Central Bank of Ireland Climate Observatory

2024

Contents

Introduction

Climate change is leading to dangerous changes to our planet. Global temperatures between 2011 and 2020 exceeded pre-industrial levels by more than 1°C (IPCC), and 2024 in now confirmed to be the warmest year on record, reaching 1.5°C for the first time (Copernicus).

Exceptional heat waves are putting billions of people at risk, with 70% of the global workforce exposed to excessive heat (UN). Rising temperatures are also contributing to an acceleration of sea-level rise which in turn increases the risks of climate-driven coastal hazards, including flooding, storms and changes to coastal ecosystems (UN). Taken together, the increasing frequency of climate-related hazards has resulted to a much more dangerous environment, in which livelihoods, habitats and economic sectors are exposed to substantial risks.

These impacts also pose significant risks to the economy and the financial sector and, as such, impact the implementation of central banks' mandates. These risks are commonly defined as "transition risks" (negative costs and impacts associated with the decarbonisation process) and "physical risks" (direct damages due to a changing climate). Many central banks, including the Central Bank of Ireland, have recently started quantifying the breadth and depth of these risks on the main components of the financial system – banks, insurers and funds.

This document – the Climate Observatory – was launched in 2023 and provides an annual update of climate-related metrics for the economy and financial sector. This year's update provides a new section (Part A) which addresses global trends in the progression of climate change, mitigation and impact. Part B provides insight into climate risks for banks, insurers and funds using climate-aligned financial sector data. Part C monitors progress and challenges in relation to national decarbonisation, while Part D presents an overview of the Central Bank's own emissions from operations and investment activities. The report also provides an overview (research/policy boxes) of developments in national policy and sustainable finance, trends in ESG terminology and an assessment of the flood protection gap in Ireland.

Disclaimer:

Readers new to this topic should be aware that the climate data landscape has limitations and gaps, but is rapidly improving, as are the methods for quantification – current and historical charts and trends in this publication may change in future iterations as new methodological innovations and improved data become available.

A large number of charts employ data published by external organisations. The Central Bank does not take responsibility for any errors contained within externally sourced data.

Contact:
Comments and suggestions by email: climatechangeunit@centralbank.ie

Summary of Terms and Abbreviations used in this Document

AMOC	The Atlantic Meridional Overturning Circulation (AMOC) circulates water from north to south in the Atlantic Ocean. The AMOC brings warmth to western Europe and carries nutrients necessary to sustain ocean life.
BER	The Building Energy Rating (BER) is Ireland's Energy Performance Certificate (EPC) system. The BER audits properties from G to A1 based on the predicted energy (kilowatt hour) per metre squared (energy for heating, lighting, pumps and fans).
CAP	The *Climate Action Plan* (CAP) describes the key sectoral targets and policies to reach an overall reduction in national emissions of 51% by 2030.
CO_2	Carbon Dioxide (CO_2) is the main global warming driver. CO_2 is commonly shortened to "carbon".
CO_2e	Non-CO_2 greenhouse gas (GHG) components (Methane, Nitrous Oxide and Fluorinated Gases) can be converted to a "CO_2 equivalent" (CO_2e) for aggregation.
CPRS	The Climate Policy Relevant Sector taxonomy provides a standardised classification of activities whose revenues could be affected positively or negatively in a disorderly low-carbon transition, based on their energy technology.
CSO	The Central Statistics Office (CSO) is the national statistical agency responsible for the gathering of information relating to economic, social and general activities and conditions.
EA	Euro Area (EA) countries are those that use the Euro.
ECB	The European Central Bank (ECB) is the central bank of the European Union countries which use the euro. Its main task is to maintain price stability. It also supervises the EA's significant credit institutions.
EEA	The European Environmental Agency (EEA) is European Union agency that delivers knowledge and data to support Europe's environment and climate goals. Core tasks include supporting policy development, providing analytical expertise and maintaining an efficient reporting infrastructure.
EIOPA	The European Insurance and Occupational Pensions Authority (EIOPA) carries out specific legal, technical or scientific tasks to shape policies and laws at EU and national levels. It is one of three European Supervisory Authorities, and focussed on insurance and occupational pensions sectors.
EPA	The role of the Irish Environmental Protection Agency (EPA) is to protect, improve and restore the environment through regulation, scientific knowledge and working with others.
GDP	Gross Domestic Product (GDP) is the most widely employed measure of economic activity within a country.
GHG	Greenhouse gas (GHG) components include the main atmospheric gases which lead to global warming – carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and fluorinated gases.

Green Bond	Instrument where proceeds are exclusively applied to finance or re-finance new and/or existing eligible green projects.
Green Mortgage	Green Mortgages offer borrowers lower interest rates for more energy efficient properties. Applicants in Ireland typically have a minimum B3 BER rating to qualify. Green Mortgages have been available in Ireland since 2019.
IPCC	The Intergovernmental Panel on Climate Change is the UN body for assessing the science related to climate change.
LULUCF	Land Use, Land Use Change and Forestry (sometimes referred to as the "Land Use Sector") encompasses the management of cropland, grassland, wetlands, forests, settlements, as well as changes in land use including afforestation (i.e., planting trees), deforestation, or draining of peatlands.
Net Zero	Net zero is a situation where emissions released equal emissions removed/captured (for example, due to an increase in forestry).
NGFS	The Central Bank is a member of the Network for Greening the Financial System (NGFS), which was launched at the Paris One Planet Summit in 2017. It is a group of Central Banks and Supervisors willing, on a voluntary basis, to share best practices and contribute to the development of environment and climate risk management in the financial sector and to mobilise mainstream finance to support the transition toward a sustainable economy.
Physical Risk	For the financial sector, physical risks relate to potential changes in asset values or economic metrics due to weather and climate events.
RCP	Representative Concentration Pathways are climate change scenarios produced by the IPCC to project the future of greenhouse gas concentrations.
Real Economy	The term "real economy" describes an economy's systems for the production of market goods and services (in contrast to the financial sector). Households (supply labour, receive income and buy products) are part of the real economy.
Scope 1 Emissions	Scope 1 GHG emissions refer to "direct" emissions released from the combustion of fossil fuels (for example, CO_2 released from burning natural gas in a boiler).
Scope 2 Emissions	Scope 2 GHG emissions are primarily associated with "indirect" emissions from the consumption of electricity. Scope 2 emissions differ by country depending on the CO_2 intensity of electricity generation. Where district heating is available, this is also included in Scope 2.
Scope 3 Emissions	Scope 3 GHG emissions include all other indirect GHG emissions – for example, Scope 3 emissions of a company include both the emissions embedded in their inputs ("upstream" emissions associated with supplier methods and distribution) and the future emissions associated with product use ("downstream" emissions associated with end-user product energy consumption).

SEAI	The Sustainable Energy Authority of Ireland (SEAI) has the goal of increasing the use and development of affordable sustainable energy in Ireland.
Transition Risk	For the financial sector, transition risks relate to the potentially negative financial impacts associated with an economy's decarbonisation. For example, asset values and credit risk could be affected by government policy (e.g. emissions taxes and quotas), regulation (e.g. an increase in emissions disclosure requirements) and climate-aligned changes in investor/customer sentiment.
WACI	Weighted Average Carbon Intensity (WACI) calculates the weighted sum of tonnes of CO_2 emissions per million euro of revenue. The weight is equal to the percentage share of the investment in a private company in the portfolio value.

Part A: Global Climate Trends

The world is dangerously close to breaching the commitments made in the Paris Agreement of limiting warming to 1.5°C. Record-breaking temperatures were recorded across all continents in 2024 and extreme temperatures continue to pose significant threats to livelihoods across the globe. Warming temperatures have also contributed to unprecedented levels of sea ice loss and warming oceans, leading to an acceleration in global sea level rise, which could pose threats to an estimated 410 million people living in coastal areas by the end of the century ([World Economic Forum](#)). This section provides an overview of global trends and projections relating to climate events and their impacts, plus an assessment of global policy and mitigation progress.

Global Temperature increase Nearing 1.5°C
A.1 | Climate Science

Chart A.1 shows total global greenhouse gas emissions and temperature increases since 1970. Global GHG emissions have increased at an average annual rate of 1.8% over the past two decades. Emissions are highly concentrated amongst select countries, with China and the United States alone accounting for 29% and 11% of total emissions in 2022, respectively. Global temperature change, which is measured as an aggregate of all local temperature changes, has increased since the start of the 20th century. While growth estimates differ slightly by source, [ESSD](#) show that the average global surface temperature between 2014 and 2023 was 1.19°C above preindustrial levels (average temperature 1850-1900). Year-to-year variations are often determined by El Niño and La Niña events, which temporarily increase or reduce temperatures, respectively.
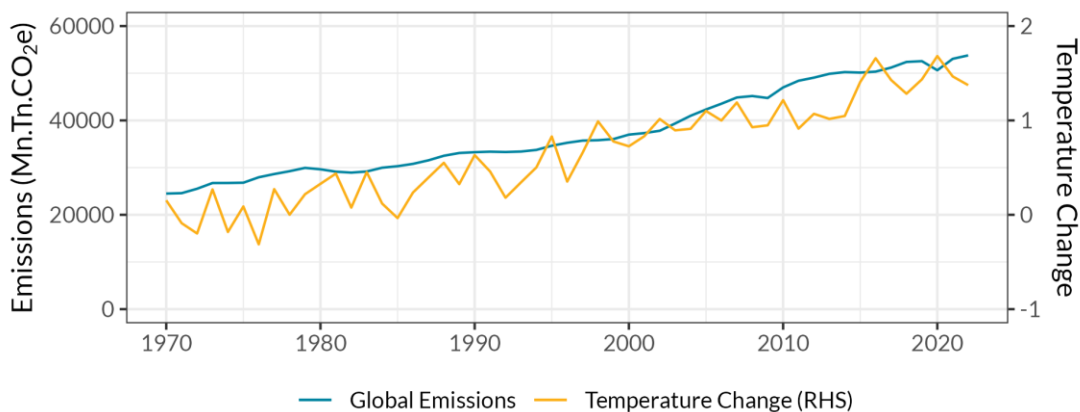

Source: Food and Agriculture Organization of the UN [[Link](#)] and European Commission - EDGAR [[Link](#)]
Notes: GHG emissions include CO_2, CH4, N2O and F-gases and are aggregated using "Global Warming Potential" values from IPCC AR5

Pace of Sea Level Change More than Doubles
A.2 | Climate Science

Chart A.2 shows the increase in sea levels compared to a 20-year mean as well as the change in sea surface temperatures relative to the median sea temperature from 1961 to 1990. Warmer sea temperatures lead to a rise in global sea levels through melting ice sheets and the expansion of seawater. The data reveal that the rate of sea level rise has more than doubled from 2014-2023 when compared with 1993-2002.
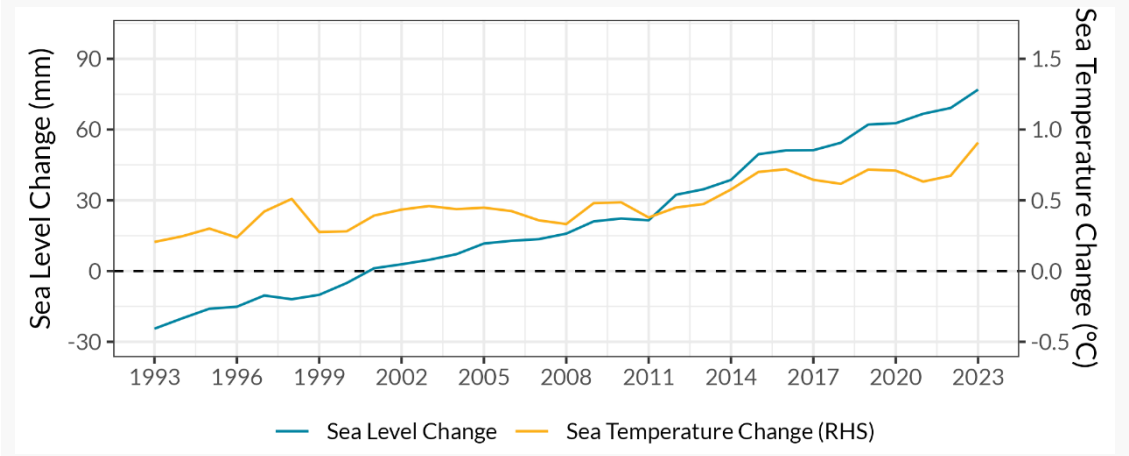

Source: NASA (Accessed via Met Office) [Link] and UK Met Office Hadley Centre Observations [Link]

Future Temperature Trajectory Dependent on Mitigation
A.3 | Climate Science - Forecasts

Charts A.3 and A.4 present climate related outcomes based on Representative Concentration Pathways (RCP) scenarios developed by the IPCC. RCP 2.6 is considered a low emissions scenario, in which mitigation is high, while RCP 4.5 is considered to be a moderate mitigation scenario. RCP 8.5 assumes a high-emission scenario in which no significant actions are taken to mitigate climate change. The below chart shows the projected rise in mean air temperature across Europe based on these three scenarios. The scenarios suggest that even in a low-emissions future (RCP 2.6), temperatures will increase above the 1.5°C target by 2040. In a high-emissions scenario, temperature increases will continue to rise over the latter half if the century.
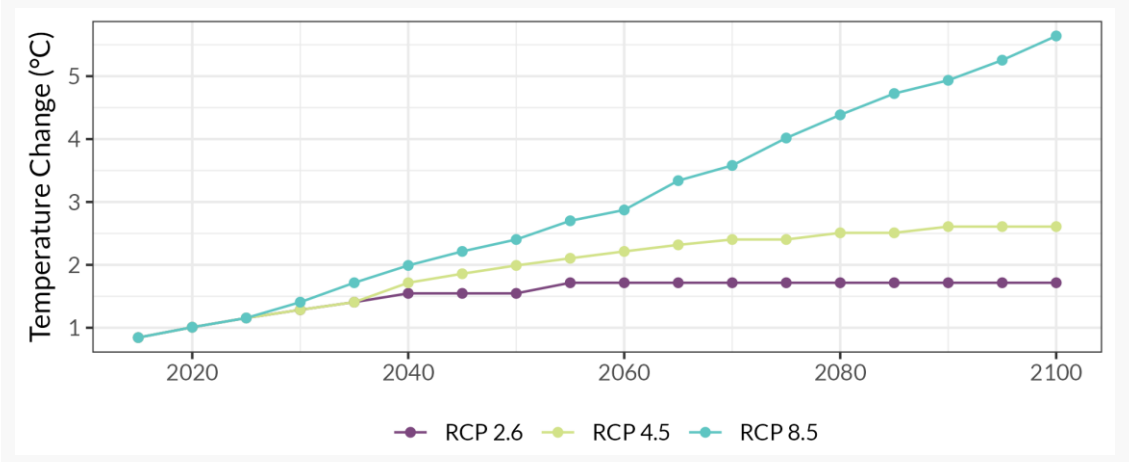
Source: Climate Analytics [Link]
Notes: RCP measures expected "radiative forcing" (heat absorbed) by 2100

European Exposure to Heatwaves Rises Significantly with Low Mitigation
### A.4 | Climate Science - Forecasts

Chart A.4 represents the same three RCP scenarios as Chart A.3 to estimate the share of european citizens exposed to heatwaves. In 2020, 2.9% of the population were exposed to heatwaves. This is expected to increase to 4%, 5.7% or 11.8% by 2050 in low (RCP 2.6), medium (RCP 4.5) and high (RCP 8.5) emission scenarios, respectively. Heatwave exposure rises very significantly post-2050 in the high-emission scenario.
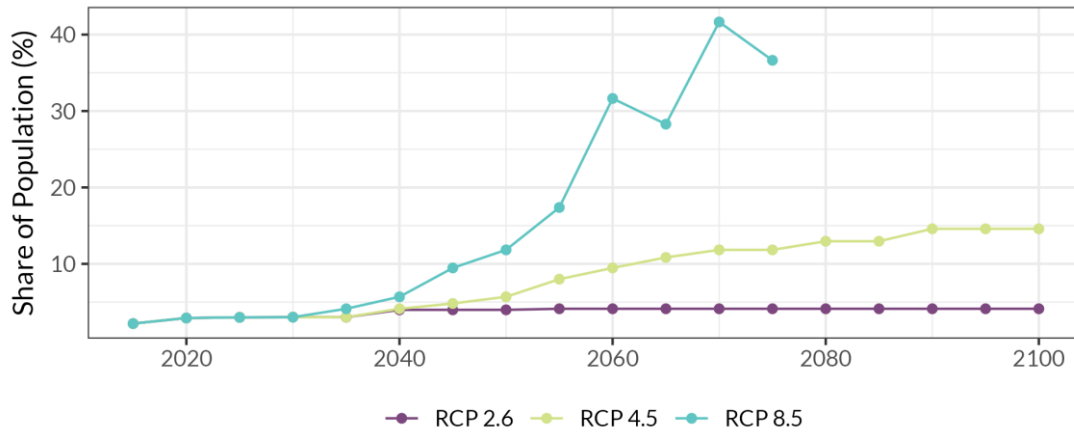
Source: Climate Analytics [Link]

