CLIMATE CHANGE ADVISORY COUNCIL

Annual Review 2025

Built Environment, Industry and Waste

Annual Review 2025: Built Environment, Industry and Waste

Submitted to the Minister for Climate, Energy and the Environment on 1 September 2025

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Summary for All

Key observations

In this Review, the Climate Change Advisory Council outlines observations and recommendations for the Built Environment, Industry and Waste sectors.

The Built Environment sector is the only sector where emissions increased in 2024, underscoring an urgent need for sustained emissions cuts through improved energy efficiency and low-carbon heating solutions. Emissions from residential buildings increased by about 4.9% in 2024 compared with 2023, primarily due to colder weather driving an increase in heating demand. Previous emissions reductions in 2022 and 2023 were due to reduced heating demand, as a result of higher energy costs and milder winters. Emissions from commercial and public buildings also increased by 7.9% in 2024. Despite progress in retrofitting and energy upgrades, both the residential buildings and commercial and public buildings Built Environment sectors are projected to exceed their sectoral emissions ceilings.

Industrial emissions fell by an estimated 4.6% in 2024, driven partly by reduced cement production and a fall in manufacturing industry output. Insufficient implementation of the National Biomethane Strategy has undermined the market to date, and targets for biomethane production will likely be missed. Waste sector emissions also fell in 2024; however, the volume of waste generated remains too high and household recycling rates are not improving.

Key recommendations

1. Fossil fuels must be urgently phased out, so it is essential that the National Building Renovation Plan due to be published this year includes a clear plan to phase out fossil fuel boilers in existing buildings.
2. Wider support, guidance and standards for solar photovoltaic installations, including in relation to batteries and changeover switches, to increase customer resilience are recommended, particularly focusing on vulnerable households and supporting resilience during extreme weather events.
3. The Council recommends that the Government take urgent action to support the development of new standards and faster approval processes for low-carbon cement technologies, and a requirement for all new buildings to have resource and waste management plans, to minimise the consumption of materials and reduce waste.

Abbreviations

AHB	approved housing body
BER	Building Energy Rating
C&D	construction and demolition
CAP	Climate Action Plan
CCUS	carbon capture, utilisation and storage
CRU	Commission for Regulation of Utilities
DCEE	Department of Climate, Energy and the Environment
DETE	Department of Enterprise, Trade and Employment
DHLGH	Department of Housing, Local Government and Heritage
EED	Energy Efficiency Directive
EEOS	Energy Efficiency Obligation Scheme
EPA	Environmental Protection Agency
EPBD	Energy Performance of Buildings Directive
ESRI	Economic and Social Research Institute
EV	electric vehicle
F-gas	fluorinated gas
FIT	feed-in tariff
KPI	key performance indicator
LULUCF	Land Use, Land Use Change and Forestry
Mtoe	million tonnes of oil equivalent
NDP	National Development Plan
NSAI	National Standards Authority of Ireland
PV	photovoltaic

RES-H	share of renewable energy used in heat
RHO	Renewable Heat Obligation
SEAI	Sustainable Energy Authority of Ireland
SEC	sectoral emissions ceiling
WAM	with additional measures
WEM	with existing measures

Contents

Key observations

Built Environment emissions and trends

- Emissions decreased in the residential buildings sector in 2022 and 2023, as relatively warm winters and high energy prices contributed to reduced demand along with the introduction of solid fuel regulations.[1] Emissions from residential buildings increased by an estimated 4.9% in 2024 compared with 2023 based on the 2024 provisional inventory of the Environmental Protection Agency (EPA).[2] Sustained emissions reductions are required in the sector through implementing energy efficiency measures and decarbonising heating systems. The residential buildings sector is projected to exceed its first sectoral emissions ceiling (SEC) under the with additional measures (WAM) scenario by 0.1 Mt CO_2 eq (0.3%) and to exceed its second SEC by 4.5 Mt CO_2 eq (19.4%).[3]
- Emissions in the commercial and public buildings sector increased by an estimated 7.9% in 2024. This sector is projected to exceed its first SEC under the WAM scenario by 0.2 Mt CO_2 eq (3.2%) and its second SEC by 1.8 Mt CO_2 eq (26.8%).
- The percentage of renewable energy used in heat increased from 5.2% in 2013 to 7.9% by the end of 2023.[1]

Retrofitting and decarbonisation of heating systems

- The Sustainable Energy Authority of Ireland (SEAI) national retrofit report for 2024[4] cautions that, while the 2025 target for Building Energy Rating (BER) B2 retrofits or better rated properties could potentially be achieved, meeting the target for heat pump installations will be extremely challenging.
- The number of BER B2 retrofits achieved under SEAI schemes increased by 24%, from 17,600 in 2023 to 21,817 in 2024. The total number of BER B2 retrofits achieved between 2019 and 2024 now stands at 57,932 against a target of 83,000 by the end of 2025. However, the rate of growth in application numbers for retrofits has slowed.
- The number of heat pump installations decreased from 3,767 in 2023 to 3,600 in 2024. This represents a 4.4% decline year-on-year. The total number of heat pumps installed from 2019 to 2024 was 14,194 against a target of 45,000 by the end of 2025.[5]
- There was a 31% increase in retrofits under the Warmer Homes Scheme from 5,898 in 2023 to 7,743 in 2024, with the average applicant waiting time reduced to 18 months for the worst-performing buildings. The number of local authority units retrofitted increased from 2,252 in 2023 to 2,607 in 2024, a 16% rise.[6] Since 2021, a total of 7,699 local authority homes were retrofitted against a target of 36,500 homes to be brought to a BER B2/cost optimal standard by 2030.[6] A total of 545 approved housing body homes were retrofitted under the One Stop Shop scheme in 2024, with 224 retrofitted under the Community Energy Grant scheme.

- The latest EPA projections have revised the WAM scenario for deployment rates of district heating. Under the WAM scenario, only 0.214 TWh are expected to be in place by 2030 and just 0.074 TWh are expected to be in place with existing measures compared with a target of 2.7 TWh by 2030. This reflects delays in implementation and the lack of funding certainty for key projects.

Industry emissions and trends

- Industrial emissions fell by 4.6% in 2024 compared with 2023, based on the EPA's 2024 provisional inventory report.[2]
- Cement industry emissions decreased by 15.6% in 2024 because of lower production levels.[7] Approximately 50% of cement produced in Ireland is exported, primarily to the UK, where fluctuations in demand and price differentials can impact cement production in Ireland.
- In 2024, carbon dioxide (CO_2) emissions from the food and drink sector decreased by 3% and emissions from the bulk manufacturing of pharmaceuticals increased by more than 5%.[7]
- Industrial production and turnover data indicate a decline in manufacturing industry outputs of 5.5% in 2024.[8] Gas demand at industrial and commercial sites increased by 9% in the same period.[a]
- The Climate Action Plan 2025 includes a target for biomethane production of 5.7 TWh by 2030; however, the latest EPA projections have revised the WAM scenario to model the use of only 4.3 TWh of biomethane across the heat sector by 2030, reflecting the piecemeal implementation of the National Biomethane Strategy to date and the lack of a clear economic case for biomethane production given current support.

Waste and fluorinated gas emissions and trends

- In 2024, waste emissions decreased by 0.7% and accounted for 1.5% of total national emissions. Methane emissions from landfill are the main contributor to emissions from the Waste sector.[2]
- The most recent data, from 2022, indicate an 11% decrease in the overall production of waste, a plateauing of the recycling rates for municipal waste at 41%, and a 2% increase in the recycling of packaging waste.[9]
- Ireland's circularity rate continues to underperform against the EU average of 11.5%, increasing from 2.1% in 2022 to 2.3% in 2023, highlighting the need for significant improvements in the circular economy.[10]

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a Gas Transportation Management System, Gas Networks Ireland, personal communication, December 2024

- Fluorinated gas (F-gas) emissions remained relatively stable and accounted for 1.0% of total national emissions in 2024. The main driver of F-gas emissions is the use of air conditioning and refrigerant gases, with the increased demand for heat pumps expected in the future likely to incur increased F-gas emissions.[2]

Key recommendations

Built Environment sector

1. It is critical that a plan for the phasing out of fossil fuel boilers be set out as part of the National Building Renovation Plan in 2025.
2. The Department of Climate, Energy and the Environment and the SEAI should prioritise the development and provision of wider support, guidance and standards for batteries and changeover switches, to increase customer resilience. Specifically, the Council strongly supports the ramp up of the Solar PV for the Medically Vulnerable Scheme of the SEAI and calls for the installation of suitable batteries, to support the needs of the medically vulnerable, and changeover switches, to support resilience during extreme weather events.
3. A clear policy and roadmap by the Department of Enterprise, Trade and Employment for the decarbonisation of commercial buildings is urgently required in 2025. This must include specific targets for numbers of building upgrades and low-carbon technologies. The Council is also calling for accelerated implementation by the Department of Housing, Local Government and Heritage of the EU's Solar Rooftop Standard, part of the Energy Performance of Buildings Directive, which mandates solar readiness in new non-residential and public buildings.
4. The Government must introduce new measures to increase the uptake of heat pumps in support of the Climate Action Plan targets. Measures should reduce operational costs, including enhanced support with packages of complementary energy technologies, and ensure that heat pumps are enabled to support electricity demand flexibility and automation.
5. The Council recommends establishing a network of independent energy renovation advisors to provide practical support to households and communities, particularly those in energy poverty, to navigate and engage in retrofitting processes.
6. The Government must urgently finalise the Heat Bill in 2025 in order to give regulatory certainty to investors in district heating and to enable the allocation of priority funding from the Infrastructure, Climate and Nature Fund to early projects. In addition, the Council reiterates its previous recommendation that the Government mandate the supply of waste heat to district heating companies by industrial facilities with a total rated energy input of at least 1 MW in appropriate areas.

Industry and Waste sectors

7. To support the decarbonisation of the cement and concrete industries, the Council recommends that the National Standards Authority of Ireland's Concrete Committee urgently develop new standards and accelerate the approval process for low-carbon cement technologies. To facilitate this, the committee should consider both the mutual recognition of European standards and research and testing.
8. The Commission for Regulation of Utilities and ESB Networks must reduce electricity grid connection costs, timescales and challenges related to switching from unabated fossil fuel use for low- to medium-temperature industrial heat decarbonisation. In addition, solar photovoltaic systems, in tandem with solar thermal energy, hybrid heat pumps and other innovative energy storage technologies, must be incentivised for low- to medium-temperature processes.
9. The Government must accelerate the implementation of the Energy Performance of Buildings Directive requirement to ensure that life cycle global warming potential is calculated and disclosed for buildings of less than 1,000 m^2 to reduce the demand for high-clinker-content cement and incentivise the procurement of low-carbon cement in private sector construction.
10. The Government should make resource and waste management plans (including pre-demolition audits) a requirement for all new buildings in order to reduce linear material consumption and ensure the consistent application of guidelines within the construction sector.

1. Introduction

The Built Environment sector includes residential, commercial and public buildings. Emissions from the sector are primarily attributed to fossil fuels used for space and water heating. Emissions data suggest that the sector accounted for 12.3% of total greenhouse gas emissions (including the Land Use, Land Use Change and Forestry (LULUCF) sector) in 2024.[2]

Emissions from the Industry sector include emissions from two separate subsectors that are reported on as part of the national greenhouse gas inventory. These are mainly associated with production processes and include emissions from manufacturing combustion and industrial processes.

- Emissions from manufacturing combustion arise from fuel combustion used in manufacturing industries and include emissions from combustion for combined heat and power systems for own use.
- Industrial process emissions encompass emissions from the mineral, chemical and metal industries, non-energy products and solvents. The majority of industrial process emissions come from the production of cement at four cement plants in Ireland.

