Banc Ceannais na hÉireann
Central Bank of Ireland
Eurosystem

Central Bank of Ireland Climate Observatory

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Summary

The Central Bank's Climate Observatory provides an annual, evidence-based view of climate science, progress on decarbonisation, and evolving financial risks. By combining Central Bank analytics with third-party data, it equips stakeholders with metrics to understand and manage climate-related risks. The Observatory is a living resource and will be enhanced as methods and data evolve. Key findings:

Part A – Climate Change: Source and Impact

- Global fossil fuel consumption pushed atmospheric CO_2 to 425 ppm in 2024 – the highest level for about 800,000 years.
- Average global temperatures in 2024 were about 1.35 °C higher than pre-industrial levels (baseline 1850–1900).
- Economic losses from extreme weather are rising: in the EU, about 25% of weather-related damage recorded since 1980 occurred between 2020 and 2024.
- Future scenarios with fast decarbonisation (aligned with 1.5°C pathways) show significantly lower impacts from extreme weather risk and a much lower likelihood of crossing climate "tipping points."

Part B – Global Transition to Net Zero

- In 2024, green energy investment made up about 65% of total global energy spending.
- Renewables (wind, solar and hydro) produced roughly one-third of global electricity in 2023 (latest year).
- Between 2014 and 2024, costs for renewable projects fell by 68% for solar, 55% for onshore wind and 49% for offshore wind.
- In 2024, global sales of electric vehicles (EVs) rose 16% and plug-in hybrids (PHEVs) rose 55%, together accounted for 22% of total sales.
- As of end-2024, global carbon prices and fossil-fuel subsidies remained far below levels consistent with IPCC 1.5°C pathways.

Part C – Irish Financial Sector

- By mid-2025, 44% of new mortgage originations were "green" mortgages (discounted rates for energy-efficient homes).
- Since 2018, the carbon intensity of investments held by funds, insurers and pension schemes has fallen, in line with the euro area averages.
- At end-2024, banks had sizable loans to non-financial companies (NFCs) in Climate Policy Relevant Sectors (about 44% of total lending).
- In 2024, the carbon intensity of Irish banks' loans to NFCs was more than twice the euro area average.
- As of mid-2025, around 6% of domestic NFC loans were exposed to flood risk (based on a 1-in-100-year event) and this share is projected to rise without adaptation.

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Part D – Irish Economy

- In 2024, Ireland had the second-highest greenhouse-gas emissions per person in the EU – about 66% higher than the EU average.
- National GHG emissions fell by around 12% between 2018 and 2024.
- Current policy projections (as of 2025) indicate that Ireland will fall short of its 2030 mitigation target (by roughly half).
- Over the decade to 2024, the carbon intensity of Ireland's electricity halved, driven by rising renewables, which supplied about 41% of electricity in 2024.
- Residential solar installations grew strongly between 2019 and 2024.

Part E – Nature and Biodiversity

- In the 2023 national habitat assessment, most Irish habitats were rated "inadequate" or "bad."
- By 2023, only about 14% of Ireland's land and 2.3% of its marine area were protected – well below EU averages.
- Forest cover stood at around 11.8% of land area in 2023, and recent tree-planting rates were below levels needed to meet climate targets.
- As of 2023, environmental expenditure and related taxation as a share of GDP was considerably below EU averages.

Part F – Central Bank of Ireland Emissions and Investments

- In 2024, the Central Bank met its €2 billion sustainable-debt investment target with holdings of green, social and sustainability bonds rising by almost 50% over the past year.
- Sovereign-bond carbon metrics (for example, weighted average carbon intensity and total CO_2) have fallen since 2020.
- Central Bank operational emissions were 2,840Tn. CO_2 in 2024 – about 65% lower than their peak in 2017.

Boxes:

- Box 1: *Climate Policy – A Year in Review*s summarises key 2025 EU and Irish climate policy developments, covering new legislation, targets for 2030/2040 and major regulatory adjustments.
- Box 2: *Rising Energy Burdens – Household Expenditure Trends, 2015–2022* uses CSO Household Budget Survey data to show sharp rises in electricity and gas spending, highlighting greater energy-poverty risks for certain cohorts.
- Box 3: *Data-centre Electricity Use in Ireland: Trends, Challenges and Future Flexibility* examines Ireland's rapid data-centre demand growth, its impact on system balance and the urgent need for storage, DSM and dispatchable capacity.