Weather and Climate-Related Damages are Trending Upwards in Europe
A.5 | Climate Impacts

Chart A.5 presents trends in economic losses caused by weather and climate-related extreme events in the EU since 1980 (figures adjusted for inflation). Aggregate losses over the past ten years (2014-2023) were €298Bn, which is the highest ten-year period on record. 38% of losses since 2014 are due to flooding, while temperature extremes and storms represent 34% and 28%, respectively.
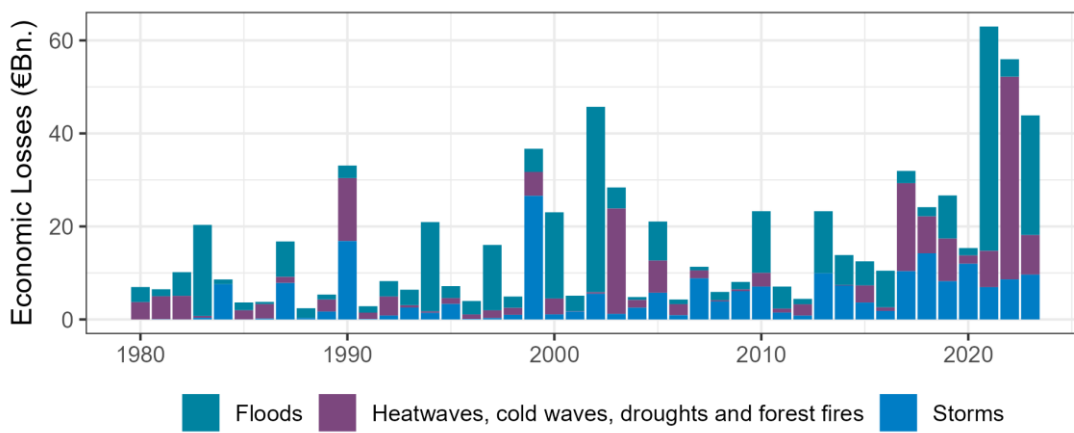

Source: EEA [Link] using RiskLayer [Link]

Back to "Contents"

Some Climate Tipping Points' Lower Bounds Already Crossed
A.6 | Climate Impacts

Tipping points refer to critical thresholds in a system that, when exceeded, can lead to a significant change in the state of the system, often with an understanding that the change is irreversible (IPCC). Chart A.6 summarises the ranges at which different policy-relevant climate tipping points may be crossed. The latest (2023) global temperature anomaly is 1.19°C (ESSD) which implies that several tipping point bounds are already being crossed.
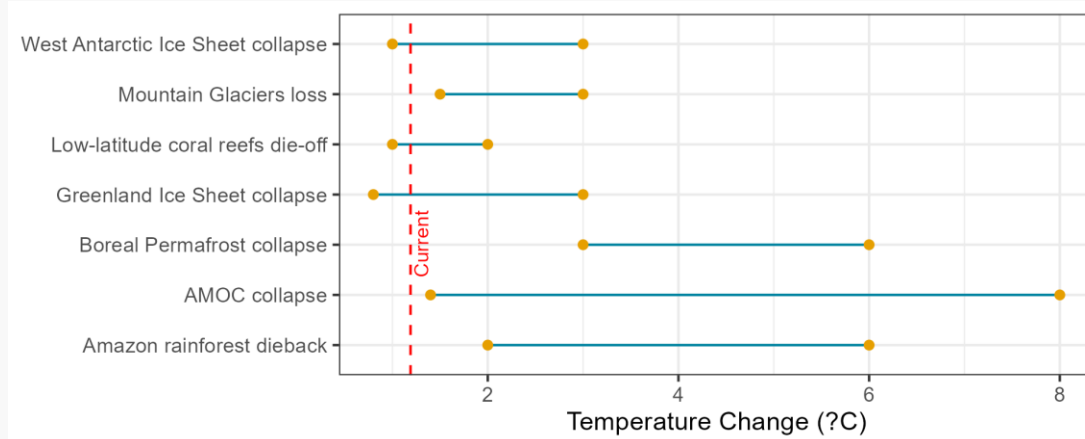
Source: OECD [link] based on research by McKay et al. (2022) [Link] and Lee (2021) [Link]

Global Wildlife Populations Declining at an Alarming Rate
A.7 | Climate Impacts

Chart A.7 presents results from the Living Planet Index, which measures changes in the population size of over 5,000 vertebrate species. The Index reveals that these populations have experienced a decline of 73% from 1970 to 2020. Global food systems and climate change are significant drivers of the loss in species.
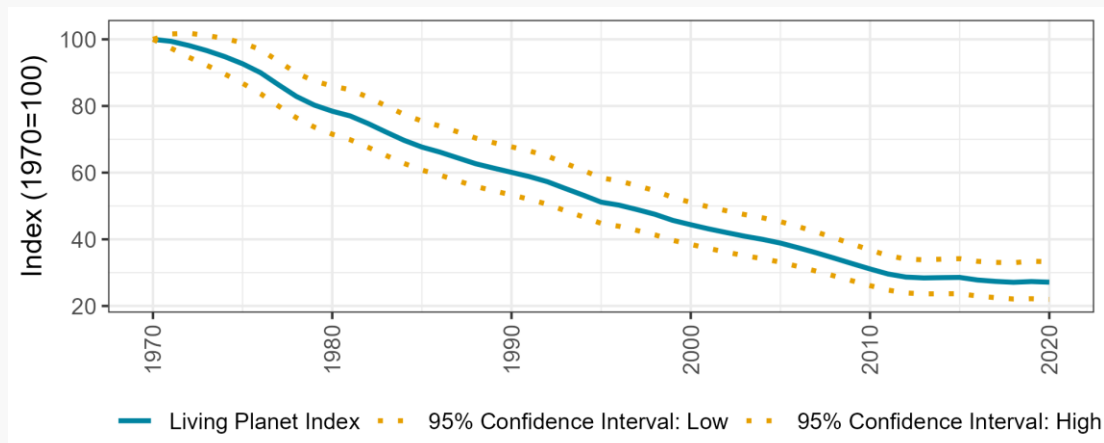
Source: Living Planet Index [Link]

Back to "Contents"

Progress on Renewable Electricity
A.8 | Mitigation

The increase in total global electricity generation (all fuel sources) since 2000 is driven by significant increases in demand in Emerging/Developing economies. Between 2000 and 2022, Emerging/Developing generation tripled, while growing 20% in Advanced economies. Current (2022) renewable shares are similar – 31% in Emerging/Developing and 35% in Advanced.
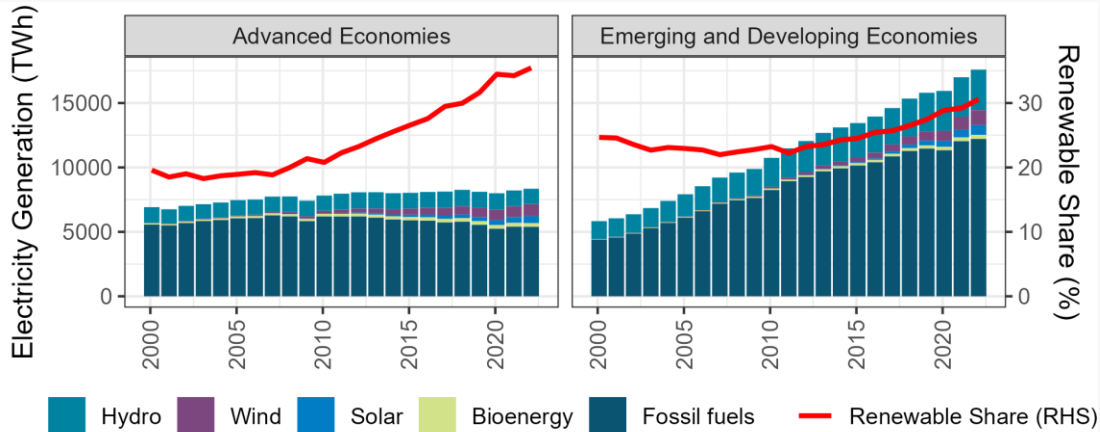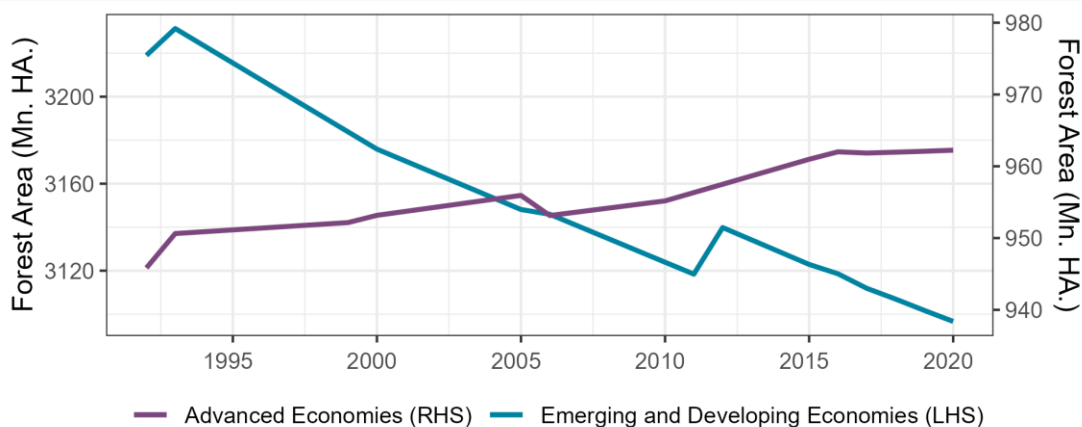

Source: IMF [link]
Notes: categorisation of advanced and emerging/developing economies follows methodology used by IMF

Global Forest Area Down 2.5% since 1992
A.9 | Mitigation

Carbon sequestration through increased forestry will play an important role in meeting economies' net zero targets. Chart A.9 displays total forest areas across Advanced and Emerging/Developing Economies over the past 30 years. Since 1992, global (all regions) forest area has declined by 2.5%. However, there are regional differences over time, with Emerging/Advancing economies declining 3.8% since 1992 and Advanced economies increasing 1.7%.


Source: IMF [link]
Notes: categorisation of Advanced and Emerging/Developing economies follows methodology used by IMF

Policy Ambition and Forecast Temperature Outcomes
A.10 | Policy

The policy pathway to maintain global temperatures at 1.5°C is extremely challenging. Chart A.10 shows the annual GHG emissions associated with different global policy scenarios. The level of Nationally Determined Contributions (NDCs are policy targets set by nations at COP meetings) would lead to 2.1°C of global warming, if implemented. To maintain a 1.5°C trajectory (paris aligned), global annual emissions in 2030 will need to reduce by 50% relative to 2020.
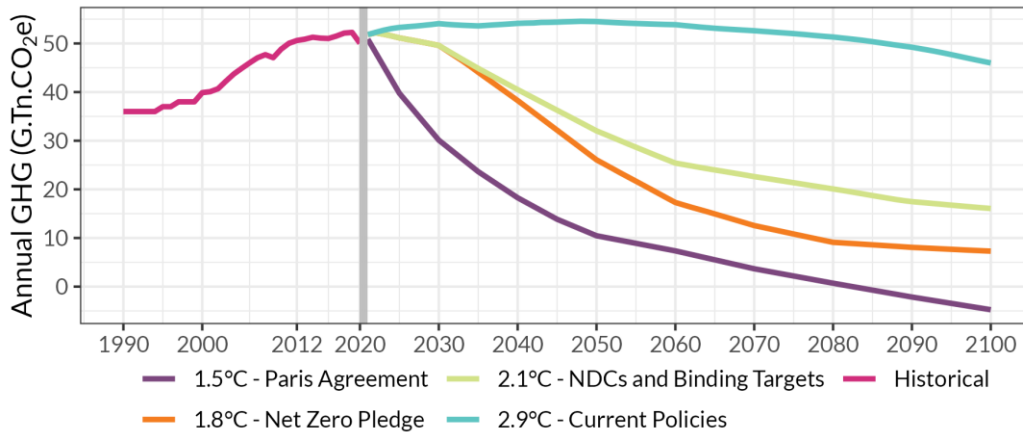

Source: Climate Action Tracker [link]

The Benefits of Reaching Net Zero 2050 far Outweigh the Costs
A.11 | Policy

Chart A.11 shows the potential economic impact of meeting 2050 net zero targets under an orderly transition scenario compared with current policies (NGFS "hot house world"). The economic benefits are measured as a difference in GDP growth between the two scenarios. While mitigating policies have a negative impact on GDP, these costs are outweighed by the benefits of avoiding chronic and acute damages associated with climate change. Overall, reaching net zero via an orderly transition could result in global GDP being 6.7% higher than under current policies.
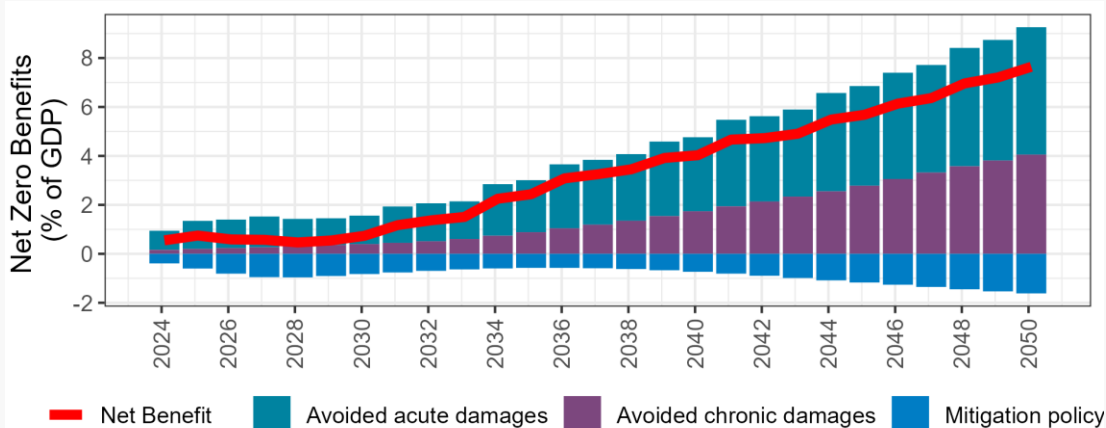

Source: IMF [Link] data based on NGFS [Link] model outputs
Notes: chart compares "Current Policies (Hot House World Scenario)" and "Net Zero (Orderly Scenario)" based on "REMIND-MAgPIE" model outputs

## Few Countries have Enshrined Net Zero Targets into Law
A.12 | Policy

Achieving net zero emissions by 2050 will minimise global damages and costs from climate change this century (see IPCC, NGFS and others). While 58% of countries have pledged to reaching net zero by 2050 (or before), just 14% of countries have enshrined these targets into law. OECD analysis shows that this group of countries, which includes the European Union plus 27 other countries, represent 16% of global GHG emissions.
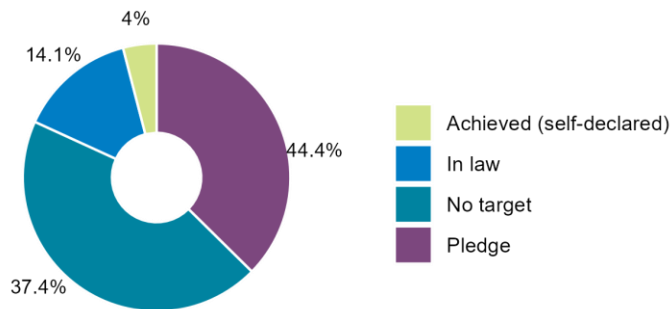
Source: OECD [Link]