Emissions from the 'Other' sector, as defined in the sectoral emissions ceilings (SECs), include emissions from three separate subsectors that are reported on as part of the national greenhouse gas inventory. These comprise emissions from fluorinated gases (F-gases), the Waste sector and petroleum refining.

- Emissions from the Waste sector include those from landfill and the open burning of waste, mechanical and biological treatment, and wastewater treatment. Methane emissions from landfill are the main contributor to emissions from the Waste sector.
- F-gases include a wide range of substances that are used in a diverse range of products and manufacturing processes. The key sources of F-gas emissions in Ireland are the production, use and disposal of equipment containing these substances (e.g. refrigerators, mobile air conditioning systems, heat pumps and electrical switchgears).

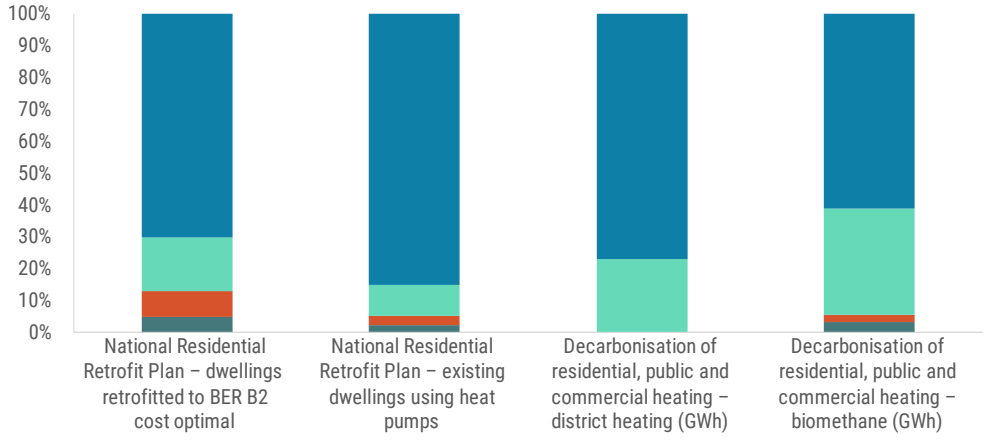
Emissions from industrial processes and manufacturing combustion together accounted for 10.4% of the national total greenhouse gas emissions (including the LULUCF sector) in 2024, with the Waste sector, petroleum refining and F-gases accounting for 2.5% of total national greenhouse gas emissions.[2]

2. Sectoral emissions ceilings and Climate Action Plan targets

The SECs for the residential and commercial/public Built Environment, Industry and Other sectors are detailed in Table 1. Figure 1 provides an overview of progress against a number of key performance indicators (KPIs) set out in the Climate Action Plan in relation to residential and commercial/public buildings. It is clear that progress has been limited, particularly in relation to biomethane and district heating. Notably, progress against the Climate Action Plan KPIs in relation to the Industry sector is not shown in Figure 1. These KPIs include a 70–75% share of renewable heat in industry and a 30% decrease in embodied carbon in construction materials, which have no pathway to implementation outlined in the Climate Action Plan and are not specifically modelled in the latest Environmental Protection Agency (EPA) projections. The KPIs for the Industry sector need to be improved in the Climate Action Plan 2026 (CAP26) by including more detailed and measurable targets and clear implementation pathways.

Table 1: Reported emissions for 2021–2024 in the context of the sectoral emissions ceiling (SEC) for the first carbon budget period (2021–2025).
(Source: Ireland's Provisional Greenhouse Gas Emissions 1990–2024.[2]) *The Other sector, as defined in the SECs, covers emissions from F-gases and the Waste sector as well as emissions from petroleum refining.

Sector	SEC	Reported emissions 2021–2024	% SEC used 2021–2024
	Mt CO_2 eq		
Built Environment: residential	29	23.6	81.3%
Built Environment: commercial/public	7	5.7	82.0%
Industry	30	26.0	86.8%
Other*	9	6.9	76.4%



2030 target	500,000	400,000	2,700	1,100
2025 target	120,000	45,000	800	600
2024 achieved	57,932	14,194	<1%	39
2023 achieved	34,691	10,596	<1%	60

Figure 1: Progress on key Built Environment national Climate Action Plan targets. BER, Building Energy Rating.
(Sources: Statistics for national home retrofit programmes,[5] Ireland's Greenhouse Gas Emissions Projections 2024–2055[3] and Sustainable Energy Authority of Ireland, personal communication, June 2025.)

3. Indicators

3.1. Built Environment sector emissions and main trends

In 2024, emissions from the residential buildings sector were 5.6 Mt CO_2 eq, representing a 4.9% increase compared with 2023 based on the EPA's provisional greenhouse gas emissions inventory.[2] In terms of the fuels used for space and water heating, use of coal, kerosene and natural gas increased by 6.6%, 8.5% and 3.3%, respectively, while peat use decreased by 8.6%.[2] This marks a disappointing reversal of the downward trends observed in 2022 and 2023, with emissions falling by 7.0% to 5.4 Mt CO_2 eq in 2023. Prior reductions were largely driven by milder winters and elevated energy prices, both of which contributed to lower energy demand. However, these factors are not expected to deliver sustained emissions reductions as part of a Just Transition.

Under the with additional measures (WAM) scenario, the residential buildings sector is projected to exceed its first SEC by 0.1 Mt CO_2 eq and to exceed its second SEC by 4.5 Mt CO_2 eq (see Figure 2).

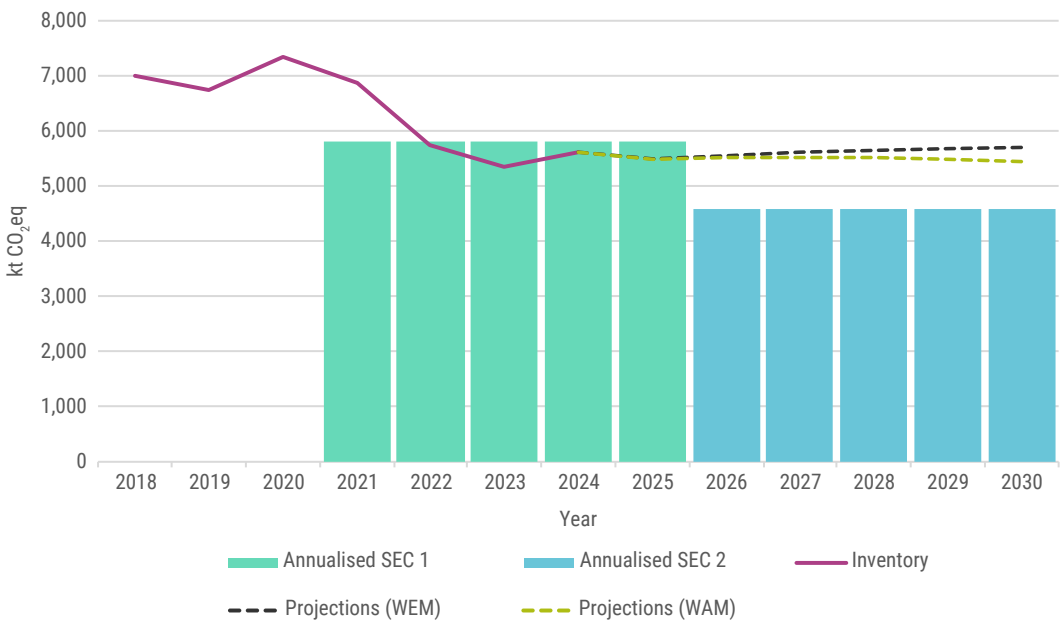


Figure 2: Inventory and projected greenhouse gas emissions for the residential buildings Built Environment sector, 2018–2030, with annualised SECs. WAM, with additional measures; WEM, with existing measures.
(Sources: Ireland's Provisional Greenhouse Gas Emissions 1990–2024[2] and Ireland's Greenhouse Gas Emissions Projections 2025–2055.[3])

In 2024, emissions from the commercial and public buildings sector were estimated at 1.5 Mt CO_2 eq, representing a 7.9% increase compared with 2023, based on the EPA's provisional greenhouse gas emissions inventory. Natural gas use increased by 8.9%, while oil use increased by 6.8%.[2] The commercial and public buildings sector is projected to exceed its first and second SECs by 0.2 Mt CO_2 eq and 1.8 Mt CO_2 eq, respectively (see Figure 3).

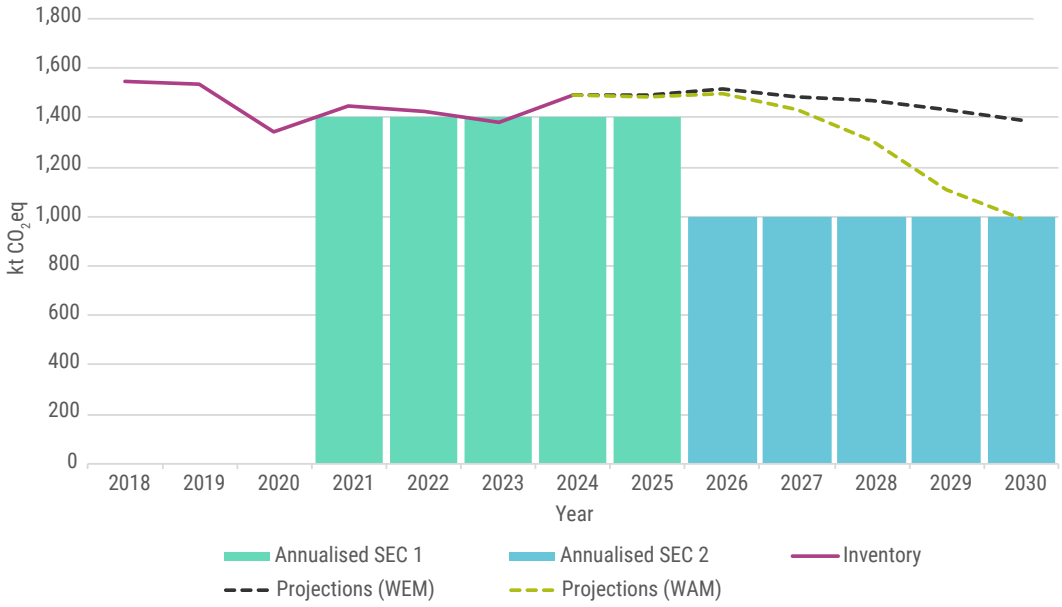


Figure 3: Inventory and projected greenhouse gas emissions for the commercial and public buildings Built Environment sector, 2018–2030, with annualised SECs. WAM, with additional measures; WEM, with existing measures.
(Sources: Ireland's Provisional Greenhouse Gas Emissions 1990–2024[2] and Ireland's Greenhouse Gas Emissions Projections 2025–2055.[3])

The share of renewable energy used in heat (RES-H) increased from 5.2% in 2013 to 7.9% by the end of 2023.[11,12] Progress in increasing RES-H remains modest and falls short of the trajectory required to meet Ireland's 2030 RES-H target. Ireland's target is to increase the RES-H to 10.3% by 2025.[a] Ireland failed to fully transpose the revised Renewable Energy Directive (Directive (EU) 2023/2413) by May 2025 and an infringement case is currently active with the European Commission[13] on the permitting provisions of the directive.