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Background

Climate change is accelerating, and faster action is urgently needed

Climate change is an escalating global risk. Atmospheric greenhouse gas concentrations, primarily from burning fossil fuels, continue to rise each year, and global temperatures are now projected to exceed the Paris Agreement's 1.5°C threshold by around 2030 – roughly a decade earlier than previously forecast.

The impacts of a warmer world are already being felt: in Europe, a quarter of all weather/climate-related damages since 1980 occurred in the past four years (€214Bn. 2021-2024), and in the United States weather/climate-related losses since 2000 total about $2.3 trillion – roughly four times the losses recorded in the preceding two decades.

Climate models indicate that very deep global decarbonisation, particularly if enacted in the next decade, could substantially reduce long-term damages. Economic analyses likewise show that while the near-term costs of rapid decarbonisation are significant, an early and orderly transition would minimise total economic costs over the course of this century.

Climate change and the Irish economy

Although Ireland is a small economy, it must play its part in meeting European and global climate targets. Both accelerating climate change and the policies required to decarbonise can affect households and businesses. Rising weather-related hazards will necessitate substantial investment in adaptation to protect communities, infrastructure and property. Biodiversity loss and ecosystem degradation can also affect the real economy through changes in productivity, prices, and asset values. Achieving net-zero emissions will require accelerated uptake of low-carbon technologies and major investment in renewable energy capacity. These changes are urgent and necessary but costly, and will require a mix of private and public investment. Importantly, the impacts and costs will not be evenly distributed across the economy: physical risks are concentrated in particular locations, and the costs and feasibility of decarbonisation vary markedly by sector and asset.

Climate change and the Irish financial sector

Real-economy impacts of climate change feed directly into the financial system. Increasing weather-related losses affect insurance pricing/availability and the value of assets exposed to climate risk. For banks, borrower repayment capacity can be affected by climate events and policy-driven changes to costs, revenues and profitability, while collateral values can decline because of physical risks and higher future energy costs tied to low energy efficiency. For investors, shifts in policy or investor preferences towards greener assets can trigger rapid repricing. Equally, the speed and success of the transition depend on the financial sector: many firms and households will require finance to adopt low-carbon technologies and adapt to a changing climate.

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The Role of Central Banks and Prudential Supervision

Climate change affects our mandates, including:

- **Financial stability**: Physical and transition risks can raise credit, market and liquidity risks across banks, insurers and funds, increasing systemic risk and the potential for abrupt repricing or contagion.

- **Prudential supervision**: Climate-related credit losses, increased insurance claims, collateral impairments, and impacts on investments can all affect the sustainability of financial market participants' business models. Supervisory authorities are incorporating these risks into supervisory guidance and activities, and expect firms to embed them in their risk-management and governance frameworks and to integrate climate scenarios into stress tests.

- **Macroprudential policy**: Regional concentration of physical risk or sectoral exposures (e.g. agriculture, real estate, energy) may call for targeted macroprudential tools or guidance to limit system-wide vulnerabilities.

- **Insurance availability**: Rising catastrophe losses will have an impact on insurance availability/pricing, affecting the resilience of households and businesses.

- **Consumer Protection:** In order to meet consumer demand for sustainable financial products, these products need to deliver on their claims and avoid greenwashing.

- **Price stability**: increased frequency and severity of weather events and transition policies can potentially add inflationary volatility, complicating inflation forecasting and monetary-policy transmission.

- **Market functioning and payments**: Climate events can disrupt markets, liquidity and payment/settlement systems; the Central Bank must monitor resilience and support orderly functioning where necessary.

- **Data, research and international cooperation**: Effective fulfilment of mandates requires better climate data, models and cross-border coordination on scenarios, disclosure and regulatory standards.

