methodology & 4. Data Collection*".

Uncertainty In Relation To The Baseline Environment

Existing GHG baseline data is available from the Environmental Protection Agency (EPA). In their latest data, the EPA has reported that in the 2022 the energy industries GHG emissions decreased from 10.26 Mtonnes in 2021 to 10.08 Mtonnes in 2022[1]. This data is based on final figures based on the SEAI's energy balance provided in September 2023 and thus there is a high degree of confidence in these figures for 2022.

However, the baseline for the purposes of the EIAR is the year of opening which is projected to be 2025. As this is three years into the future from the most recent confirmed data, there will be uncertainty with the projected baseline figures. The EPA report[2] entitled "*Ireland's Greenhouse Gas Emissions Projections- 2023-2050*" (EPA, May 2024) suggests that the 2021 – 2025 and 2026 – 2030 Carbon budgets will be difficult to comply with. Likewise the report suggests that the 2021 – 2025 and 2026 – 2030 sectoral emission ceilings (including the electricity sector) will be difficult to comply with. The report outlined two scenarios to project into the future:

- With Existing Measures (WEM) - a projection of future emissions based on currently implemented measures and actions committed by Government which are in place by the end of 2022.
- With Additional Measures (WAM) - a projection of future emissions based on currently implemented measures and actions committed by Government including all WEM measures plus those included in Government plans but not yet implemented.

However, in relation to electricity, there are number of measures which have been excluded from the EPA WEM and WAM scenarios as discussed above. These excluded measures include:

- CAP24 has projected 9 GW onshore wind, 5 GW offshore wind and 8 GW solar PV whilst the EPA has assumed in their projections that in reality, by 2030, there will be 7.2 GW onshore wind, 3.5 GW offshore wind and 6 GW solar PV.
- New gas fired generation of 1.4GW was assumed by 2030 compared to 2 GW in CAP24
- The CAP24 policy of 2 GW offshore wind for green hydrogen post-2030 is also not included in the EPA projections.

Thus, in projecting forward to the opening year and to 2030 when compliance with the electricity emission ceiling is determined, there is a range of possible baseline GHG levels depending on whether some or all of the proposed measured are implemented in a timely manner. AWN Consulting have adopted a conservative approach to the assessment and potential uncertainty.

In terms of assessing the "*do nothing*" scenario, as a conservative approach, the GHG emissions in the assessment for the "*do nothing*" scenario has been assumed to be zero. This should be viewed as a very conservative assumption as, in reality, the operation of the Proposed Development (a data centre) will replace other existing and future computing and IT activities with greater GHG emissions as outlined in Section 6.3 "*A6.5 the objective of mitigating greenhouse gas emissions and adapting to the effects of climate change in the State*" in Appendix 3 of the Response to the 3rd Party Appeals (dated 6th November 2023):

[1] https://www.epa.ie/our-services/monitoring--assessment/climate-change/ghg/latest-emissions-data/#

[2] https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/irelands-greenhouse-gas-emissions-projections-2023-2050.php

- Data Centre facilities such as the Proposed Development represent a significantly more efficient means of data storage when compared to the historic distributed model of on-site data storage by individuals and companies (or 'enterprise sites'). The GHG savings associated with this have conservatively not been quantified and are not included in the assessment. The results of a recent study of US enterprise data centres by 451 Research[3] found the Operator's data storage facilities to be 3.6 times more energy efficient than the traditional alternative and achieved an 88% reduction in carbon footprint for workloads that moved from on-premises data storage to the Operator's, helping the Operator's customers to become greener in the cloud.

Uncertainty In Relation To The Proposed Development

The proposed development will have uncertainty associated with it which will impact on the calculated GHG emissions. The factors which will be important include:

- Year of opening,
- Phasing of operations,
- Operational load,
- Changes to the electricity grid.

