

File With \_\_\_\_\_

**SECTION 131 FORM**

Appeal NO: ABP 318180-24

Defer Re O/H

Having considered the contents of the submission (dated) 28/05/2024  
from

Colin Doyle 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 material issues

E.O.: Pate B

Date: 04/06/2024

**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 2/3/4 weeks – BP \_\_\_\_\_

EO: \_\_\_\_\_

Date: \_\_\_\_\_

AA: \_\_\_\_\_

Date: \_\_\_\_\_

File With \_\_\_\_\_

**CORRESPONDENCE FORM**

Appeal No: ABP 318180-24

M \_\_\_\_\_

Please treat correspondence received on 28/05/2024 as follows:

1. Update database with new agent for Applicant/Appellant _____	1. RETURN TO SENDER with BP _____
2. Acknowledge with BP <u>23</u>	2. Keep Envelope: <input type="checkbox"/>
3. Keep copy of Board's Letter <input type="checkbox"/>	3. Keep Copy of Board's letter <input type="checkbox"/>

Amendments/Comments <u>Colin Doyle response to S.131</u>
<u>14/05/24 - 04/06/24 ✓</u>

<b>4. Attach to file</b> (a) R/S <input type="checkbox"/> (d) Screening <input type="checkbox"/> (b) GIS Processing <input type="checkbox"/> (e) Inspectorate <input checked="" type="checkbox"/> (c) Processing <input type="checkbox"/>	<b>RETURN TO EO</b> <input type="checkbox"/>
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	Plans Date Stamped <input type="checkbox"/>
	Date Stamped Filled in <input type="checkbox"/>
EO: <u>Pete B</u>	AA: <u>Fadimaie Khattar</u>
Date: <u>04/06/2024</u>	Date: <u>04/06/2024</u>

<b>AN BORD PLEANÁLA</b>	
LDG- _____	1 of 14
ABP- _____	
November 2 2023 Y 2024	
Fee: € _____	Type: _____
Time: <u>9.00am</u>	By: <u>REG. POST</u>

## Colin Doyle Submission on Applicant's Response of 6<sup>th</sup> November 2023 Y 2024

### Introduction

I believe the Board would accept that the matters raised in my appeal, and responded to by the applicant are quite complex. In accordance with requirements of the EIA Directive and planning legislation the Board must ensure it has, or has access as necessary to, sufficient expertise to examine the environmental impact assessment report to ensure its completeness and quality. Compliance with this requirement will be essential for reaching a reasoned decision on this case.

The response from the applicant amounts to over 160 pages. It is quite difficult for a member of the public to process such a volume of complex material in the limited time provided by the Board (allowing for postal delays). To reduce this work load I believe the Board may accept it as reasonable that I ignore the 35 page AWS promotional brochure (Appendix 5), as in my view such general promotional brochures have no place in the appeals process. There is further scope to achieve brevity in my present submission as there is a lengthy section of the AWN Appendix 3 (Item A6, p. 35 to 42), which addresses specifically section 15 of the Climate Act 2015. Section 15 refers to the duties of relevant bodies (the Board and Fingal in this case), and consequently the applicant's comments on this aspect were not required, and in any event are a repetition of points already made in their response. Regarding Appendix 4 (H. J. Lyons Report) I accept that the analysis has been revised, and have only very brief comments on this aspect. I will also confine my submission to aspects related to climate impact, as this was the basis of my original submissions to Fingal County Council and in my appeal to the Board.

The core documents in the applicant's response are the Response to Third Party Appeals prepared by John Spain Associates (JSA), and Appendix 3 (AWN Environmental Response). There is considerable overlap and repetition in these documents, and consequently a point by point response from me would prove tedious and fail to clearly identify my principle concerns and my continued view that the proposed development will have a significant impact, in the context of national climate action policies and targets.

Given the repetition and overlap it will be helpful to identify three main claims/aspects which recur in the applicant's responses. I will discuss these in some detail below with supporting arguments and will subsequently refer to these in my submissions on the JSA and AWN (Appendix 3) responses. While the discussion below is somewhat lengthy, it will permit a rapid and condensed submission on the Applicant's response.

### Main Disputed Claims/Aspects

#### A. Was There a Long-Term Connection Contract in 2017 ?

The claim is that the applicant already had a connection contract with Eirgrid in 2017, covering the future electricity demands, and asserts that growth of demand within this contract has been allowed for in calculation of national Sectoral Emissions Ceilings. Hence, it is argued that CAP 23 has accounted for this new load, and the proposed development will not breach Sectoral Target for the Electricity Sector. The total power demand of the original masterplan was around 205 MW<sup>1</sup>, made up of 35 MW for building A, 52 MW for buildings B and C, and 73.1 MW from the present proposed

<sup>1</sup> Total power data presented at oral hearing 200-205 MW ABP 248544

development which is before the Board. That remaining capacity is presumably for future development. The applicant claims that the 74.1 MW for the proposed development was already factored in to the 2017 contract.

I do not believe the above claim. It is not credible that Eirgrid would enter into a commercial power connection contract which would effectively reserve capacity for a customer over a 7 year period. Looking briefly at Eirgrid demand contract requirements I understand that they must be ramped up within specified periods (18 months) and I see no provision in the rules for customers to reserve this capacity for the future. I can only speculate on the actual situation, as the applicant has not provided any details. A possible scenario is that a connection contract was obtained for the first data centre in 2017 for 35 MW (Building A: FW17A/0025, ABP 248544). This was then upgraded to a contract for an additional 55 MW in 2019 to accommodate additional data centres (FW 19A/0087). In Eirgrid procedures the increased quantum of demand is treated as a new connection application. Consequently if a contract has been entered into for the additional 73.1 MW required for the present project then is considered a new connection. The claim that the development represents a permitted demand ramp-up dating back to 2017 (or 2019), and was factored into calculations of Sectoral Ceilings in my considered opinion is most likely false.

#### **B. False CPPA Mitigation Claims**

Much weight is placed on the applicant entering into a CPPA as specified in condition 13. In a number of climate impact assessments in recent years "CPPA" has become a magic incantation which erases all impacts. I argued in detail against this as an acceptable mitigation in my appeal, on the basis of failure to demonstrate renewables additionality. The Board has all the relevant details in my appeal documents. I have just the following points to add which I ask the Board to carefully consider.

I note that the applicant studiously avoids the word "additional" or "additionality" in their response which gives me reason to believe that they have no intention of complying with this principle. Furthermore even if a CPPA with demonstrated renewables additionality were somehow obtained and certified, it would not contribute towards a reduction in GHG emissions either nationally or within the Electricity sector, because the renewables purchased would be consumed entirely by the development.

The only situation where a CPPA would benefit the state's decarbonisation targets is if an existing large energy user (LEU) entered into such a contract for renewables from proposed generation projects, as it would accelerate the deployment of renewable electricity, but would not have the downside of a new load consuming the benefit.

It is a widely held incorrect view, by data centre developers, and also at the highest levels in the state, that new LEUs that enter into CPPAs will contribute to our decarbonisation goals. For example the argument has been publicly made by Eirgrid<sup>2</sup> that achieving RES-E of 80% will in fact require additional large loads plus matching CPPAs, and that otherwise we will continue to languish at around 40% renewables. It is quite true that such new loads with corresponding CPPAs would

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<sup>2</sup> Joint Committee on Environment and Climate Action debate -Tuesday, 30 Jan 2024 – Evidence of Mark Foley, Eirgrid, available at <https://bit.ly/49KG0si>

crease the percentage renewables on the grid. However, there would not be a single kilogramme reduction in GHG emissions, as the new loads would consume the benefit of the renewables. The underlying reason for the national 80% target is to achieve GHG reductions. Moving up in %RES-E by means of new loads and CPPAs will not achieve this objective. One could have apparent progress in terms of an increasing %, but no reduction in GHG emissions. In fact, recent projections in renewables beyond 80% (as referred to by applicant) are indicative not of a likely beneficial GHG reduction, but represent the higher percentage renewables that will be required to undo the effect of the projected new loads.

Consideration of the potential benefits of CPPAs to the state's GHG reduction goals is evidently not quite straightforward. There is no national body which can certify that a CPPA represents additional renewables. The applicant has provided no proof of additionality, and presumably expects ABP to inform itself on this aspect through its competent experts, and decide upon this complex issue, which is at the heart of my appeal.

On a final point, and as expanded on in detail below, if a development can claim mitigation by entering into a CPPA, then any and all such developments could make a similar claim, and all projects would be deemed to have no GHG impact. This would make a nonsense of EIAs.

### **C. Logical Flaw in Automatic Alignment/Balance Claim**

An underlying theme in the addendum to the EIAR and in the response in Appendix 3 is that planned decarbonisation of the national electricity grid will automatically ensure that the development is on the same GHG reduction trajectory as the national targets. This could be very loosely described as a methodology, but is clearly heavily reliant on professional judgement that the national targets will all be met, in particular the 80% RES-E target for 2030, and subsequent hoped for zero carbon electricity by 2050 (and revised to 2040 in Appendix 3).

This automatic alignment argument is not presented explicitly as such in a separate section of the addendum to the EIAR, nor in Appendix 3, but references to this aspect and implied alignment appear repeatedly, such as

".... It can be argued that even in the absence of CPPAs the pre-mitigation scenario could, in actual fact, be characterised as minor adverse, as the trajectory of GHG emissions will align with the 1.5 C compliant trajectory and achieve net zero in advance of 2050 with the national grid predicted to obtain net zero by 2040 (ESB Networks, 2023)" (Appendix 3, p. 5)

And

"The GHG emission factor of electricity is based on current reported levels (Year 2021) with the assumption that the GHG emission factor will decrease in a linear fashion to reach 100 gCO<sub>2</sub>/kWh by 2030 in line with government policy as shown in Table 2 below" (Appendix 3, p. 19)

Similar lines of reasoning have led the Board in previous decisions relating to large energy users to adopt the view that a "balance will be achieved" between new electrical loads and the provision of compensating renewables to account for these loads. In stating this, I am also

anticipating that the Board may adopt a similar reasoning to the present case, which I argue would be an invalid EIA.