The recast Energy Efficiency Directive (EED) (Directive (EU) 2023/1791) requires that EU Member States set indicative national energy efficiency targets based on both primary and final energy consumption contributions to meet the EU target.[b] In February 2024, the Irish Government approved a final energy consumption target of 10.451 million tonnes of oil equivalent (Mtoe) and a primary energy consumption target of 11.294 Mtoe, in line with the EED formula.[c] The most optimistic scenario for energy use reductions that has been produced by the Sustainable Energy Authority of Ireland (SEAI) (the WAM projection) for Ireland's National Energy and Climate Plan, submitted to the European Commission, projects that Ireland's final energy consumption in 2030 will be 12.46 Mtoe, which is 2.01 Mtoe higher than Ireland's target for 2030. The Council urges the Government to develop a plan and supporting strategy aimed at ensuring compliance with this target.

a Technically, Ireland is required to increase the renewable energy share in heating by 0.8 percentage points annually from 2021 to 2025 and by 1.1 percentage points annually from 2026 to 2030.

b Ireland is required to transpose the EED by October 2025.[22]

c See Section 2.2.1 of the final National Energy and Climate Plan for Ireland submitted to the European Commission.

3.2. Industry sector emissions and main trends

Fuel switching from carbon-intensive energy sources to a diverse range of alternative energy sources, including renewable electricity, hydrogen, bioenergy and waste, is essential for the decarbonisation of the Industry sector. The Industry sector's fuel mix has remained stagnant for the last decade, indicating insufficient electrification and uptake of sustainable fuels.[14] Electricity and renewable fuel usage as percentages of total final consumption only slightly increased over 15 years, from 27.1% and 6%, respectively, in 2008 to 29% and 8%, respectively, in 2023. Overall, while there have been significant reductions in coal and oil use in the past decade, this has been replaced by increased natural gas consumption, which accounted for 41% of energy consumption in 2023, rather than increased use of renewables and electrification. The Industry sector accounted for 17.1% of total final consumption in Ireland in 2023, a 3% reduction compared with 2022. Compared with the 5-year average of 62.7%, the proportion of fossil fuels used in the Industry sector declined to 60.1% in 2023, down from 61.9% in 2022, reflecting minor increases in electrification and the combustion of non-renewable waste, while the renewables share declined, reflecting poor progress in decarbonising the sector.[14]

EU Emissions Trading System data for 2024 indicate that Irish industrial emissions decreased by 6.9% in 2024. The cement industry drove the most significant reductions, with a decrease of 15.6% in emissions due to lower production levels.[7] The five largest emitters accounted for approximately 70% of industrial CO_2 emissions in 2024, with the largest emitter being Aughinish Alumina in the non-ferrous metals sector, producing 1.13 Mt CO_2 eq, an 11% increase on 2023. Cement production accounts for the next four largest emitters, with their emissions totalling 2.28 Mt CO_2 in 2024, down from 2.70 Mt CO_2 in 2023.[15]

The EPA's 2024 provisional greenhouse gas inventory estimates an annual decrease of 0.3% or 0.01 Mt CO_2 eq in emissions arising from fossil fuel use in the Industry sector, driven by fuel reductions for the year, with coal, petroleum coke and fuel oil use decreasing by 14.4%, 31.8% and 53.7%, respectively.[2] There was a 15.4% decrease in combustion emissions from non-metallic minerals, while emissions increased in the other major subsectors, including non-ferrous metals, chemicals and food processing, and beverages and tobacco, at 3.3%, 8.1% and 6.8%, respectively. Correspondingly, 2024 Central Statistics Office industrial production volume indices for manufacturing industries indicate an annualised decrease of 5.5% for 2024 on 2023 levels.[16] Process emissions decreased by 12.8% (0.28 Mt CO_2 eq) in 2024, following decreases of 6.1% in 2023 and 7.2% in 2022. Total process emissions from the mineral products subsector (including cement), which accounts for 88% of Irish process emissions, decreased by 14.3%, in line with a reduction in production.

Despite recent reductions, the Industry sector is projected to significantly underperform in achieving its emissions reductions targets due to inadequate levels of electrification, technology uptake and fuel switching to renewables. Emissions were only 13.6% lower in 2024 than in 2018, with 86.8% of the 2021–2025 SEC having been used, and, thus, an emissions reduction of 34.3% or 2.1 Mt CO_2 eq is needed in 2025 for SEC compliance.[2] Not only is such a reduction not projected by the EPA (Figure 4), but an annual reduction in emissions of this magnitude has never been achieved under the greenhouse gas inventory time series, which was started in 1990, including during the 2008 financial crisis. Additionally, the Industry sector is projected to perform poorly against its 2026–2030 SEC due to a stagnation in emissions reductions, amounting to only a 13% reduction from 2018 levels compared with the target reduction of 35% (Figure 4). By 2030, industrial process emissions are projected to increase by 3%, from 2.3 Mt CO_2 eq to 2.4 Mt CO_2 eq, from 2018 levels, driven by forecasted growth in the production of cement.[3]

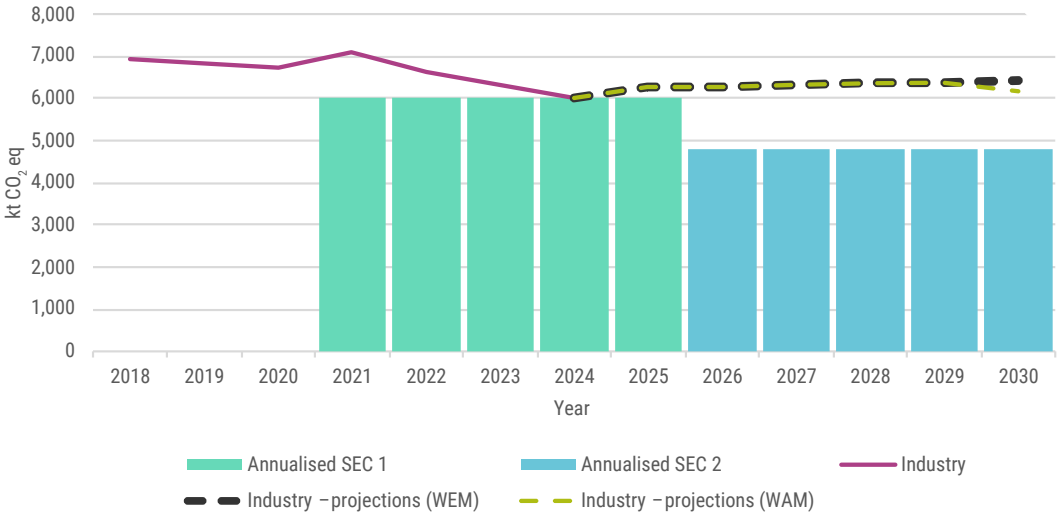


Figure 4: Inventory and projected greenhouse gas emissions for the Industry sector, 2018–2030, with annualised SECs. WAM, with additional measures; WEM, with existing measures.
(Sources: Ireland's Provisional Greenhouse Gas Emissions 1990–2024[2] and Ireland's Greenhouse Gas Emissions Projections 2025–2055.[3])

The most ambitious emissions scenario for manufacturing and combustion is a projected decrease of 19% as a result of the increased roll-out of energy efficiency programmes and a significant uptake of biomethane use in high-temperature industry settings by 2030.[3] This highlights the need for the rapid implementation of the National Biomethane Strategy if the sector is even to achieve its projected overshoot.

3.3. Other sector emissions, including Waste sector, fluorinated gas and petroleum refining emissions, and main trends

Emissions from the Waste sector accounted for 0.84 Mt CO_2 eq or 1.5% of total national emissions in 2024, decreasing by 0.7% from 2023 due to a 1.4% reduction in emissions of methane from landfill sites.[2] Projections for Waste sector emissions predict a 25.2% reduction by 2030 from 2018 levels, driven by a 39.4% reduction in landfill emissions.[3] There has been an overall emissions reduction of 14.5% in the sector since 2017, when Ireland's second waste-to-energy plant came into operation, leading to a reduction in emissions from landfill sites. However, the carbon emissions associated with the incineration of waste in such plants are accounted for in the Electricity sector, with the latest EPA data indicating that 0.33 Mt CO_2 eq was emitted from waste incineration plants in 2023 alone.[d][17]

Available statistics show continued waste generation at high volumes and worsening or stagnating metrics for rates of recycling of packaging waste and waste to landfill. In 2022, Ireland generated

d The EPA submits annual inventory information under the United Nations Framework Convention on Climate Change, including the National Inventory Document and Common Reporting Table (CRT) data files. These data come from CRT Table1.A(a)s4.[17] Note that these data comprise the fossil fuels portion of emissions only and do not include biogenic wastes, as biomass is not included in inventory reporting.

15.7 million tonnes of waste, equivalent to 8 kg per person per day, with Ireland's annual waste generation having grown by over 20% in the last decade. Ireland is now certain to miss the EU municipal waste recycling target of 55% for 2025, with the national rate remaining stagnant at 41%, with no significant change in 10 years. Additionally, Ireland continues to rely on waste exports, with 39% of municipal waste being exported for final treatment and 369,000 tonnes of residual municipal waste being exported for energy recovery through incineration in 2022, highlighting a waste infrastructure gap in Ireland.[9] Examples of more sustainable practices in Ireland do exist, such as the Aran Islands Co-op Recycling Project[18] (see Box 1).

Box 1: The Aran Islands Co-op Recycling Project

The Aran Islands Co-op Recycling Project has transformed waste management on the Aran Islands over the past 20 years. The initiative has successfully eliminated three landfill sites and reduced the volume of exported waste by 70%. Key actions include:

- implementing a community-run kerbside recycling system for dry packaging and compost,
- composting food and organic waste,
- using crushed glass as aggregates for concrete,
- shredding timber for composting,
- reusing bulky items, such as old windows, in garden sheds and on farms on the islands.

The construction and demolition (C&D) waste stream is the largest in Ireland by both weight and volume, with 8.3 million tonnes of C&D waste being recorded in 2022 and 82% of C&D waste being soil and stone. C&D waste generation has grown considerably in recent years due to increased activity within the construction sector in Ireland, and now 1.5 times more waste is generated in total from the sector, resulting in an almost eight-fold increase in total C&D waste since 2014.[19] However, in 2022, the majority of C&D waste treated in Ireland was recovered by backfilling (81%), far above the EU-required target of 70%, while 7% went for disposal and 10% was recycled.[9]

F-gases include a wide range of substances that are used in a diverse range of products and industrial processes, including refrigeration, air conditioning and semi-conductor manufacturing. The F-gas sector accounts for a small amount of Ireland's national emissions, with the latest emissions data for 2024 indicating that F-gas emissions have increased by 2.7%, or 0.02 Mt CO_2 eq, from 2023 levels, with the largest increase occurring in the semi-conductor industry.[2] The EPA's greenhouse gas projections indicate that emissions are expected to decrease by approximately 23.9% by 2030 compared with 2018 levels, attributed to a reduction in the use of F-gas air-conditioning units in vehicles, despite a minor increase in F-gas emissions due to the roll-out of heat pumps across Ireland.[3] Lastly, petroleum refining is the remaining activity within the Other sector, and this accounts for 0.4% of total national emissions and is projected to remain relatively stable out to 2030.

Figure 5 shows that projected emissions from the Other sector (i.e. combined emissions from the Waste, petroleum refining and F-gas sectors) indicate a reduction of 21.6% or 0.4 Mt CO_2 eq on 2018 levels. The sector is projected to comply with its 2021–2025 SEC, with a further decline of 3.8% or 0.3 Mt CO_2 eq, but to overshoot its 2026–2030 SEC by 3.4% or 0.3 Mt CO_2 eq.