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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

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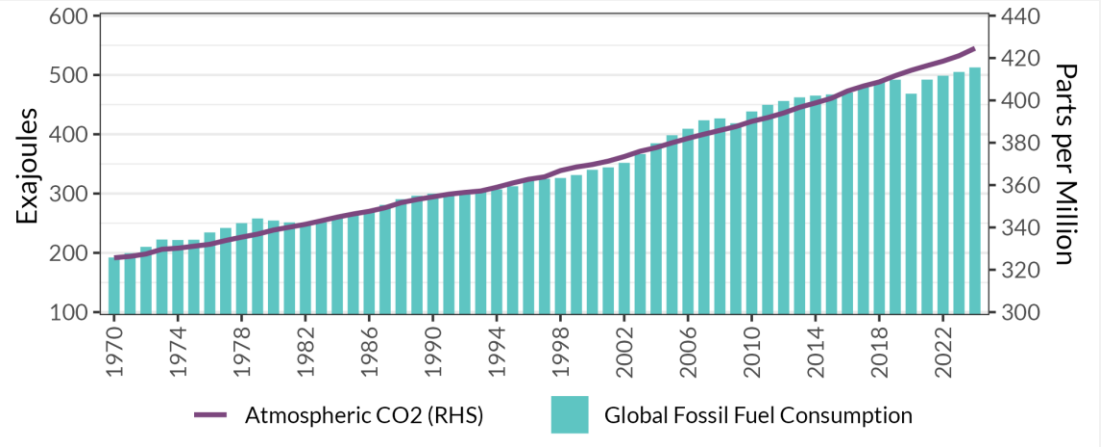
Part A: Climate Change – Source and Impact

Atmospheric CO_2 at historic high, driven by fossil fuel consumption
A.1 | Global Fossil Fuel Consumption and Atmospheric CO_2, 1970-2024

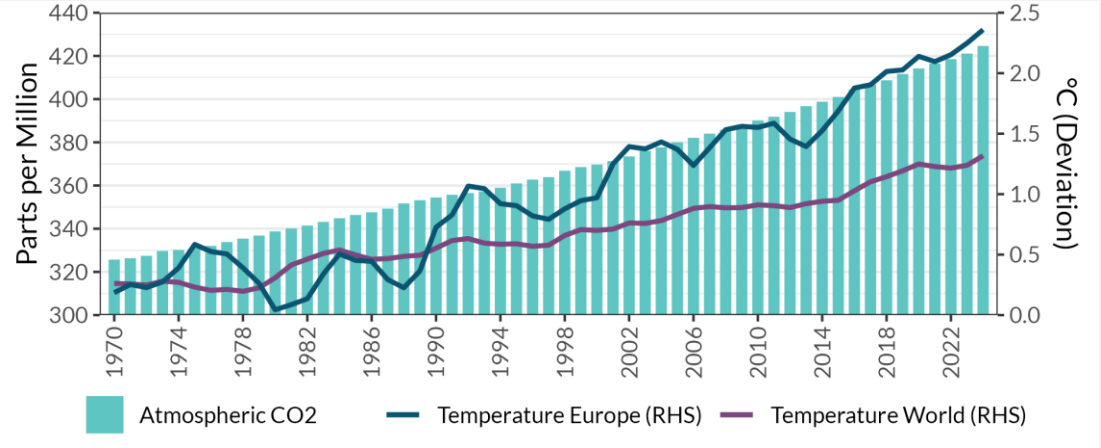
Global consumption of coal, gas and oil has risen by an average of 1.8% per year since the 1970s, with consumption in 2024 166% higher than 1970. Consequently, atmospheric CO_2 has increased from 326ppm (parts per million) in 1970 to 425ppm in 2024, the highest reading in at least 800,000 years.



Source: Own calculations using Energy Institute [Link] and NOAA [Link]
Notes: Fossil fuels are measured in exajoules of coal, natural gas and oil

Higher atmospheric CO_2 increasing temperatures, particularly in Europe
A.2 | Global Atmospheric CO_2 and Temperatures, 1970-2024

With higher concentrations of atmospheric CO_2, global temperatures have risen. Average global temperatures over the five years (to 2024) are 1.35°C higher than baseline (1850-1900), with increases significantly higher in Europe (2.4°C).