A superficial consideration may lead one to believe that the development must inevitably follow the decarbonisation trajectory of the state through the progressive implementation of existing supporting measures and the "invisible hand" of market forces (carbon taxes, state financial supports). Valid counter-arguments could be made regarding the achievability of the state's targets, and the impact of additional large energy loads on these targets. However, it is not necessary to go into that level of detail to demonstrate that there is an inherent logical flaw in a climate impact assessment which relies on the assumption of automatic alignment with national decarbonisation plans and achievement of balance between demand and renewables.

Let us assume firstly that absolutely all of the decarbonisation targets in CAP 23 are achieved (plus anything additional in CAP 24), and also that we achieve the national transition objective for a zero carbon energy supply in 2050 (or for electricity even in 2040, just 16 years from now, as claimed by the applicants).

A valid methodology for assessing climate impact must be capable of differentiating between developments which have an adverse impact and those which do not have an adverse impact. If the methodology or reasoning is incapable of making this fundamental distinction it is of no use.

The fatal logical flaw in the "Automatic Alignment" methodology is that any and all developments which draw energy from the national electricity grid would be assessed as being in alignment with national targets. Consequently, all proposed projects could be described as having a "not significant climate impact", or "slight/minor" adverse impact.

Since the methodology would automatically assign the same assessment of not-significant climate impact to all projects, regardless of energy consumption, it is of absolutely no use as a basis for conducting an EIA. During the COVID epidemic the public became educated in the concept of reliability of test results, and the concepts of "false positive" and "false negative". If one defines an absence of climate impact as a "negative", then it would be the case that all climate impact assessments would yield "negative" outcomes. While a proportion of these may in fact have no climate impact, there would be no means of differentiating these from the "false negative" projects which have in fact a climate impact.

Furthermore repeated recitals of national decarbonisation plans by the applicant mislead the Competent Authorities into accepting that developments with objectively large GHG emissions are of no concern from a climate perspective, and that mitigation is not the responsibility of the applicant. That regardless of the quantitative impact the state will respond with matching mitigation.

#### **D. Irrelevant References to Coyne Decision**

There are numerous quotations from the High Court decision in the Coyne case within the JSA response document and in the AWN Appendix 3 document. I was only vaguely aware of the Coyne case, but having read the decision in detail I am somewhat puzzled as to why it is referenced so many times in the applicant's response. The carefully reasoned decision expressed in plain language has certainly cast useful light on the duties of relevant bodies under the Climate Act 2015, and the advantages of considering the effects of a development on climate within the context of the EU ETS, as opposed to attempting the impossible task of linking emissions from individual developments or

...cumulative impacts from similar developments to specific effects on climate (i.e. environmental damage).

Mr. Justice Holland confirmed the requirement for assessment both within the context of the EU ETS and in the context of national policies, including reference to the Electricity Sector (213). For the proposed development at Cruiserath, the applicant had already submitted the GHG analysis in the context of the EU ETS in the original EIAR (but nothing additional), and had updated this in the revised EIAR provided with Further Information, which also included relevant additional analysis of GHG in the national policy context. I had not suggested in my appeal nor am I suggesting here that any additional further data or analysis is required by the applicant. The Board has all of the relevant analyses before it to arrive at a reasoned decision regarding GHG impact.

My final observation on this matter is that Coyne decision was based on the law and national policy in existence at the date of the appeal. Since then section 15 of the Climate Act has been revised by the Climate Bill 2021, and legally binding carbon budgets, along with derived sectoral ceilings have been introduced. This needs to be borne in mind in interpreting the relevance of the Coyne decision.

### **Comments on JSA Applicant's Response**

*Section numberings below are as per the JSA Report.*

#### **JSA 4.6**

I note that the applicant would welcome a request from the Board for further information. I suggest that production of evidence for the claimed 2017 connection contract showing that it incorporated guarantees of future supply would be relevant. See section A in my submission.

In addition please ask the applicant to respond to the table of emissions from projects assessed by AWN, presented in my appeal (p.15). A technical response in the context of national policy and targets is required, not a recital of legal precedents which has already been submitted. In the interests of justice it would also be important to provide the applicant with a copy of my present submission, and to ask for a technical response in the context of national policy and targets to the revised table of emissions from AWN projects. All of the information referred to is in the public domain.

#### **JSA 4.7, 4.8**

The JSA response gets straight to the core of an important concern here. I agree that PAs are permitted within planning law to grant permission for projects which emit GHG, and which consume a portion of the remaining carbon budget. There is no provision in planning law for any centralised overview of GHG emissions from new developments. There exists no programmatic masterplan, nor allocation of portions of the remaining carbon budgets between PAs or within sub-sectors, nor any restriction in law on PAs granting permission for developments as they arise. This is all completely legal, and in terms of national GHG emissions all completely uncontrolled. Until such time as planning law is amended to rectify this unsatisfactory situation PAs must make a decision based on the evidence presented for the particular case before them, without the benefit of outside guidance (i.e. in an *ad hoc* manner).

**A 4.9 – 4.17**

These are disputed matters which are for the Board to consider in light of my original appeal, and additional points in my present submission.

**JSA 4.18 – 4.27**

Repetition of CPPA mitigation, which I challenged in my appeal, and also reject in this submission . See section B of my submission.

**JSA 4.28 – 4.33**

Invalid claim that electricity demands of proposed development were factored into national targets. See section A of my submission.

**JSA 4.34 – 4.35**

Irrelevant quotations from Coyne decision. See section D of my submission.

**JSA 4.36 4.45**

Repetition of CPPA claims, which I contest. See section B of my submission.

**JSA 4.46**

It is a fact that the applicant refused to provide details on additionality and on how much renewable energy is already used by the applicant's operations in Ireland, as requested under Item 3.(c) in the request for further information.

**JSA 4.47**

I agree with Friends of the Earth that CPPA for the proposed development would crowd out renewables which would otherwise be used to decarbonise the Irish Electricity System.

**JSA 4.48 – 4.54**

Repetition of CPPA claims, which I contest. See section B of my submission.

**JSA 4.55**

No comment on Mannix Coyne, John Conway appeal regarding "integral project".

**JSA 4.56 – 4.58**

Recital of Amazon promotional material plus repetition of CPPA claims, which I contest. See section B of my submission.

**JSA 4.59 – 4.79**

No comment on appeal by others regarding alleged overconcentration of data centres, other than that the quotations from the Coyne judgement do not necessarily limit the EIA to an individual project, as the necessary consideration of national policy (as confirmed in Coyne decision) may require consideration in the context of the sectoral emissions ceiling, and in particular consideration of subsectors. Such an assessment would not at all be precluded by the Coyne decision. See also section D in my submission.

**A 4.80 – 4-98**

As discussed above it is quite within the scope of EIA to consider the impact in the context of national sectoral emissions ceilings, in addition to within the EU ETS. Given the absence of any designated state body for consideration of allocation of the carbon budget the EIA Directive is the only remaining option to flag developments where there is risk of the carbon budget or the corresponding sectoral emissions ceilings may be breached. It would be wrong to conclude that one's hands are tied based on any elements of the Coyne decision, which clearly and repeatedly refers to assessment in the context of national policy. See section D of this submission.

Regarding point JSA 4.83 I note that the applicant chose not to comment on the cumulative emissions data for data centres which were assessed by AWN, and which I compiled and submitted to the Board in my appeal. This showed that just four projects assessed by AWN would consume between 44 to 65% of the emissions ceiling for the electricity sector in 2030. Instead of commenting on this extraordinary estimate, or indeed rebutting the data, the applicant has focussed on legal analysis of whether such a compilation is required or lawful. To deliberately ignore such evidence based on dubious legal arguments is simply irresponsible.

I have since updated the list to include a total of ten data centre projects assessed by AWN, and I include this new table at the end of this submission. In the updated compilation, and in the assumption of maximum mitigation, these ten projects are projected to exceed the indicative emissions ceiling for the Electricity sector in 2030.

**JSA 4.99 4.102**

The impact was certainly underestimated. Referring to Table 1.10 in the revised EIAR provided with FI, it was incorrect to state that the identified significance was "moderate adverse", prior to mitigation. The values presented in the table included allowance for 80% RES-E, which amounts to an assumption of mitigation. This aspect is addressed further in my submission on AWN Appendix 3.

**JSA.103 – 4.111**

I agree with Friends of the Earth that there was undue weight placed on impact within the EU ETS in the original EIAR, and I argued this point in my original submission to the PA. This imbalance was however rectified in the revised FI EIAR which provides useful data on the impact in the national context. I therefore do not understand why the applicant has reverted to a defence of the original assessment which was limited to the EU ETS, calling on irrelevant legal references. The requirement of EIA is clear – direct and indirect impacts must be assessed. As clarified by Holland, impact within the EU-ETS should be considered, and impact in the context of national policy. See section D of my submission.

**JSA 4.112 – 4.115**

Compliance with section 15 of the Climate Act 2015 is a matter for the relevant body, i.e. the Board.

**JSA 4.116 4.122**

I agree with the other appellants that new demand from LEUs will have to be moderated. I do not agree with the applicant that development does not represent "new demand growth". See section A of my submission.

**JSA 4.123**

Agree that policy and regulation badly needed.

**JSA 4.125- 4.127**

Based on the GHG emissions, under conditions of maximum assumed mitigation, the GHG emissions per job are objectively very high. CPPA claim is repeated. See section B of my submission.

**JSA 128 – 4.129**

My comments on compliance with the Govt Statement on Data Centres 2022 are included in my appeal to the Board, and I stand by these. The Govt Statement is wide open to interpretation. JSA picks on aspects favourable to the development, but does not quote sections which signal the need for control of growth in demand. For example:

“In the short to medium term, serious energy infrastructure constraints will prevail and will necessarily limit the available capacity for additional data centre development. The Government is of the view that the principles for sustainable data centre development articulated here will facilitate the appropriate plan-led approach.” Govt Statement 2022, p. 22

**JSA 4.130 – 4.139**

I have no significant additional comments on the economic aspects, other than the favourable tax regime in Ireland is most likely the main attraction for DCs, along with a planning system which places no restrictions on GHG emissions.

**JSA 4.140 - 4.146**

In low wind conditions, an additional base generating capacity will be required. This is basic physics. The applicant goes on to claim that the power demand contracts for all buildings was factored in to 2017 Eirgrid contract, which I do not believe. See section A of my submission.

**JSA 4.147 - 4.149**

The AQ assessment in the EIAR was based on 72 hours operation, and modelled NOx concentrations were 63% and 83% of 1 hr and annual air quality standards respectively. Operation for periods significantly in excess of 72 would clearly risk breaching AQ standards. Conditions 11 and 12 address this issue, and require the applicant to firm up on operation times of the generators.