The factors outlined above have been reviewed below to determine their underlying uncertainty into the future. As a general principle, a reasonable worst-case assessment has also been applied in the EIAR as shown by the following approaches below:

- Year of opening: This has been assumed to be 2025 as a conservative assumption. There is no possibility of an earlier operational date but a later date is possible. GHG emissions will be higher when an earlier operational date is assumed as later dates will have a high percentage of renewables in the national grid. Hence, an opening year of 2025 is conservative.
- Phasing of operations: The assessment assumed 100% operation of the entire Proposed Development in Year 2025. In reality, there will be a ramp-up period with 100% operation not occurring until mid-2027 on the basis that construction starts in 2024.
- The assessment assumed a continuous 100% operational load for the data centre development, however annual average load is likely to be closer to 80% (as outlined in the recent Department of Environment, Climate and Communications [DECC] publication "*Summary of Analysis to Support Preparation of the Sectoral Emissions Ceilings*" (DECC, 2022b)). Thus, the assumption of 100% operations will overestimate GHG emissions in the early years of the project particularly for Years 2025 and 2026. Secondly, the assumption of 100% operational load will likely overestimate GHG emissions by approximately 20% every year.
- It is acknowledged that due to delays in decision making and logistical delays that the opening year may move beyond Year 2025. However, by assuming Year 2025 as the opening year it will be a conservative assumption. Each year the percentage of renewables in the national grid is likely to increase in line with government policy. As a results, the GHG emissions associated with the use of electricity from the national grid are likely to decrease on a year by year basis.
- As the Sectoral Emission Ceilings and Carbon Budgets have targets set for 2030, the assessment has predicted future GHG emissions for this year. Information on future GHG emissions, beyond 2030, from electricity will be naturally uncertain as it will depend on many factors including the percentage of renewables in the grid, the

[3]https://assets.aboutamazon.com/b0/3e/b0fc6b8a4a85b38ac65a3fbc584c/11061-aws-451research-advisory-bw-cloudefficiency-eu-2021-r5-final-corrected-data.pdf

fossil fuel mix (gas, oil, coal) and the average wind speed. Thus, the assessment approach and the use of the 2030 target is conservative to allow for this uncertainty.

- a GHG emission rate of 100 gCO_2/kWh has been conservatively assumed for the national grid in 2030 which is higher than the SEAI[4] predicted 92.9 gCO_2/kWh for 2030,
- the power generation mix in 2030 is forecast by EirGrid to be 83% renewable rather than the assumed 80% renewable generation which was conservatively used in the current assessment.

Looking further ahead to 2050 will lead to greater uncertainty in GHG emissions. It is projected that GHG emissions will reduce from 2030 onwards, hence the use of the 2030 figures is a conservative approach. The government in CAP24 has reiterated the goal of achieving net-zero GHG emissions by 2050:

"Under the Climate Action and Low Carbon Development (Amendment) Act 2021, Ireland's national climate objective requires the State to pursue and achieve, by no later than the end of the year 2050, the transition to a climate-resilient, biodiversity-rich, environmentally sustainable and climate-neutral economy."

Thus, the assessment of the Proposed Development was based on this legally binding target. However, this is likely to be conservative for the following reasons:

- It is assumed that net zero electricity would not be achieved until 2050, whereas recent data from the ESB and UCC/MaREI suggests that this is likely to be achieved by 2040 at the latest as outlined in "*Networks For Net Zero – Delivering the Electricity Network for Ireland's Clean Electric Future*" (ESB Networks, 2023).
- UCC / MaREI have also separately published the report "*Our Climate Neutral Future – Zero by 50*" (UCC / MaREI, 2021) which details how the energy system can achieve net zero by 2050 by using technologies, concepts and interventions will already exist today. As shown in Figure 2, of the 122 TWh (1 TWh = 1000 GWh) of primary energy, 77 TWh will be derived from wind, 4 TWh will be derived from solar, 38 TWh will be derived from Bio and other renewables whilst only 1 TWh will be derived from oil. Thus, the report predicts that the energy system will be dominated by renewable energy in 2050.
- Although the pathway may vary somewhat depending on future policy decisions, it is likely that net zero electricity (shown in green below in Figure 1) will be achieved by 2040, given that Figure 1 shows net zero electricity being achieved by 2035, compared to the conservative assumption in the Addendum to Chapter 9 of the EIAR that net zero electricity would not be achieved until 2050. Thus, the GHG emissions in the Addendum to Chapter 9 of the EIAR should be viewed as a

[4] Private communication from SEAI- dated 12th October 2023

From: [redacted]@seai.ie>
Sent: Thursday, October 12, 2023 11:45 AM
To: Avril [redacted] <[redacted]@awnconsulting.com>
Subject: RE: Future Carbon Intensity for Grid Electricity

Dear Avril,

Thank you for your email. Please find attached spreadsheet with a projection of electricity carbon intensity out to 2050.