Source: NOAA [Link] and Copernicus [Link]
Notes: Temperatures are Copernicus ERA5 moving average (60-months)

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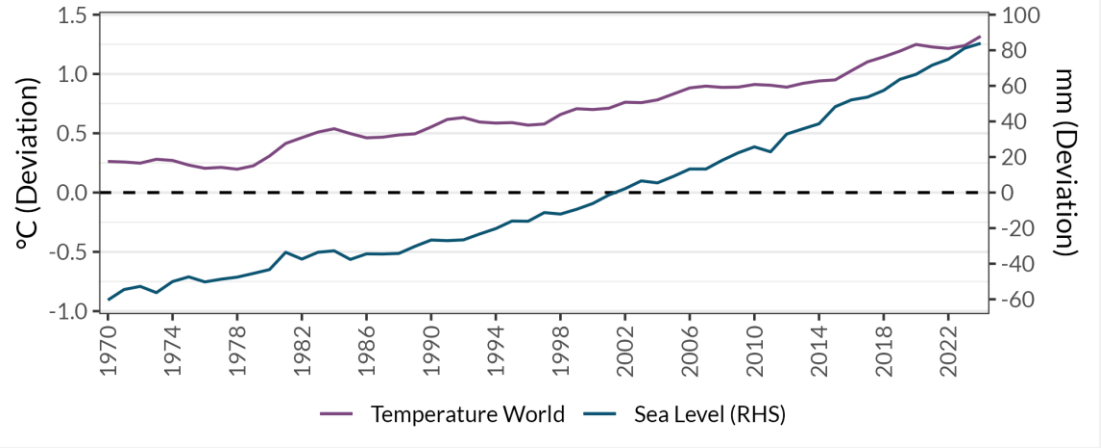
Rising temperatures increasing sea levels at an increasing rate
A.3 | Global Temperatures and Sea Level Rise 1970-2024

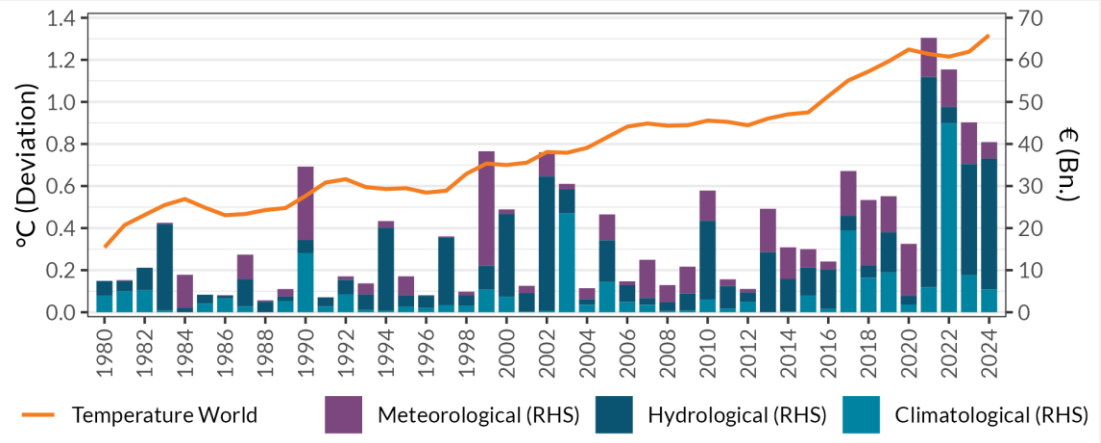
Rising global temperatures have led to ice melt and ocean expansion, both of which have increased sea levels. Sea level rise has increased from 1.7mm per year in the 1970s (average) to 4.5mm in the past ten years.



Source: Copernicus [Link] and EEA [Link]
Notes: Sea level deviation is measured relative to the 1995-2014 average

Rising temperatures causing increasing weather/climate damage
A.4 | Global Temperatures and Economic Losses (Europe), 1980-2024

Since 1980, weather/climate-related extremes have caused €823Bn in economic losses in Europe, a quarter of which have occurred in the past four years. Over the past decade, hydrological events account for most losses (43% of total), followed by climatological (32%) and meteorological (25%).



Source: Copernicus [Link] and EEA [Link]
Notes: Economic losses are adjusted for inflation (in 2024 €) and represent total direct monetary damage caused by a disaster. Climatological relate to heatwaves, wildfires, droughts, cold spells and frost. Hydrological relate to floods. Meteorological relate to storms, hail and wind.