**JSA 4.150 – 4.152**

For my comments on renewables additionality see section B of my submission.

**JSA 4.153 – 4.163**

See section B of my submission for my comments on CPPA. District heating proposals have become a feature of DC planning applications. There are much cheaper and simpler upgrades and renewables solutions available for residential heating, without tying in to a single industrial operator who may not be here in the next decade.

**JSA 4.164 – 4.168**

My critique of Amazon's claimed commitment to renewables is included in my appeal.

**JSA 4.169 – 4.179**

The description of the Community Benefits aspect has been expanded. I stand corrected, as I missed reference to the figure of €150,000 fund managed by ChangeX. For an organisation of the size and turnover of Amazon this is still a modest figure.

**JSA 4.180 – 4.199**

I did not refer to the CDP in my appeal, and have no comment on these sections.

**JSA 4.200 – 4.205**

I note that the HJL carbon report has been updated to include the embodied carbon emissions of construction materials. In the context of the overall GHG impact this is a minor issue. I only raised the matter in my submission as it exposes the minimalist approach of the applicant in answering questions validly put by the PAs and public.

**JSA 4.206 – 4.237**

I believe there are valid concerns regarding back-up generators as mentioned in Friends of The Earth appeal. The issue is that AQ standards may be exceeded if there is prolonged operation of the generators which may be required during periods of grid stress. Condition 11 and 12 are directed at these concerns.

**JSA 4.238 – 4.242**

No comment

**JSA 4.243 – 4.247**

I have nothing to add to my previous comments on Amazon's commitment to renewables, which I view as a very well conducted greenwashing campaign.

**Comments on Appendix 3 – Technical response to Third Party Appeals, AWN Consulting****General Comments**

In reading the "General Summary of Response to Climate Issues", I refer the Board to the section at the beginning of my present submission headed: Main Disputed Claims/Issues, where there is a detailed explanation provided of four aspects which are relevant for countering the claims of the applicant.

Referring to the AWN report, the first item in the bulleted list on p. 4 (range of design measures) refers to a number of trivial mitigations (PV, LEDs), and refers to district heating, which I contested in my appeal.

The second and third items refer to benefits of assumed future low and zero carbon electricity. Any and all projects can claim the same projected benefits, and all could claim low GHG impact on this basis – see section C of my submission.

No comment on fourth and fifth items

The sixth item claims an unprovable GHG saving, which if it occurred would be outside Ireland and of no relevance in the context of Irish policy

The seventh item claims CPPA will mitigate impact. This is countered in section B of my submission.

The ensuing discussion on p4/5 continues with what I contend is the false CPPA claim. I draw the Board's attention to the identified GHG impact in the last paragraph on p.5, which was described as a "moderately adverse, significant impact". I accept this description. However I do not accept that this impact can be mitigated by a CPPA in accordance with Condition 13.

### **Detailed Comments**

*Section numbering below as per Appendix 3 AWN Response*

#### **AWN 1.3**

CPPA claim – countered in section B of my submission. The core issue for achieving a mitigation and compliance with national policy is "additionality". Please note that AWN refuses to use this word.

#### **AWN 2.1**

False CPPA mitigation claim – see section B of this submission (items 2.2 to 2.4 do not relate to my appeal).

#### **AWN 3.2**

Please note that I did not argue that there would be cumulative impacts at a global level. I argued that emissions should be considered in the context of national policy, especially in relation to Emissions Ceiling for Electricity Sector.

To assist the Board getting an overview of emissions in the Electricity Sector, I supplied a table on p. 15 of my appeal which summarised the emissions from four projects assessed by AWN, showing that these projects would consume 44 to 65% of the national Emissions Ceiling in 2030 (the lower value refers to maximum mitigation assumptions). I note that neither AWN nor John Spain have commented on this data.

My valid point on the high consumption of the Emissions Ceiling was conflated in the AWN Item A3 with appeal claims by others regarding global impact. The recitals from the Coyne decision was validly used to deal with the question of global impact. However my comment and data referred to national policy, and should have been considered, as the Coyne decision has no bearing on this aspect (see section D in my submission).

I also draw the Board's attention to the revised table which I have prepared and which is included at the end of this submission. This presents emissions data for ten projects assessed by AWN which could potentially emit 3.5 Mt GHG in 2030 (under maximum mitigation) in 2030. This would exceed the national emissions ceiling. I suggest that this is relevant information for the Board in discharging its duties under section 15 of the Climate Act 2015/21. The Board's hands are not tied in any way by the Coyne judgment in this respect.

#### **AWN 3.4**

I agree that AWN correctly contextualized the impact in terms of EU ETS in the first EIAR, and upon FIR they revised the assessment to include the Emissions Ceiling context. Where I disagree is that the identified adverse impact can be termed "slight" by invoking CPPA (see section B of my submission).

**VN A4**

The AWN response to this item is rather long, and repeats much of the claims made in JSA response, and in the EIARs. I will deal with the response with reference to the summary on p. 13.

**AWN A4.1 – A4.7**

I accept that AWN provided the necessary sectoral data in the revised EIAR, following RFI. However they failed to discuss the significance of the magnitude of impact of the development in the Electricity Sector. The proposed development would consume 2.2% of the emissions ceiling (AWN FI Table 1.10). This would have to be considered a substantial consumption, as it would mean that just 45 similar projects would consume 100% of the national ceiling. Likewise, the overall project was calculated to consume 6.5 % of the ceiling, which would by any criteria have to be considered substantial and concerning. Just 15 such projects could consume the entire emissions ceiling.

AWN made no comment on these substantial potential impacts. They avoided entering into this difficult discussion by invoking the magic of CPPA which (falsely) reduces the impact to slight (see section B of my submission). I suggest that the impact in the context of sectoral targets will be a relevant consideration for the Board in discharging its duties under section 15 of the Climate Act 2015/2021.

Regarding "significant impact" According to IEMA guidelines, any project which increases GHG emissions has a significant adverse impact. The description of the impact is then assigned based on criteria, if available, or on professional judgement. I agree (with some reservations), with the AWN descriptor of "Moderate Adverse", which was based on their assumption of maximum mitigation, with responsibility for mitigation being passed on to the state to achieve its renewables targets for 2030. This approach has however an inherent logical flaw, see section C of my submission.

In my submission, I described a credible scenario where new base load fossil generation is required to serve the growing demands of data centres, which is just basic physics – conservation of energy. If there is an increased baseload demand, there must be a corresponding increase in baseload supply. In this case the impact would be "Major Adverse". However, for the purposes of this submission I will accept with reservations described in section C of my submission that the "Moderate Adverse" descriptor can serve as a common basis for assessment. The net issue then reduces to the CPPA mitigation claim which I reject (see section B of my submission).

In the ensuing discussion AWN refer to CPPA mitigation, and that the development's power demands were factored into the preparation of the state's Sectoral Emissions Ceiling, and that emissions factors for the grid can be assumed to reduce over time. See sections A and B and C of my submission for refutation of these claims.

At the bottom of page 15 in the AWN response there is an interesting and relevant statement:

"In addition, there is no current evidence that there will be an exceedance of the Sectoral Emission Ceiling"

I submit that the consultants had this evidence in their files had they chosen to compile it (see my table submitted with my appeal (p.15), and the updated table of emissions at the end of this submission.

**AWN 5.3 – 5.4**

The original EIAR had considered impact only within the EU ETS context. The revised FI EIAR included the relevant national context. The ensuing discussion refers to the proposed CPPA, which I do not accept as constituting mitigation (see section B of my submission).

**AWN 6**

Alleged non-compliance with section 15 of the Climate Act 2015/2021 is a matter for the PAs or the Board to defend. The applicant has no role in this, so I am ignoring this section.

**AWN 7**

I note that the carbon assessment has been revised. From data in the revised HJL report I calculate the emissions to be 26,486 tGHG, before mitigation, which agrees well with my estimate submitted at the FI stage, which was 27,000 tGHG. With mitigation in the form of low carbon concrete and steel, the revised report indicates that emissions can be reduced to less than 13,000 tGHG.

I raised the issue of carbon assessment of the building phase to highlight the minimalist approach of the applicant to provision of information requested. For example they have steadfastly refused to supply any details of the existing use of renewable energy in Ireland. An FI request for carbon during construction would generally be interpreted by engineers as just that – how much carbon will be released upon building the project. However the applicant automatically adopted a minimalist response, and did not include the much larger emissions associated with concrete and steel, and just submitted the much lower scope A4, A5 emissions. They now claim that this reduced scope is exactly what the PA asked for, and went to the trouble of getting the PA to confirm this, in which matter they helpfully obliged. Why a PA would specifically request such a limited scope of project carbon data is inexplicable.

For the majority of industrial developments consideration of the carbon emissions associated with construction is quite relevant, as over the lifetime of the project they are significant. However for a data centre development which will result in indirect emissions of 499,000 tGHG in the first five years from 2026 to 2030 (Table 1.10 in FI EIAR), the embodied carbon in construction becomes insignificant.

**AWN 8**

I repeat my comment which I made to JSA 4.206-4.237:

I believe there are valid concerns regarding back-up generators as mentioned in Friends of The Earth appeal. The issue is that AQ standards may be exceeded if there is prolonged operation of the generators which may be required during periods of grid stress. Condition 11 and 12 are directed at these concerns.

**/N 9**

GHG emissions from generators are minor compared with the large indirect emissions. The proposal for using HVO is just greenwashing. If they could power the whole data centre continuously on HVO that would be a different matter. But given the limited supply of this fuel they would consume all the national supply in a few days.

A handwritten signature in blue ink that reads "Colin Doyle". The signature is written in a cursive, flowing style.

**Colin Doyle**

27/5/2024

### Table of GHG Emissions from Data Centres assessed by AWN

The table below presents a compilation of GHG emissions from data centres assessed by AWN. The emissions estimates are taken from the EIA reports which are in the public domain. The lower range refers to conditions of maximum mitigation. I submit that the Board should take account of this data in discharging their duties under section 15 of the Climate Act 2015/21.

