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:

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

Re: ABP 318180 Universal Developers LLC Data Centre Developrnent 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,

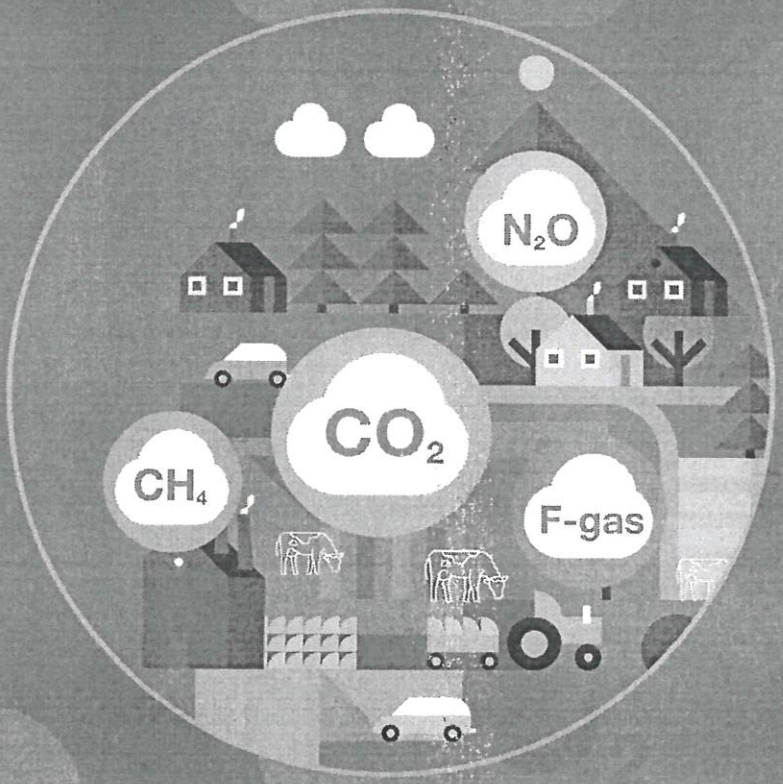
Colin Doyle

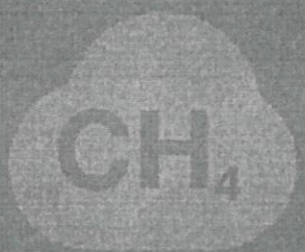
[2] AWN Further Information Response (sum of data for years 2026-2030 in Table 1.8)

Ireland's Greenhouse Gas Emissions Projections

2023-2050

May 2024





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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

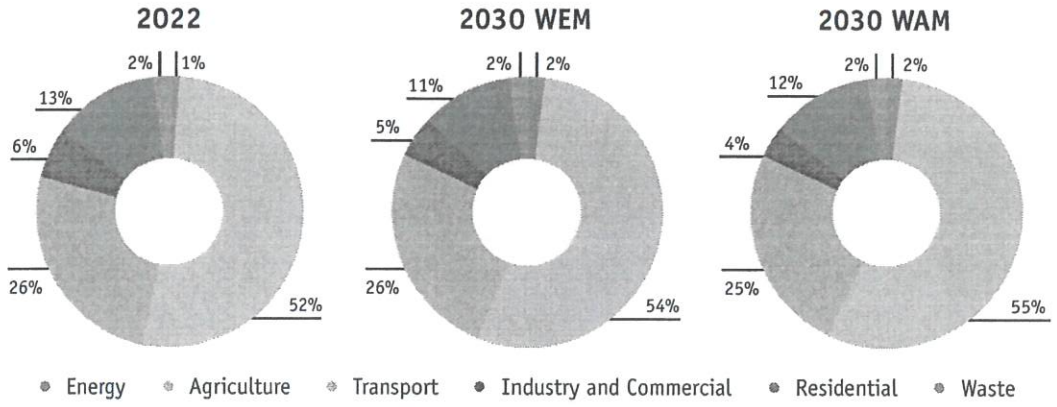
Ireland's 2030 target under the EU's Effort Sharing Regulation (ESR) is to deliver a 42% reduction of emissions compared to 2005 levels by 2030. This target was set in April 2023 upon amendment of the ESR. The ESR includes sectors outside the scope of the EU Emissions Trading System (EU-ETS) such as 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