Global Carbon Pricing Schemes, When Available, Are Insufficient
A.13 | Policy

Chart A.13 presents current carbon prices (April, 2024) associated with emission trading systems (or direct carbon taxes) in 72 separate policy systems. The World Bank have recommended a minimum carbon price of $63 in 2024 to achieve long run decarbonisation goals. Currently, just seven schemes are above this threshold. Over time, carbon prices will need to increase significantly, with, for example, the NGFS models showing shadow carbon prices reaching $600 by 2050 to support the transition to net zero.
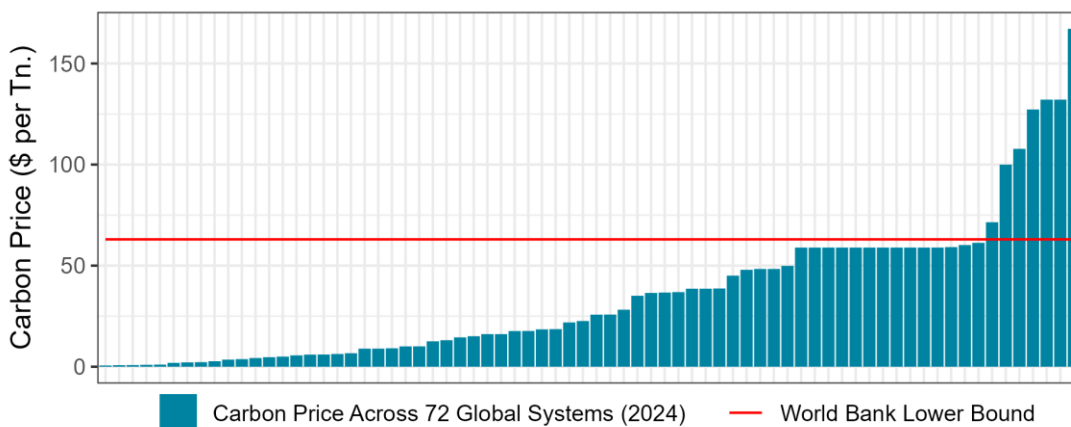

Source: World Bank [link]
Notes: for each jurisdiction, the main price rate (covering the largest volume of emissions in the jurisdiction) is shown. Prices are not directly comparable due to differences in coverage, compliance and compensation arrangements

Fossil Fuel Subsidies Amount to $7 trillion in 2022
A.14 | Policy

Chart A.14 shows both implicit and explicit fossil fuel subsidies as a share of GDP for the top 20 highest emitting countries, representing 75% of global GHG emissions in 2022. Explicit subsidies involve setting retail prices below the cost of supplying the fuel or through providing direct support to producers. Implicit subsidies occur when the retail price fails to include negative externalities, such as contributions to climate change. As of 2022, fossil fuel subsidies accounted for 7.1% of total GDP, with total subsidies reaching $7 trillion. Explicit fossil fuel subsidies in Ireland (not shown in Chart A.14) were €4.7 billion in 2022, representing 1.8% of GNI*.
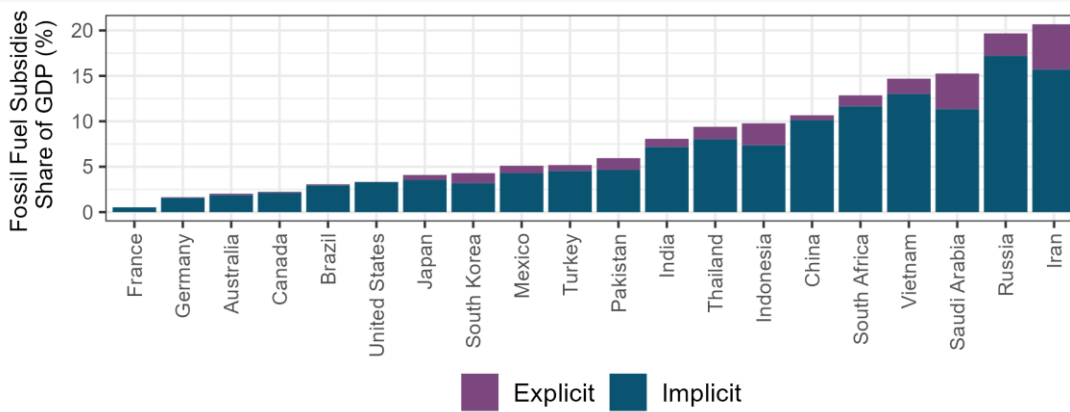
Source: IMF [Link] and CSO [Link]

Box 1: The Growth of ESG Vocabulary in Bank Annual Reports (1998-2023)

By Paul Lyons and Quentin Bro de Comères (Macro-Financial Division)

We evaluate to what extent the rise of Environmental, Social, and Governance (ESG) concerns translates to the activity and communication of Irish retail banks by assessing the presence of ESG vocabulary in their annual reports over the 1998-2023 time span. To that aim, we construct an ESG vocabulary lexicon, and perform an "ESG-sentiment" analysis on bank annual reports to extract the salience of such vocabulary in their communications. For each report, we apply our lexicon to extract the ESG related phrases in Irish bank annual reports. We also compute an ESG score as the share of ESG related phrases over all phrases in each report.

Overall, we identify 208 unique ESG expressions in Irish bank annual reports, among which the most frequent over time appear as **"governance"** and **"corporate governance"** (34.8% and 8.5% of total occurrences, respectively), **"sustainability"** and **"sustainable"** (6.8% and 5.1%), and **"scope emissions"** (4.8%), followed by **"ESG"** and **"green"** (3.9% and 3.4%, including related expressions such as "green asset"). The remaining 32.7% are covered by around 200 other expressions. There is a clear evolution over the time-period, with much fewer references to ESG in the earlier years, for example, the 1998 annual reports and significantly more references in more recent annual reports (Chart 1.1 and Chart 1.2).

That increase reflects growing concerns on ESG-related issues, encouraged by initiatives such as the Task Force on climate-related Financial Disclosures (TCFD) and the European Central Bank's (ECB) climate-related risk guidelines and climate related stress testing. The disclosure of ESG-related risks is also a part of the third pillar of the Basel III framework, and will be implemented in Europe as part of the CRR III and CRD VI banking packages. These initiatives have played an important role in raising bank's awareness to ESG risks. Mechanically, the variety of vocabulary also largely increased in the reports.

Chart 1.1: Word Cloud of ESG Vocabulary in Irish Bank Annual Reports in 1998

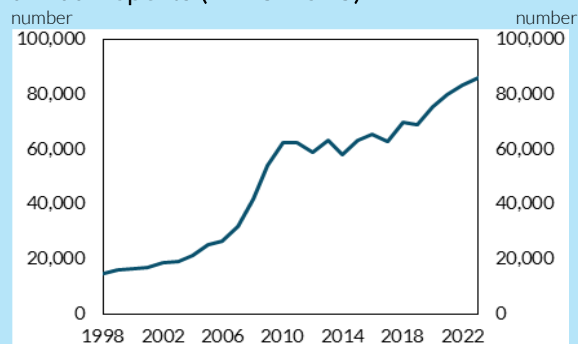Chart 1.2: Word Cloud of ESG Vocabulary in Irish Bank Annual Reports in 2023
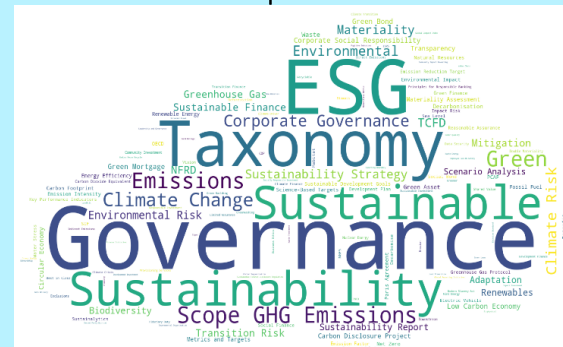
Source: Central bank of Ireland using annual reports of Irish banks from 1998 to 2023.
Notes: To compute the share of ESG vocabulary in bank reports, we collected all annual reports for AIB, BOI, and PTSB from 1998 to 2023, from which we constructed a corpus of relevant words only (i.e. excluding stop words and digits). We then extracted all ESG expressions considering a lexicon we constructed considering multiple sources (*inter alia* International Capital Market Association, and UNDP Climate Dictionary), removing ambiguous expressions.

This analysis also allows us to highlight a trend in the longer length of bank annual reports (Chart 1.3) while banks try to balance increased disclosure requirements, including ESG disclosures and the need for transparent communication. The total number of words in reports increased by more than 415%, from an average of 16,700 words in 2000 to 86,100 words in 2023. Along with the increase in the average total word count of annual reports, the share of ESG related words has also increased from less than 0.4% in 1998 to 5.6% of total words in the annual reports in 2023 (Chart 1.4). Interestingly, a strong increase can be observed from 2019, when increased ESG disclosures were starting to be required of European institutions.

Chart 1.3: Average number of words in bank annual reports (1998-2023)

number | number

Source: Central bank of Ireland using annual reports of Irish banks from 1998 to 2023. Relevant tokens only.

Chart 1.4: Share of ESG related words to total words in bank reports (1998-2023)

per cent | per cent
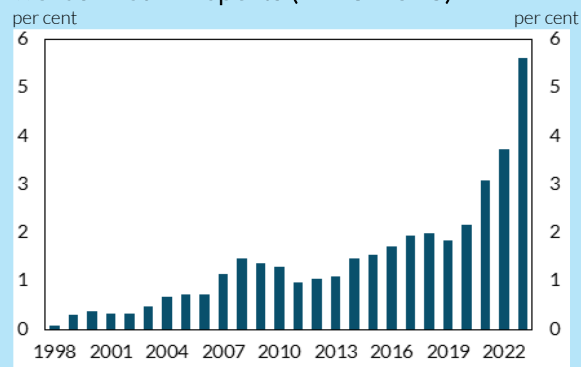
Source: Central bank of Ireland using annual reports of Irish banks for years 1998 to 2023. Share of ESG words over relevant tokens.

Over the past two decades, growing awareness of, and demand for governance and sustainability matters have led to a significant increase in Environmental, Social, and Governance (ESG) investment by economic agents globally. The Global Sustainable Investment Review estimates that over US$30.3Tn. was invested with explicit ESG goals as of 2022. Therefore, this topic is a growing priority for investors, which is reflected in the increasing use of ESG vocabulary in companies' annual reports.

The financial sector has an important role to play in helping to channel investments and finance to firms in transition and it remains to the fore of the risks and opportunities presented by ESG. In addition, bank balance sheets reflect the economy they finance and that economy more and more requires sustainable finance, to support the strategic priorities set forth in the United Nations Environment Programme Finance Initiative, of which Irish banks are signatories.

Conclusion:

All in all, this box points towards the clear increase in the use of ESG vocabulary in the annual reports of global banks over the past decades being reflected also in the annual reports of Irish retail banks. This rise is associated with the increasing demand for transparency, regulatory requirements and consumer expectations regarding how banks manage ESG risks but also from banks' own commitment to sustainable practices and transparency, which in the long-run, will sustain their overall business models.

Part B: Irish Financial Sector

The financial sector plays a key role in delivering national climate targets and mitigating climate risks. In line with the European Green Deal, this includes financing the technological transition to net zero emissions by 2050. However, the financial sector also faces risks posed by climate change and the transition to net-zero. Section A provides an overview of both the means by which the sector is financing the transition as well as measurements of the sector's exposure to physical and transition risks.

## Green Mortgage Originations Steady since Q42022
B.1 | Banking

Green Mortgages provide borrowers with lower interest rates on energy efficient properties (typically for BER rating of "B3" or higher). Chart B.1 shows quarterly new green mortgage originations since 2020. The green share rose up until Q4 2022, but has remained relatively stable since. The latest data (first half of 2024) shows that approximately 40% of new mortgage originations are green.
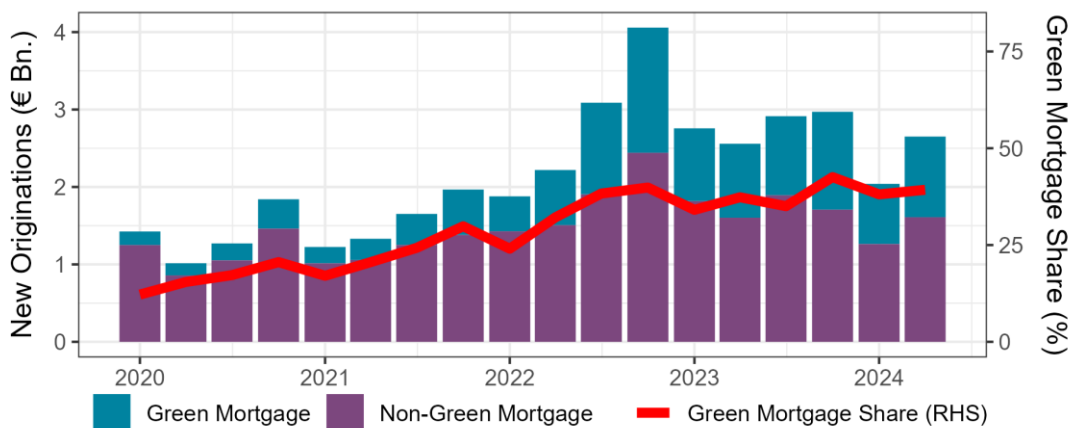
Source: own calculations using Central Bank *Monitoring Template Data*
Notes: methodology follows Lambert et al. (2023), *Financial Stability Notes* [Link]. Green mortgage origination refers to all new mortgage loans which availed of a Green Rate discount for energy efficient homes

Approximately 10% of Business Loans at Risk of Flooding
B.2 | Banking

Chart B.2 presents the ECB's physical risk indicators for two hazards – coastal flooding and river flooding, accounting for flood protections – using the IPCC's intermediate climate scenario (RCP 4.5) for 2050. Ireland is in a group of countries with approximately 10% of potential exposure at risk (PEAR). This calculation includes both domestic and non-domestic exposures for banks licenced in Ireland. While such economic effects are potentially significant, the ECB show that collateral can insulate bank portfolio losses from flood risk – the ECB's collateral-adjusted exposure at risk (CEAR) is less than 0.02% in Ireland.
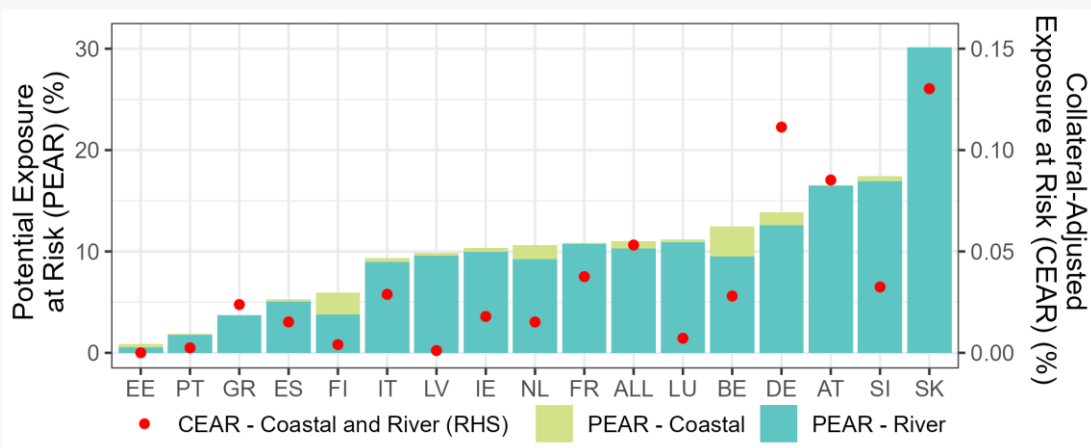