Development	Planning ref	GHG Emissions tonnes ktCO <sub>2</sub> eq/year	EIA Climate Impact Assessment	Reference
EngineNode Clonee	R789/20, ABP 307546	591	not stated	Addendum to EIA, 9.2.2.2
Amazon Drogheda	LB/191735 EPA P1181-01	183	long-term, negative, and imperceptible	EIA ch.9, p. 24
Tunis Properties LLC, Drogheda	ABP-310729-21	473	indirect, long-term, negative and slight	EIA, Ch.9, P.24
Crag Wicklow Ltd., Arklow	ABP-311778-21	361	indirect, long-term, negative and slight	EIA Ch.8, P. 22
Data and Power Hub	SD20A/0058, SD20A/0324 ABP 309773-21 EPA P1165-01	262 - 400	indirect, long-term, negative, and imperceptible	EIA, p. 150
Art Data Centres Ltd. Ennis	ABP-314474-22	293 - 657	indirect, long-term, negative and slight	EIA NTS, P.2, and AWN Report to ABP Table 5
Crag Arklow Ltd.	WCC 21/1080 EPA P1202-01	448	direct, long-term, negative and slight	EIA ch8., p. 20
Universal Developments (Overall Project)	FW22A/0308	196-457	Imperceptible to Slight (original EIA) minor adverse (FI)	EIA Ch.9 P. 42 AWN FI response, P. 43
EdgeConnex	ABP-317802-23 EPA P1204-01	331-420	moderate adverse prior to mitigation, minor adverse with mitigation	EIA May 2023 Table11.10 + Table 11.11
Crag, Clondalkin	SD23A/0158	334	long-term, negative and slight	EIA 2023 Table 9.11, ch. 9 p3.2
<b>Total for above 10 developments</b>		<b>3470 - 4320 kt</b>		
<b>Total</b>		<b>3.5 to 4.3 Mt</b> 116% to 144% of indicative emissions ceiling for Electricity Sector in 2030		

An Bord Pleanála  
64 Marlborough Street  
Dublin 1, D01 V902

**AN BORD PLEANÁLA**

LDG- \_\_\_\_\_  
ABP- \_\_\_\_\_

**29 MAY 2024**

Fee: € \_\_\_\_\_ Type: \_\_\_\_\_

Time: 9:34 By: reg post

Colin Doyle  
12 Cottage Gardens  
Ennis  
Co. Clare  
28<sup>th</sup> 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 27<sup>th</sup> 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<sup>1</sup>.

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 conceivably be arranged by the applicant.

One could reasonably conclude that a balance will not be 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.

<sup>1</sup> <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<sup>2</sup> 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.

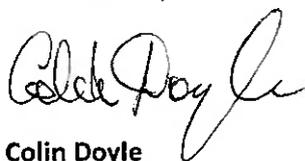
I trust that the Board will take the above facts into account in performing its functions in accordance with section 15 of the Climate Act 2015/21.

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:

<b>2023-2050 ETS GHG Emissions Projections (kt CO2 eq)</b>	<b>2035</b>	<b>2036</b>	<b>2037</b>	<b>2038</b>	<b>2039</b>	<b>2040</b>
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	<b>2897.29</b>

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,



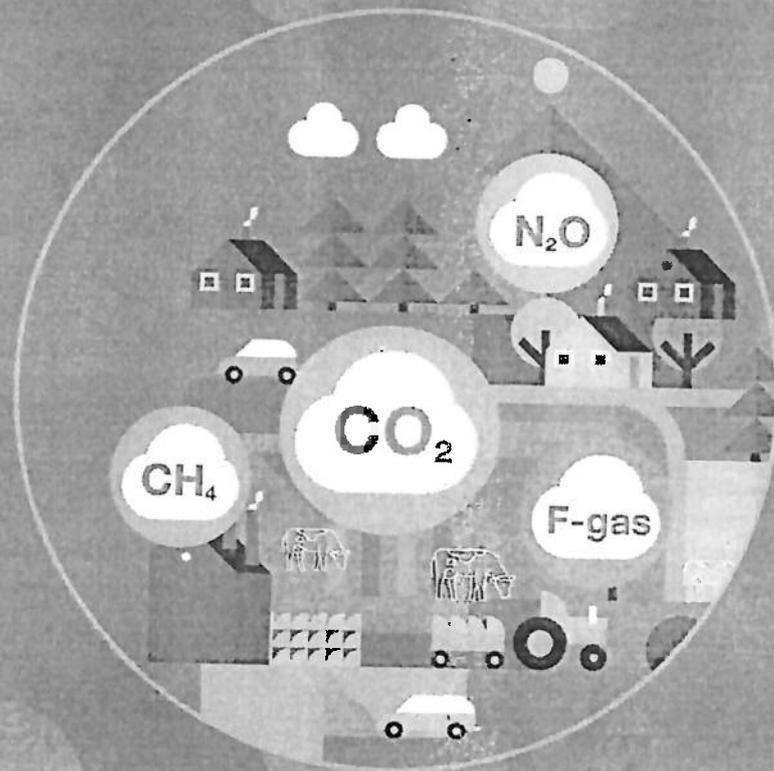
**Colin Doyle**

<sup>2</sup> 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



$CH_4$

$CO_2$

F-gas

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## Key Findings

<b>Ireland's Climate Act Ambition</b>	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.
<b>Carbon Budgets</b>	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.
<b>Sectoral Emissions Ceilings</b>	Sectoral emissions ceilings for 2025 and 2030 are projected to be exceeded in almost all cases, including Agriculture, Electricity, Industry and Transport.
<b>EU Targets</b>	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.
<b>Rate of Change</b>	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.
<b>Implementation Gap</b>	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.
<b>Agriculture</b>	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.
<b>Transport</b>	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.
<b>Electricity Generation</b>	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.
<b>Land use, Land use Change and Forestry (LULUCF)</b>	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<sup>1</sup>. 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<sup>2</sup> and to the public as outlined in the Climate Action Plan 2024<sup>3</sup>. 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<sup>4</sup>.

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<sup>5</sup>. 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](http://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<sup>6</sup> 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<sup>7</sup> 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<sup>8</sup>. This target was set in April 2023 upon amendment of the ESR<sup>9</sup>. 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<sup>10</sup> 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<sup>11</sup> allowances and credit from action undertaken in the Land use, Land use Change and Forestry (LULUCF) sector<sup>12</sup>.

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](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](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](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<sup>13</sup>.

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<sup>14</sup> 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<sup>15</sup>;
- 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<sup>16</sup>. 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<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O) and fluorinated-gases and reported as carbon dioxide equivalent<sup>17</sup> (CO<sub>2</sub> eq). Emissions are classified into nine sectors: Energy Industries, Transport, Agriculture, Residential, Manufacturing Combustion, Commercial & Public Services, Industrial Processes, Waste and F-Gases<sup>18</sup>.

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13 The data is available at [www.epa.ie/publications](http://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<sub>2</sub> 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 (IPCC's) fifth assessment report (AR5).

18 F-gases are hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>)

## 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<sup>19</sup> 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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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

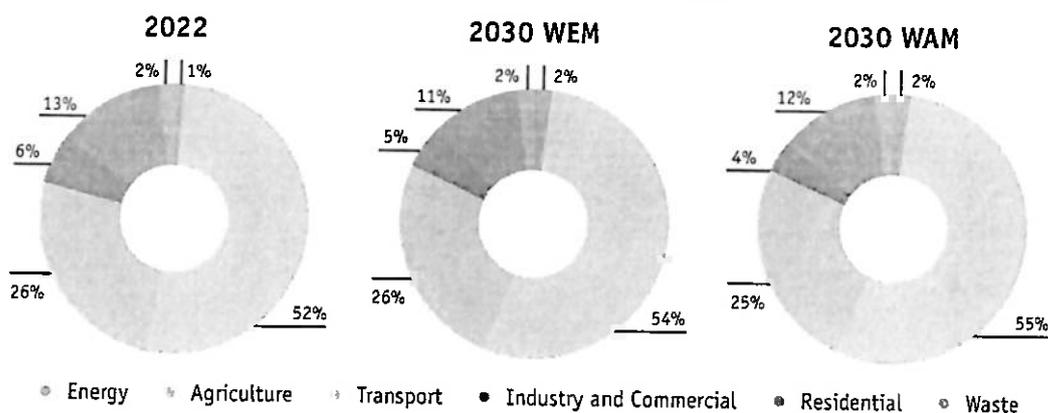
Ireland's 2030 target under the EU's Effort Sharing Regulation (ESR) is to deliver a 42% reduction of emissions compared to 2005 levels by 2030. This target was set in April 2023 upon amendment of the ESR. The ESR includes sectors outside the scope of the EU Emissions Trading System (EU-ETS) such as Agriculture, Transport, Residential, Public/Commercial Services and Waste and is also referred to as a "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<sup>20</sup>.

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**



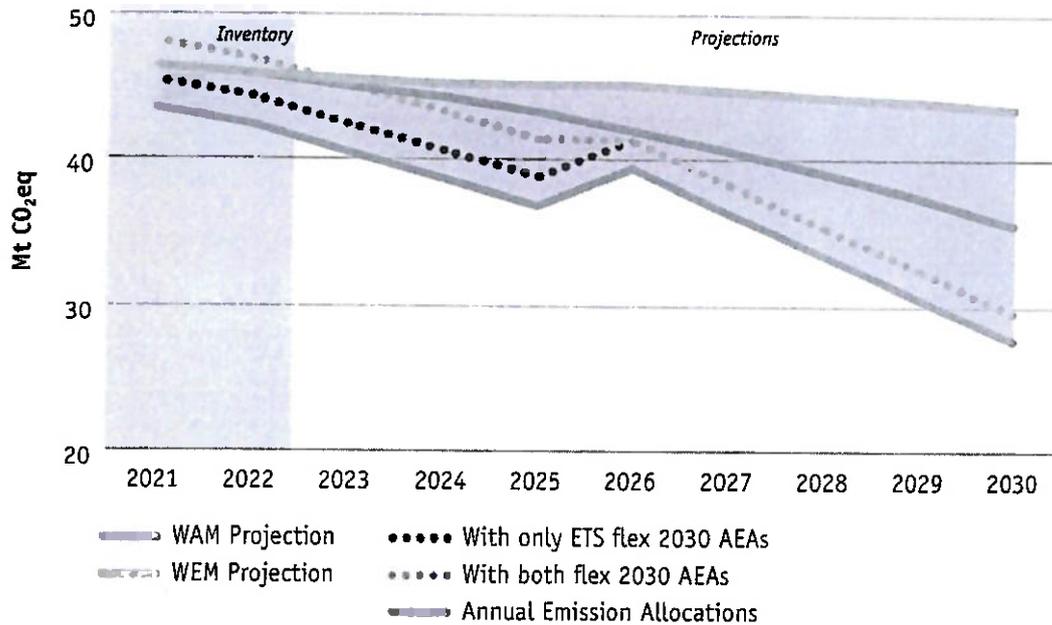
Targets for 2030 under the ESR include binding annual limits per member state known as "Annual Emission Allocations" (AEAs). The AEAs required updating to reflect the 42% reduction target set in 2023. To-date new AEAs have been implemented for 2021 to 2025<sup>21</sup> only. Limits for 2026-2030 have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

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

<sup>21</sup> 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)

<sup>22</sup> 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<sub>2</sub> eq by 80.3 Mt CO<sub>2</sub> 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<sub>2</sub> eq without the use of flexibilities.