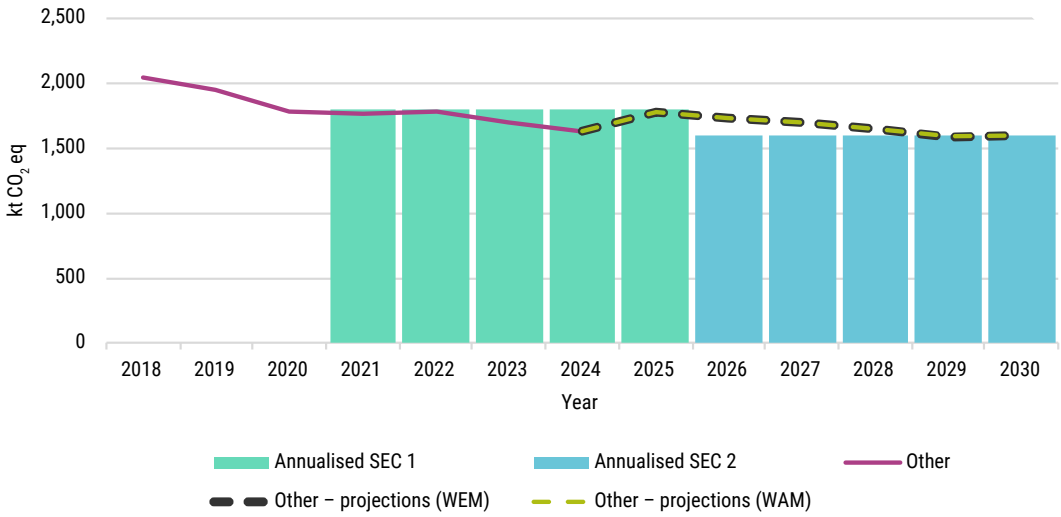


Figure 5: Inventory and projected greenhouse gas emissions for the Other sector (Waste sector, F-gas and petroleum refining emissions), 2018–2030, with annualised SECs. WAM, with additional measures; WEM, with existing measures.
(Sources: Ireland's Provisional Greenhouse Gas Emissions 1990–2024[2] and Ireland's Greenhouse Gas Emissions Projections 2025–2055.[3])

4. Progress on previous Climate Change Advisory Council recommendations

4.1. Industrial decarbonisation and process innovation

The Council has repeatedly called for policies to target the decarbonisation of industrial heat demand through changes in technology and substituting fossil fuels with alternative, sustainable fuels. The Roadmap for the Decarbonisation of Industrial Heat[20] was finally published in July 2024 along with confirmation of €300 million in ring-fenced State funding available for capital projects to support the decarbonisation of the Industry sector. The cement industry is a major source of industrial emissions in Ireland and the Council has called for measures to reduce the clinker content of cement and the carbon intensity of clinker production.[21] Industrial process emissions arising from clinker production are outside the scope of the Roadmap for the Decarbonisation of Industrial Heat. The Climate Action Plan[22] includes a number of actions targeting a reduction in the use of cement and the use of technologies to prevent process emissions, including the development of a carbon capture, utilisation and storage (CCUS) strategy. However, in the medium term, the decarbonisation of cement production will be driven by cement reformulation and the use of alternative, sustainable fuels in clinker production. Recent industry-led innovations in this regard are promising, and continued engagement between the Cement and Construction Sector Decarbonisation Working Group and the cement sector through Enterprise Ireland will be vital for accelerating the deployment of low-carbon technologies in the sector (see Section 5.7).

The Programme for Government 2025 offers support for data centres that contribute to economic growth and efficient grid usage, such as by prioritising waste heat capture for district heating systems, committing to enhancing their use of renewable energy sources and energy efficient technology, and scaling up critical grid infrastructure. As previously recommended by the Council, it is vital

that the Government ensures sufficient new renewable energy capacity, in excess of the maximum electricity demand of new data centres, and is connected to the grid in advance of commissioning. The Large Energy Users Connection Policy was recently released for consultation. It proposes that ramping up data centres' electricity demand will be linked to the delivery of necessary generation capacity and suggests that new data centres connecting to the electricity network be required to provide dispatchable generation or storage on-site. Following the conclusion of the consultation in April 2025, the Council urges the Commission for Regulation of Utilities (CRU) to finalise and publish the Large Energy Users Connection Policy without delay to ensure that the rapid growth in electricity demand from data centres does not outpace the deployment of renewable energy, compromising both grid stability and the meeting of emissions targets.

4.2. Sustainable construction, materials and circular economy

The Council has consistently called for increased use of timber in construction, alongside essential updates to the Building Regulations to support this, and the establishment of a high-level cross-departmental taskforce to prepare an overarching national strategy for all aspects of the timber industry (production, processing and use) in Ireland. The formation of the Timber in Construction Steering Group is a welcome step, and in June 2025 the steering group published its first progress report.[23] This includes a suite of interim recommendations, including advocating for all publicly procured buildings to be built mostly of timber or other bio-based materials; establishing early embodied carbon thresholds for new buildings in advance of requirements of the Energy Performance of Buildings Directive (EPBD); greater integration of timber modules in third-level education for future engineers and architects; and the publication of case study projects. The Minister of State with responsibility for forestry has welcomed the report and called for a 'wood first' approach to national housing and infrastructure delivery.[24] The enactment of the Planning and Development Act 2024, along with the ongoing review of the Planning and Development Regulations,[24] represents a critical opportunity to formally support the use of timber in construction and to mandate whole-life carbon assessments for all new planning applications, as previously recommended by the Council. The Council urges the Government to finalise and publish the revised regulations without delay, to accelerate the increased use of timber in construction.

The Council has previously recommended measures to minimise food and food packaging waste and to advance the circular economy, particularly in relation to the reuse of C&D waste. The national Deposit Return Scheme was launched in February 2024 and achieved a collection rate of 73% in its first year,[25] putting Ireland on track to achieve the EU collection target of 77% by the end of 2025. The revised EU Packaging and Packaging Waste Regulation[26] came into force in February 2025 and will play a key role in driving circularity within the packaging sector. In support of the reuse of C&D waste, the EPA published end-of-waste criteria in 2023 and levy exemptions for this waste began to be phased out in 2024. Greater focus on the promotion of markets for this material is needed. The Circular Economy Roadmap for the Construction Sector (due in Q4 2024) and the Whole-of-Government Circular Economy Strategy (due in Q4 2023) have still not been delivered.[22] It is vital that the Government concludes this work urgently to establish clear targets and metrics and a robust implementation plan to drive and track progress in the circular transition.

4.3. Residential and commercial buildings

The choice of renovating derelict and vacant properties or retrofitting existing building stock over demolition can significantly reduce embodied carbon emissions by limiting demand for cement and enabling the use of lower carbon construction materials such as timber. The Council has previously recommended taxation and land activation measures be implemented to incentivise retrofitting and renovation and welcomes progress in this area. There have been over 11,300 applications for

the Vacant Property Refurbishment Grant since its introduction in 2022,[27] with 7,700 approvals and 1,400 grants having been paid out. Adjustments to planning regulations that exempt certain vacant commercial premises from requiring planning permission for change to residential use, such as 'over the shop' units, have yielded over 1,100 notifications to date, creating up to 2,700 new homes.[27] Further grants to support the restoration of derelict and vacant shops across the country are being introduced,[28] including up to €100,000 for 'over the shop' units and new grants for vacant and derelict commercial properties. A review of grants for existing vacant and derelict properties is being undertaken with a view to introducing staged payments for recipients to assist with upfront funding.[28] Further building and land acquisition measures have been announced as part of the 2025 Town and Village Renewal Scheme,[29] providing an allocation for 2025 of up to €500,000 for each local authority to purchase up to three vacant or derelict buildings or lands for regeneration purposes. The National Development Plan (NDP), published in July 2025, sets a clear goal of delivering 300,000 homes by 2030.[30] This must be balanced with the retrofitting and reuse of existing buildings to support emissions reductions in the Built Environment sector.

The Council has repeatedly emphasised the urgent need to phase out fossil fuels and for clear choices to be made on the long-term roll-out of low-carbon heat sources in Ireland's existing buildings, including the interaction between district heating and deep retrofits to support heat pump installation. The transposition of the EU EPBD into Irish law in December 2024 means that from 1 January 2025 public bodies cannot provide any financial incentives for the installation of fossil fuel boilers.[31] A roadmap to phase out fossil fuel boilers in existing buildings is being prepared by the Heat and Built Environment Taskforce,[22] and the Domestic Heat Pump Installation Incentivisation Scheme, launched in 2024, supports plumbers to upskill as SEAI-registered heat pump installers. Publication of the roadmap in 2025 will be vital for increasing the uptake of heat pumps in line with Climate Action Plan targets.

The Council has also recommended that the delivery of district heating schemes be accelerated along with the introduction of legislation mandating the supply of waste heat to district heating companies by industrial facilities whose total rating energy input is at least 1 MW. To support this, the Council called for the urgent publication of the National Heat Policy Statement and the adoption of the Heat (Networks and Miscellaneous Provisions) Bill in its 2024 Annual Review. The National Heat Policy Statement was delayed due to Strategic Environmental Assessment requirements, and a consultation on this by the Department of Climate, Energy and the Environment (DCEE) has not yet occurred. While Government approval for the Heat (Networks and Miscellaneous Provisions) Bill was granted in November 2024, this has not yet been adopted and has yet to be subject to scrutiny by the Joint Committee on Environment and Climate Action. A consultation on the proposed bill was launched by DCEE in June 2025 focused on the potential impacts of the bill on small and medium-sized enterprises.[32] The draft general scheme of the bill seeks to provide the required legislative and regulatory framework for the district heating sector in Ireland, and work to adopt this must be concluded without any further delay. This is now urgent in order to provide the critical legal and regulatory frameworks necessary to support the development of the district heating sector in Ireland.

4.4. Just Transition, adaptation and resilience

The Council has called for a sectoral adaptation plan for the Built Environment sector, so that coordinated action is taken to ensure the resilience of the sector to projected climate impacts and to ensure that existing building design regulations are fit for purpose and account for a range of climate risks. A scoping exercise on the potential for a Built Environment and Planning Sectoral Adaptation Plan, led by the Department of Housing, Local Government and Heritage (DHLGH), is due for completion in Q3 2025. It is vital that this work is completed on time to ensure climate resilience

is embedded into the built environment and planning systems without delay, so as to avoid expensive maladaptive outcomes.

The Council previously recommended the development of a Just Transition Plan, including a coordinated Government assessment of the skills required to achieve the National Climate Objective. This will enable SOLAS (the Government agency that oversees further education and training), education providers and employers to make the necessary investments in training and ensure the provision of a transition pathway for industry that does not disadvantage segments of the workforce and wider community. Green Skills 2030,[33] the first national further education and training strategy for the green transition, was published in October 2024. This proposes a suite of recommendations aimed at ensuring that the green skills needed for existing and emerging occupations across key economic sectors in Ireland are addressed by stakeholders through the further education and training system where applicable. The Programme for Government 2025 includes a commitment to develop and launch a new 5-year Apprenticeship Action Plan for 2026–2030, ensuring the provision of new courses in green skills to support Ireland's transition. The swift implementation of these recommendations and commitments is essential, to avoid critical skills shortages and to ensure that no segments of the workforce are disadvantaged in the transition.

5. Analysis and discussion

5.1. Heat pump deployment

As set out in Section 3, emissions from the Built Environment sector increased significantly in 2024 and policies to deliver sustained emissions reductions are required. The National Building Renovation Plan, due to be completed by the DCEE in 2025, will be critical for providing clarity on a planned phase-out date for fossil fuel boilers. A focus on heat pump and district heating deployment with appropriate spatial planning is critical.