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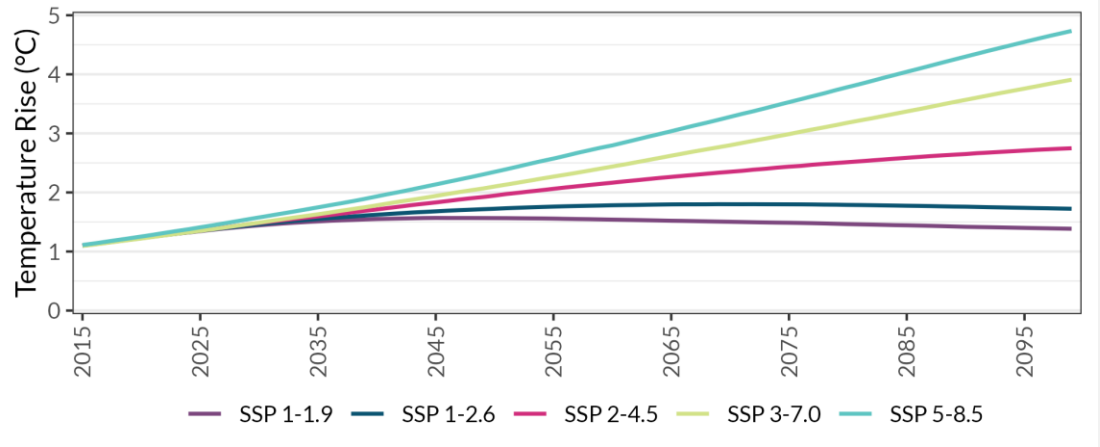
Global temperatures could rise an additional 2.4°C by 2100 if targets missed
A.5 | Forecast – Global Temperature by Climate Scenario, 2015-2100

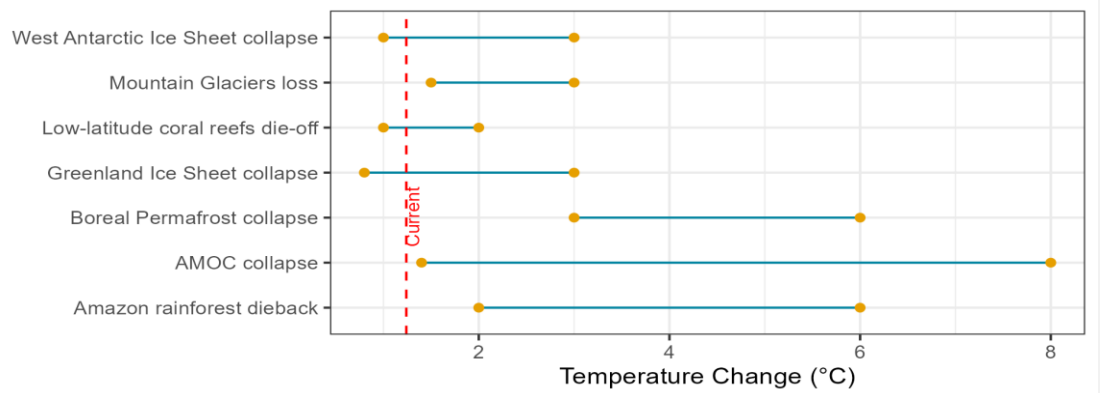
The IPCC's Shared Socioeconomic Pathways (SSPs) are plausible future development, cooperation and emissions pathways, each associated with a 2100 global warming outcome. In their best-case scenario, global temperatures would rise an additional 0.22°C by 2050 and then drop 0.18°C by 2100. In the worst-case, temperatures could rise an additional 2.4°C by 2100.



Source: IPCC [Link]
Notes: Shared Socioeconomic Pathways (SSP) are used by climate modellers to describe future development pathways associated with social and economic factors which drive fossil fuel use. The figures – for example, SSP 1-1.9 – describe how much extra heat the Earth keeps by 2100: 1-1.9 watts per square metre.

Global temperatures cross several climate tipping point lower bounds
A.6 | Forecast – Global Temperature and Tipping Points Ranges

Chart A.6 summarises the ranges at which different policy-relevant climate tipping points may be crossed. For the 2015–2024 decade average, observed warming relative to 1850–1900 was 1.24°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]