The ESR provides two flexibilities (EU-ETS and LULUCF)<sup>23</sup> 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<sub>2</sub> eq (or 1.91 Mt CO<sub>2</sub> eq annually).

The revised LULUCF Regulation (2023)<sup>24</sup> 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:o>, 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<sub>2</sub> eq reduction by 2030<sup>25</sup>. 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<sup>5</sup> and projections data, the maximum amount of LULUCF flexibility now projected to be available is 13.4 Mt CO<sub>2</sub>eq in the first 5-year period (or 2.68 Mt CO<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> eq by 2030. The latest projections show that under the WAM scenario, Ireland's ESR emissions will be 35.6 Mt CO<sub>2</sub> eq in 2030; under the WEM scenario Ireland's ESR emissions will be 43.5 Mt CO<sub>2</sub> eq in 2030. Including the use of flexibilities, Ireland's ESR emissions are projected to be 33.7 Mt CO<sub>2</sub> eq in 2030 under the WAM scenario and 41.6 Mt CO<sub>2</sub> eq in 2030 under the WEM scenario.

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

## 4 Projected Performance against National Climate Objective

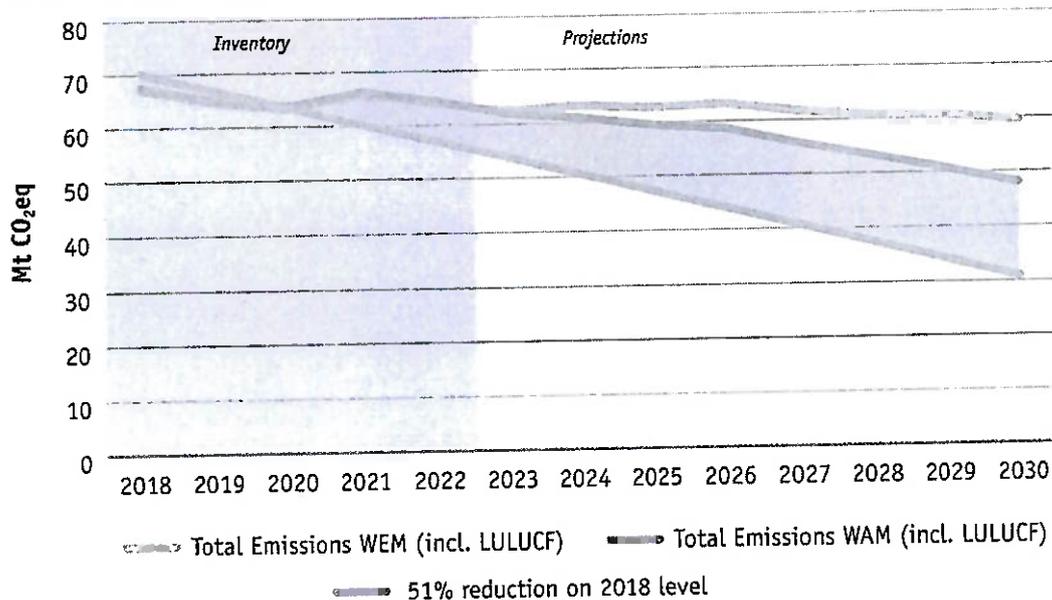
The Climate Action and Low Carbon Development (Amendment) Act 2021 sets a national climate objective of achieving a climate resilient and climate neutral economy by the end of the year 2050. An interim target has been set out to achieve a reduction of 51% in total emissions (including LULUCF) over the 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<sub>2</sub> 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<sup>26</sup>.

<sup>26</sup> <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<sub>2</sub> eq;
- Budget 2 from 2026-2030, 200 Mt CO<sub>2</sub> eq;
- Budget 3 from 2031-2035 (provisional), 151 Mt CO<sub>2</sub> eq.

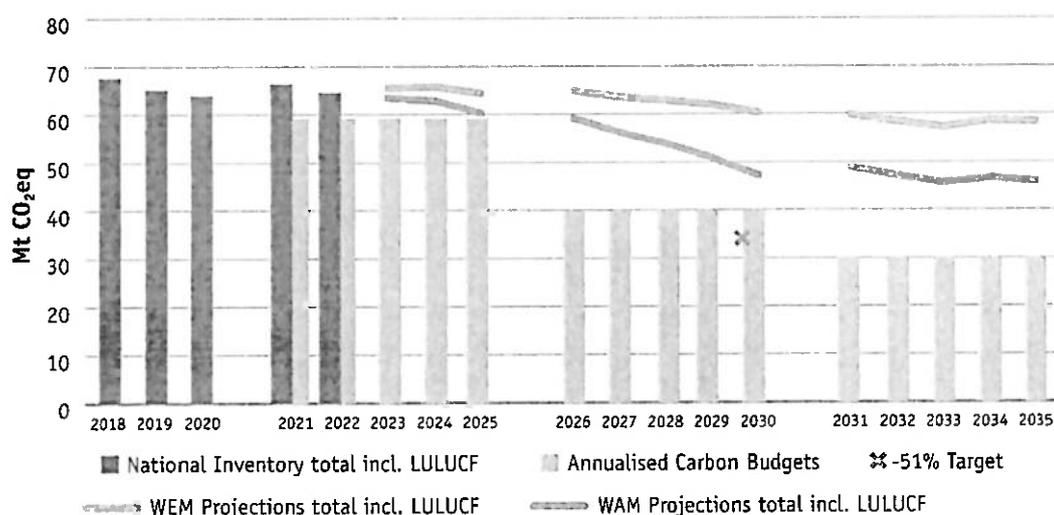
For Budget period 1 the latest EPA projections show that this is projected to be exceeded by 26 Mt CO<sub>2</sub> eq in the WEM scenario and 19 Mt CO<sub>2</sub> eq in the WAM scenario. Based on this assessment, Budget 2 from 2026-2030 is projected to be exceeded by 109 Mt CO<sub>2</sub> eq in the WEM scenario and by 67 Mt CO<sub>2</sub> eq in the WAM scenario. Budget 3 from 2031-2035 is projected to be exceeded by 143 Mt CO<sub>2</sub> eq in the WEM scenario and by 86 Mt CO<sub>2</sub> 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<sub>2</sub> eq in the WEM scenario to 174 Mt CO<sub>2</sub> eq, and decrease by 19 Mt CO<sub>2</sub> eq in the WAM scenario to 181 Mt CO<sub>2</sub> eq. With this carryover, Budget 2 is projected to be exceeded by 135 Mt CO<sub>2</sub> eq in the WEM scenario and by 85 Mt CO<sub>2</sub> 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<sub>2</sub> 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<sup>27</sup> 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<sup>28</sup> 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)<sup>29</sup> will be adopted.

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

Sectors	Emissions 2018 (Mt CO <sub>2</sub> eq)	Projected Emissions 2030 (Mt CO <sub>2</sub> 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<sub>2</sub> 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 <sub>2</sub> eq)	Sectoral Ceiling 2021-2025 (Mt CO <sub>2</sub> eq)	Projected Emissions 2026-2030 (Mt CO <sub>2</sub> eq)	Sectoral Ceiling 2026-2030 (Mt CO <sub>2</sub> 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

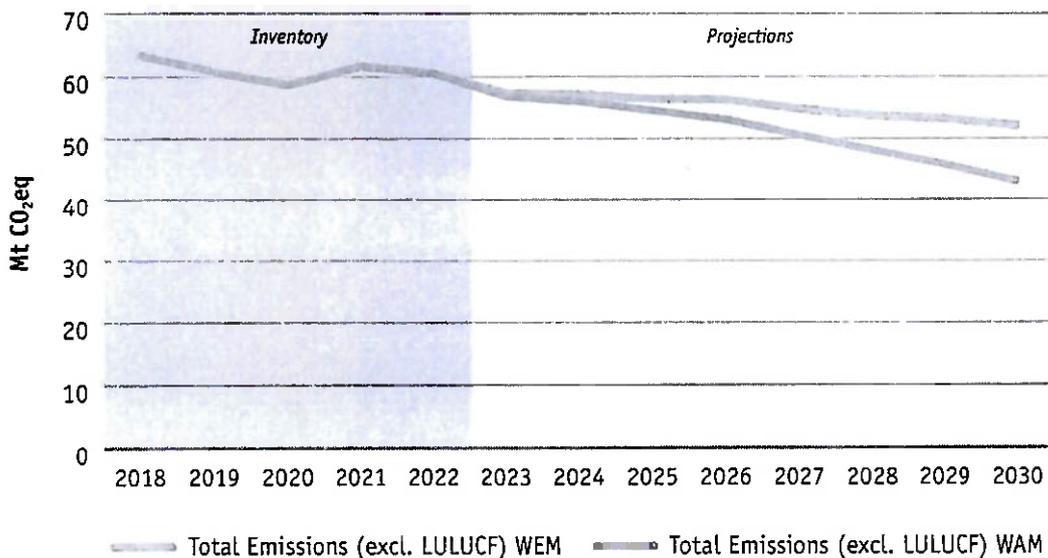
## 5 Sectoral Assessment of Projections out to 2030

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<sup>30</sup>.