Source: ECB [Link]
Notes: LT, MT and CY excluded due to data availability

High Variation in Business Flood Risk across Ireland
B.3 | Banking

Chart B.3 presents the share of domestic business borrowers located in "1-in-100" year flood areas by county (1-in-200 year for coastal). Risk is presented by share of loan numbers and share of loan values, and figures account for flood defences (OPW "benefiting areas"). There is large heterogeneity across Ireland, with elevated risk in Cork, Wicklow, Louth, Limerick and Clare.
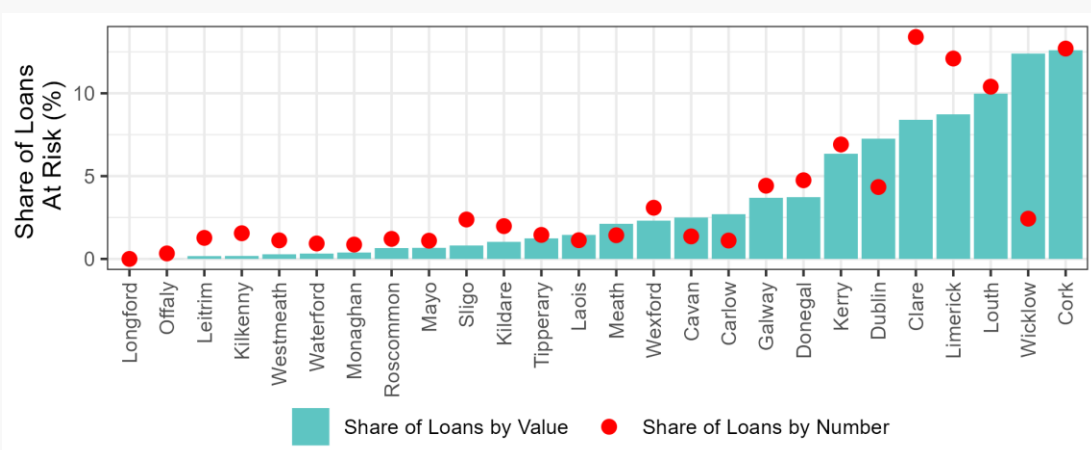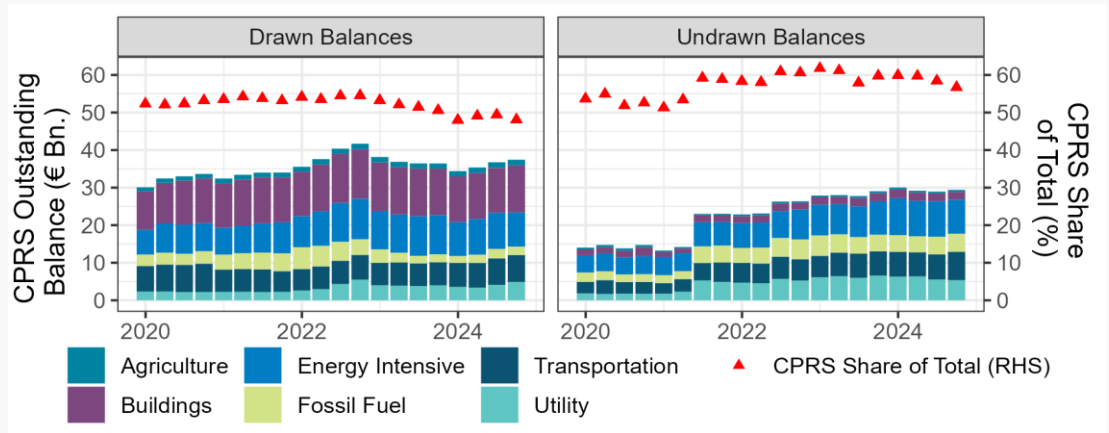

Source: own calculations using ECB AnaCredit and OPW flood maps [Link]
Notes: a "1-in-100" return period implies that a location has a 1% chance of flooding in a particular year. See Appendix for further details

## High Banking Sector Exposure to Climate Policy Relevant Sectors
B.4 | Banking

Chart B.4 presents drawn and undrawn balances to corporates operating in Climate Policy Relevant Sectors (CPRS). The CPRS share of drawn balances has declined from 55% in Q3 2022 to 48% in the latest quarter. For the same period, undrawn CPRS balances declined from 62% to 57%. Buildings, energy-intensive and transportation sectors represent 37% of drawn balances, while energy-intensive, utility and fossil-fuel sectors represent 42% of undrawn balances.

Source: own calculations using AnaCredit and CPRS taxonomy [Link]
Notes: includes all banks licenced in Ireland for lending from their Irish entity and selected EU branches. Excludes loans from non-EU subsidiaries

CO_2 Intensity of Bank Investments Second Lowest in Euro Area
B.5 | Investments

Chart B.5 displays the exposure of the banking to NFCs' Scope 1 emissions based on their direct holdings of debt securities and listed shares issued by NFCs at end-2021 using the Weighted Average Carbon Intensity (WACI) indicator. WACI is a relative indicator that can be used to compare transition risk between firms and sectors. Ireland has the second-lowest WACI of the countries reported (137 tonnes) which is considerably less than the euro area average (208 tonnes).
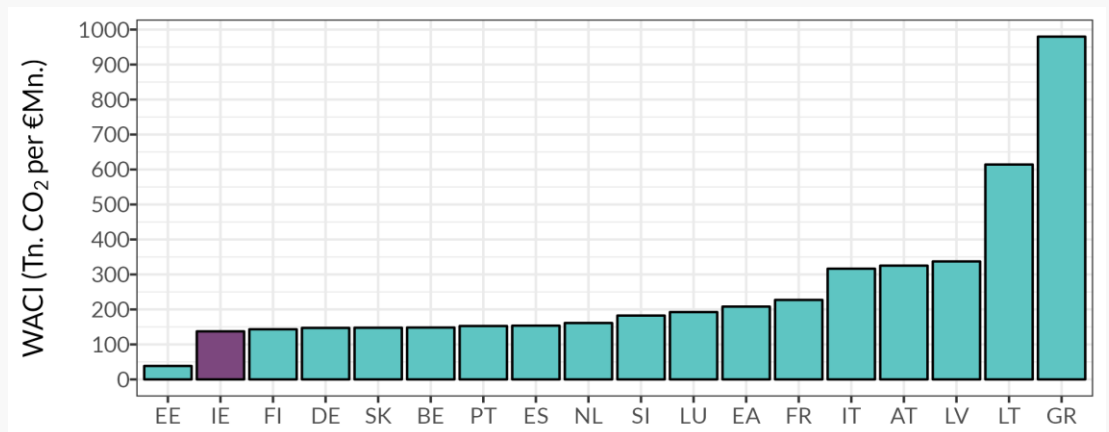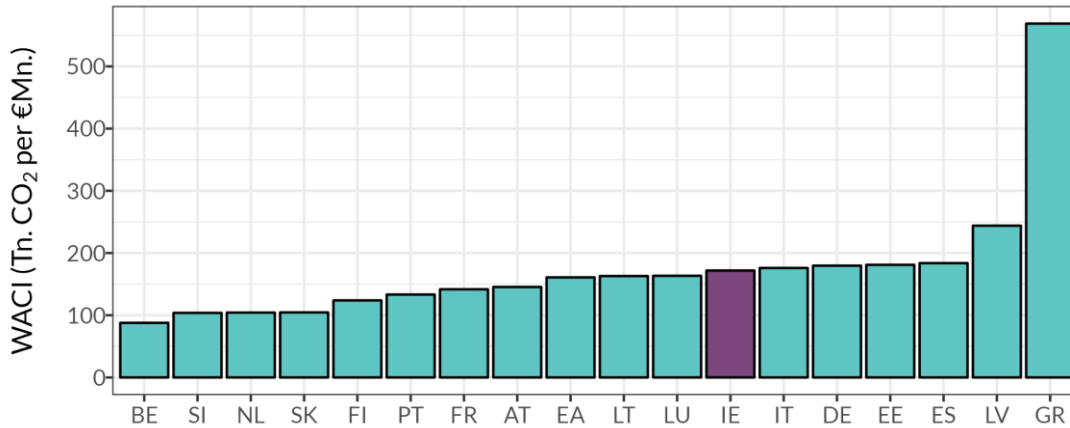

Source: ECB [Link] WACI indicator [Link]
Notes: chart created using results from ECB's balanced panel. Indicator includes both domestic and non-domestic exposures

CO_2 Intensity of Investment Funds 7% Higher than Euro Area Average
B.6 | Investments

Chart B.6 displays the exposure of the Investment Funds' sector to NFCs' Scope 1 emissions based on their direct holdings of debt securities and listed shares issued by NFCs at end-2021 using the WACI indicator. The CO_2 intensity of investment funds resident in Ireland (172 tonnes) is slightly above the euro area average (161 tonnes).
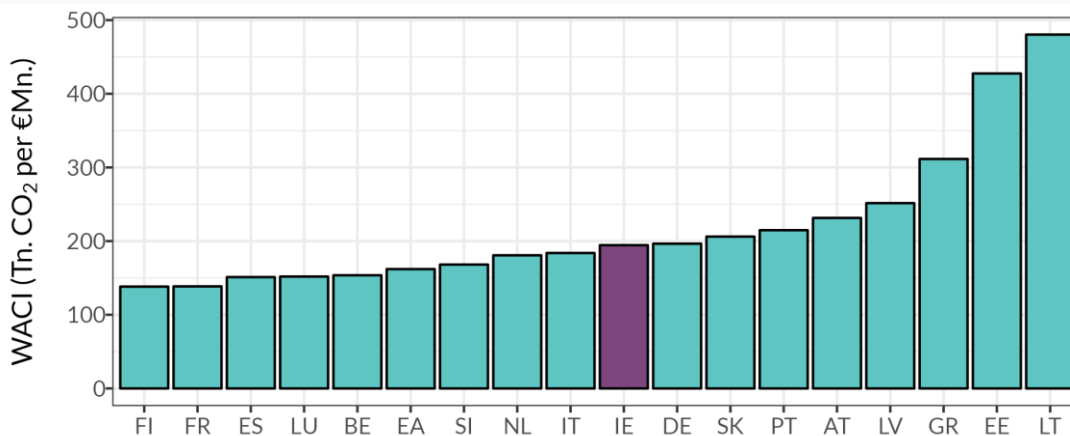

Source: ECB [Link] WACI indicator [Link]
Notes: chart created using results from ECB's balanced panel. Indicator incluides both domestic and non-domestic exposures

CO_2 Intensity of Insurance/Pension Funds 20% Higher than Euro Area Average
B.7 | Investments

Chart B.7 displays the exposure of the insurance corporations' and pension funds' sector to NFCs' Scope 1 emissions based on their direct holdings of debt securities and listed shares issued by NFCs at end-2021 using the WACI indicator. The CO_2 intensity of Irish resident insurance corporations' and pension funds' resident in Ireland (194 tonnes) is 20% higher than the euro area average (162 tonnes).
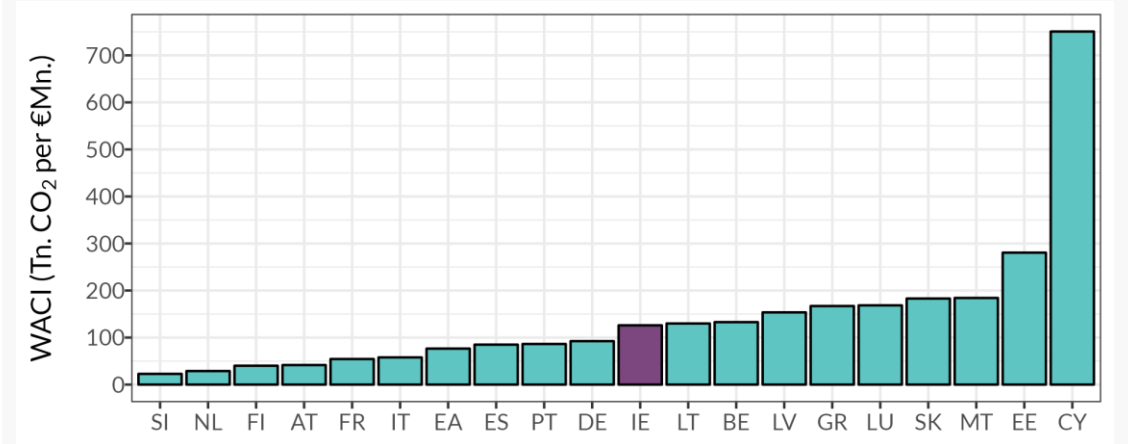

Source: ECB [Link] WACI indicator [Link]
Notes: chart created using results from ECB's balanced panel. Indicator incluides both domestic and non-domestic exposures

CO$_2$ Intensity of Bank Loans Higher than Euro Area Average
B.8 | Banking

Chart B.8 displays the exposure of the banking sector to NFCs' Scope 1 emissions based on banks' outstanding volume of loans to NFCs at end-2021 using the WACI indicator. The CO$_2$ intensity of loans at Irish resident banks (126 tonnes) is 64% higher than the euro area average (77 tonnes).


Source: ECB [Link] WACI indicator [Link]
Notes: chart created using results from ECB's balanced panel. Indicator includes both domestic and non-domestic exposures

Irish Resident Green Bond Holdings Low but Growing
B.9 | Investments

Chart B.9 presents green bond holdings by Irish residents, by the region of issuer. As of Q2 2024, €51.7 billion of green bonds were held by Irish resident holders. While growth has been strong to date, green bonds represent just 2.2% of total debt securities held by Irish resident holders.
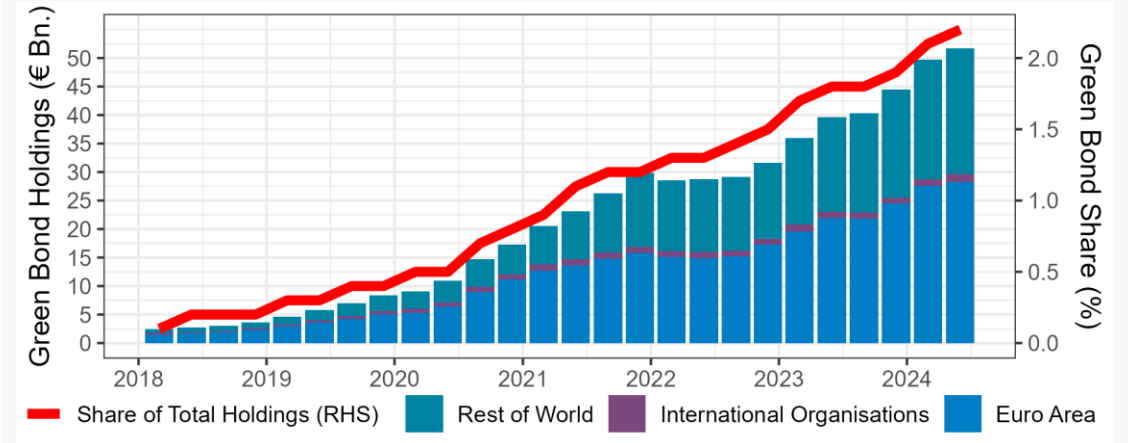

Source: CBI Statistics Division [link]

Back to "Contents"

Physical Risks in Insurance Sector Mainly non-Domestic
B.10 | Insurance

Chart B.10 displays the capital charges ("Gross Risk" charge) associated with the main natural catastrophe perils for the Irish Insurance sector. Values reflect expected losses associated with 1-in-200 year events in each region. Irish regulated entities are required to hold the most capital for domestic windstorms, which corresponds to a Gross Risk charge of €2.3 billion. Overall, 81% of capital charges for the Irish Insurance sector are non-domestic.
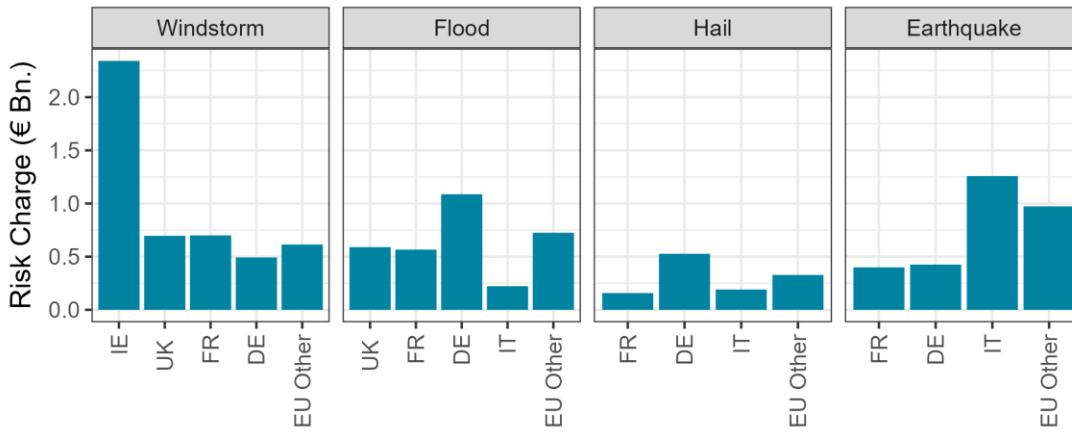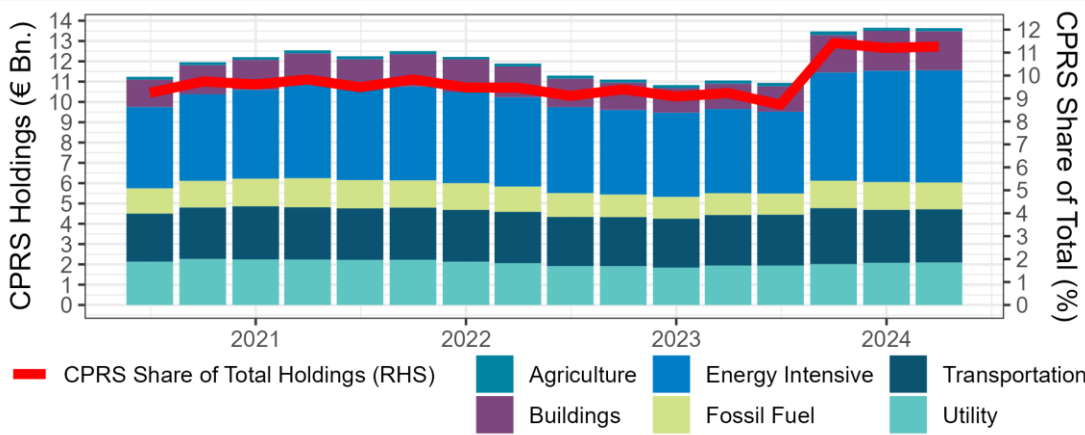

Source: Solvency II Quantitative Reporting Templates, template S.27
Notes: Gross Risk charges shown are calculated using the standard formula calculation before mitigation. Gross Risk charge is the 1-in-200 year loss expected from that peril in that region (excluding non-proportional reinsurance) and before reinsurance recoveries etc.