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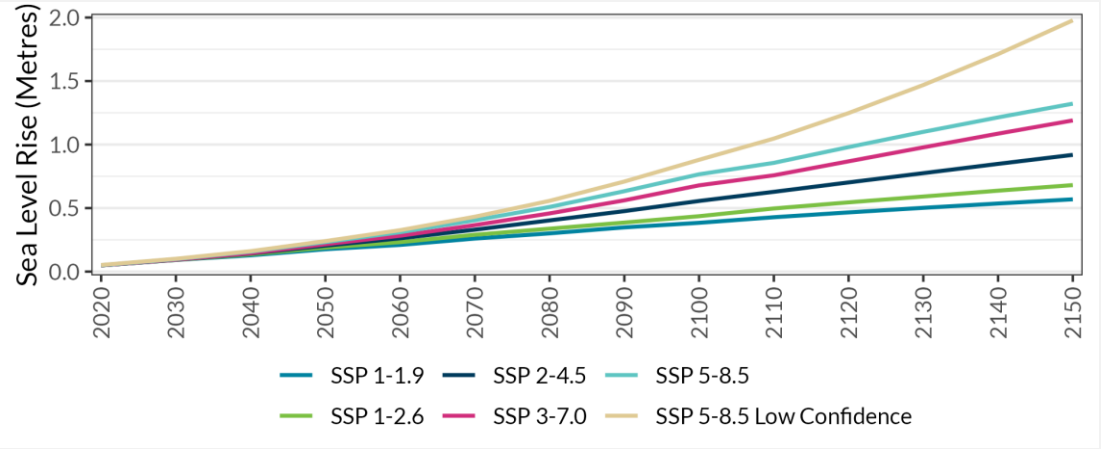
Sea level to rise by 34-83cm by 2100, and continue into 22nd Century

A.7 | Forecast – Sea Level Rise by Climate Scenario, 2020-2150

IPCC provide sea level forecasts across different SSPs. In a high decarbonisation (best-case) scenario, sea levels would rise an additional 13cm by 2050 and 34cm by 2100. Under a low decarbonisation, worst-case scenario, sea levels could rise 19cm by 2050 and 83cm by 2100.

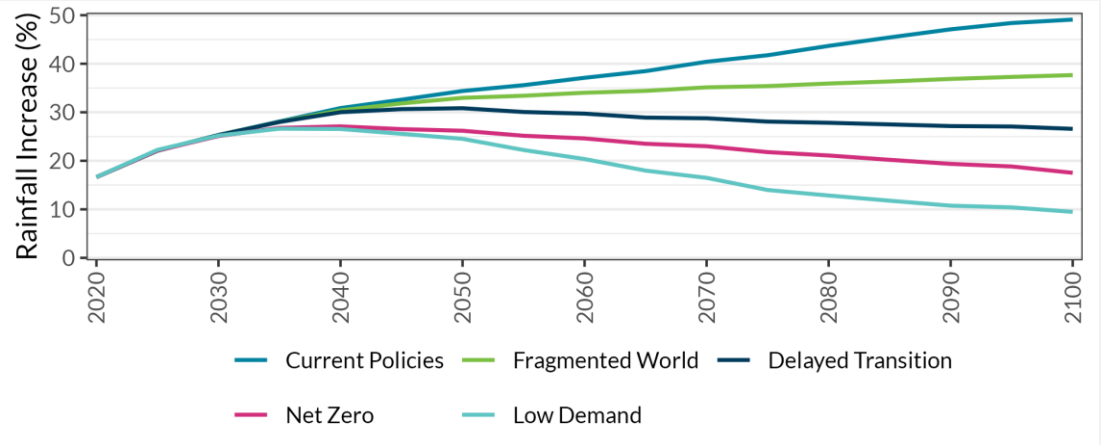


Source: IPCC AR6, accessed through NASA [Link]
Notes: Shared Socioeconomic Pathways (SSP) are used by climate modellers to describe future development pathways associated with social and economic factors which drive fossil fuel use. The figures – for example, SSP 1-1.9 – describe how much extra heat the Earth keeps by 2100: 1-1.9 watts per square metre.

Extreme rainfall to rise in Europe to at least 2040

A.8 | Forecast – Total Precipitation from Extreme Events (Europe) by Climate Scenario, 2015-2100

Increases in future extreme rainfall depend on global decarbonisation. Relative to the reference year (1995-2014), extreme rainfall is forecast to increase by 25% (Low Demand) to 34% (Current Policies) by 2050. By 2100, forecasts range from 9.5% to 49%.