This projections is based on the WAM-CAP23 scenario from our latest set of projections. This broadly assumes that the targets set in the latest 2023 Climate Action Plan will be achieved. Because the current focus of government policy is on the period to 2030, there is less detail on policies and measures that will be adopted from 2030 to 2050. This is reflected in the scenario shown, where there are still emissions from electricity generation out to 2050. In reality we expect further policies and measures to be developed later in the decade that will provide a pathway to a zero carbon electricity system by 2050.

Regards,
Mary

reasonable worst-case assessment in line with the IEMA guidance (IEMA, 2022).

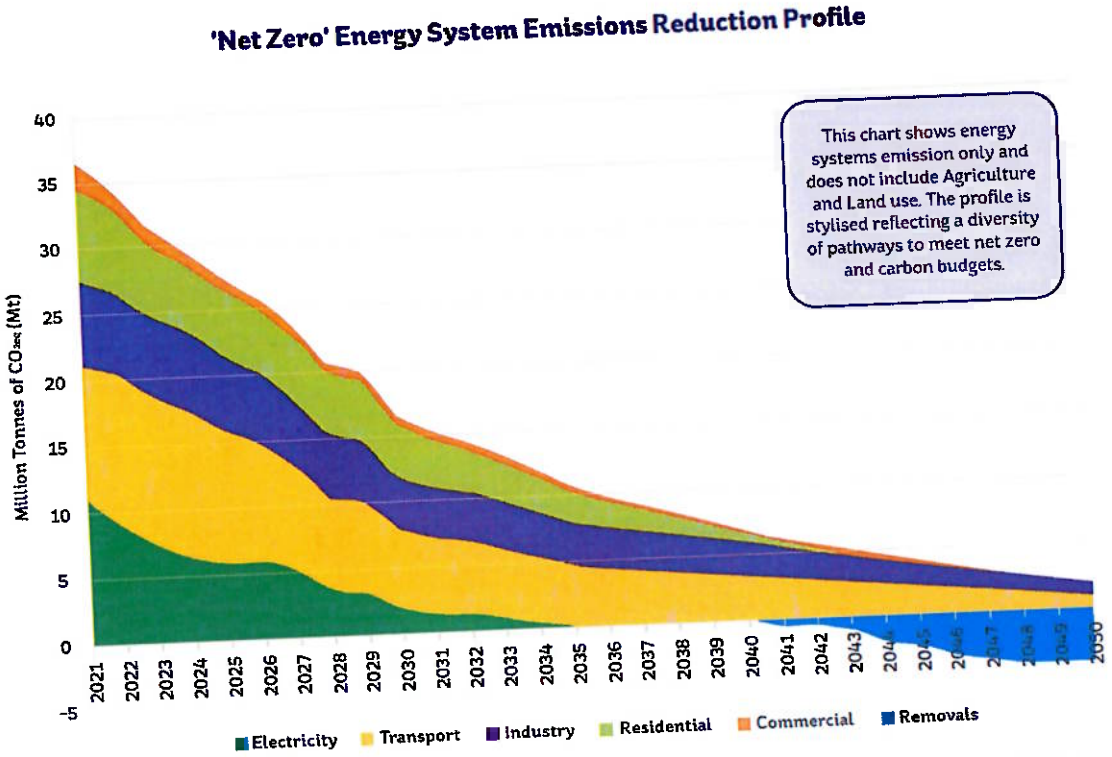

Figure 1 Net Zero Energy System Emissions Reduction Profile (UCC / MaREI) (ESB Networks, 2023)