One Tenth of Insurance Sector Assets in Climate Policy Relevant Sectors
B.11 | Insurance

Chart B.11 displays the aggregate value of the insurance sector's non-linked investments that are exposed to Climate Policy Relevant Sectors (CPRS). As of Q2 2024, the Irish Insurance Sector held €13.6Bn of assets in CPRS, representing 11.3% of total assets.

Source: own calculations using Solvency II Quantitative Reporting Templates and CPRS taxonomy classification.
Notes: non-linked investments are directly held by insurers in order to be able to fulfil their regulatory obligations and meet policyholder liabilities.
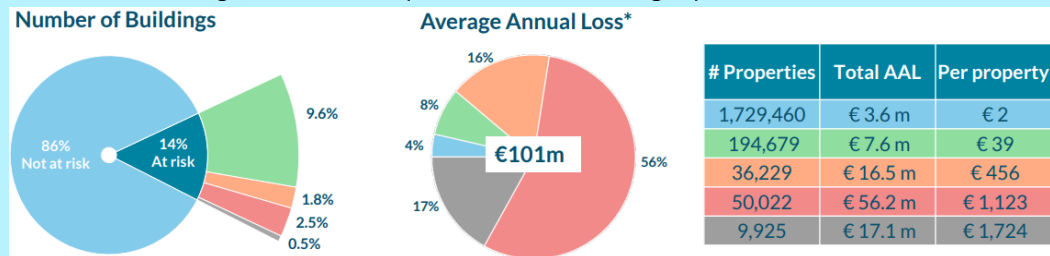
Box 2: Flood Protection Gap in Ireland

By Anna Downey, Fiona Bent, Brian Balmforth and Emily Duffy

In 2024, the Central Bank undertook analysis to measure the current and future flood protection gap [Link]. The Flood Protection Gap (FPG) refers to the shortfall between the cost of flooding in Ireland and that portion of the cost which is insured. For this project, the FPG is considered in terms of the accessibility of insurance i.e. if a home or commercial property owner seeks to obtain flood cover on their property insurance today, will it be available? The analysis does not account for a person's choice to not purchase insurance, which also contributes to the FPG.

Chart 2.1 presents results from this analysis. Approximately 1-in-20 buildings have difficulty accessing flood insurance today. The estimated average annual loss (AAL) of inland (river and surface water) flooding is c. €101m. Severe losses can be much higher than this, with a c. €510m loss expected about once every 25 years.

Chart 2.1: Average Annual Loss per Flood Risk Category

Number of Buildings

Average Annual Loss*

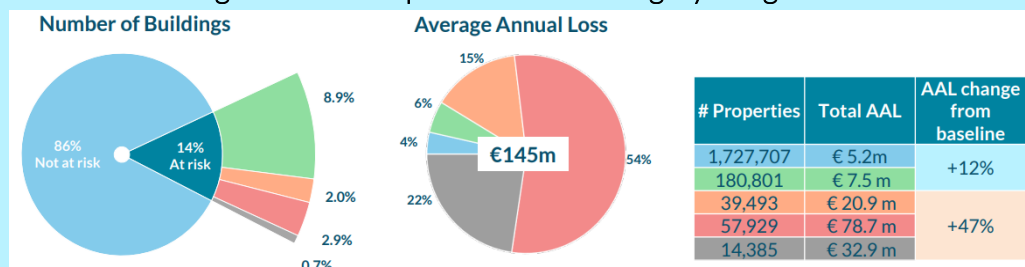| # Properties	Total AAL	Per property
1,729,460	€ 3.6 m	€ 2
194,679	€ 7.6 m	€ 39
36,229	€ 16.5 m	€ 456
50,022	€ 56.2 m	€ 1,123
9,925	€ 17.1 m	€ 1,724

Source: Central Bank of Ireland Flood Protection Gap Publication [link]
Notes: colours green, orange, red and black indicate properties with higher risk

2023 was the wettest and warmest year on record in Ireland, and this trend is expected to continue. Met Éireann's TRANSLATE data [Link] shows a steady increase in average precipitation, with extreme storms and floods expected to become more frequent. As global temperatures rise, Ireland can expect drier summers and wetter winters. Winter rainfall could increase by up to 34% in an extreme climate change scenario. This is reflected in our modelling, which shows, for example, that an extreme event costing €2.5Bn becomes twice as likely by 2050, moving from a 1-in-200 year event to a 1-in-100 year event.

In order to model the effects of climate change, we consider the OPW high-end scenario. Chart 2.2 shows that under the high-end scenario for those buildings with access to insurance, the AAL increases by 12%. For those in the protection gap, the AAL increases by 47%.

Chart 2.2: Average Annual Loss per Flood Risk Category – High-End Scenario

Number of Buildings

Average Annual Loss

# Properties	Total AAL	AAL change from baseline
1,727,707	€ 5.2m	+12%
180,801	€ 7.5 m	
39,493	€ 20.9 m	+47%
57,929	€ 78.7 m	
14,385	€ 32.9 m	

*Source*: Central Bank of Ireland Flood Protection Gap Publication [link]
Notes: colours green, orange, red and black indicate properties with higher risk

Part C: Real Economy

By global standards, Ireland is an emission intensive economy. While total emission in Ireland account for just 0.12% of global emissions as of 2022, Ireland is in the top 30 global emitters on a per capita basis. On a sectoral basis, agriculture accounts for the largest share of national emissions (32%), followed by transport, households and energy supply. Part B uses publically available data to describe the trends and challenges of decarbonising the economy.

Ireland's GHG Emissions per Capita are Second Highest in Europe
### C.1 | National Emissions

Chart C.1 compares Ireland's GHG emissions (CO_2, methane, nitrous oxide and fluorinated gases) per capita to the rest of the EU. While emissions per capita have declined by 40.2% since 2000, Ireland ranks second highest in the EU and is 59.4% above the region average in 2023.
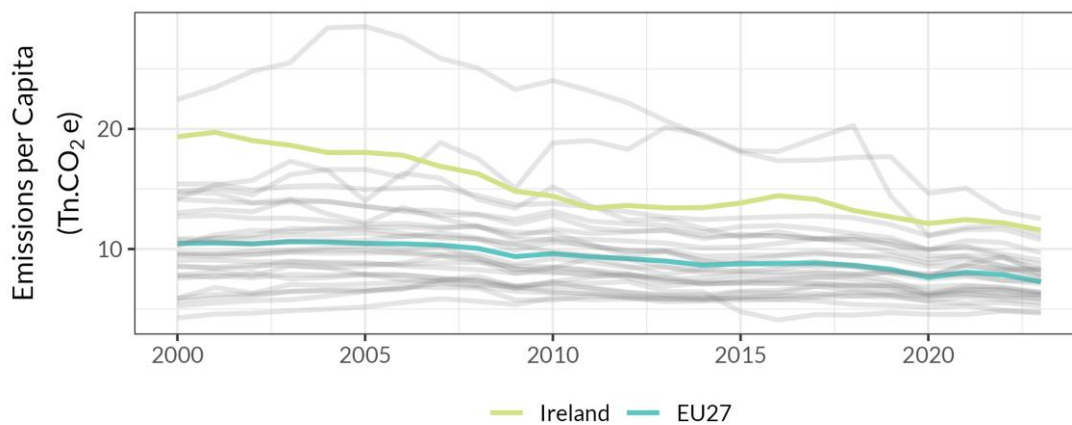
Source: EDGAR - Emissions Database for Global Atmospheric Research [link]

Agriculture and Transport/Storage sectors account for over half of Emissions
C.2 | National Emissions

Chart C.2 presents the share of emissions by sectors across the EU and in Ireland (2022). This chart highlights the relative intensity of agricultural emissions in Ireland compared to the EU. In contrast, energy supply and households account for a larger share of emissions across the EU when compared to Ireland.
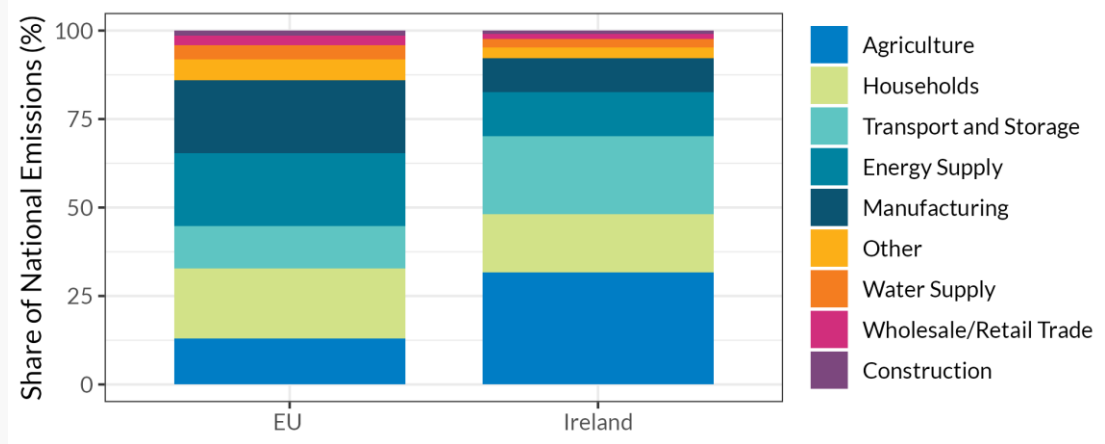

Source: Eurostat [link]
Notes: energy supply includes electricity, gas, steam and air conditioning supply

Energy Cost Pressures Highest Amongst Low-Income Group
C.3| Households

Chart C.3 compares household CO_2 emissions across euro area countries in 2021. Average Irish emissions are the highest within this group (9.3 tonnes). Also displayed are energy-to-income ratios, both overall (average) within each country and for low-income households (defined as those with income in the bottom quarter). While the average share of income spent on energy in Irish households (7.6%) is in line with other countries, this is not the case for low-income households in Ireland, whose energy-to-income ratio is the highest in the euro area (17%).
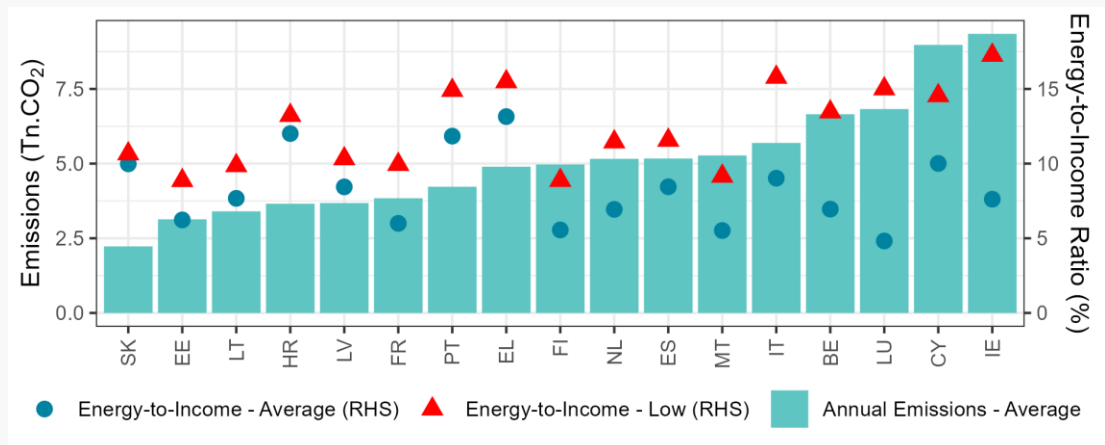

Source: own calculations using CSO Household Budget Survey and EU-SILC
Notes: see Adhikari et al. (2023) for more details [Link]. Emissions and energy estimates calculated in EU-SILC using analysis of fuel expenditures from the Household Budget Survey.

Back to "Contents"

Residential Sector Emissions Declining Over Time
C.4 | Households

Households are the third-highest emitting sector in Ireland (see Chart C.2). The main source of household emissions in 2023 were from liquid fuels (household heating oil) and gas, which together account for 79% of total household emissions. The prevalence of coal has declined significantly from 17% in 2013 to 8% in 2023. Household emissions have declined considerably since 2013 (24%) and are projected to decline a further 9% to meet the EPA's "existing measures" forecast for 2030. In order to meet the measures set in the Climate Action Plan, however, household emissions will need to fall an additional 27% between 2023 and 2030.
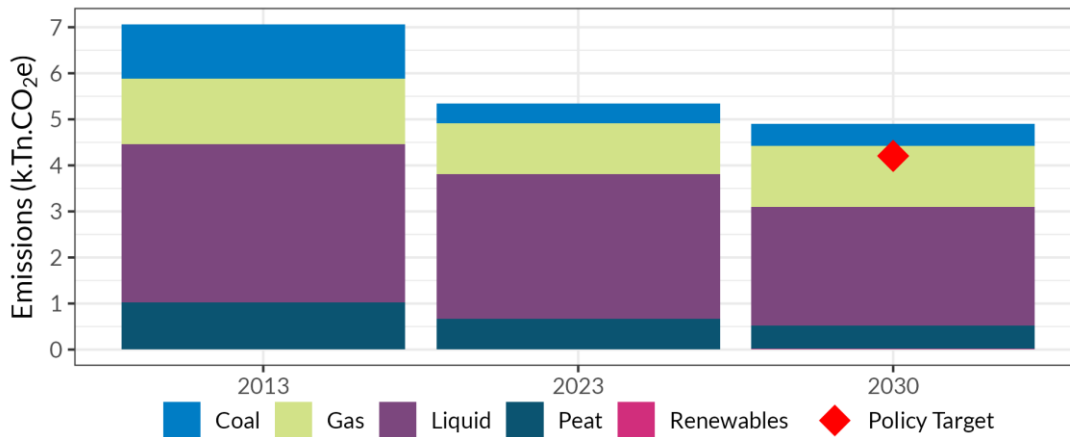

Source: EPA [link]

Household Energy Efficiency is Rising
C.5 | Households

All property sales and lettings transactions are required to have a Building Energy Rating (BER). Chart C.5 presents the share of properties with "A1-B3" BERs for new audits conducted in each year. This category has shown considerable growth over the past decade, to represent 51% of BER assessments conducted during 2023. According to available data from the CSO, the stock of properties categorised as A1-B3 has reached just over 348,000.
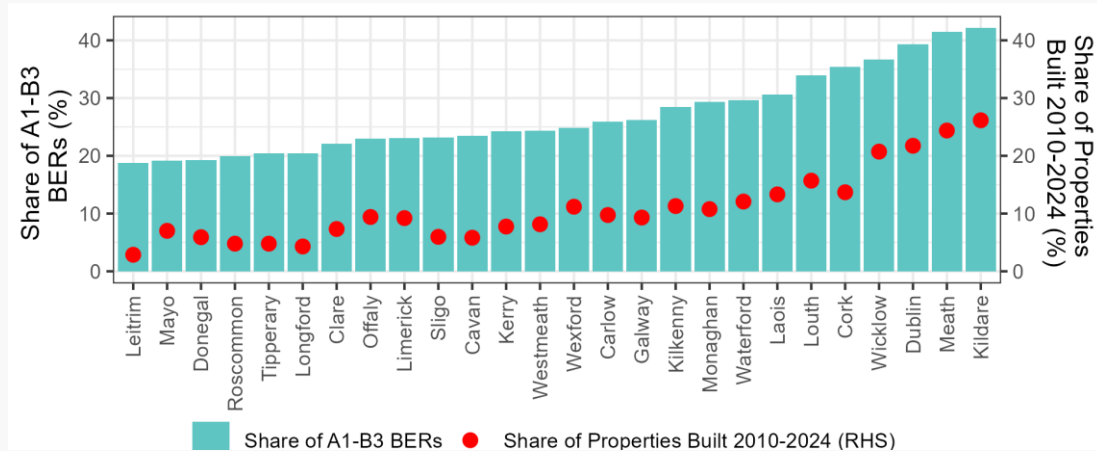

Source: CSO Table EBA02 [link]

Back to "Contents"
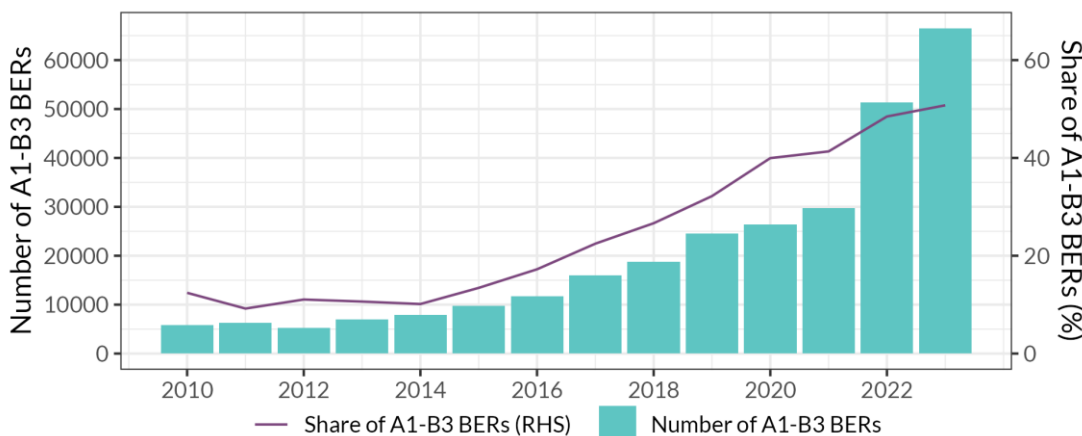
Household Energy Efficiency Varies by County
C.6 | Households

Chart C.6 depicts the share of A1-B3 BER ratings by county (for all BER assessments between 2009 and Q1 2024). A significant degree of variation in household energy efficiency exists between counties, which is part-driven by the share of new properties in each county.