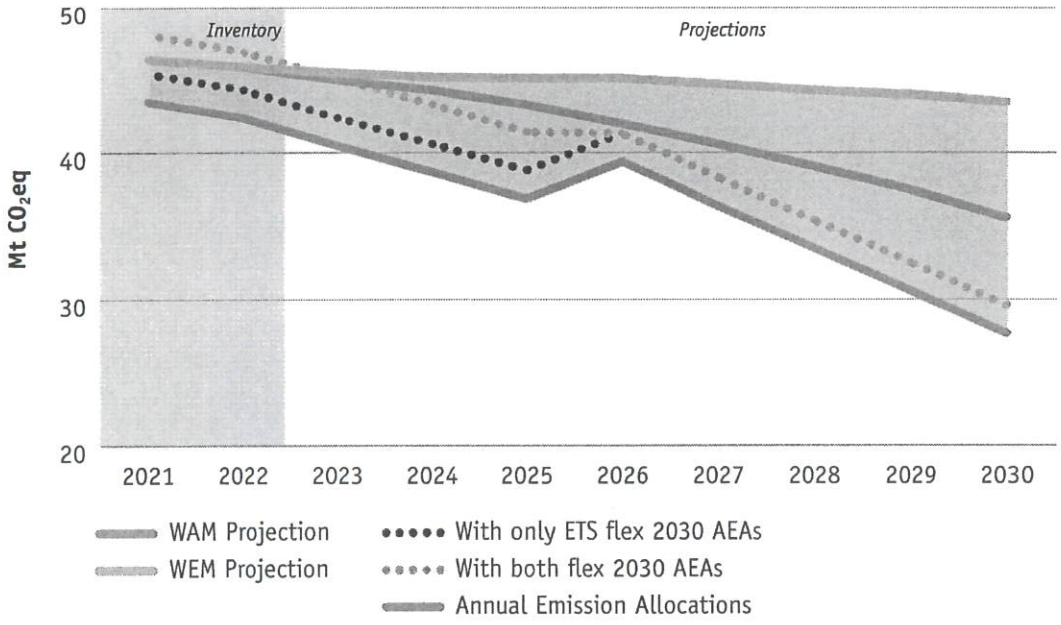
Targets for 2030 under the ESR include binding annual limits per member state known as "Annual Emission Allocations" (AEAs). The AEAs required updating to reflect the 42% reduction target set in 2023. To-date new AEAs have been implemented for 2021 to 2025[21] only. Limits for 2026-2030 have been estimated 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

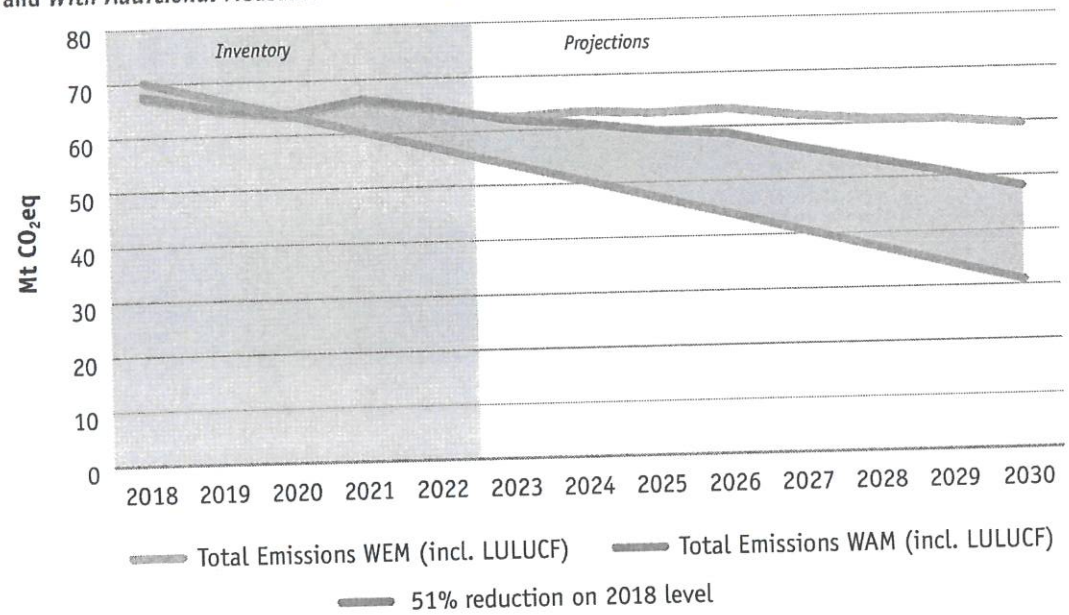
The Climate Action and Low Carbon Development (Amendment) Act 2021 sets a national climate objective of achieving a climate resilient and climate neutral economy by the end of the year 2050. An interim target has been set out to achieve a reduction of 51% in total emissions (including LULUCF) over the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

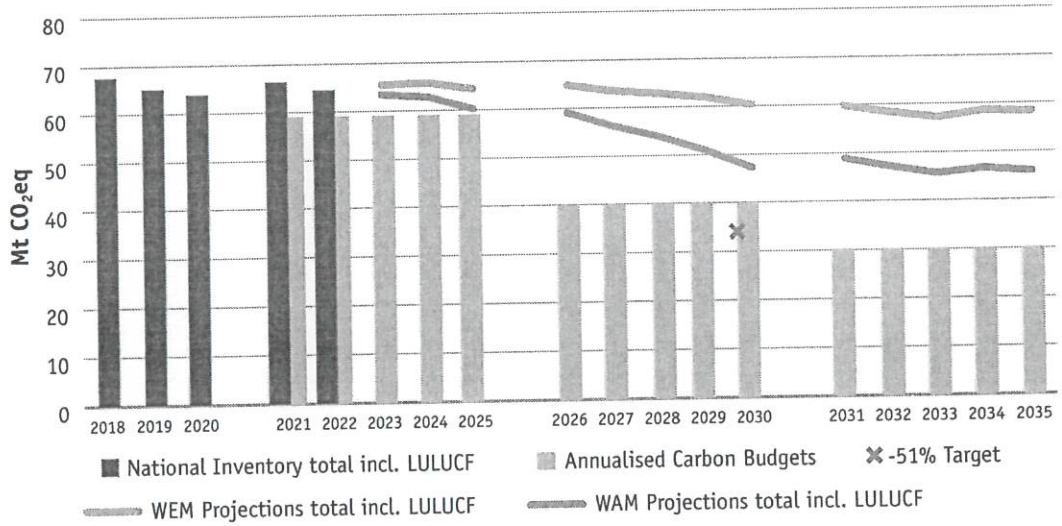
For Budget period 1 the latest EPA projections show that this is projected to be exceeded by 26 Mt CO_2 eq in the WEM scenario and 19 Mt CO_2 eq in the WAM scenario. Based on this assessment, Budget 2 from 2026-2030 is projected to be exceeded by 109 Mt CO_2 eq in the WEM scenario and by 67 Mt CO_2 eq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