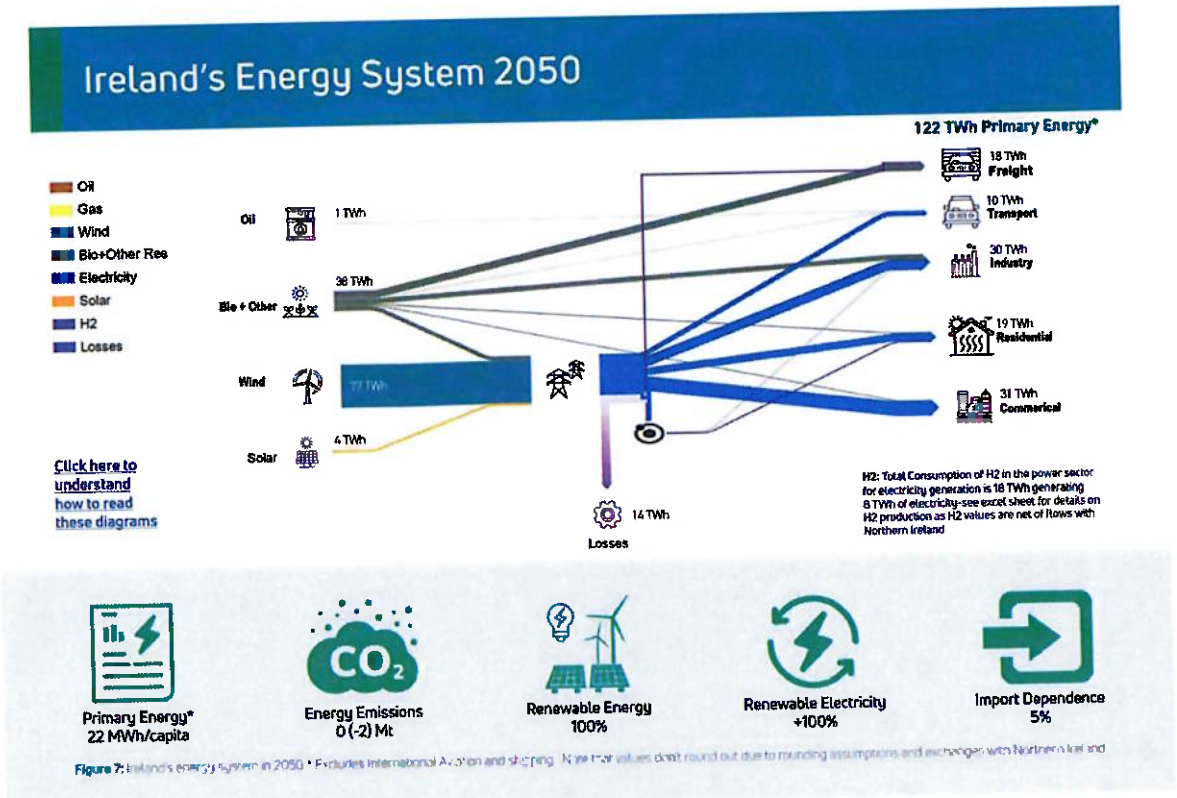

Figure 2 Ireland's Energy System 2050 (UCC / MaREI, 2021)

Uncertainty In Relation To Mitigation

AWS are committed to implementing a range of mitigation measures which will be implemented in line with "*best practice*" as outlined in IEMA (IEMA, 2022). These measures can be viewed as allowing for the inherent uncertainty in future emissions as the CPPA will match the actual GHG emissions regardless of the quantity of emissions in any one year and the time period in which they occur whilst the operation of both indirect electricity and direct emissions will operate within the ETS which has committed to achieving net zero by 2050:

- A Corporate Purchase Power Agreement(s) will be entered into, as required by Condition 13, which demonstrates that the energy use of the development will be met by new renewable energy generation in line with the Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy (2022). The proposed development's energy use will be met by the CPPA which will mitigate the actual GHG emissions in terms of quantity of emissions on an annualized basis.

- The indirect electricity emissions and the direct emissions from backup generators will both require greenhouse gas permits under the ETS in order to operate and thus the GHG emissions associated with the Proposed Development will be in line with CAP24 which stresses the importance of the EU ETS in reducing industry GHG emissions.

- Whether or not climate and greenhouse gas emission targets are varied due to changes to legislation and policy, the CPPAs and the operations of the EU ETS will ensure that GHG emissions from the facility will be fully mitigated throughout its lifetime.

Summary

In summary, the climatic assessment of the Proposed Development has taken into account the inherent uncertainty of the assessment by taking a conservative approach in line with the relevant guidance (IEMA (2022), EU (2013), EU (2017)) as summarised below:

Baseline Scenario – this assessment has highlighted that uncertainty is inherent in predicting future GHG emissions both in terms of the overall national GHG emissions over the period 2023 – 2050 and in terms of the "*do nothing*" scenarios and the GHG emissions where the proposed data centre development is not available to store and process IT data.

Proposed Scenario - this assessment has highlighted that uncertainty is inherent in predicting future GHG emissions for the proposed scenario in terms of year of opening, phasing of operations, operational load and changes to the national grid.

Mitigation - this assessment has highlighted that uncertainty is inherent in predicting future mitigation requirements for the proposed scenario in terms of quantum of offsets required to fully mitigate the proposed development and in terms of the availability of renewable energy and variability in the GWh from these sources on an annual basis. However, AWS is committed to ensuring that the CPPA for the energy use of the proposed development will mitigate the actual GHG emissions in terms of quantity of emissions on an annualized basis.