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

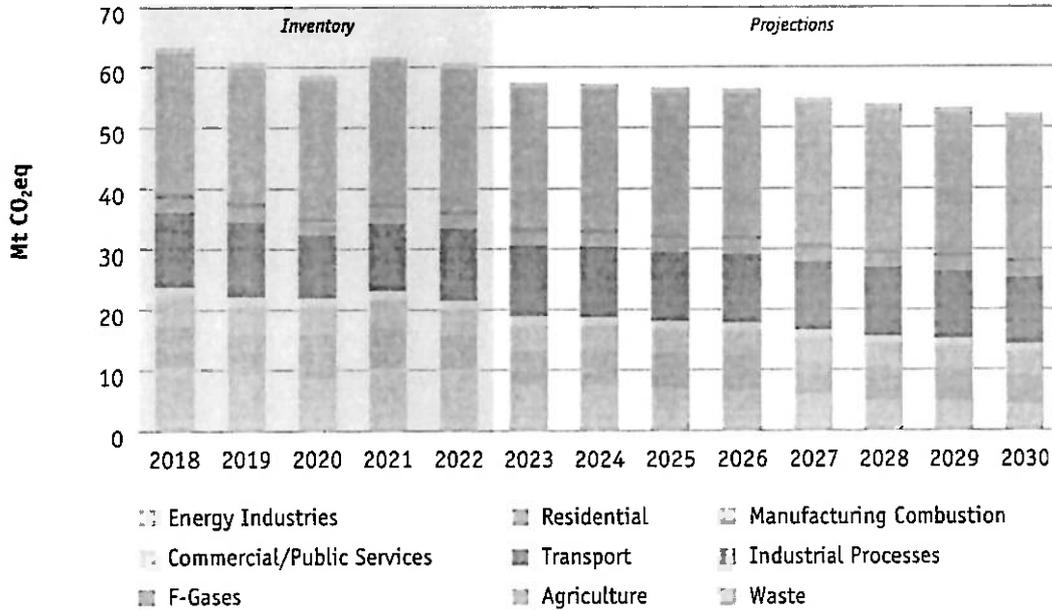
**Figure 5: Total Greenhouse Gas Emissions (excluding LULUCF) under the *With Existing Measures* and *With Additional Measures* scenarios out to 2030**



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.

<sup>30</sup> <https://www.gov.ie/en/publication/07fbc-ag-climatise-a-roadmap-towards-climate-neutrality/>

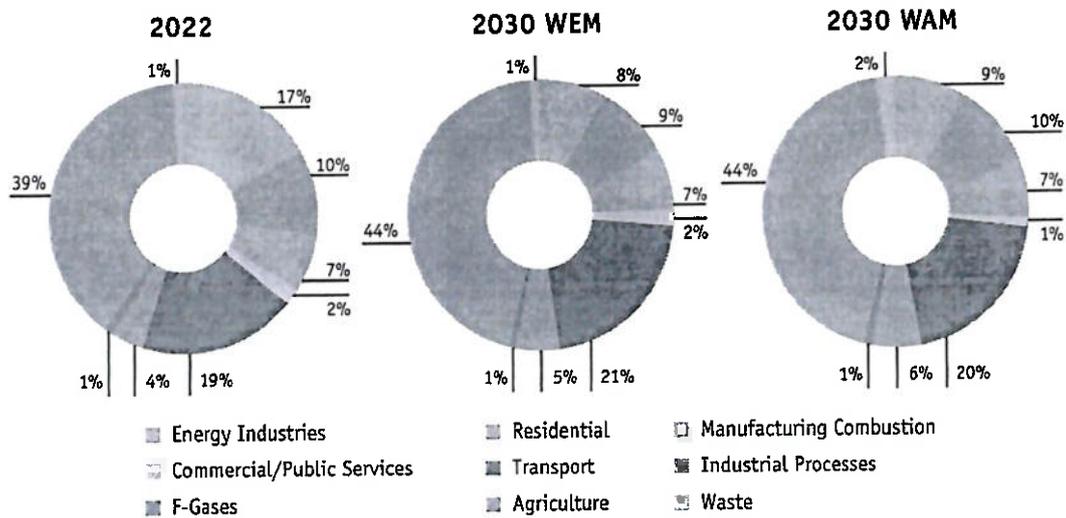
**Figure 6: Total Greenhouse Gas Emissions Projections (excluding LULUCF) by sector out to the year 2030 under the WEM scenario**



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.

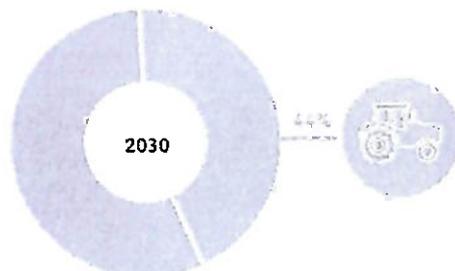
The share of total emissions coming from the energy industries sector (mainly power generation) are projected to decline from 17% in 2022 to 8% in 2030 in the WEM scenario and to 9% in the WAM scenario. This reflects the projected ongoing phase out of coal, oil and gas usage in power generation, implementation 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<sup>31</sup>) 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<sub>2</sub> 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<sup>32</sup> 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.

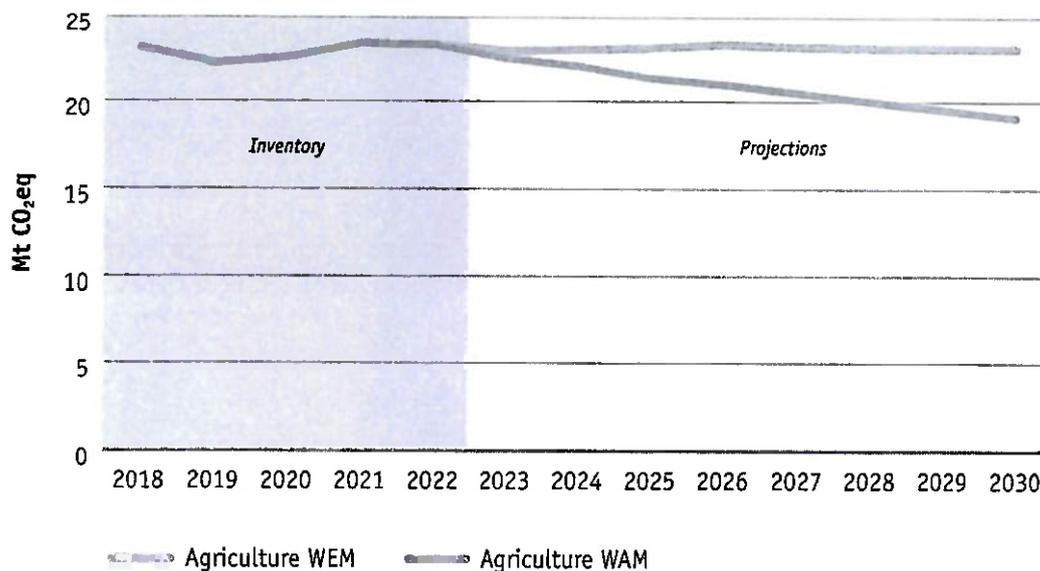
### *With Additional Measures scenario*

Under the WAM scenario emissions are projected to decrease to 19.1 Mt CO<sub>2</sub> 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 NH<sub>3</sub> 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<sub>2</sub> 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**

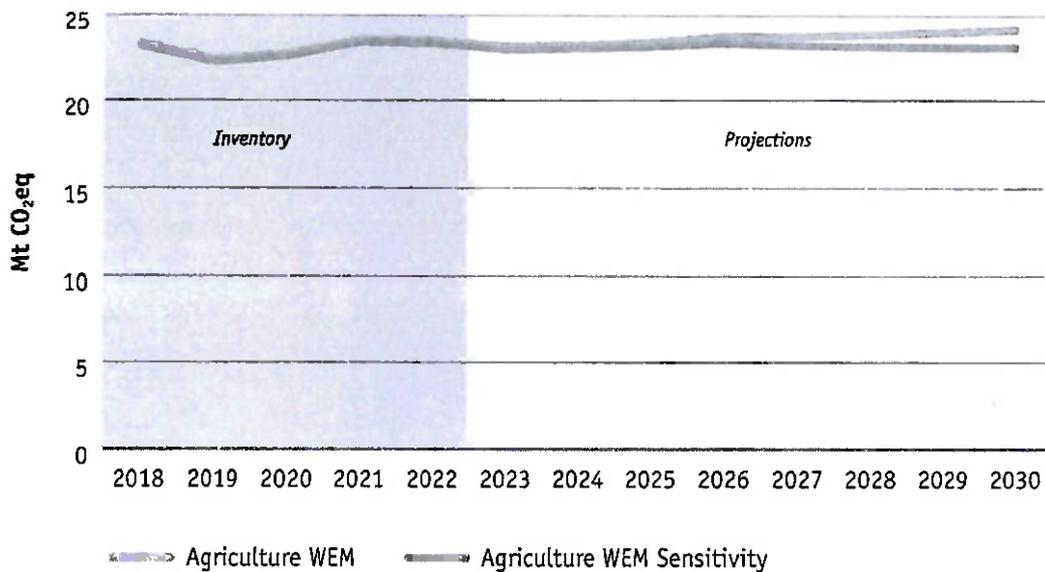


### Sensitivity Analysis

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.