The majority of retrofits carried out to Building Energy Rating (BER) B2/cost-optimal level to date have not included the installation of a heat pump, with existing policies not being sufficient to incentivise uptake at the level required.[34] The number of heat pumps installed as part of home retrofits declined in 2024, and only 14,194 were installed between 2019 and 2024 compared with 57,932 homes having been upgraded to BER B2 level in the same period.[4] Table 2 outlines the number of homes upgraded under different SEAI programmes along with the number of heat pumps installed under each programme in 2024. Under the Warmer Homes Scheme, the installation of new gas or oil heating systems was covered; however, as of 1 January 2025, Member States can no longer provide financial incentives for the installation of fossil fuel boilers under the EPBD.

Heat pump grants have been in place since 2021, and despite the introduction of a reduced VAT rate (9%) for the supply and installation of heat pump systems, along with changes to the technical assessment process, current measures will not deliver the required uptake of heat pumps by 2030. The EPA with existing measures (WEM) scenario assumes that only 81,400 heat pumps will be installed in existing homes by 2030, compared with the target of 400,000, based on the continuation of existing grant levels and the current rate of local authority retrofits.[3] Given limited overall Government budget and capacity, support for energy efficiency should be linked to the deployment of low-carbon heating technologies along with improved regulation and incentives to decarbonise heating systems. Complementary schemes such as the Vacant Property Refurbishment Grant, with over 5,000 applications being approved to date, should also incentivise heat pump installation.[35]

The International Energy Agency has recommended that, given the high share of oil and solid fuel use in existing homes in Ireland, grants for heat pumps should be targeted to homes with carbon-intensive heating systems.[36]

Table 2: Number of homes upgraded compared with the number of heat pumps installed in 2024.
(Source: SEAI Programme Impact Report 2024: Measuring Our Impacts on the Irish Energy Transition.[34])

Scheme	Warmer Homes Scheme	Community Energy Grant (domestic)	National Retrofit Scheme (One Stop Shop)	Better Energy Homes Scheme (individual upgrades)
Number of homes upgraded	7,743	683	1,474	15,660
Number of heat pumps installed	49	650	1,359	1,542

Recent research by the SEAI has found that those using oil to heat their homes have a much higher reliance on secondary heating, indicating that switching oil-heated homes to heat pumps could result in even greater emissions savings, as such homes would also reduce their use of secondary heating.[37]

Financial incentives such as grants, subsidies, VAT reductions[e] and tax exemptions are key tools for reducing the upfront costs of heat pumps, which to date have exceeded those of heating systems powered by fossil fuels. These measures should be designed to provide sufficient support for low-income households and address the related costs of upgrading heat distribution systems. Examples of tax-based incentives in place in a number of EU countries that have not been included in policies in Ireland to date are outlined in Box 2.

There are broader barriers to the uptake of heat pump technology, including technical requirements, a lack of awareness about the benefits and a perception that the technology remains too expensive.[38] This suggests that any incentives should be paired with public engagement, effective communication and support.[41] Heat pumps that are enabled for smart communications would also allow for greater demand flexibility and automation, which would support a reduction in operating costs. Recent SEAI research has highlighted the importance of factors influencing a heat pump's flexibility during the installation stage, including thermal storage, smart controls and tailored advice for use to fully utilise their flexible operation.[42]

Heat pump sales decreased across Europe in 2023 and 2024 due to changes to Government support schemes, the cost-of-living crisis, a slowdown in the construction sector and the low price of subsidised gas.[43,44] The operating cost of heat pumps presents a challenge, with gas remaining cheaper than electricity in many European countries.[45] According to the European Heat Pump Association, for heat pump running costs to be competitive, the cost of electricity should be at most twice the price of gas, and this condition is currently met in only a handful of European countries. Research suggests that purchase subsidies for heat pumps are most effective where electricity prices are relatively low.[46] A number of measures have been suggested for closing the

e A number of countries have introduced reduced VAT rates on heat pumps, for example rates of 0% in the UK and 5.5% in France.

Box 2: Tax-based incentives for heat pump deployment in Europe

A number of tax-based incentives, in addition to regulation and grant support, have driven heat pump sales in European countries.

In Germany, which has seen significant heat pump sales, in addition to grant support, there are incentives for homeowners who replace a fossil fuel system with a heat pump and have a taxable income of less than €40,000 per year.[38]

In Italy, heat pump sales are incentivised through a range of tax deductions.[39] The Superbonus scheme has strongly incentivised heat pump installation in recent years by allowing people to recover up to 110% of the cost of heat pumps and other energy efficiency measures through tax deductions. From 1 January 2025, the Superbonus was reduced to 65%.[40]

In Spain, income tax deductions for homeowners installing heat pumps between 2021 and 2025 allowed for a maximum cumulative deduction of €15,000.[38]

In Sweden, tax breaks are available when heat pumps are installed during the renovation of houses over 5 years old. A 30% tax rebate is available on labour costs, up to a maximum of €5,000.[39]

gap between gas and electricity prices, such as shifting taxes and levies away from electricity bills and introducing dynamic electricity tariffs and carbon-pricing mechanisms.[47] In the Netherlands, for example, the Dutch Climate Agreement set out a plan to incrementally increase the tax on natural gas while decreasing the tax on electricity from 2020 to 2026, in order to incentivise the move away from fossil fuels.[48] In its 2025 progress report, the UK Climate Change Committee's highest priority recommendation is to remove policy costs from electricity prices to reduce the running costs of heat pumps compared with fossil fuel boilers.[49]

The decline in the cost of renewable technologies, including solar photovoltaic (PV) systems, along with their strong uptake to date, can also be leveraged to reduce the running costs of a heat pump. The SEAI supported a total of 28,424 solar PV installations in 2024 compared with the installation of only 3,600 heat pumps.[34] Using self-produced electricity in combination with a heat pump system provides a low-cost energy source for buildings.[46] This suggests that any incentives for residential heat pumps should be considered alongside incentives for the adoption of other renewable technologies, allowing households to take advantage of the synergies between technologies and reduce costs. In Poland, for example, grants have been provided for solar PV systems in combination with heat pumps.[39]

5.2. District heating deployment

Recent research has highlighted the critical importance of district heating in Ireland's energy system,[50] with the potential to deliver significant cost savings in a spatially optimised system. The 2025 EPA WEM scenario assumes the expansion of only two district heating schemes currently under development by 2030,[f] with a combined capacity of 0.074 TWh, which grows to just 0.214 TWh under the WAM scenario.[3] This compares with a target capacity of 2.7 TWh by 2030. Clear ambition from the Government and legislative and regulatory certainty are required and should be achieved

f The Tallaght District Heating Network and the Dublin District Heating System.

through the finalisation of the proposed Heat Bill and Heat Policy Statement by the DCEE in 2025. The Council notes that a public consultation on the proposed Heat (Networks and Miscellaneous Provisions) Bill 2024 was launched in June 2025 to assess potential impacts on businesses. The Council welcomes the provision under the Heat Bill to mandate that public sector buildings connect to district heating networks where feasible.

The Council has previously highlighted the importance of spatial planning and the integration of district heating with heat pump deployment, which are critical for identifying the most appropriate technology in each geographical area and making use of excess heat where available. The Council's 2024 Annual Review noted that evidence-based zoning for district heating at the local authority level and comprehensive characterisation of heat sources are crucial for progression. In Denmark, heat planning and zoning is mandatory at a local government level and have been critical in delivering district heating in urban and suburban areas.[51] Under Article 25.6 of the EED, regional and local authorities will be required to prepare local heating and cooling plans in areas with a total population higher than 45,000. While local authority climate action plans have elements of heat planning, more support and guidance are needed.[52] An independent assessment has found that access to the required data on heating and cooling for use in detailed heating planning assessments at the local level is fragmented in Ireland.[53] The District Heating Steering Group recommended that the District Heating Centre of Excellence in the SEAI should undertake economic analysis to include how to support or deliver heating and cooling plans for relevant local authority areas.[54] The SEAI has carried out an initial analysis to identify candidate areas with high heat demand densities for district heating, including potential sources of waste heat, anchor loads and geothermal heat pump suitability.[55] Guidance has also been developed on conducting feasibility studies for district heating projects.[56]

The development of district heating networks is capital intensive, with long payback periods. District heating expansion requires investors to have clear visibility and be supported by long-term committed policy measures. This must be reflected in how the capital funding is allocated, through both the departmental allocation plans under the NDP and the Infrastructure, Climate and Nature Fund, alongside continued support from the Climate Action Fund. The recent allocation of €5 million from the Climate Action Fund to support the pre-construction development costs of district heating projects is a welcome development.[57] Additional funding will be necessary to support the development of a future pipeline of projects. A business case is currently being prepared that seeks to secure State funding for district heating over the period 2026–2030. The Council notes that the DCEE published a consultation on the terms and conditions for the Support Scheme for Renewable Heat in May 2025, which CAP25 indicates will be updated to accommodate funding support for large-scale district heating projects.

5.3. Retrofitting programmes and energy poverty

Under the EPBD, a first draft of the National Building Renovation Plan is due to be submitted to the European Commission for review in Q4 2025. This will need to consider Article 9(2) of the EPBD, which requires the development of a national trajectory for the progressive renovation of residential buildings and targets for decreasing primary energy use.[58] This includes specific requirements for the worst-performing 43% of residential building stock – buildings with the lowest energy performance.

The final report on the Government's 'Warmth & Wellbeing' pilot scheme was published in July 2024.[59] The research shows that, over a 3-year period, following energy efficiency upgrades, participants reported fewer GP consultations (a decrease of 26%), fewer emergency department visits and fewer hospital admissions, particularly in relation to respiratory conditions (a decrease of 56%), and fewer prescriptions for medication. Similar findings were reported recently by the London School of Hygiene and Tropical Medicine, demonstrating the role of retrofitting in delivering significant health

benefits, including improved comfort and indoor air quality.[60] This pilot helped inform the Government's retrofitting schemes to provide more extensive retrofits for low-income households. In 2024, the Central Bank of Ireland found that the average share of income spent on energy by low-income households in Ireland (the energy-to-income ratio) was the highest in the euro area, at 17%.[61] The total number of upgrades completed under the Warmer Homes Scheme in 2024 was 7,743, an increase of 31% compared with 2023, with capital expenditure of €228.7 million. The average waiting time for the scheme is currently 17–20 months. However, the scheme does not provide access to retrofit support for many low-income households experiencing energy poverty or for the majority of renters.[62] The International Energy Agency has recommended considering the expansion of the Warmer Homes Scheme to cover other vulnerable households, once waiting times have been reduced. This could be paired with a decrease in funding to those in better economic conditions, as is the case in France's MaPrimeRénov' scheme.[36]

Targeted, area-based approaches to retrofitting have the potential to increase industry capacity and deliver more with fewer resources. The Council recommends that the DCEE, SEAI and DHLGH review area-based approaches to retrofitting of the Warmer Homes Scheme and local authority housing based on learnings from successful pilots and area-based approaches to retrofitting to date (such as pilots introduced under the Community Energy Grant scheme in 2024) in order to increase the efficiency and delivery rates of retrofits.

CAP25 notes that in July 2024 the SEAI launched a pilot scheme to deliver additional retrofits to households at risk of energy poverty, leveraging private investment from the 'obligated parties' under the Energy Efficiency Obligation Scheme (EEOS). The revised EED significantly increases the annual energy savings obligation (Article 8) by 2028 and requires a share of energy use savings to be achieved among those affected by energy poverty, vulnerable customers and low-income households. This is one of the key instruments of the directive to drive energy savings in end-use sectors, such as the Built Environment, Industry and Transport sectors. Ireland's National Energy and Climate Plan notes that it intends to deliver the energy savings required through a combination of the EEOS[g][63] and a range of alternative measures and that a consultation was recently launched on the redesign of the EEOS.[64] The Council recommends that the DCEE further explore mechanisms for obligated suppliers under the EEOS to deliver retrofits under the Warmer Homes Scheme and to approved housing bodies (AHBs) as part of a strategy to meet new requirements under the EED.