Source: NGFS-aligned precipitation scenarios accessed through Climate Impact Explorer [Link]
Notes: median precipitation change is relative to 1995-2014 period

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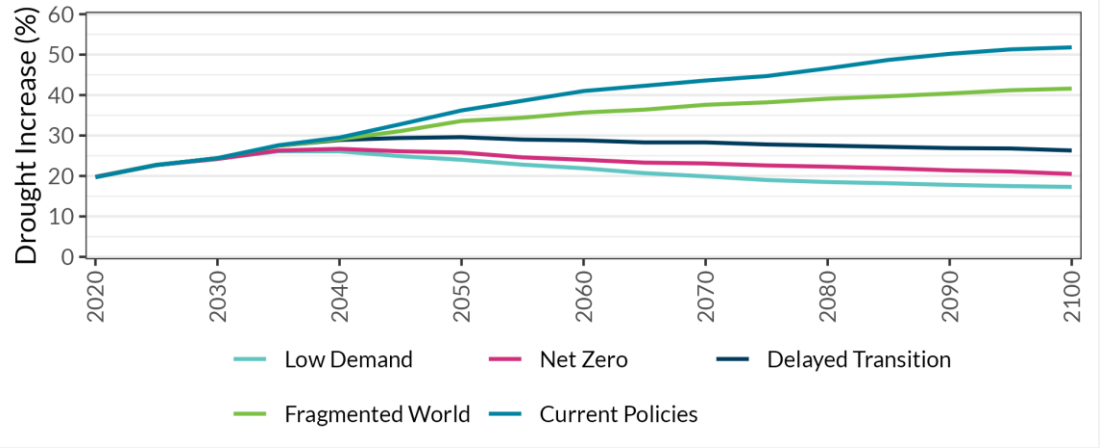
Half of Europe could be exposed to extreme drought conditions by 2100

A.9 | Forecast – Area Under Extreme Drought (Europe) by Climate Scenario, 2015-2100

In 2025, about 23% of European land is exposed to extreme drought conditions up from 18% just 10 years earlier. In the high emission, worst-case scenario, over half of European land could be exposed to drought by 2100. Under a high global decarbonisation scenario, this will decline to 17% by 2100.



Source: NGFS-aligned extreme drought scenarios accessed through Climate Impact Explorer [Link]
Notes: measure shows the share of land exposure to extreme drought conditions (SPEI-2) in at least one month per year. SPEI-2 is a 2-month index measuring short-term drought or moisture surplus based on water balance.

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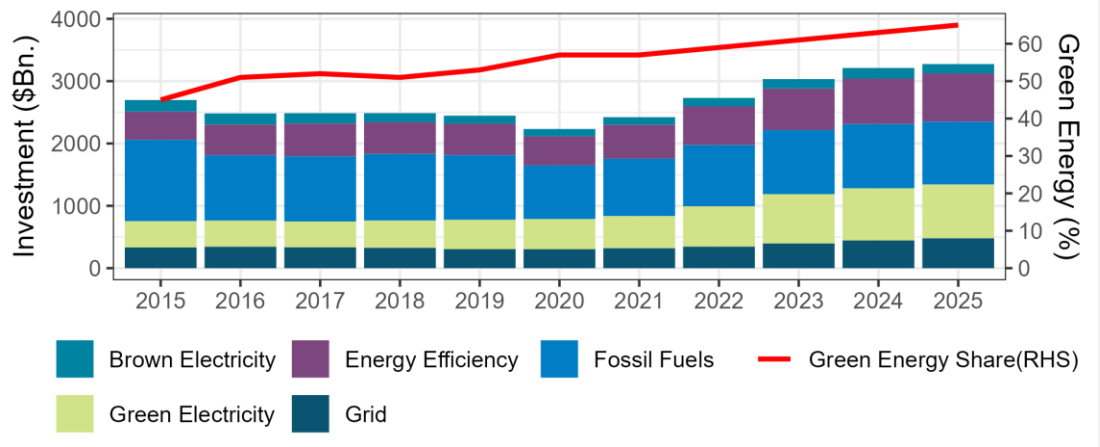
Part B: Global Transition to Net Zero

Global green energy investment is now significantly outpacing brown
B.1 | Global Investment in the Energy Sector, 2015-2025