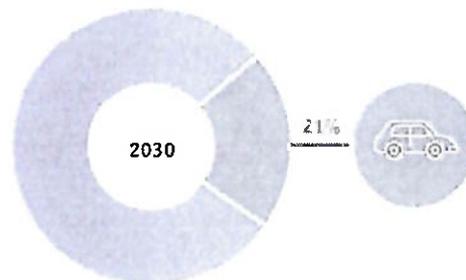
The sensitivity scenario examines the consequences of continued strong growth in the dairy herd accompanied by beef cow herd that is projected to contract at a slower rate than the rate of decline observed since the end of the milk quota regime in 2015. Under this sensitivity scenario, with stronger 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<sub>2</sub> 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<sub>2</sub> eq (see Figure 10). Measures included in the WEM scenario are:

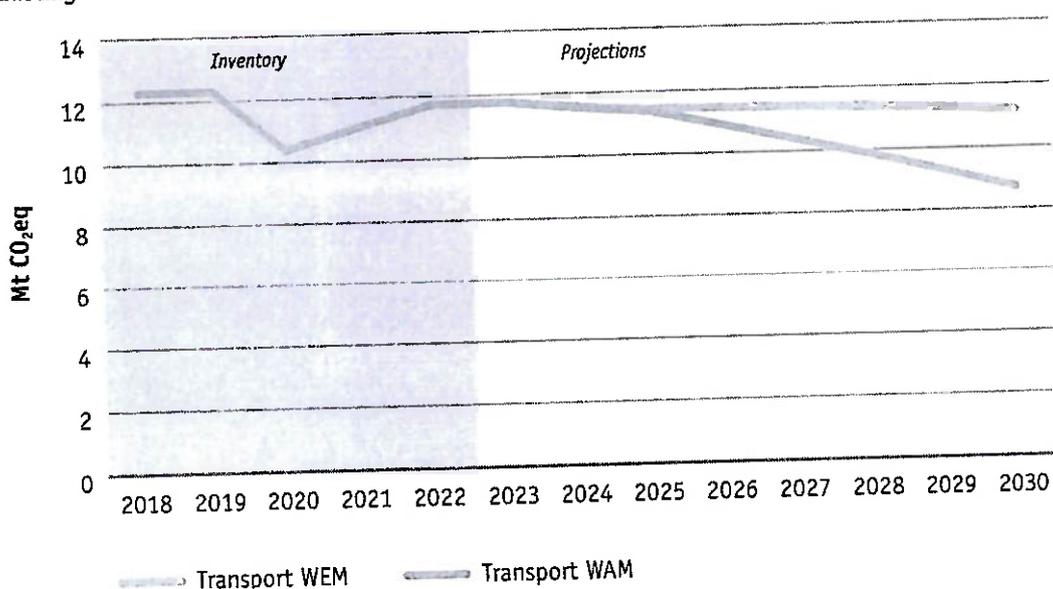
- A 10% blend for petrol and a 12% blend for diesel at the pumps by 2025 is assumed and blends remain at this level until 2030.
- For uptake of Electric Vehicles, the WEM scenario assumes approximately 693,000 electric vehicles on the road by 2030. This includes approximately 430,000 passenger battery 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<sub>2</sub> 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.

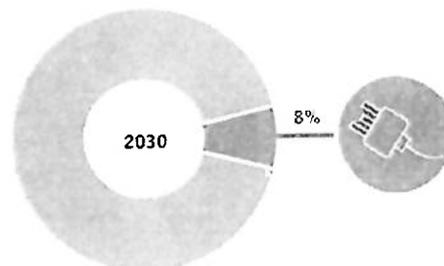
**Figure 10 Greenhouse Gas Emissions Projections from the Transport Sector under the *With Existing Measures* and *With Additional Measures* scenarios out to 2030**



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<sup>33</sup>. 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<sup>34</sup>. A Government Policy on Interconnection<sup>35</sup> 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<sub>2</sub> 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<sub>2</sub> eq over the period 2022 to 2030 (Figure 11). In addition to the WEM measures, the WAM scenario includes:

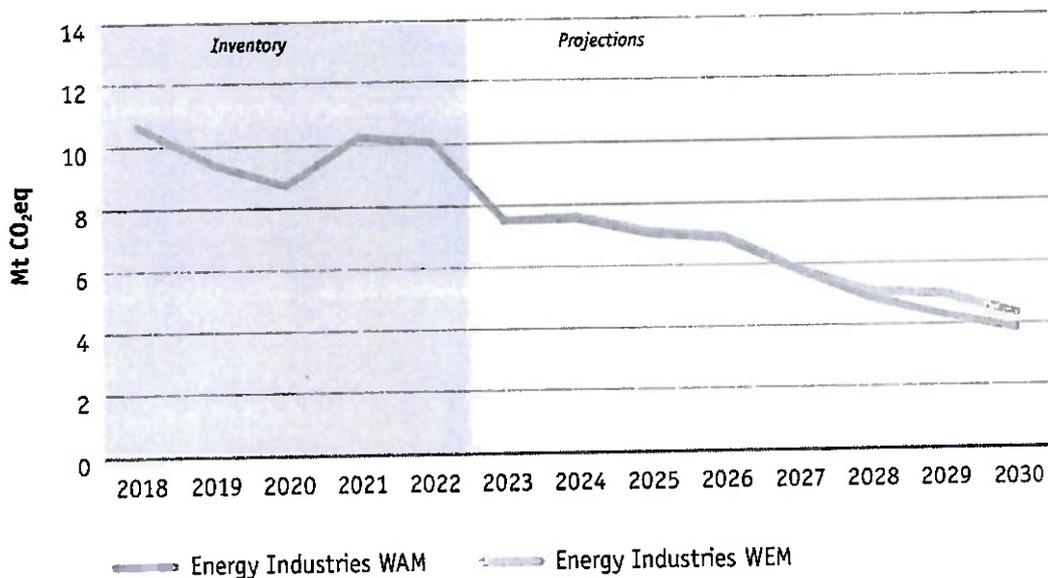
- A renewable electricity share of 80% by 2030 (as set out in the Climate Action Plan 2024), mainly a result of further and rapid expansion in wind and solar energy;
- Production of up to 5.7 TWh of Biomethane by 2030;
- Additional interconnection LirIC (700 MW) between Northern Ireland and Scotland,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

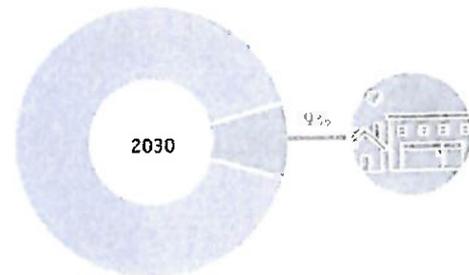
35 gov - National Policy Statement on Electricity Interconnection 2023 ([www.gov.ie](http://www.gov.ie))

**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<sub>2</sub> eq (Figure 12).

The *With Existing Measures* scenario assumes the following:

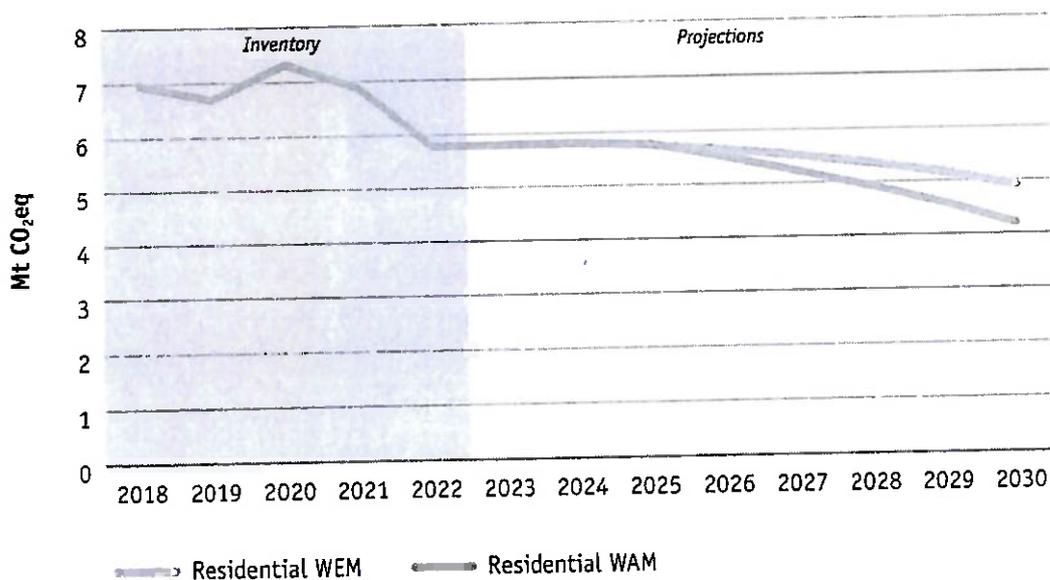
- Domestic heat pump uptake based on grant rates as of February 2022 (funded by National Development Plan 2021-2030 allocation) and, an 'effective' ban on oil boilers (from 2022) and gas boilers (from 2025) in new dwellings;
- Implementation of a range of residential energy efficiency programmes in line 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<sub>2</sub> 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:

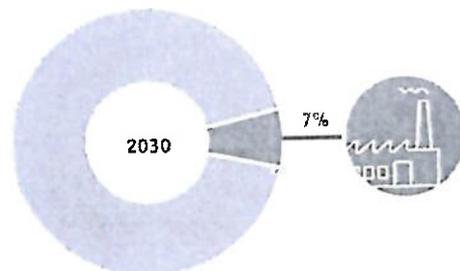
- The installation of 680,000 heat pumps by 2030 (400,000 in existing homes and 280,000 in new homes);
- Residential Energy Efficiency programmes involving upgrades to homes, and retrofits to achieve the cost optimal equivalent of a BER 'B2' rating in 500,000 dwellings by 2030;
- District heating growth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



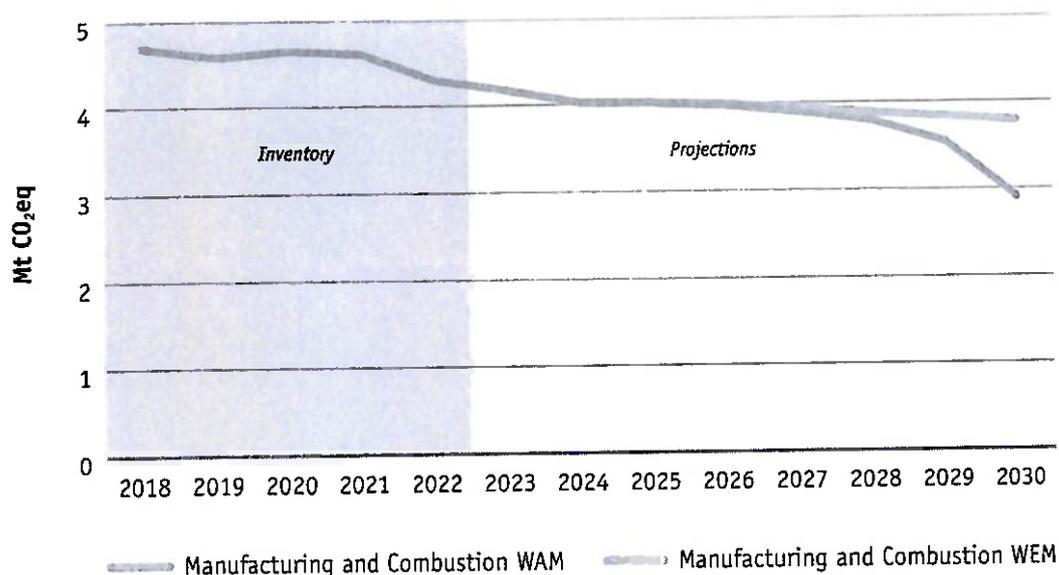
### 5.5 Manufacturing Combustion

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<sub>2</sub> 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.