The number of local authority homes retrofitted under the Energy Efficiency Retrofitting Programme increased by 16% between 2023 and 2024, from 2,252 to 2,607.[6] Funding increased by 26% in the same period, from €70.2 million to €88.8 million, with €90 million being allocated to the programme for 2025. Since 2021, a total of 7,699 local authority homes have been retrofitted against a target of 36,500 to be brought to a B2/cost-optimal standard by 2030.[h][6] The Council recommends that delivery of local authority retrofitting targets be accelerated, with sustained funding allocation and assessment of capacity being used to increase delivery rates. This aligns with previous recommendations from the Council in its 2023 and 2024 Annual Reviews. A report on energy poverty by the Joint Committee

g The EEOS, which was introduced through S.I. No. 522/2022 European Union (Energy Efficiency Obligation Scheme) Regulations 2022, set a target for the obligation period between 2021 and 2030 for obligated parties (energy companies, including the largest energy suppliers and distributors in Ireland, which sell more than 400 GWh of energy per year to final customers) to deliver cumulative end-use energy savings of 36,424 GWh (although this is likely to increase). Obligated parties are set specific annual targets based on their market share, which can be met by supporting homeowners, businesses and communities to carry out energy efficiency upgrades.

h A total of 81,920 local authority units have been retrofitted since 2013; however, many earlier retrofits involved shallow measures such as attic insulation.

on Social Protection, Community and Rural Development and the Islands in 2024 called for increased ambition in the retrofitting of State-owned housing stock and a multi-annual strategy for local authorities and budget allocation.[65] AHBs also have the potential to contribute to the delivery of retrofitting targets for lower income households, particularly through aggregation of retrofit projects.[66] In 2024, 545 AHB homes were retrofitted under the One Stop Shop scheme (accounting for the majority of retrofits under the programme), along with 224 under the Community Energy Grant scheme, with the number of AHB homes having increased by approximately 43% each year since 2020.[34] The level of grant funding for the retrofitting of AHB building stock should be reviewed in recognition of AHBs' role in addressing energy poverty. This should focus on older homes with the lowest BERs. At present, partial grant support can be accessed through a number of SEAI programmes; however, tailored mechanisms considering particular administrative barriers and financing challenges that AHBs may face in engaging with these programmes should be considered. In particular, adjustments to the Community Energy Grant scheme should be assessed to improve its overall suitability for AHBs. Recent studies have also considered solutions to address funding for retrofitting in the sector to allow AHBs to raise private funds. These include Government-guaranteed mortgage bonds or loans issued by third-party private financial actors to support the financing of non-profit housing, potential access to EU funding or grants through community energy funds or models such as Energiesprong[i] in the UK social housing sector.[41,66,67]

Private rentals represent approximately 18% of households in Ireland,[68] a significant portion of the housing stock. Split incentives for investment in energy retrofits and clean energy technology have been identified as significant in the rental sector.[69] This needs to be addressed, particularly in multi-tenancy buildings. The Finance Act 2022 introduced a new tax incentive for small-scale landlords who undertake retrofitting measures, providing a deduction of up to €10,000 per property, against taxable rental income, for certain retrofitting expenses incurred by the landlord on rented residential properties.[70] The Central Statistics Office carried out research to link BERs and Residential Tenancies Board data that found that achieving a minimum BER standard of E by 2025 for private rental properties would require approximately 9% of the rental stock to be upgraded.[71] The study also found that 35.6% of rental properties had either a D or E BER, while 8.9% had an F or G BER.[68] Housing Assistance Payment tenants in private rental properties are much more likely to live in housing with a low BER (D to G). More recent research by the Economic and Social Research Institute (ESRI) found that approximately 45,000 rental properties have an E, F or G rating.[72] The Housing for All plan committed to the introduction of minimum BER standards for private rental properties by 2025.[35] Mandating minimum standards for rented properties is a potentially impactful measure that could ensure that very inefficient buildings undergo energy efficiency upgrades.[73,74] This could be combined with targeted subsidies.[75] CAP25 notes that research is being undertaken by ESRI and the DHLGH on the introduction of minimum BERs for privately rented dwellings, with an assessment recently published by ESRI assessing investment requirements in the sector.[72] The Council strongly supports the Housing Commission's recommendation to support a transition to a minimum BER requirement of E within 4 years where technically and economically feasible. A plan for phased retrofitting in the sector to ensure that buildings are of an appropriate standard in line with the EPBD is required given the clear evidence of improved health outcomes through retrofitting.

The Council also recommends that pilot projects are supported by the CRU and ESB Networks in consultation with stakeholders to help resolve the split incentive issue, including through the use of solar PV systems to reduce energy costs for low-income tenants in multi-tenancy buildings. The potential for schools and other public buildings to participate in renewable energy communities

i This involves retrofitting measures being partially paid for by tenant payments equivalent to energy savings over a period of time.

through peer-to-peer energy trading, to support those in energy poverty, should be explored, along with local energy sharing as envisaged under the EU Clean Energy Package.

There are limited data available on or real-time monitoring of energy use, thermostat setting and temperature before and after retrofit interventions.[37] Gathering these data is important, as the evidence-based demonstration of benefits and increasing household trust in the process will help to increase engagement in complex retrofit works. Research has demonstrated that inconvenience and disruption are significant barriers to uptake.[76] As previously recommended by the Irish Green Building Council, a network of independent renovation advisors, as envisaged in the EPBD, could help support complex retrofit decisions and provide tailored advice. A number of studies have investigated the energy performance gap between the projected and actual performance of renovated buildings, with user behaviour, as seen through the 'rebound effect', being identified as a potential cause. A recent study has focused on the technical performance of buildings,[77] highlighting the underperformance of insulated buildings as an additional cause of this performance gap. This underlines the need for adequate training, standards of installation and evaluation.

Approximately 270,000 homes in Ireland were constructed prior to 1945, with construction being mainly of solid masonry walls of brick, stone or clay using lime-based mortars and timber-framed roofs, for which modern retrofit methods are not appropriate. Limited grant support and technical guidance in this area has been a barrier to the energy renovation of these building types to date. In 2024, the DHLGH published the guidance document Improving Energy Efficiency in Traditional Buildings: Guidance for Specifiers and Installers[78] and a pilot scheme for traditionally built homes was launched. Flexibility will be required in the design of a scheme for traditional buildings that ensures the quality of the interventions. This should take into account the protection of building character and fabric, consider the materials necessary to avoid or limit condensation risk and potential maladaptation, acknowledge the BER limits that such buildings may have, and reflect the greater level of work and expertise required for retrofitting heritage buildings.

5.4. Decarbonisation of commercial and public sector buildings

Less than a quarter of non-residential buildings have a BER of between A1 and B3, with emissions varying substantially by building and business type.[61] CAP25 lacks specific targets for the decarbonisation of commercial buildings in terms of building upgrades, energy management tools and heat pump installations. A roadmap for the long-term decarbonisation of the commercial built environment is currently being finalised by the Department of Enterprise, Trade and Employment (DETE).[22,79] The Business Energy Upgrades Scheme was launched in November 2024,[80] providing grant funding for technical assistance and capital investment in specific retrofit measures for qualifying non-residential buildings. While these steps represent progress, the Council stresses the need for clear timelines to be published for the development of the decarbonisation roadmap, to provide certainty for stakeholders and to support timely action in line with climate targets. This roadmap needs to account for different high-impact measures across different building typologies and commercial uses and their respective energy demands.

The EPBD introduces requirements for minimum energy performance standards for commercial buildings. Under this directive, Member States have been required to gather data on the energy performance of non-residential buildings since 1 January 2020. By 2030, the worst-performing 16% of buildings must be improved, with this target increasing to 26% by 2033. Significant work is required to establish the actual energy performance of non-domestic buildings, to develop and set targets under the National Building Renovation Plan. Impacted businesses also need to be provided with technical and financial support, to help them understand the new requirements under the EPBD and the steps that they will be required to take. A recently published SEAI-funded Business

Energy Upgrade resources suite aims to address the combination of financial, technical and behavioural challenges that prevent small and medium-sized enterprises from reducing their energy use by providing a suite of tools, including practical guidance, financial tools and case studies.[81] The Council recommends that a targeted communications campaign be run to inform affected businesses of the timelines under the EPBD, the benefits of energy renovation and support available. This should be developed in consultation with relevant industry bodies, such as trade associations.

The Council is calling for the accelerated implementation of the EU Solar Rooftop Standard, required as part of the EPBD, under Article 10, which mandates solar readiness, the deployment of suitable installations in new non-residential and public buildings with a floor area greater than 250 m^2 by 2026, and phased implementation in existing commercial and public buildings up to 2030. The potential for the accelerated deployment of suitable solar energy installations in buildings should be outlined in Ireland's National Building Renovation Plan.

5.5. Finance

Article 30 of the EED sets an obligation for Member States to promote innovative financing schemes and leverage private investments. For example, Member States are required to promote energy efficiency lending products, such as green mortgages and green loans, under Article 30(3).

A Government collaboration with the European Investment Bank led to the launch of a Home Energy Upgrade Loan Scheme in 2024. This provides low-interest loans for energy efficiency improvement measures of between €5,000 and €75,000 per property over 1 to 10 years. Loans are available up to 31 December 2026 and can be used in conjunction with SEAI home upgrade grants. As of May 2025, the scheme was available through 11 finance providers, with 7 additional credit unions recently participating.[82] However, as at June 2025, only 355 loans had been approved, worth only a combined €17 million out of the €500 million allocated to the scheme.[83] This low uptake is concerning and the Government needs to engage with lenders to ensure that the scheme is being promoted and to gain an understanding of any barriers to uptake.

Banking and Payments Federation Ireland's Personal Loan Report – Q4 2024 noted a 21.4% increase in the volume of green loans compared with 2023, which includes loans for home energy efficiency improvements.[84] Green mortgages, which typically offer lower interest rates on more energy efficient properties (usually a minimum standard of BER B3), as a percentage of new mortgages increased up to the end of 2022, but this proportion remained stable, at approximately 40%, up to the end of 2024.[61] There are, as yet, no residential lending products specifically aimed at properties that require retrofitting or refurbishment on purchase, as previously recommended by the Council.[85]

The Growth and Sustainability Loan Scheme, launched in September 2023, is available through the Strategic Banking Corporation of Ireland for eligible businesses wishing to invest in climate action and environmental sustainability. Small and medium-sized enterprises can apply for low-cost loans in the scheme's first phase, with amounts ranging from €25,000 to €3 million. As at March 2025, 1,651 loans had been approved in the first phase, together totalling €278 million.[86] Banks and other financial institutions have significant potential to contribute to climate-related projects through participation in public–private partnerships, but more coordination is needed between the retail banking sector, the Government and State bodies as identified by the Banking and Payments Federation Ireland.[87]

5.6. Biofuels and biomethane

Ireland's National Biomethane Strategy was published in May 2024.[88] It states that the Irish Government is committed to supporting an indigenous biomethane industry and includes the target

of delivering up to 5.7 TWh of indigenously produced biomethane by 2030. Applications for a €40 million capital grant scheme for biomethane production plants opened in August 2024[89] and 18 projects have received funding, all of which are due for completion by the end of 2025.[90] Grant aid of 20% of investment up to a maximum of €5 million is available. The second round of capital funding is promised in 2026.