Source: CSO Table EBA02 [link]

Heat Pumps Rising but Faster Growth Required for 2030 Targets
C.7 | Households

Residential heat pumps will play a key role in decarbonising residential heating. The *Climate Action Plan* 2024 has a target of 680,000 heat pump installations by 2030. Chart C.7 presents the number of properties with heat pumps by BER assessment year. Installations continue to grow rapidly, with installations in 2023 increasing 23% from 2022. Since 2012, there have been 106,900 installations.
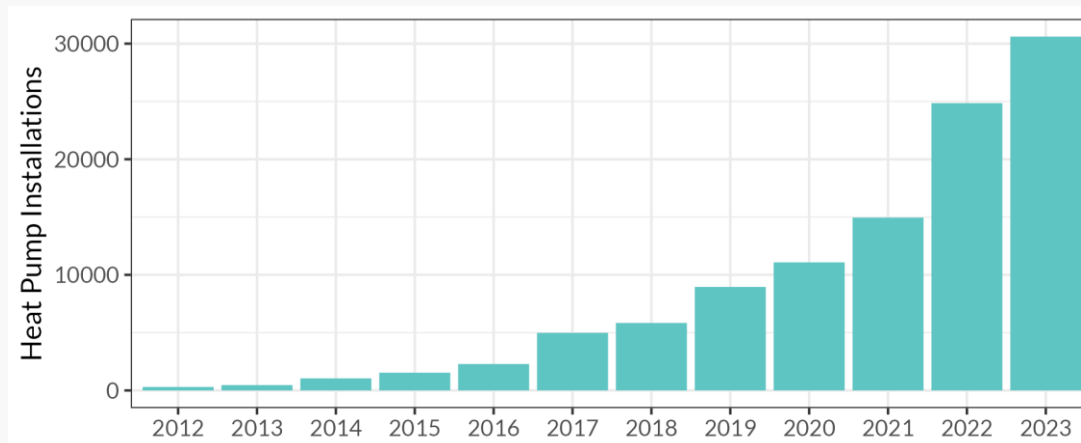

Source: own estimates based on the SEAI BER database [link]

Rise in Residential Energy Prices Higher than Euro Area
C.8 | Prices

Eurostat publish cross-country residential energy price data on a half-yearly basis. While Irish household gas prices (right panel) were similar to the Euro Area average up until mid-2022, they increased at a faster pace after. The most recent data (H1 2024) show gas prices in Ireland (right panel) converging back towards the euro area average. For electricity (left panel), prices in Ireland have historically been higher than the EA. Household energy supports in Ireland in H1 2022 and H1 2023 reduced household prices significantly, however, the latest data show that electricity prices in Ireland are 22% higher than the euro area average.
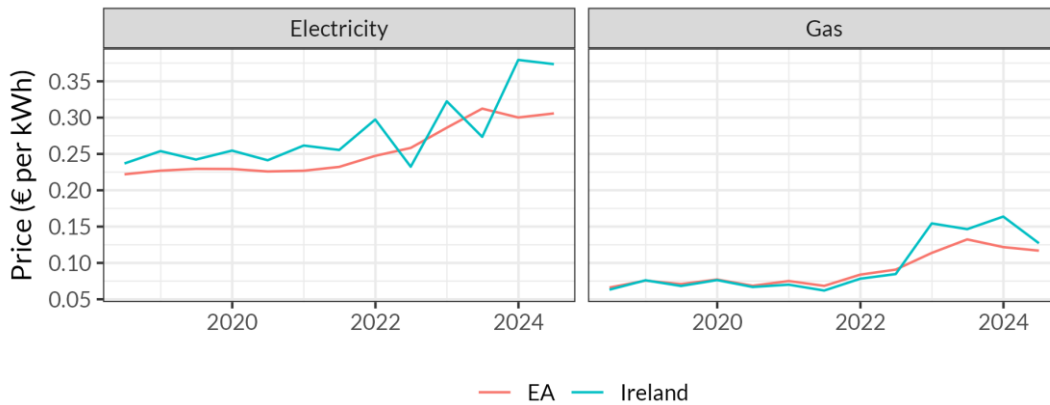

Source: Eurostat electricity [link] and gas [link]
Notes: prices include taxes and levies. Band DC used for electricity and band D2 used for gas

## CO_2 Intensity of Business Sectors Lower than EU
C.9 | Business

In Chart C.9, sectoral emission intensity is measured as the quantity of CO_2 (Scope 1) per €Mn of Gross Value Added (GVA). This is displayed for Ireland's top five emitting business sectors relative to the EU average, excluding agriculture, power and transport (explored in detail separately below). CO_2 intensity is lower in Ireland across all sectors, particularly in manufacturing due to significantly smaller shares of heavy (Scope 1-intensive) industry here.
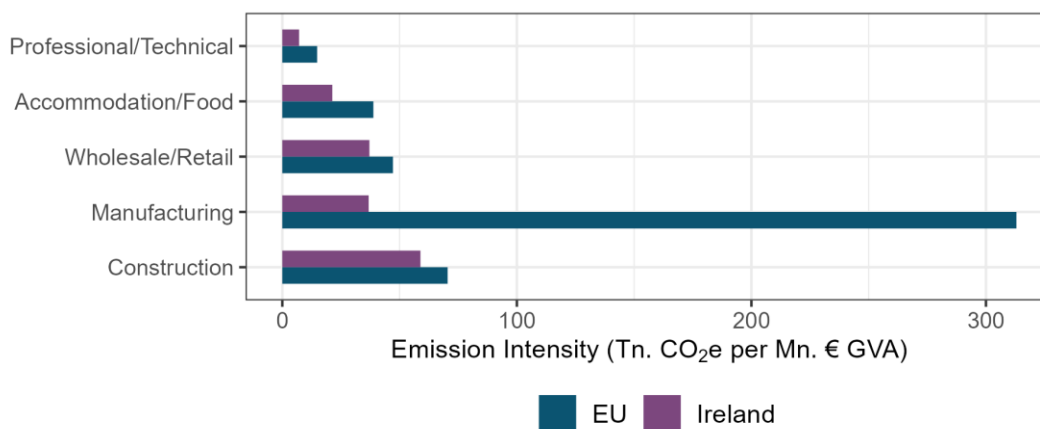
Source: own calculations using Eurostat emissions [Link] and GVA [Link]

Back to "Contents"

Non-Residential Building Energy Efficiency lower than Residential
C.10 | Business

Chart C.10 shows the share of A1-B3 BERs from 2009 to Q3 2024 on a regional basis for non-residential buildings. Across all counties, less than a quarter of these buildings have a rating between A1-B3. Overall, the share of efficient properties is lower than the residential sector (Chart C.6).
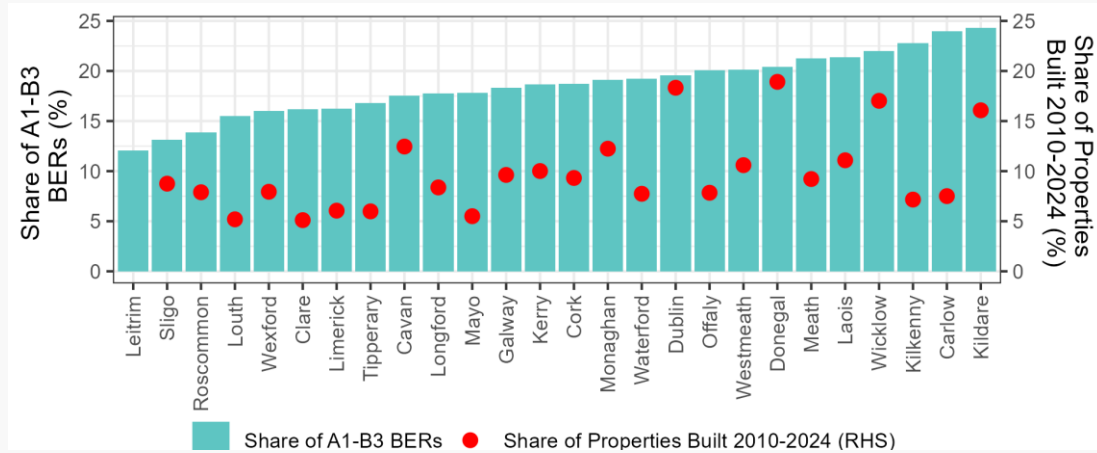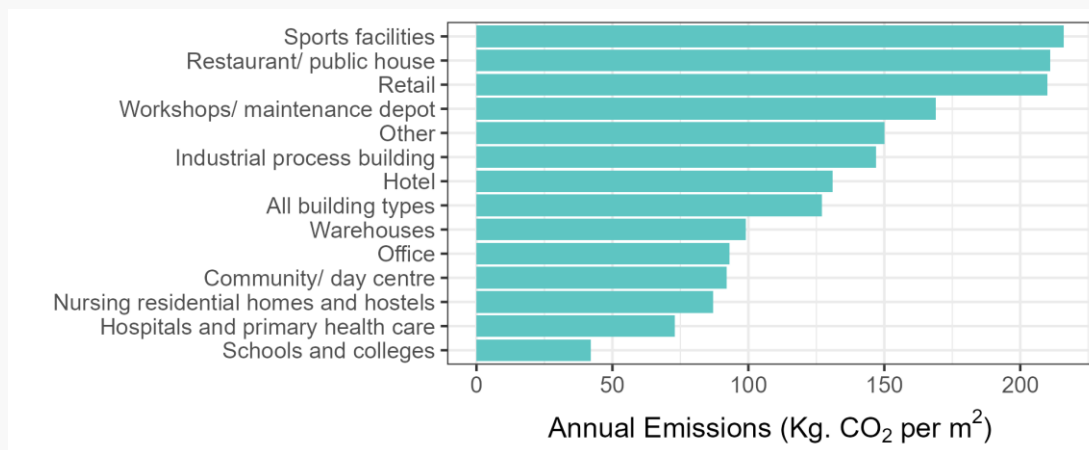

Source: CSO [link]
Note: share of properties built 2010-2024 is missing for Leitrim due to data availability

Emissions Vary Substantially by Building Type
C.11 | Business

Chart C.11 presents average annual CO_2 emissions by non-residential building types. School buildings are more energy efficient, emitting 67% less than average, whereas sports facilities and restaurants emit 70% and 66% more.


Source: CSO [link]

Back to "Contents"

Transport Emissions
C.12 | Transport

90% of transport emissions relate to road transport (2023). Emissions in this sector have increased by 6.7% since 2013. This rise is considerably lower than the growth in vehicle numbers, which reflects fuel efficiency improvements over this time. Under the EPA's "existing measures" forecast, emissions will decline by 5.1% between 2023 and 2030. However, if all additional measures required to meet targets are fully implemented, emissions will decline by 26%.
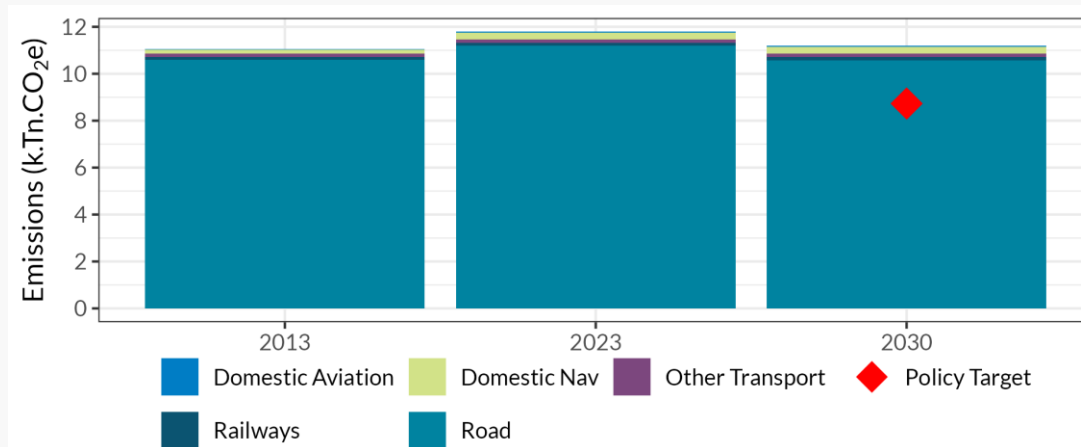

Source: EPA [link]
Notes: figures exclude international aviation

Transport Emissions Dominated by Private Cars and Declining Over Time
C.13 | Transport

Chart C.13 presents final energy by road transport. Private cars account for the majority of road emissions (58% in 2022), followed by heavy and light goods vehicles (23% in 2022). Road emissions increased 5% between 2021 and 2022 but still remain 6% lower than pre-Covid levels in 2019.
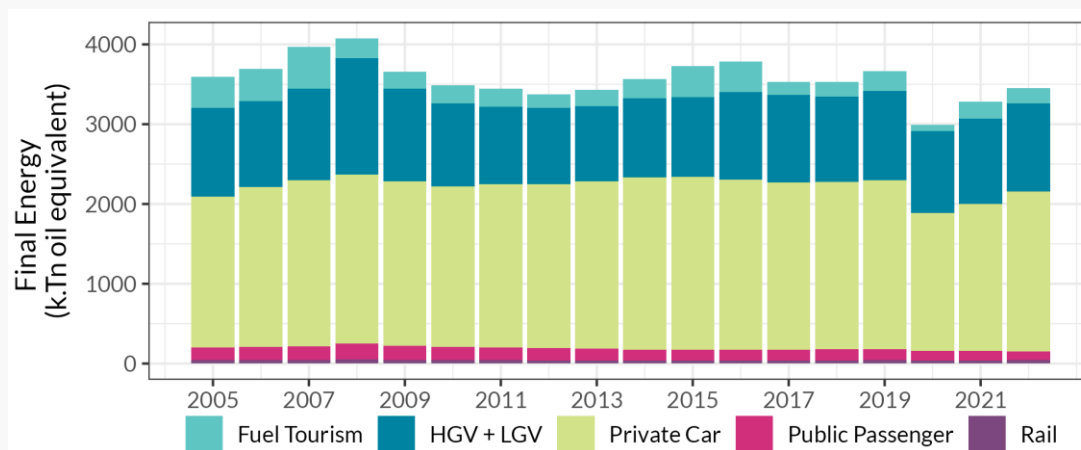

Source: SEAI [link]
Notes: fuel tourism is defined as fuel that is bought within the State by private motorists and hauliers but consumed outside the State

Share of Electric Vehicles Rising But Far From Target
C.14 | Transport

Chart C.14 shows all numbers of private vehicles licensed by fuel type (electric and non-electric). The Climate Action Plan 2024 aims for 845,000 private EVs on the road by 2030. Annual EV registrations have grown from 0.02% in 2010 to 15% in 2023. By end-2023, cumulative EV licenses (62,459 vehicles) represent 7% of 2030 targets. Monthly data show that EV licensing has declined by 24% in the first 10 months of 2024 compared with 2023, while non-EV licensing has increased 12% over the same period.
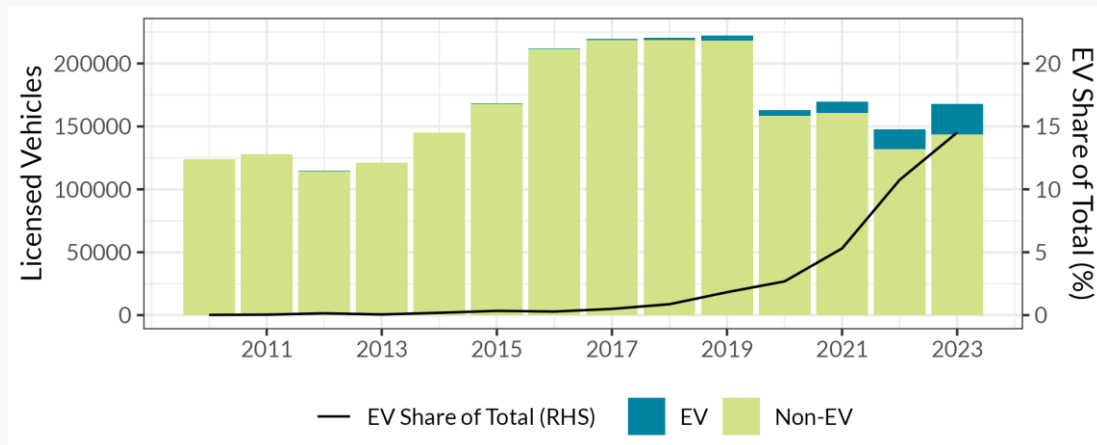
Source: CSO Table TEM27 [link]

Energy Industry Showing Rapid Decarbonisation
C.15 | Energy

"Energy Industry" emissions are dominated by electricity generation (95% in 2023). The sector has shown considerable decarbonisation over the past decade – emissions have reduced 32% between 2013 and 2023. Current measures in place have the energy sector on track to reduce emissions by 45% by 2030 but with full implementation of the Climate Action Plan, the EPA project that emissions will decline 51% between 2023 and 2030.