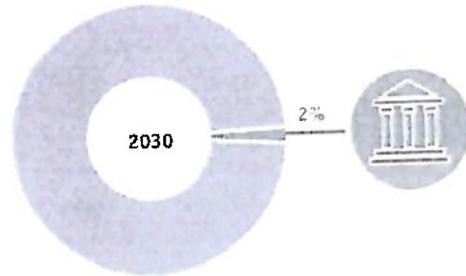
#### *With Additional Measures* scenario

Under the WAM scenario, emissions from manufacturing combustion are projected to decrease by 32% from 4.3 to 2.9 Mt CO<sub>2</sub> eq between 2022 and 2030 (Figure 13). This scenario assumes further roll out of energy efficiency programmes including those listed above. It also includes:

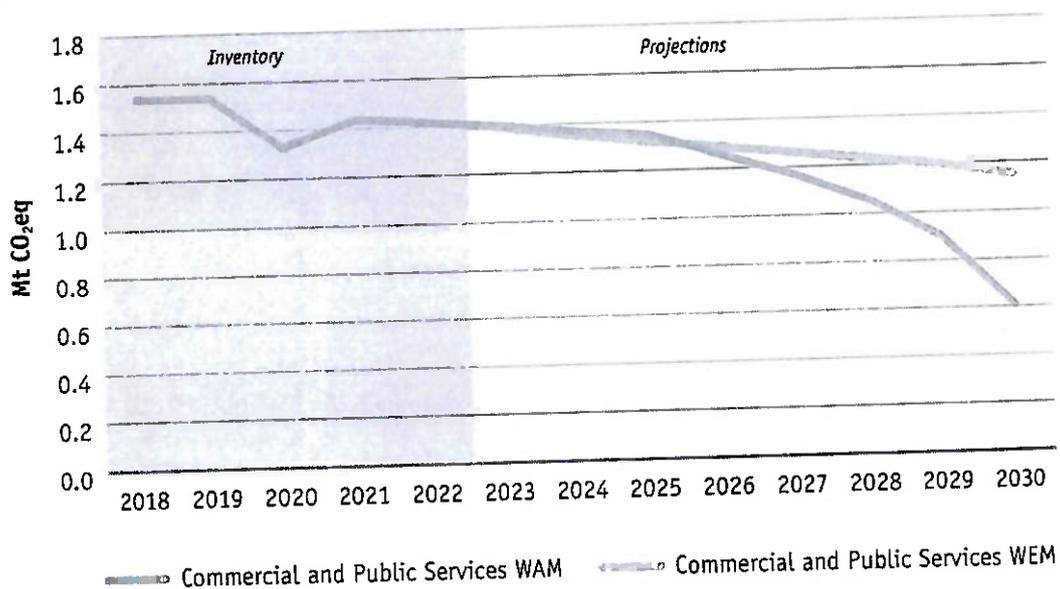
- As indicated in the Climate Action Plan 2024, a total of 5.7 TWh of biomethane use across the heat sector by 2030 (split between Commercial/Public Services and Manufacturing Combustion for these Projections);
- An increase in carbon-neutral heating in low and high temperature heat in Manufacturing 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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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<sup>36</sup>.

In addition, the LULUCF Regulation<sup>24</sup> 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<sub>2</sub> eq, below an average of 2016, 2017 and 2018 emissions for this sector, to reach a currently estimated target of 3.7 Mt CO<sub>2</sub>eq. 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<sub>2</sub> 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<sub>2</sub>eq.

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.

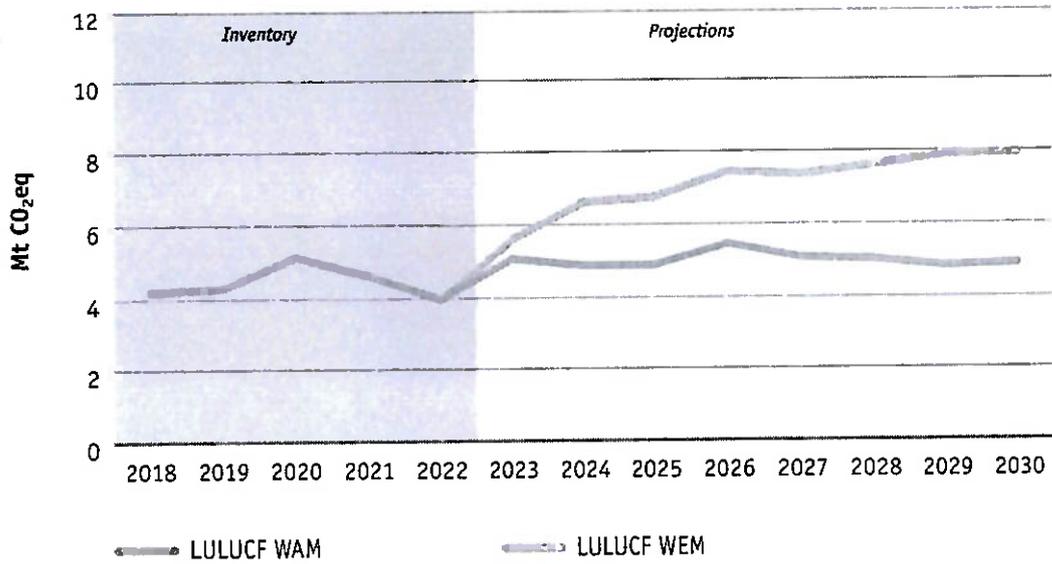
### *With Additional Measures scenario*

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<sub>2</sub> eq (Figure 15), exceeding our current LULUCF Regulation target by 1.35 Mt CO<sub>2</sub> 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.

<sup>36</sup> <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<sup>37</sup> (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

<sup>37</sup> <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						
<b>GNI*</b>	-4.4	3.1	3.0	3.2	3.2	3.2	3.3
	2022	2025	2030	2035	2040	2045	2050
<b>Housing Stock ('000)</b>	1,944	1,995	2,165	2,308	2,450	2,590	2,728
<b>Population ('000)</b>	4,962	5,043	5,250	5,466	5,690	5,924	6,166
<b>EUETS: Carbon €/tCO<sub>2</sub></b>	82	82	82	84	87	133	164
<b>Carbon tax €/tCO<sub>2</sub> (WEM Scenario)</b>	48.5	63.5	100	100	100	100	100
<b>Coal €/toe</b>	146	128	130	131	139	146	153
<b>Oil €/toe</b>	442	643	643	643	680	738	824
<b>Gas €/toe</b>	389	554	473	473	473	473	494
<b>Peat €/MWh</b>	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<sup>38</sup>) 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.

### 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<sub>2</sub> 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 CO<sub>2</sub> eq) for With Existing Measures and With Additional Measures scenarios**

Historical	Non-ETS sector		ETS sector		Total
	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	<i>With Existing Measures scenario</i>				
	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
	<i>With Additional Measures scenario</i>				
	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

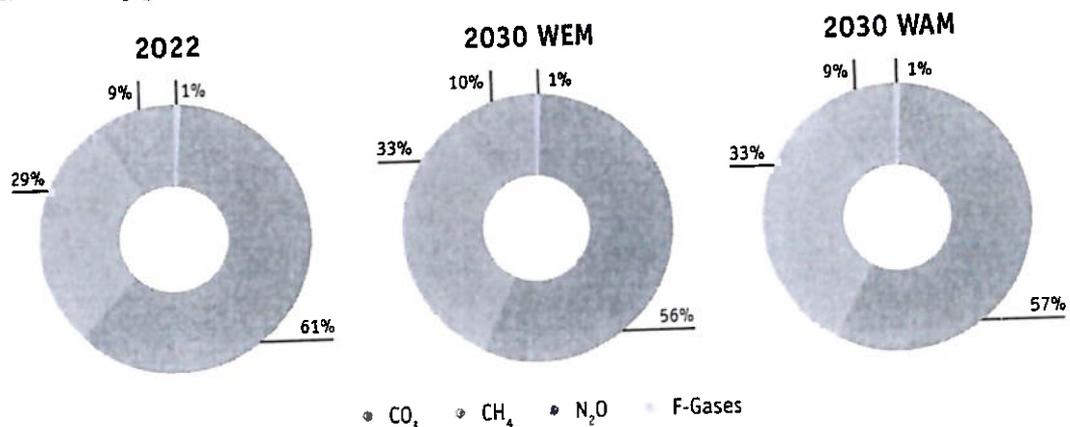
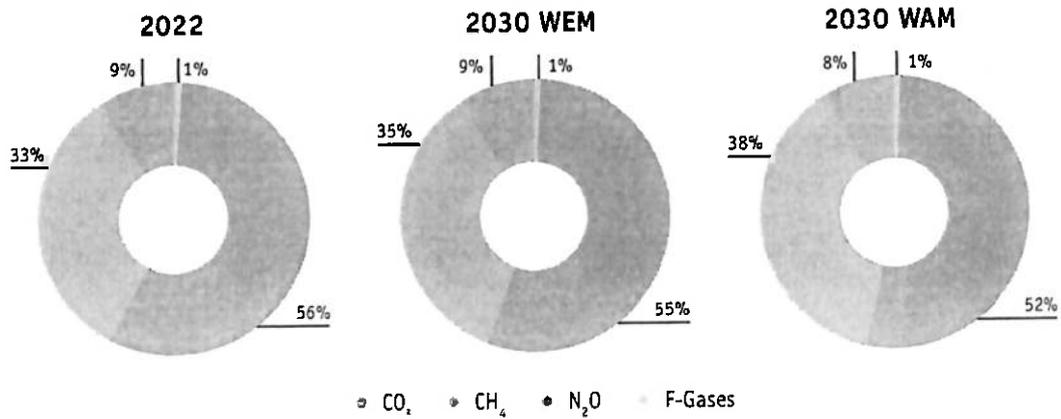


Figure A2: Share of emissions by gas (including LULUCF) in 2022 and projected share of emissions by gas in 2030 under the WEM and WAM scenarios



### 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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