The funding of projects under the Biomethane Capital Grant Scheme is welcomed. After significant delays, the Government's recent approval to commence drafting the Renewable Heat Obligation (RHO) Bill 2025 will finally lead to the establishment of the legislative framework for implementation of the scheme in 2026.[91] In the drafting of the bill, the Government has reaffirmed its commitment to supporting the indigenous biomethane sector; however, as the bill is not set to come into effect until 2026, short-term uncertainty remains for the biomethane market and for the viability of ongoing projects. There is a need for coordination between the Department of Agriculture, Food and the Marine, DETE and DCEE to ensure the growth of a robust biomethane market in line with the National Biomethane Strategy, so that there is sufficient demand to drive market development. The Council recommends that biomethane be utilised in particular for back-up electricity generation and suitable high-temperature industrial applications that are hard to electrify.

The cost of producing biomethane is higher than that of natural gas, and there are two market models in Europe that allow producers to be compensated for this additional cost.[92] In a subsidised (voluntary) model, the Member State offers production subsidies to operating facilities, whereas in an unsubsidised (compliance) model (e.g. Ireland's RHO) biomethane is sold at a premium to a market obliged to include a certain percentage of non-fossil gas. The RHO will legislate to oblige providers of fossil fuels to ensure that a proportion of the energy they supply is renewable.[93] The forthcoming RHO Bill 2025 will identify biomethane as a key renewable fuel and will include a specific measure to provide support for indigenously produced biomethane, encouraging obligated parties to procure supplies from domestic producers (subject to formal notification at the EU level).[91] In the short to medium term, this will provide a strong signal of support in the sector to investors.

The shift from a subsidy-based model to obligation-based or market-driven models reflects a broader European trend in biomethane policy. A recent study analysed the evolution of biogas/biomethane policies in three EU Member States – Germany, Denmark and Italy.[94] Italy and Denmark had some of the largest biomethane production growth rates in Europe in 2023 and Germany was Europe's biggest biogas and biomethane producer.[95] The study noted a common pattern in policy evolution in the biomethane industry in these countries over a 10-year period. Initially, they introduced feed-in tariffs (FITs) to incentivise biogas/biomethane production. FITs are long-term contracts with guaranteed pricing that provide stability, drive technological development and reduce risk to investors. However, FITs can be costly and do not provide sufficient market integration to allow new technologies to compete in the market. FITs were therefore replaced by feed-in premiums and competitive auction/tender systems, which respond to price signals in the energy market. Feed-in premiums encourage market participation while maintaining viability for producers. As previously noted by the Council, investors in the sector in Ireland will need assurances that there will be a stable and reliable market for biomethane in the long term.[96]

The Programme for Government 2025 highlights the potential to consider the use of biofuels in existing home boilers where decarbonisation is not possible in the short term. Any use of hydrotreated vegetable oil or biofuels for heating needs careful consideration given the limited supply of sustainable renewable fuels. The development of a clear strategy that reflects the most appropriate use across sectors is required by the DCEE in tandem with the Department for Transport.

5.7. Cement decarbonisation

Cement manufacturing is Ireland's single biggest industrial emitter, accounting for 43% of total industrial emissions.[97] The cement-manufacturing industry in Ireland consists of three companies operating four factories,[98] while the wider concrete industry includes over 500 active quarries and 200 concrete-manufacturing plants.[99] Cement accounts for around 90% of concrete's carbon footprint,[100] so decarbonising the cement industry is critical for decarbonising the concrete industry. The Global Cement and Concrete Association has outlined a net-zero roadmap, which focuses on CCUS technology along with increased clinker substitution, reduced use of fossil fuels with increased use of alternative fuels, and improved efficiency in the production and use of concrete.[101] A recently published assessment of CCUS technology and the cement industry in Ireland has called for the development of a coherent policy framework to address regulatory, permitting, financial and public acceptance challenges and to reduce risk associated with long-term investment decisions in the industry.[98] The Council welcomes the action in CAP25 for the CCUS taskforce to develop a workplan to report on the market readiness for CCUS and to progress the development of a policy and regulatory framework. However, while CCUS technology is part of the solution, continued focus on increasing clinker substitution and the use of alternative fuels, along with whole-life carbon assessments and efficient design, is critical for reducing emissions in the near term.

Substituting clinker with supplementary materials is a particularly effective cement decarbonisation strategy in the Irish context given that Ireland's clinker-to-cement ratio of 85% is significantly higher than the European and global average of 71%.[102] There are two main supplementary cementitious materials used internationally as substitutes for cement clinker: ground granulated blast-furnace slag, which is derived from the steel manufacturing process; and pulverised fly ash, which comes from the burning of coal in coal-fired power stations. Further clinker reduction can be achieved by diversifying the type of materials mixed with clinker, including calcined clays, natural pozzolans and industrial by-products. Recovered cement has also been identified as a potentially abundant, economically competitive decarbonated feedstock for clinker substitution.[103] New research shows that a 50% reduction in clinker is achievable with available technologies.[104]

The publication of the 2024 DETE report on reducing embodied carbon in cement and concrete through public procurement in Ireland was a very significant and welcome development that highlights the purchasing power of the State to drive change.[102] Public bodies are now mandated to use best practice in project design to reduce embodied carbon, procure concretes with clinker replacements and require that large projects produce a whole life cycle greenhouse gas emissions assessment.[105] Concrete products procured by public bodies must specify a minimum of 30% clinker replacement, and high-carbon Portland cement products should not be procured for projects commencing design from September 2024. To monitor the implementation of this green procurement guidance,[105] DETE also highlighted the need to develop and improve systems for data collection on carbon in public sector projects. The CAP25 action[22] for the Cement and Construction Sector Decarbonisation Working Group to consider mechanisms for public bodies to report compliance with this new guidance will be critical for ensuring that a reduction in carbon emissions from publicly procured construction projects is achieved.

While the public procurement mandate is an important first step, expanding clinker reduction requirements beyond public projects to the wider private sector will deliver far greater impacts and ensure that low-carbon cement becomes the industry standard rather than the exception. The Cement and Construction Sector Decarbonisation Working Group's engagement with research into the formulation and production of cement and concrete products is essential for delivering clinker substitutes at scale in Ireland and for ensuring that any new materials meet the relevant strength and durability criteria. EN 206 is the European standard for the specification, performance,

production and conformity of concrete.[106] It is not a harmonised standard under the EU Construction Products Regulation, which means that, while it sets a common technical framework for concrete performance across Europe, its application is governed nationally through each country's National Annex. These annexes allow Member States to adapt EN 206 to suit local raw materials, climate conditions and regulatory needs, including the ability to approve new or alternative binders not listed in the base standard. To support the decarbonisation of cement and concrete, the Council is calling on the National Standards Authority of Ireland (NSAI) Concrete Committee to urgently develop new standards and accelerate the approval process for low-carbon cement technologies. To facilitate this, the committee should consider both the mutual recognition of European standards and research and testing. DETE and the NSAI must also review current structures and resources, to ensure that systems are ready to support the decarbonisation of the cement and concrete industries. It is also important to reduce the carbon intensity of clinker by switching to alternative fuels, to achieve maximum fossil fuel replacement and reduce the overall emissions associated with cement production.

5.8. Industrial heat decarbonisation

The main strategies for industrial heat decarbonisation are energy efficiency, fuel switching (e.g. to bioenergy, hydrogen, electrification or district heating) and CCUS. These approaches vary in terms of the magnitude of the barriers to their implementation. Energy efficiency is generally easier to implement, while there are moderate-to-severe barriers to implementing fuel switching and CCUS, including high implementation costs, volatile or uncertain policies or markets, limited complementary resources and infrastructure, inexperience and poor stakeholder alignment.[107]

In Ireland, emissions from fuel combustion used in manufacturing industries are projected to decrease by between 13% and 19% under the WEM and WAM scenarios, respectively. This is largely due to the implementation of existing energy efficiency programmes, such as the SEAI's Large Industry Energy Network, the Accelerated Capital Allowance programme and the Excellence in Energy Efficient Design programme, along with the roll-out of biomethane (see Section 5.6) and an increase in carbon-neutral heating in low- and high-temperature industrial heat.[3] CAP25 highlights fuel switching (from fossil fuels to less carbon-intensive fuels) as a key driver for emissions reductions in the Industry sector. The DETE's Roadmap for the Decarbonisation of Industrial Heat[20] and the SEAI's National Heat Study[108] highlight the benefits of electrification, particularly through industrial heat pumps. These offer an alternative for low- and medium-temperature heat applications (up to about 150°C), especially in situations where there is a requirement for simultaneous heating and cooling or where there are waste heat streams that can be utilised. Notably, up to 40% of industrial heat demand comes from such low- or medium-temperature applications.[108] However, electrification is constrained by high electricity costs and grid connection delays.[107] The Council's 2025 Electricity Annual Review[109] stressed the need for significant investment and political support at the national, regional and local levels for upgrading electricity grid infrastructure. In addition, the CRU and ESB Networks must reduce electricity grid connection costs, timescales and challenges for switching from unabated fossil fuel use for low- to medium-temperature industrial heat decarbonisation.

The use of solar PV systems, in tandem with solar thermal energy, hybrid heat pumps and innovative energy storage technologies, must be incentivised for low- and medium-temperature industrial processes. For example, a recent landmark project at Aughinish Alumina demonstrated the first application of a high-pressure electric boiler within an energy-intensive industry. Aughinish Alumina was granted innovation funding from the EU for a project aiming to partially decarbonise the production of high-pressure steam used in the aluminium refinery by substituting existing gas-fired boilers with an electric boiler powered during peak renewable production. The 25 MW high-pressure electric boiler will replace close to 10% of the current demand for steam at the site and

enable the use of renewable electricity that would otherwise be constrained or curtailed, thereby avoiding 5% of its typical greenhouse gas emissions.[110] The plant's constant steam demand is guaranteed by using smart controls, enabling the interaction of the electric boilers (operated by a non-constant supply of renewable energy) with existing combined heat and power steam generation.

5.9. Circular construction and waste

Circularity is essential for a sustainable and resilient economy. Promoting a circular economy in Ireland can reduce carbon emissions, enhance resource efficiency and create new markets for services and goods. There is significant potential for circular enterprises in sectors like the construction, food and drink, and biopharma and chemical sectors. Ireland's economy, however, is currently mostly linear, lacking circular supply chains and infrastructure, making it reliant on other countries for material management. Achieving a circular economy is challenging and requires support for refurbishment, reuse, repair and recycling activities. To foster a circular economy, the EPA has identified a need to invest in infrastructure, implement new EU legislation to support circular growth and offer incentives to promote best practices in production, supply, purchasing, use and reuse. Furthermore, the recent appointment of a new Minister of State with special responsibility for Employment, Small Business, Retail and the Circular Economy has created a new opportunity for DETE and the DCEE to collaborate closely in this area to support businesses to take advantage of the benefits that come from implementing circular economy principles.

5.9.1. Circular construction

C&D waste forms the largest waste stream in Ireland and accounts for over 50% of all waste generated nationally, with 8.3 million tonnes generated in 2022.[9] Project Ireland 2040[111] sets out the State's development ambition, with forecasted growth in housing and infrastructure projects; thus, the construction sector has one of the highest potentials to increase circularity in the future via targeted measures for its expanding waste stream. Embodied carbon is expected to increase five-fold by 2030 from 2010 levels if business continues as usual, potentially accounting for up to 40% of territorial emissions,[112] with the Circularity Gap Report Ireland[113] highlighting the necessity of reducing the consumption of virgin materials and embedding sustainable construction practices in the sector to avoid this. With Ireland's circular material use rate at just 2.3%, far below the EU average of 11.8%,[10] urgent action is required to move away from an environmentally damaging linear economy towards a sustainable, circular one.