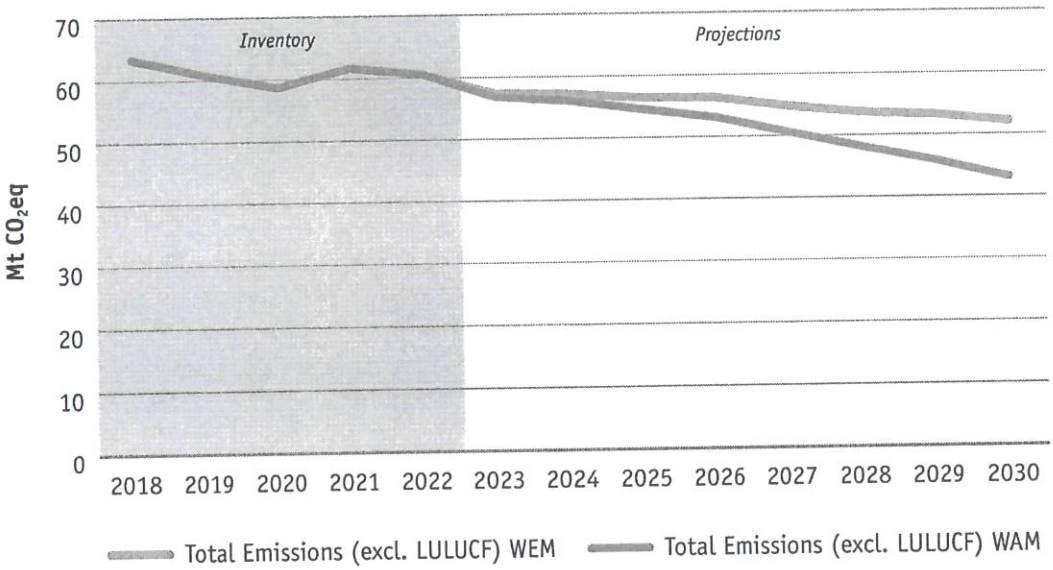
5 Sectoral Assessment of Projections out to 2030

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.

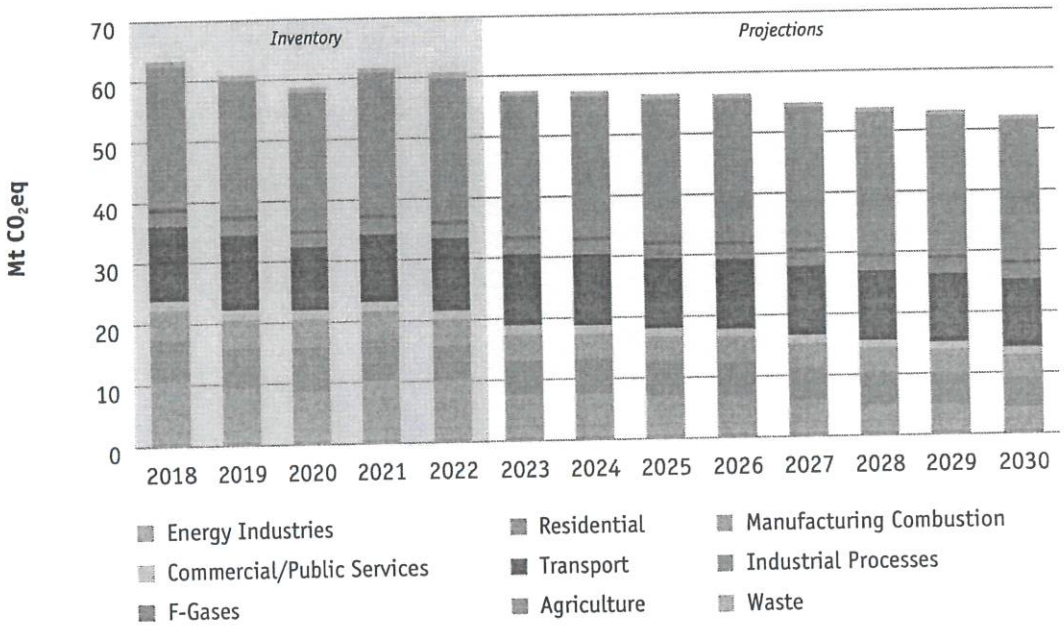
Figure 5: Total Greenhouse Gas Emissions (excluding LULUCF) under the *With Existing Measures* and *With Additional Measures* scenarios out to 2030