Source: EPA [link]

Back to "Contents"
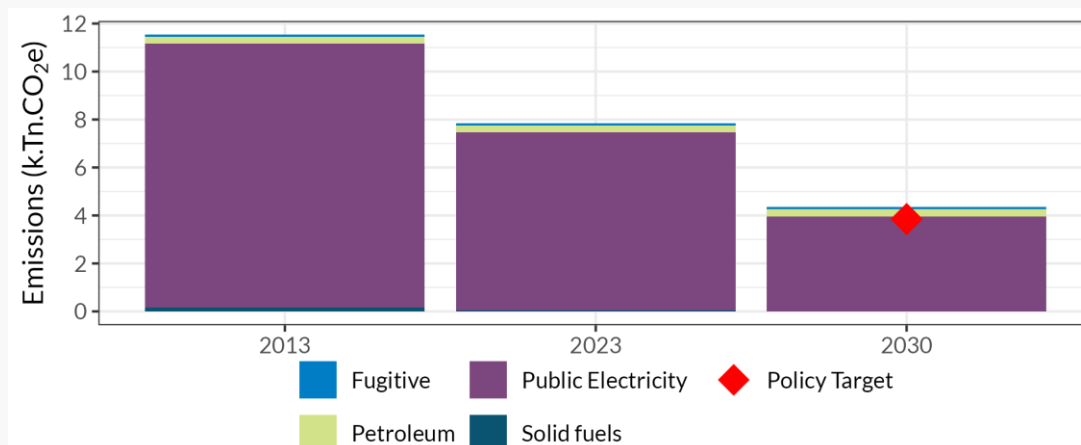
Shift to Renewables Significant but Stagnant
### C.16 | Energy

Chart C.16 presents the CO_2 intensity of Irish electricity – measured in grams of CO_2 per kilowatt-hour (the standard unit of electricity). Emissions from this sector in 2022 were 4.5% lower than 2021 and 37.6% lower than 2012. A large driver for this decline is the increase in the share of renewables (from 20% in 2012 to 39% in 2022) and the decline in coal (35% to 22% over the same period). While the increase in renewables is encouraging, the share has not improved since 2020.
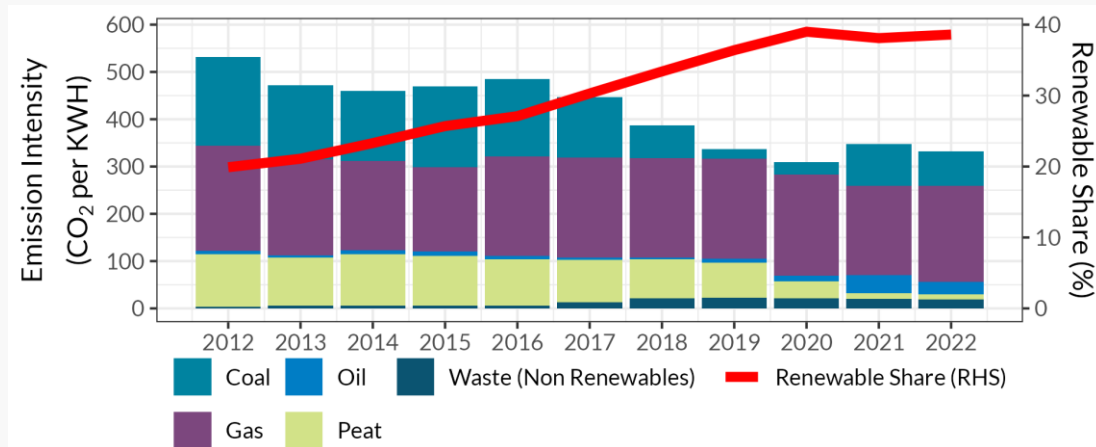
Source: SEAI [link] and EEA [link]

Wholesale Energy Prices
C.17 | Prices

Chart C.17 presents the CSO's wholesale price index (Base 2015, excluding VAT) for four fuels. While prices peaked in 2022 (Ukraine war), they have since declined (although rising again since mid-2023). Wholesale electricity prices are now back to pre-war levels but remain elevated relative to pre-2021 levels.


Source: CSO [link]

Back to "Contents"
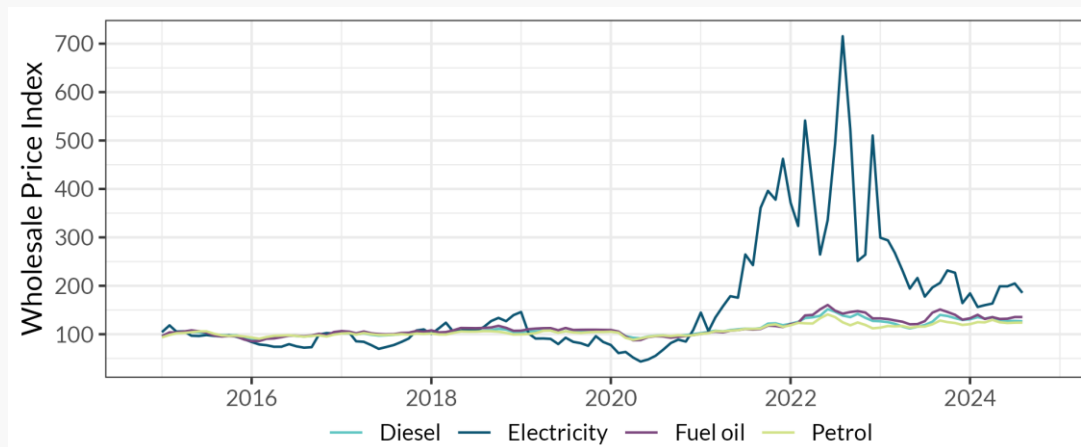
Agricultural Emissions Projected to Increase by 2030
C.18 | Agriculture

Ireland's relatively high national emissions in the EU is primarily due to high levels of agricultural activity. The agricultural sector accounts for the highest share of Ireland's greenhouse gases and these emissions continue to increase. Between 2013 and 2023, emissions increased 7% in the sector. In 2023, 75% of agricultural emissions were connected to livestock – enteric fermentation and manure management. Unlike other high-emitting sectors, the EPA projections show that agricultural emissions are projected to increase between 2023 and 2030 (by 11%). However, if all measures in the Climate Action Plan are met, agricultural emissions would decline by 8%.
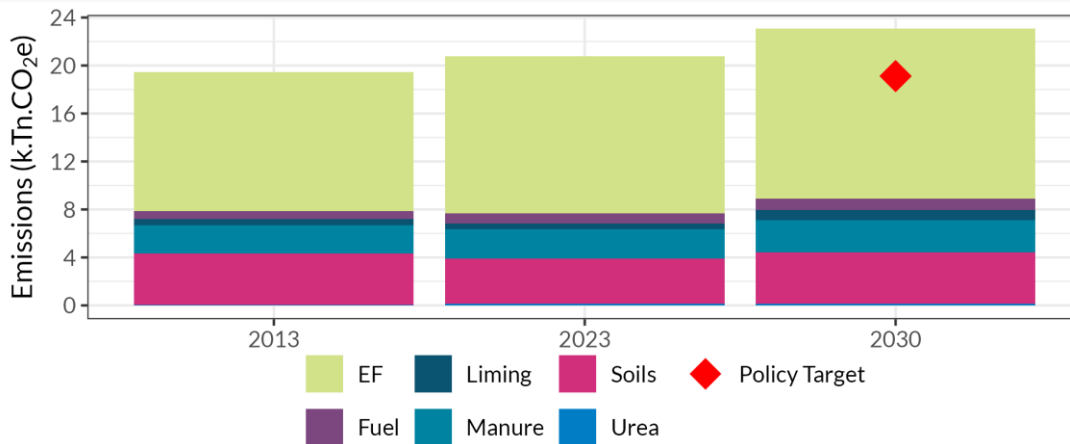
Source: EPA [link]

Agricultural Emissions Driven Largely by Livestock
C.19 | Agriculture

The previous chart showed that livestock is the main source of agricultural emissions and growth. Chart C.19 presents trends in the main components of national livestock (dairy cows, non-dairy cattle and sheep). Relative to 2013, there has been a 4% decline in the number of non-dairy cattle, while the number of sheep and dairy cows have risen by 13% and 40%, respectively.

Source: CSO [link]

Back to "Contents"
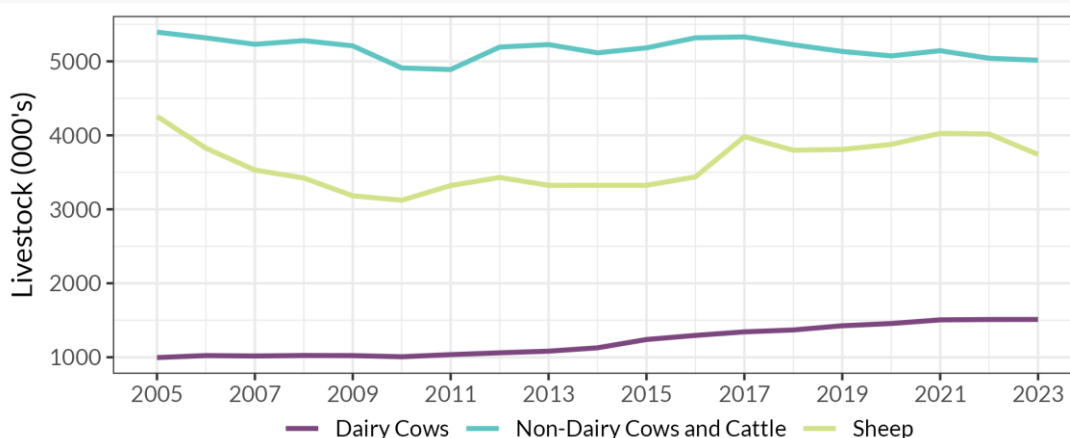
Land Use Sector in Ireland is a Net Emitter
C.20 | Land Use

The "land use, land use change and forestry" (LULUCF) sector is critical to meeting climate targets for most countries. In 2022, the LULUCF sector removed 7% of the EU's annual greenhouse gases (EEA, 2024). Chart C.20 shows the removals and emissions of the LULUCF sector in 2021 scaled by total land area across EU countries. Ireland is one of few countries where the LULUCF sector is a net emitter of CO_2.
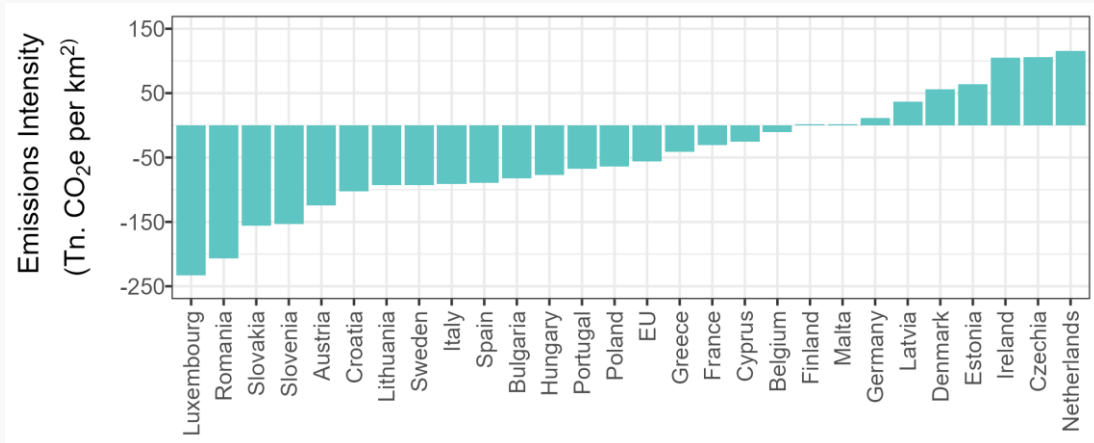

Source: own calculations using total emissions reported by European Environment Agency [link] and total land area reported by Eurostat [link]

LULUCF Emissions Driven by Grasslands and Wetlands
C.21 | Land Use

Chart C.21 looks more closely at the sources of emissions in Ireland's LULUCF sector. Agricultural land management is an important factor in the emission or removal of GHGs; emissions from Grasslands and Wetlands are significant, due largely to the drainage of organic soils. Peat extraction and conversion of peatland to grassland or forestry also releases high levels of carbon.
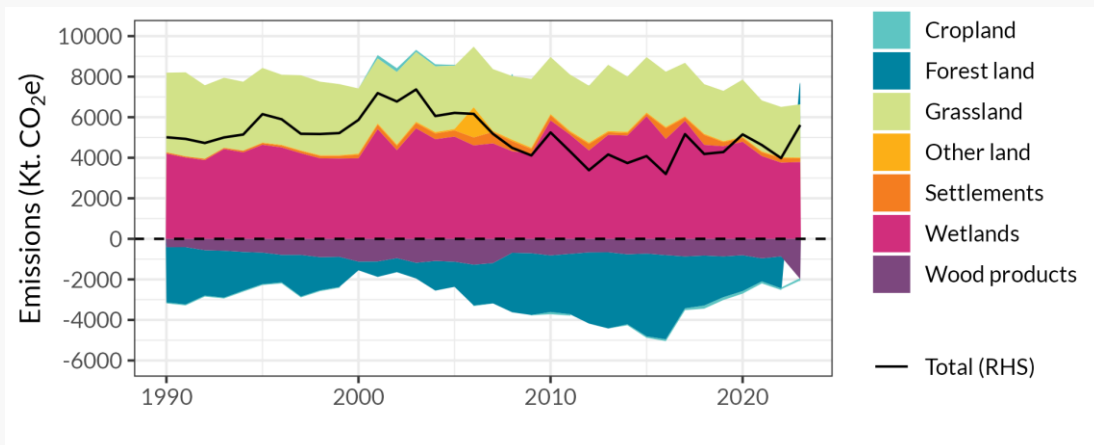
Source: EPA [link]

Forest and Woodland Ecosystems Expanding Gradually
C.22 | Land Use

Forest land serves as an important carbon sink, offsetting emission in the LULUCF sector. Chart C.22 presents the extent of forest and woodland ecosystems by ecosystem type. The majority of forest land in Ireland is dominated by Coniferous forests (76%). Total forest and woodland area has increased 5.6% from 2012 to 2021, but the rate of growth has declined over recent years.

Source: CSO [link]

Afforestation Rates Declining Significantly
C.23 | Land Use

Planting of trees on land not previously under forest (referred to as afforestation) is a significant driver in the growth of total forest areas. While total forest area has increased over recent years, the growth rate has slowed considerably (2.3% growth from 2015 to 2018 compared with 0.9% growth from 2018 to 2021). This slowdown is reflected in the decline of afforestation, which fell from over 6,000 hectares prior to 2017 to just 1,652 hectares in 2023. The Climate Action Plan has a target of achieving afforestation rates of 8,000 hectares per year.