While retrofitting is broadly favourable to demolition, in some cases demolition is required for new higher density buildings. Successfully implemented resource and waste management plans, including pre-demolition audits, have been shown to achieve significant circularity in Ireland. The Opera Square project in Limerick city reached a 98% diversion rate for C&D material from landfill through green procurement, focusing on circular economy practices.[114] However, the demolition of buildings across Ireland is frequently based on financial considerations being a priority, disregarding the potential to retain material through adequate deconstruction methods. The EPA's updated Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects[115] provides an updated approach to construction waste generation, with a focus on the prevention and management of C&D wastes and resources for a project throughout its design, construction and, ultimately, deconstruction stages. However, these guidelines are not mandatory and their inconsistent application has been a significant drawback, meaning that there has been no significant shift in the C&D waste stream. Local authorities have an important role to play in supporting the use of the guidelines, particularly at the planning stage, and must seek resource

and waste management plans for infrastructure and building projects, including housing projects, from project developers.

The Government should require that resource and waste management plans (including pre-demolition audits) be mandatory for all new buildings in order to reduce linear material consumption and ensure the consistent application of guidelines within the construction sector and mandate full adherence to the EPA's updated Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects for each project. Through embedding circular construction practices in all projects, Ireland can scale up its lacking secondary materials market in the construction sector, to reduce linearity and thus environmental impacts. The Opera Square project[114] acts as a useful template for embedding circularity in public procurement, along with lessons learned from the Irish Green Building Council's Construction Materials Exchange pilot study,[116] helping to create an initial structure to aid in activating the supply chain for secondary materials in Ireland. In its 2024 Annual Review, the Council welcomed the EPA's publication of the national end-of-waste criteria for recycled aggregates[117] and the national by-product criteria for site-won asphalt.[118] In a further welcome development, the national by-product criteria for greenfield soil and stone[119] were published in 2024, and this has led to further growth in the secondary materials market in Ireland, with more than 400 registrations from companies for by-product criteria being made in 2024,[120] showing significant interest from industry. NSAI standards are crucial in the context of recertification, dictating which recycled materials can be reused. There is a growing market and demand for recycled aggregates for use in structural applications, with such uses permitted in other Member States but not in Ireland. These limitations are directly in conflict with the principles of a circular economy.[121] The Government must develop a comprehensive and appropriate recertification system for the C&D waste stream,[122] ensuring that the standards of materials align with those of the insurance sector. This will require the updating of pre-existing standards, such that there are no inhibiting factors for the inclusion of end-of-waste and by-product materials in construction where appropriate, as well as a new national end-of-waste decision for aggregates, to expand recycled aggregate utilisation to include structural purposes in line with other EU Member States.

5.9.2. Waste infrastructure gap

Ireland's waste treatment infrastructure is currently insufficient to meet the demands of its growing population and economy, leading to a heavy reliance on export markets for the treatment and processing of waste and for recycling. The EPA's State of the Environment Report 2024 highlighted how Ireland's capacity to collect and treat waste is vulnerable and underperforming, with an over-reliance on other countries to treat recycling materials, general municipal waste and hazardous wastes.[123] Ireland's recycling rates have stagnated over the last decade, as, while recycling tonnages are increasing, any potential improvements in the rates of recycling are being negated by the increasing amount of waste being generated.[123] Ireland continues to rely on the exportation of waste from key waste streams, such that 39% of municipal waste, 67% of packaging waste, 94% of waste tyres and 33% of organic waste were exported for treatment in 2022.[9] This resulted in 369,000 tonnes[9] of residual municipal waste and 720,000 tonnes[124] of packing waste being exported for energy generation through incineration and recycling treatment overseas rather than in Ireland. Although there may always be a need to rely on other Member States for some waste treatment options, this represents a missed opportunity to increase the contribution of Ireland's recycling sector to the circular economy of the future, and it is essential that Ireland is able to manage its residual waste itself and not have to rely on others. The Government should invest in indigenous waste facilities, including recycling/reuse and waste-to-energy capacities, in order to optimise the full economic value of wastes within Ireland, with the aim of treating 100% of residual waste in Ireland via thermal treatment. The Government must invest centrally in expanding recycling capabilities, to improve

Ireland's self-sufficiency in terms of long-term certainty and resilience in the system in order to deal with market shocks or unforeseen events that give rise to additional quantities of waste.

There is a lack of a national strategy when it comes to targeting potentially recyclable materials in the Irish waste ecosystem. In most waste streams, current practices involve initial segregation before shipping valuable materials overseas for further processing and the eventual reclamation of materials such as energy-critical elements embedded in products. This exportation of potentially recyclable or reusable materials undermines opportunities to cycle materials back into the Irish economy, weaking the national recycling ecosystem. Newly emerging and growing waste streams are leading to sufficient feedstock for expanding indigenous facilities through the implementation of the Re-Turn scheme and significant projected growth in renewable technologies including wind turbines, solar panels and electric vehicle (EV) batteries across Ireland and the rest of Europe. End-of-life net-zero technologies are being increasingly repurposed in Ireland, with wind turbine blades having been reused in the construction of the Midleton to Youghal Greenway Bridge[125] and EV batteries being reused as second life battery packs for vital energy storage.[126] Projects such as the development of EirBlade,[127] a national database that provides access to detailed information on the age, condition and decommissioning dates of wind turbine blades in Ireland, highlight the growing feedstock and potential for reuse of these emerging streams in Ireland. The Council calls for the Government to conduct feasibility research into the future role that a centralised, national facility could play in the processing of net-zero technologies (e.g. wind turbine blades, EV batteries) and other resource streams that are currently expanding in Ireland and the rest of Europe.

5.10. Improving resilience

The Council has previously highlighted the need to prepare Ireland's buildings to withstand the impacts of climate change and for technologies and the design of residential, public and commercial buildings to deliver benefits for climate resilience, environmental sustainability and biodiversity conservation. It also recommended the expansion of the retrofit programme to incorporate adaptation, nature-based solutions and biodiversity-friendly considerations into the design, renovation and retrofitting of public buildings, housing and commercial properties. The uptake of these recommendations remains low and is a significant missed opportunity.

In 2023, Met Éireann published a new series of climate maps (driving rain index, extremes in temperature, soil temperature, snow loadings and rainfall frequencies) to support building design standards.[128] Climate data for use in building design, consisting of past and future weather data for overheating risk assessments, were also included. The outputs of this analysis should be used to inform building regulations and public policy and to future-proof investments, particularly those relating to the Built Environment sector such as for the building of bridges, roadways and buildings, to ensure that Irish buildings and infrastructure remain climate resilient over their full design lives. Implementing water use efficiency measures should also be mandated for new builds, with recent research showing the considerable co-benefits of reduced energy requirements and CO_2 emissions.[129] The DCEE and DHLGH should integrate adaptation- and biodiversity-positive measures for housing into building regulations and relevant funding programmes to ensure resilience to the impacts of climate change. These programmes include the Urban Regeneration and Development Fund, the Infrastructure, Climate and Nature Fund and the National Retrofit Plan.

Storm Éowyn and other storms in recent years have exposed the vulnerability of households and businesses to extreme winds and flooding events. State support schemes have been put in place to support households and businesses damaged in these events, including the Humanitarian Assistance Scheme for households[130] and the Emergency Humanitarian Flooding Scheme for Small

Businesses.[131] Anecdotal end-user experiences of recent extreme weather events[132–135] have highlighted several shortcomings in these support schemes, including complex application procedures, delays and lack of clarity on eligibility and coverage. In this context, the Council welcomes the Programme for Government 2025 commitment[136] to develop an Extreme Weather Event Assistance Scheme for homes, community organisations, farms and businesses. The Council recommends that this scheme be established on a permanent basis in advance of the 2025/2026 storm season and be appropriately resourced with streamlined processes and procedures to allow for rapid response. There continues to be a need for more proactive approaches to climate risk management through public bodies and businesses. It is recommended that DETE support public bodies and businesses to implement the International Organization for Standardization (ISO) standards for climate risk assessments. ISO 14091:2021 specifically refers to adaptation to climate change, including guidelines on vulnerability, impacts and risk assessment.[137] The implementation of this standard is critically needed, to increase awareness of climate risk assessment methodologies and adaptation measures consistent with the National Climate Change Risk Assessment timelines and scenarios.

The Council has previously emphasised the need to retrofit the homes of vulnerable electricity customers.[109] The Solar PV for the Medically Vulnerable Scheme is a targeted scheme for installing solar PV panels for customers/households registered under the life support category of the Priority Services Register. The Council strongly supports the ramp up of installations under this scheme by the SEAI and calls for installations of batteries, suitable for supporting the needs of medically vulnerable people, and changeover switches, to support resilience during extreme weather events and other grid outages. This vital scheme is open to households where a qualifying individual is dependent on equipment, including life-protecting devices, assistive technologies to support independent living and medical equipment, or where an individual is particularly vulnerable to disconnection during the winter months for reasons of advanced age or physical, sensory, intellectual or mental health. Furthermore, the DCEE and SEAI should prioritise the development and provision of wider support, guidance and standards for batteries and changeover switches to increase customer resilience during extreme weather events.

Irish homes and businesses are highly exposed to flood events, with research estimating that Ireland will be the second most affected European country in terms of the proportion of the national population likely to reside in flood-prone areas by 2100.[138] Guidelines for Planning Authorities: The Planning System and Flood Risk Management[139] were issued in 2009 by the Minister of State with responsibility for local government under Section 28 of the Planning and Development Act 2000. The guidelines advocate for a sequential approach to development that incorporates flood risk assessment, involving identification of flood zones based on risk and classification of the vulnerability of different types of development to flooding. The guidelines provide for exceptions to restrictions on development through the use of a justification test at both the plan-making and planning application stages. In order to pass this test, a compelling planning need (with regard to stated criteria) must be demonstrated, together with evidence that the risk can be sustainably managed. It is also incumbent on the Office of the Planning Regulator to independently evaluate and assess local authority development plans and to identify issues such as inappropriate land use zoning within areas at known risk of flooding. This has led to a process where the minister has issued a number of directions to individual planning authorities in recent years that have directed changes to individual plans on the basis of flood risk.

In spite of these safeguards, the Council remains concerned that developments continue to take place in areas at risk of flooding in the future due to sea level rise, coastal erosion and pluvial flooding.[140] Recent research has also revealed the share of business bank loans in Ireland that will be potentially affected by flooding according to a range of Office of Public Works scenarios.[141] Reforms

to the planning system outlined in the Planning and Development Act 2024[142] offer an opportunity to better integrate future climate projections and adaptation measures into regional and local planning. National Policy Objective 78 of the National Planning Framework emphasises the need for local authorities to avoid inappropriate development in areas at risk of flooding, while taking into account the potential impacts of climate change on flooding and flood risk. The review of regional spatial and economic strategies (which are now to include a strategy relating to climate change adaptation and mitigation) and the alignment of more strategic county and city development plans and area-based plans with the revised National Planning Framework offer opportunities to prioritise adaptation measures and to prevent maladaptation linked to the expansion of critical infrastructure and housing developments. The Council also welcomes the fact that the Office of Public Works is developing an appendix to the guidelines for planning authorities, which will provide practical advice on how to consider climate change in the context of planning and development management, in line with the principles set out in the guidelines. Plans should take into consideration the scenarios and timelines used in the National Climate Change Risk Assessment, TRANSLATE project projections and Met Éireann guidance on sea level rise. Local authorities with support from the Office of the Planning Regulator should ensure that planning guidelines are properly followed, including through the rigorous application of the justification test, so that new housing is not built in locations at risk from future flooding and does not lead to increased vulnerability and maladaptation.

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