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/

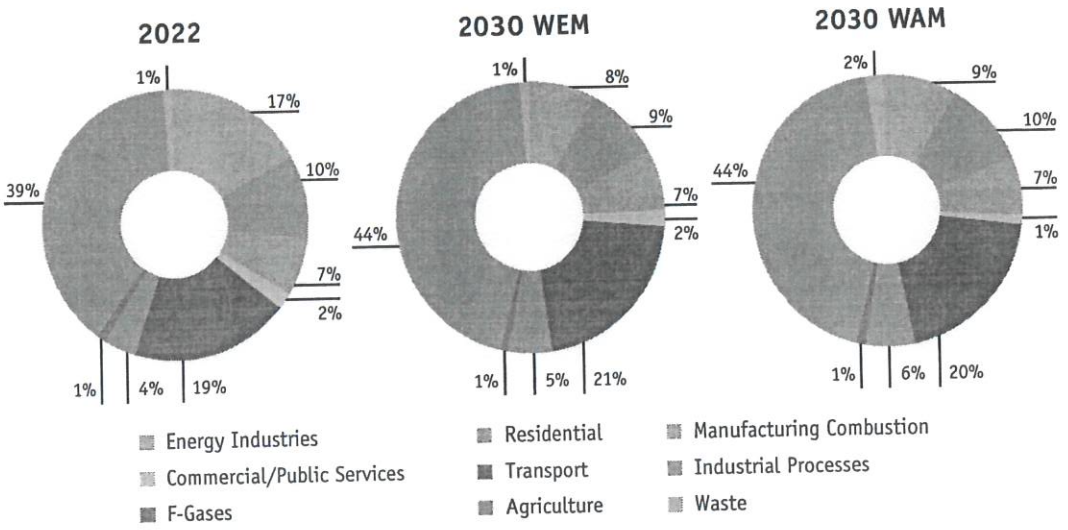
Figure 6: Total Greenhouse Gas Emissions Projections (excluding LULUCF) by sector out to the year 2030 under the WEM scenario



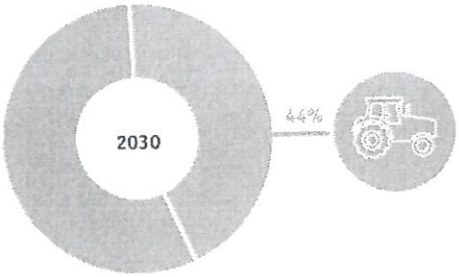
The agriculture and transport sectors remain the largest contributors of emissions in 2030 in both the WEM and WAM scenarios as a consequence of other sectors of the economy projected to decarbonise faster. Under the WEM scenario, emissions from agriculture and transport are projected to decrease by 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.