Source: CSO [link]

Back to "Contents"
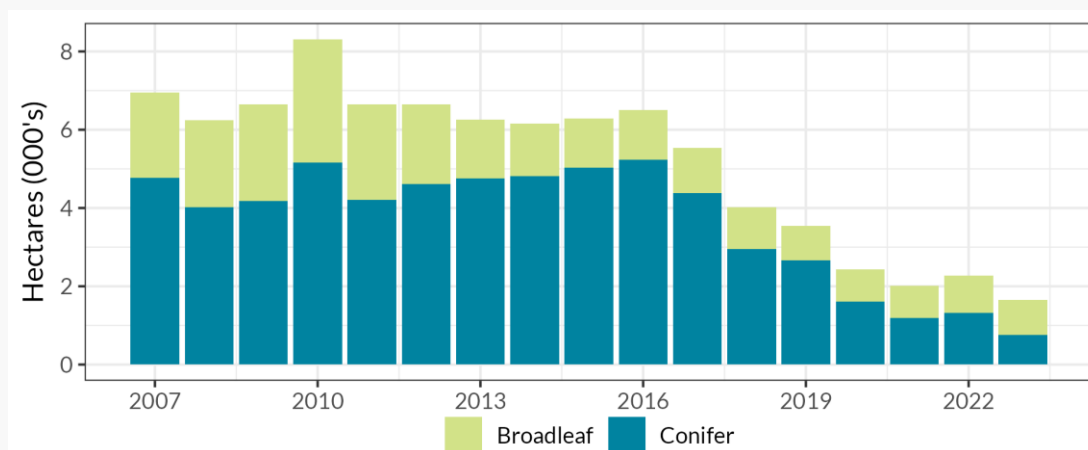
Box 3: Climate Policy Context for Ireland

By Wendy Disch (Climate Change Unit)

International Commitments

Scientists and governments agree that the accelerating impact of climate change must be reversed. Ireland has been active in committing to targets set by global treaties, EU-wide targets and national level policies. All of these measures seek to reduce greenhouse gas emissions and support a transition to net zero. As the first legally binding international treaty on climate change, the Paris Agreement paved the way for many of the policies that followed on climate action. Ireland is one of 190 countries that signed the Paris Agreement in 2016, which aims to limit the increase in global temperatures to 1.5°C.

EU member states contribute to their commitments under the Paris Agreement and have come together to develop policies set at the European level, such as the European Green Deal, a far-reaching framework for reaching net zero by 2050 (European Commission, 2019). In order to meet its 2050 goal, the Green Deal also includes the "Fit for 55" package, which sets out to align EU laws with a 55% reduction in emissions by 2030, compared to 1990 levels. Covering targets relating to climate change, biodiversity loss and pollution, the European Green Deal sets out the key parameters within which Ireland has aligned its national targets.

The EU has also established an EU-wide Emissions Trading System (ETS) for high-emitting sectors, in which participants purchase allowances for every tonne of emissions emitted. The ETS is a central policy to achieving the EU target of a 62% GHG emissions reduction by 2030, relative to 2005 levels.

National Policy Commitments

While this Box focuses on actions relating to Climate Action, it's worth noting that Ireland has adopted measures to improve air and water quality, protect biodiversity, reduce waste generation and promote sustainable development.

The Climate Action and Low Carbon Development (Amendment) Act 2021 was signed into law in 2021 to affirm Ireland's commitment to halving emissions by 2030 and reaching net-zero by 2050, as agreed upon in the Paris Agreement and European Green Deal. The Climate Action Plan 2024 (CAP24) sets the framework for achieving these goals. CAP24 is the third annual update to Ireland's Climate Action Plan; it builds upon the establishment of carbon budgets and sectoral emission ceilings set in 2023 and integrates the principles of Ireland's Just Transition Framework.

Sectoral emission ceilings are prepared in alignment with Ireland's carbon budget programme. This programme designs a carbon budget which represents the total amount of emissions that may be released in an agreed upon five-year period.

While Ireland has made progress on reducing emissions and progressing on several targets, there is a significant need to intensify activities to address climate change. EPA projections show that reaching 2030 targets will require full implementation of all emission-reducing policies, including a shift away from fossil fuels in the energy sector (EPA 2024). Recent EPA estimates indicate that Ireland has already used 47% of its 2021-2025 carbon budget by the end of 2022, therefore requiring a 12.4% reduction in emissions each year to stay within budget.

Section C of the Climate Observatory provides a more in depth view of sector-specific progress on these targets.

Table 3.1: Summary of National Targets

| Sector	Target
Energy & Electricity	• 75% reduction in emissions by 2030 (2018 base) • Share of renewable energy 50% by 2025 and 80% by 2030
Built environment	• 5.7 TWh of biomethane used across the heat sector • District heating growth 2.7 TWh
Agriculture	• Reducing methane and nitrous oxide emissions • -25% (17.25 Mt CO_2eq.) per annum by 2030
Transport	• 20% reduction in total vehicle kilometres travelled • 50% reduction in fossil fuel usage • 845,000 private EVs and 95,000 commercial EVs
Industry	• Reduce fossil fuel demand by 10% by 2030 • 50-55% carbon-neutral heating in the industry by 2025 and 70-75% by 2030 • Decrease by at least 30% embodied carbon for materials by 2030
LULUCF	• Afforestation rates of 8,000 kha/year • Rehabilitate 33,000 ha of peatlands of exploited Bord na Móna peatlands and additional 30,000 ha exploited peat rehabilitated • Increase sequestration in tillage land and grassland on mineral soils and promote carbon farming

Part D: Central Bank of Ireland Emissions

The Central Bank established a Sustainability Taskforce in 2022 to coordinate improvements in operations as a means of meeting the Bank's path to net zero emissions by 2050. In addition, the Central Bank is committed to incorporating sustainable investment principles into the management of our discretionary Investment Assets. We established our Sustainable Investment Charter in 2022, which guides us in considering how sustainable investment principles apply to our own investment practices. The Bank also publishes climate-related financial disclosures, as part of a common Eurosystem stance. The common reporting framework considers the recommendations of the Task Force on Climate-related Financial Disclosure (TCFD).

Carbon-Intensity of Investment Assets Similar to 2022
D.1 | Own Emissions

Chart D.1 presents emissions (Scope 1) associated with the Central Bank's sovereign asset holdings for two metrics: total CO_2e emissions (TCE) and weighted average CO_2e intensity (WACI). Sovereign/sub-sovereign bond holdings accounted for 76 per cent of the Investment Assets in-scope for emissions calculations. Holdings of these assets in 2023 were associated with 1.98 Mn. tonnes of CO_2e. Since 2020, the TCE has decreased 25%, driven largely by the reduction in the absolute size of the Investment Assets, while the WACI metric has reduced by 14% over the period.
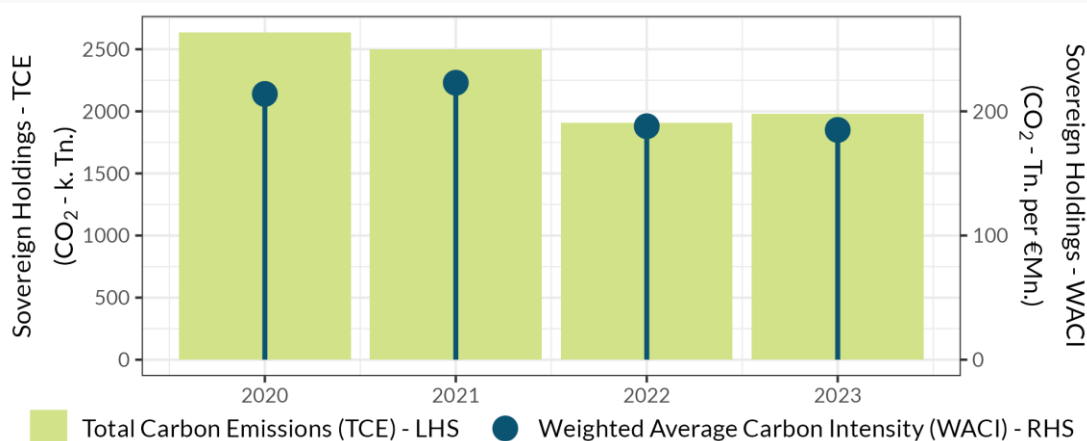
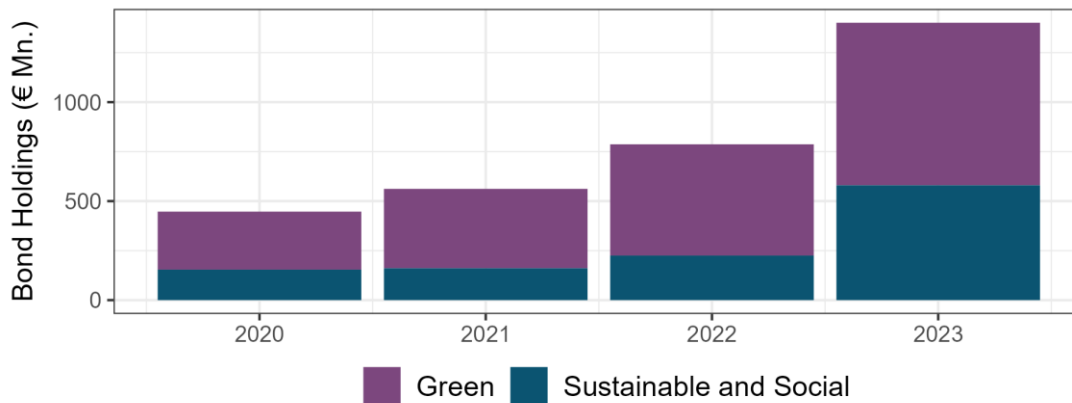*Source*: Central Bank Financial Markets Division [Link]
Notes: TCE is estimated using production emissions excluding effects of LULUCF. Given the lagged nature of certain input data for the calculation of climate metrics, our reported metrics in any given year are subsequently revised and restated in light of updated data becoming available. See source publication [Link] for full methodological details.

Central Bank's Holdings of Green, Social and Sustainable Bonds up almost 80%
D.2 | Own Investments

The Central Bank invests in thematic bonds comprising Green, Social and Sustainability (GSS) bonds, issued by multilateral development banks, supranational organisations, governments and sovereign-linked agencies. The Central Bank also invests in green bonds indirectly via the Bank for International Settlements (BIS) green bond funds for central banks. The Central Bank has increased its GSS bond holdings significantly, from €787 million in 2022 to €1.4 billion in 2023. In addition, we have set a target to increase our allocation to GSS bonds to €2.0 billion by the end of 2024, subject to availability.
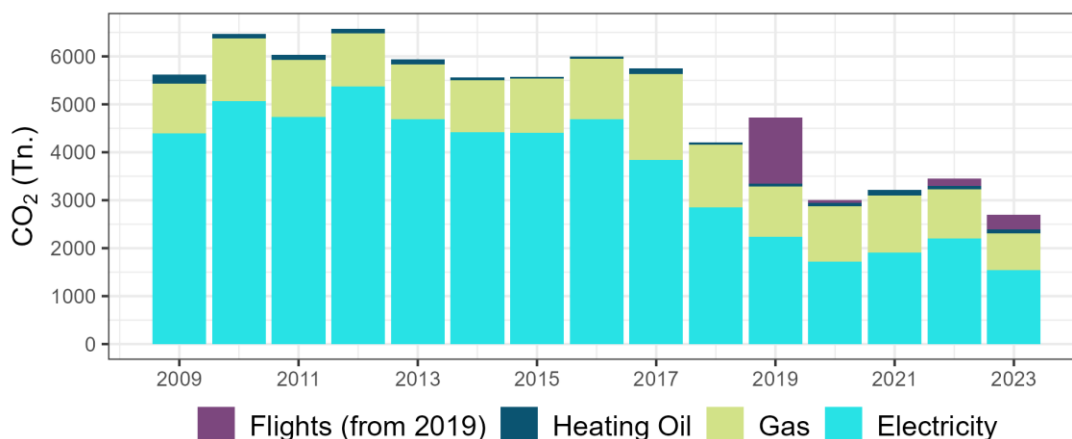

Source: Central Bank Financial Markets Division [Link]
Notes: Bank for International Settlements (BIS) green bond funds support, for example, clean transportation, renewable energy and green buildings.

Emissions from Central Bank Operations Declined in 2023
D.3 | Operations

The majority of emissions from Central Bank operations in 2023 were associated with electricity use (Scope 2 – 1,548 tonnes), followed by gas (Scope 1 – 767 tonnes). Between 2022 and 2023, total emissions declined 22%. While emissions from flights have increased in 2023, they remain below pre-Covid levels. Flight emissions in 2023 were 78% less than 2019.

Source: Central Bank Financial Markets Division [Link]
Notes: Bank for International Settlements (BIS) green bond funds support, for example, clean transportation, renewable energy and green buildings.

Box 4: European Sustainable Finance Regulation

By Jonathan McKeon (Climate Change Unit)

Timeline of recent developments

Sustainable Finance refers to the process of taking into account environmental considerations when making investment decisions. The European Union has developed regulations that aim to channel private investment into the transition to a climate-neutral, climate-resilient, resource-efficient economy, as a complement to public money.

The table below contains a timeline of the European Sustainable Finance regulations that have come into effect over the last 12 months, as well as public reports, opinions, and responses to them by the Bank and other European institutions.

		Summary
Central Bank of Ireland response to SFDR	Dec 2023	The report acknowledges the importance of disclosures in securing funding for a green transition, gives feedback on the Bank's experience implementing SFDR, and suggestions to consider when developing product categories.
ESMA Guidelines on funds' names	May 2024	The guidelines limit the use of ESG related names to funds that meet ESG criteria in SFDR (80%), or to the share of sustainable investments for sustainability-related terms (50%).
ESA Report on Greenwashing	June 2024	The report makes findings on how the supervision of greenwashing could be enhanced in the coming years, makes recommendations to NCAs and the European Commission and sets out actions ESMA is taking on greenwashing.
Joint ESAs Opinion: Assessment of SFDR	June 2024	The opinion recommends introducing a categorisation system and/or an indicator of sustainability for financial products to enable retail investors to better understand their underlying sustainability profile. It also proposes reviewing the definition of "sustainable investment", simplifying disclosures, and increasing transparency about the adverse ESG effects of financial products.

		Summary
ESMA Opinion: Functioning of SFDR	July 2024	The opinion sets out ESMA's long-term view on Sustainable Finance Framework. It contains recommendations on testing, the EU Taxonomy, supporting the transition, transparency requirements, product categorisation, ESG data quality, and SIVC actors
ESA Consolidated Q&As on SFDR	July 2024	The document responds to questions posed by market participants on the practical application of implementation of SFDR and the SFDR Delegated Regulation. It deals with issues of scope, definitions, PAI disclosures, Financial Product Disclosures, Multi-option products, and Taxonomy-aligned investment disclosures.
EU Green Bond Standard Regulation	Dec 2024	The regulation provides a common framework of rules for issuers electing to use the "European Green Bond" label for green use of proceeds bonds that pursue environmentally sustainable objectives. It also establishes a system to register and supervise external reviewers of such bonds.

Appendix: Technical Methodology

Chart	Description
B.1	Methodology follows Lambert et al. (2023), *Financial Stability Notes* [link], where green mortgages are classified in new mortgage origination data based on observed interest rate differences (discounts) applied to energy efficient properties.
B.2	See ECB [link] for full description of methodology and caveats. Chart B.3 present the ECB's "potential exposure at risk" (PEAR) indicator and "collateral-adjusted exposure at risk". The PEAR indicator gives information on the total amount exposed to some type of natural hazard. It does not differentiate whether the probability or the intensity of the hazard event is high or low. $$PEAR = \frac{\sum_{i=1}^{N}(EXPOSURE_i | RS_{i,j} > 0)}{\sum_{i=1}^{N}(EXPOSURE_i)}$$ The CEAR indicator offers an estimate of expected losses within a financial institution's portfolio and also considers the mitigating effect of collateral pledged with a loan commitment. When evaluating physical collateral, it is crucial to factor in the potential reduction in collateral value due to the destruction of physical assets by natural hazard – and notably these aspects are reflected in the CEAR indicator. $$CEAR = \frac{\sum_{i=1}^{N} max[0, Financial\ Risk\ Ratio_i * Exposure_i - CV_i}{\sum_{i=1}^{N}(Exposure_i)}$$
B.5/B.6/B.7/B.8	See ECB [link] for full description of methodology and caveats. Charts A.5, A.6 and A.7 use the Weighted Average Carbon Intensity (WACI) indicator which calculates the weighted sum of tonnes of CO_2 emissions per million euro of revenue. The weight is equal to the percentage share of the investment in a private company in the portfolio value. $$WACI_{b,s} = \sum \left(\frac{investment_{b,i}}{portfolio\ value_{b,s}} \ x \ \frac{company\ GHG\ Scope\ 1_i}{revenue_i} \right)$$

Banc Ceannais na hÉireann
Central Bank of Ireland

Eurosystem