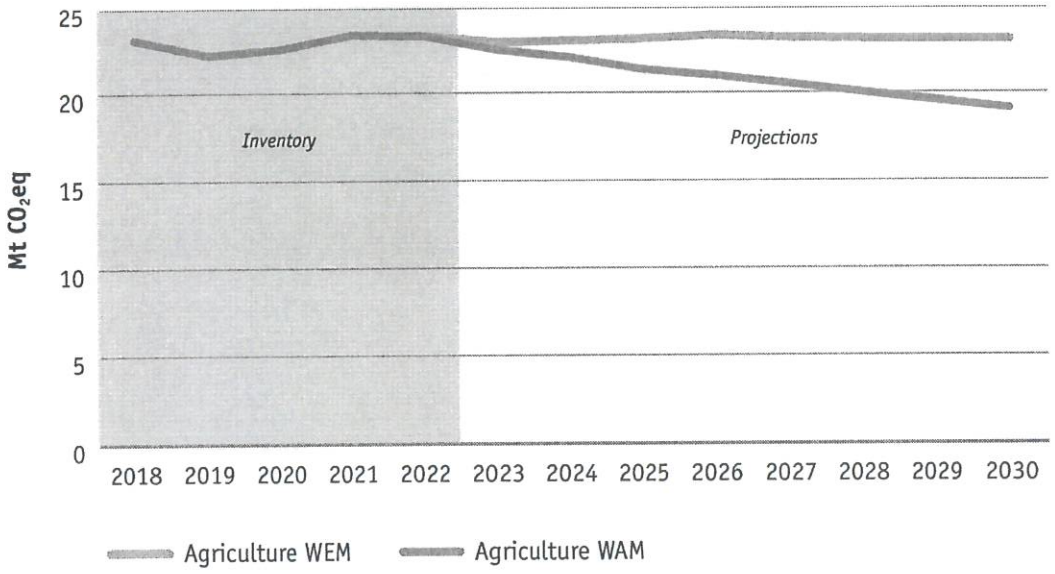
With Additional Measures scenario

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

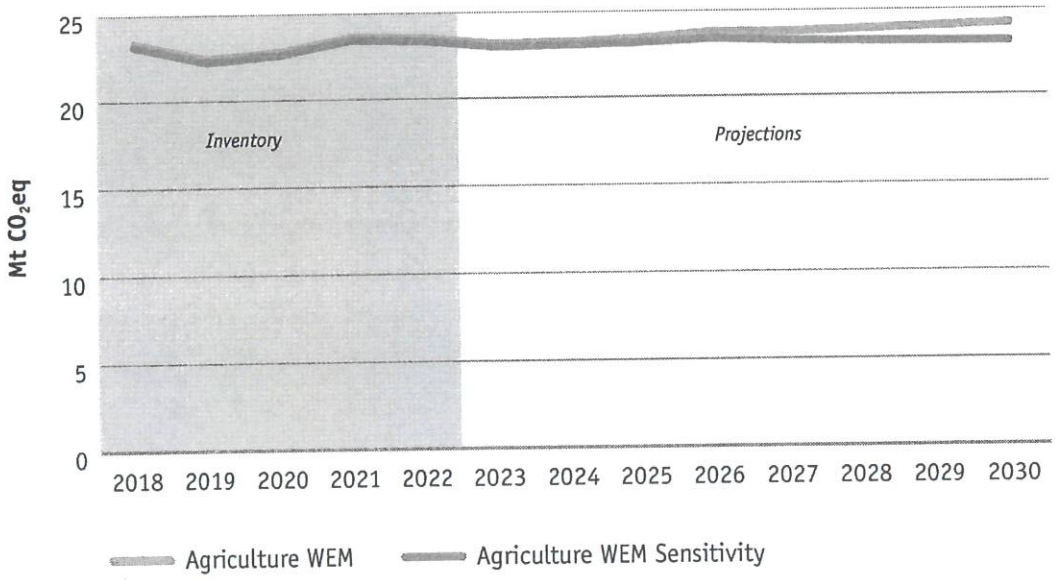


Sensitivity Analysis

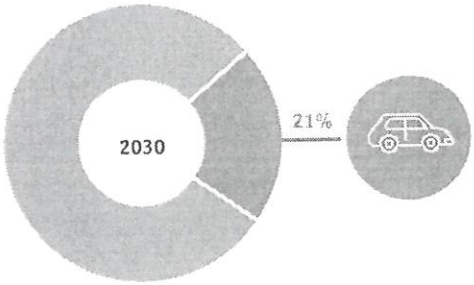
A sensitivity analysis of the With Existing Measures emissions scenario has been undertaken for the agriculture emissions projections based on alternative projected activity data that assumes stronger growth in agricultural activity levels. The resulting alternative scenario is presented in Figure 9 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:

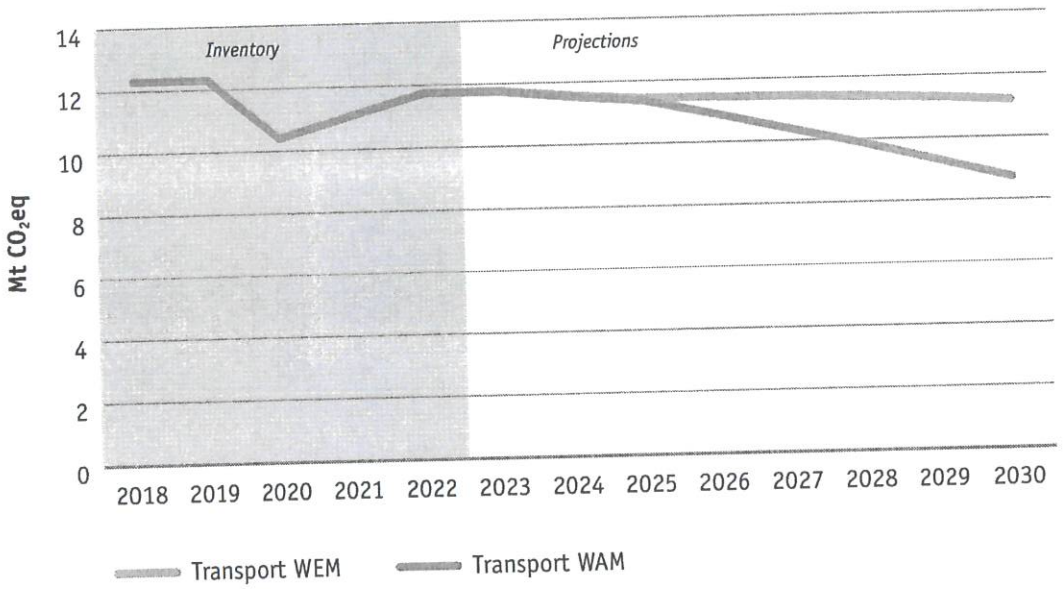
- A 10% blend for petrol and a 12% blend for diesel at the pumps by 2025 is assumed and blends remain at this level until 2030.
- For uptake of Electric Vehicles, the WEM scenario assumes approximately 693,000 electric vehicles on the road by 2030. This includes approximately 430,000 passenger battery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

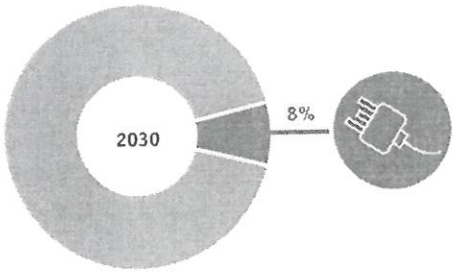
- It is assumed that incremental blend increases will occur reaching a 10% blend for petrol and a 20% blend for diesel at the pumps by 2030 as detailed in Climate Action Plan 2024;
- Uptake of electric vehicles up to 945,000 by 2030, as a result of the implementation of the Climate Action Plan 2024. 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:

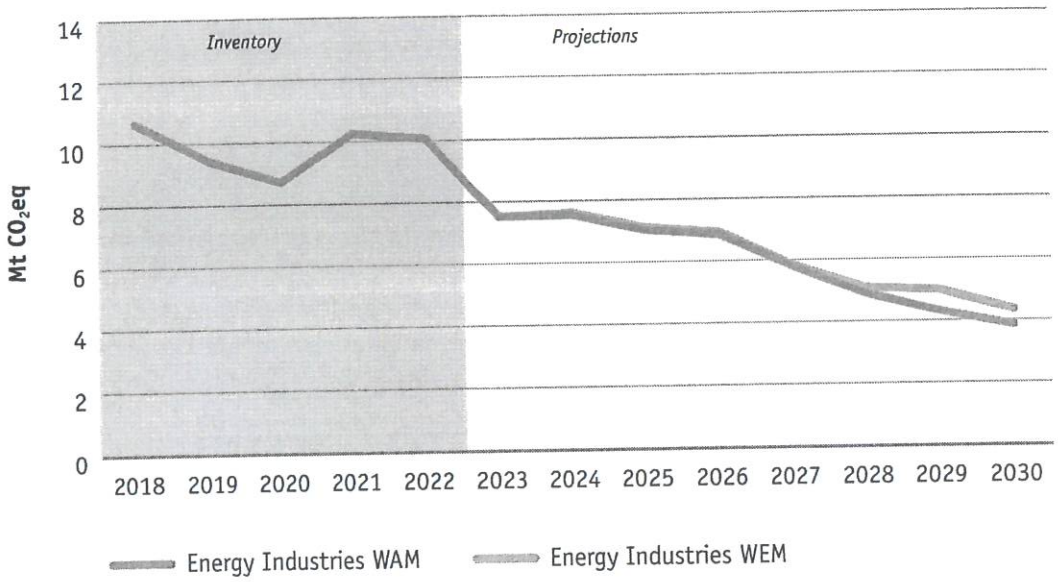
- A renewable electricity share of 80% by 2030 (as set out in the Climate Action Plan 2024), mainly a result of further and rapid expansion in wind and solar energy;
- Production of up to 5.7 TWh of Biomethane by 2030;
- Additional interconnection LirIC (700 MW) between Northern Ireland and Scotland,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

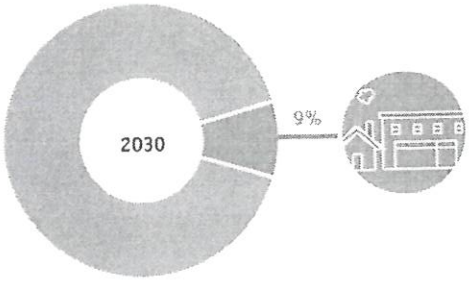
35 gov - National Policy Statement on Electricity Interconnection 2023 (www.gov.ie)

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:

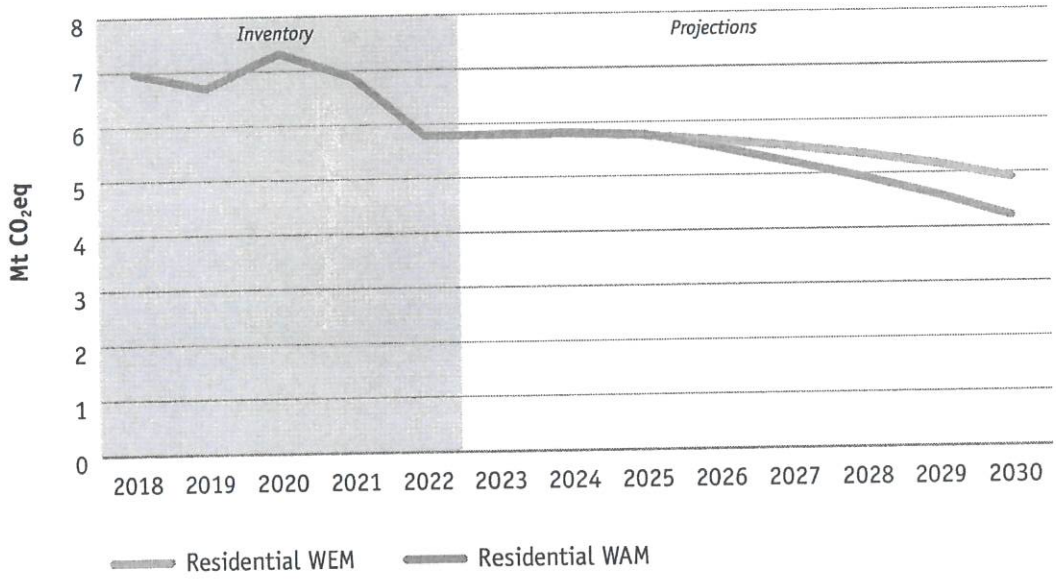
- Domestic heat pump uptake based on grant rates as of February 2022 (funded by National Development Plan 2021-2030 allocation) and, an 'effective' ban on oil boilers (from 2022) and gas boilers (from 2025) in new dwellings;
- Implementation of a range of residential energy efficiency programmes in line 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:

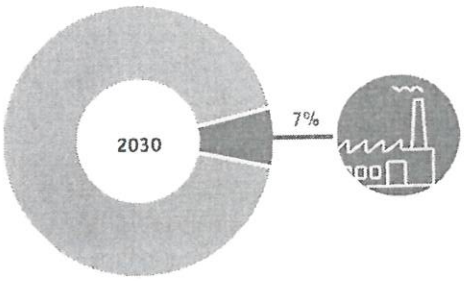
- The installation of 680,000 heat pumps by 2030 (400,000 in existing homes and 280,000 in new homes);
- Residential Energy Efficiency programmes involving upgrades to homes, and retrofits to achieve the cost optimal equivalent of a BER 'B2' rating in 500,000 dwellings by 2030;
- District heating growth 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



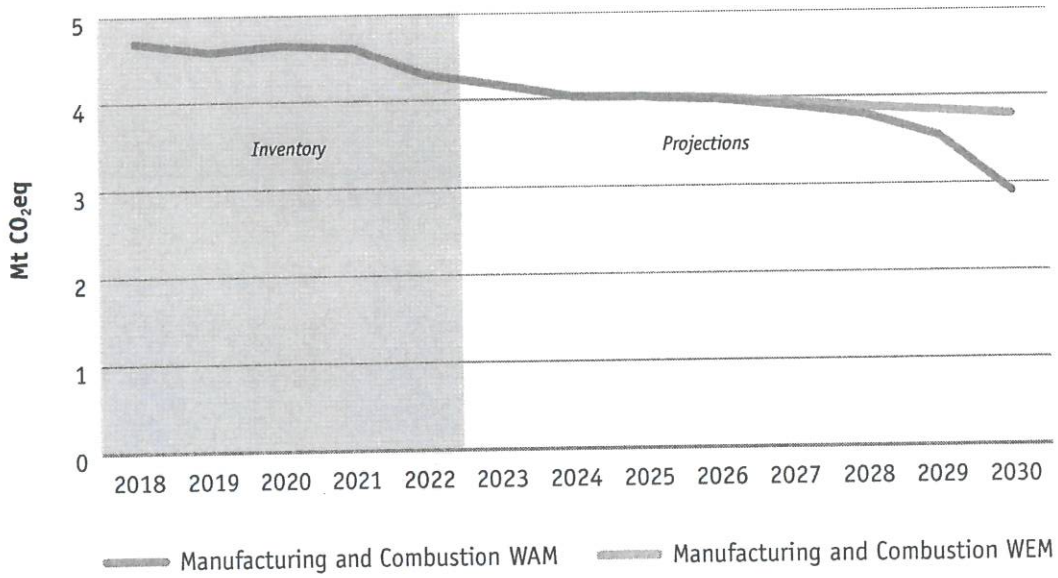
5.5 Manufacturing Combustion

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.

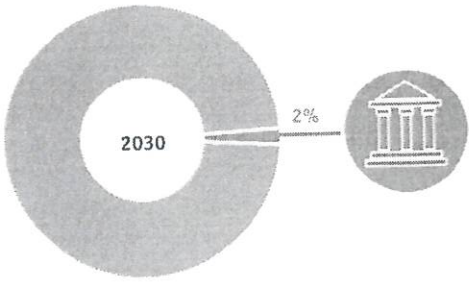
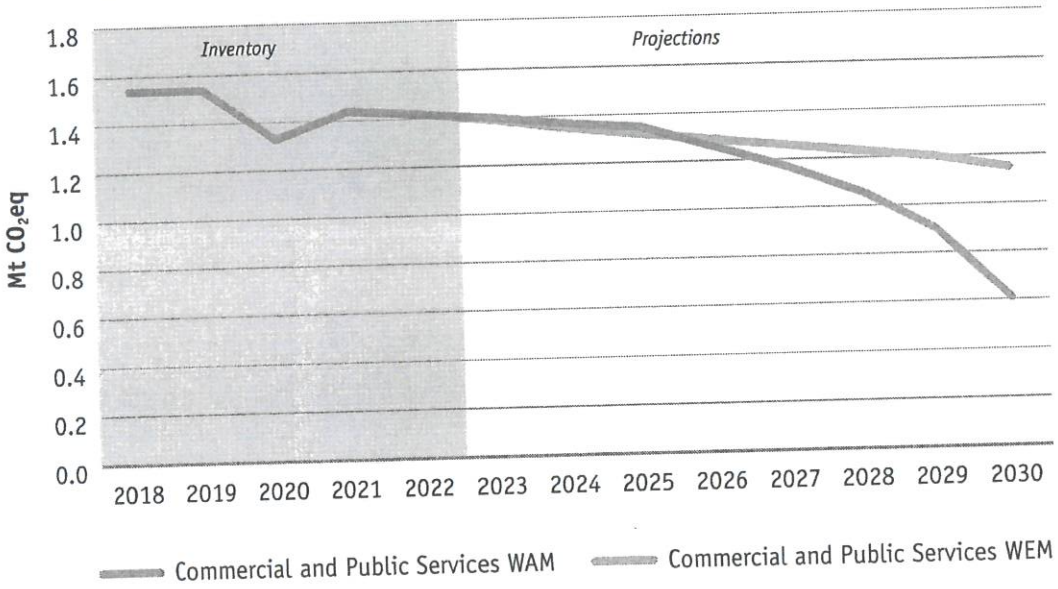


Figure 14: Greenhouse Gas Emissions Projections from the Commercial and Public Services Sector under the *With Existing Measures* and *With Additional Measures* scenarios out to 2030



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.

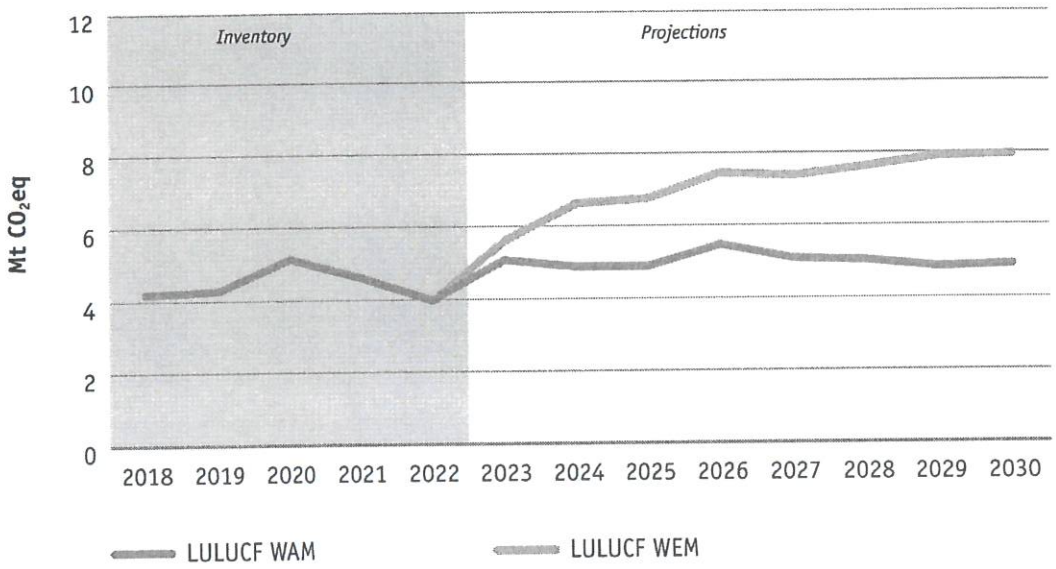
With Additional Measures scenario

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

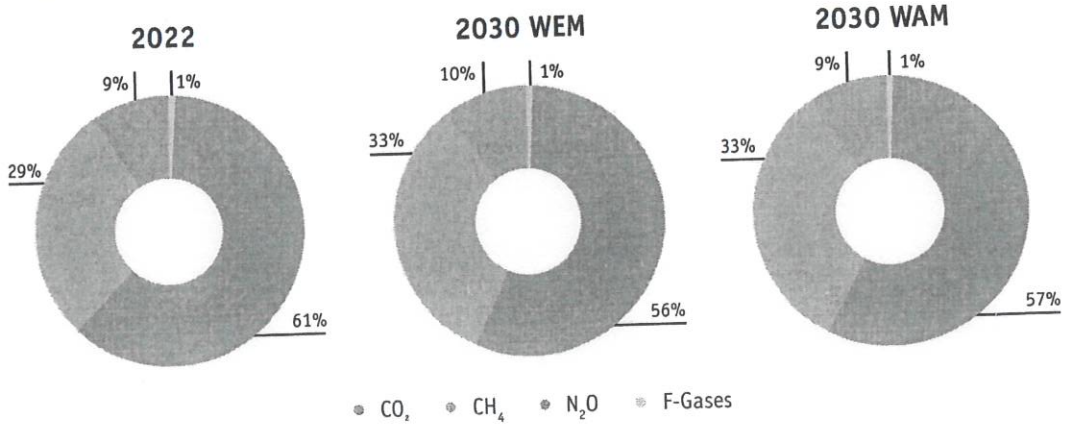
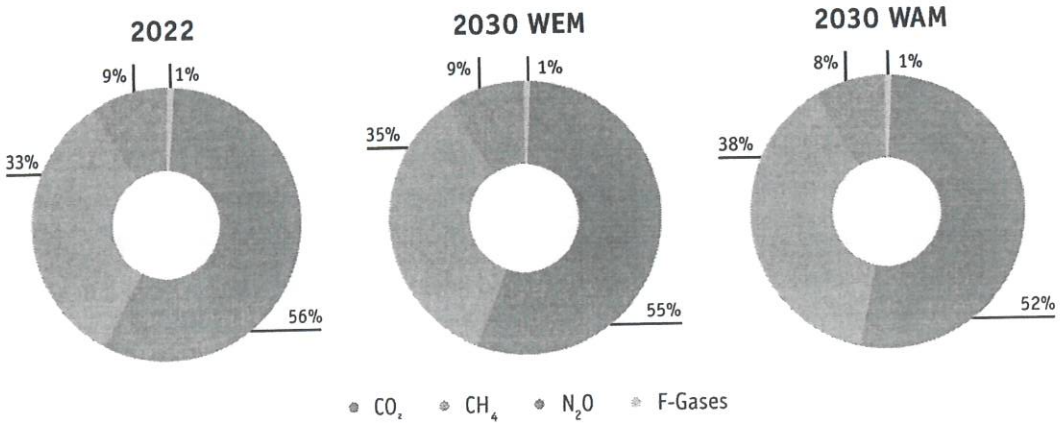


Figure A2: Share of emissions by gas (including LULUCF) in 2022 and projected share of emissions by gas in 2030 under the WEM and WAM scenarios



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**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