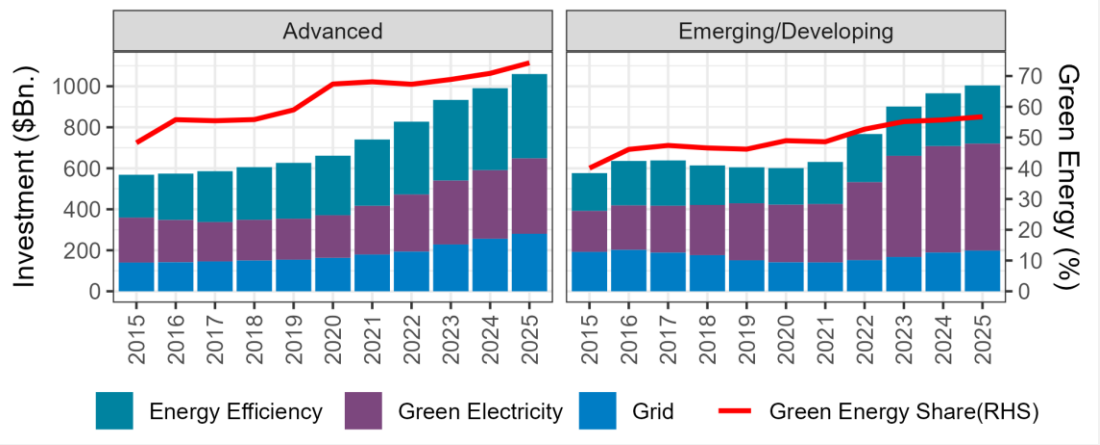
The "green" share of global energy investment has risen from 45% in 2015 to 65% in 2025, driven by both declines in brown energy (down 23%) and increases in green (up 76%). Strong growth is observed in green electricity (up 105%), energy efficiency (72%) and grid investments (44%).



Source: Own calculations using IEA World Energy Investment [Link]
Notes: Green energy includes all non-fossil fuel generation, clean fuels, grid-related investment and energy efficiency. Brown energy includes fossil fuels and fossil fuel generation

Strong growth in green investment in all regions, but for differing reasons
B.2 | Global Investment in Clean Energy, 2015-2025

The green share of investment has grown in both Advanced and Emerging economies, rising to 74% and 57% of total in 2025, respectively. Advanced economies experience higher growth in energy efficiency and grids, while Emerging show very rapid growth in green electricity.



Source: Own calculations using IEA World Energy Investment [Link]
Notes: Green energy includes all non-fossil fuel generation, clean fuels, grid-related investment and energy efficiency. Advanced economies include all OECD countries plus Bulgaria, Croatia, Cyprus, Malta and Romania. Emerging/Developing countries include all other non-Advanced countries.

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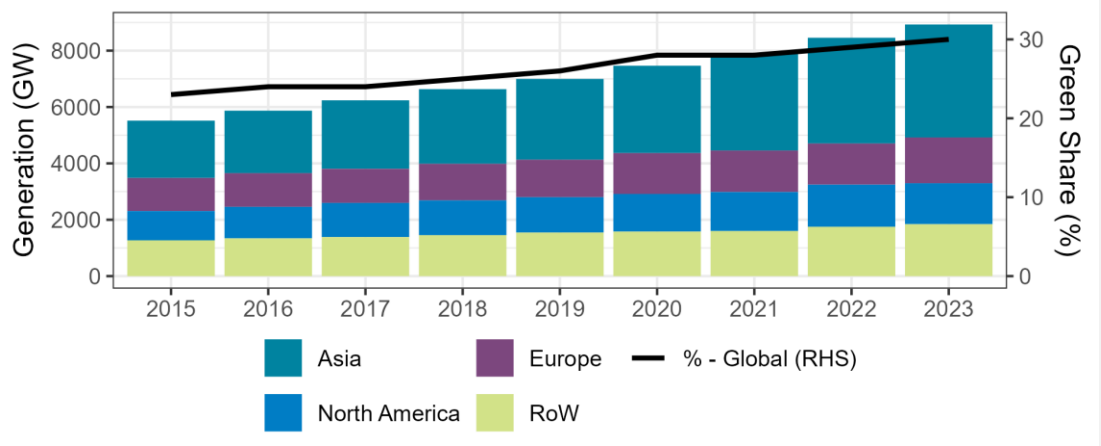
Almost one third of global electricity from renewables
B.3 | Global Renewable Electricity Generation, 2015-2023

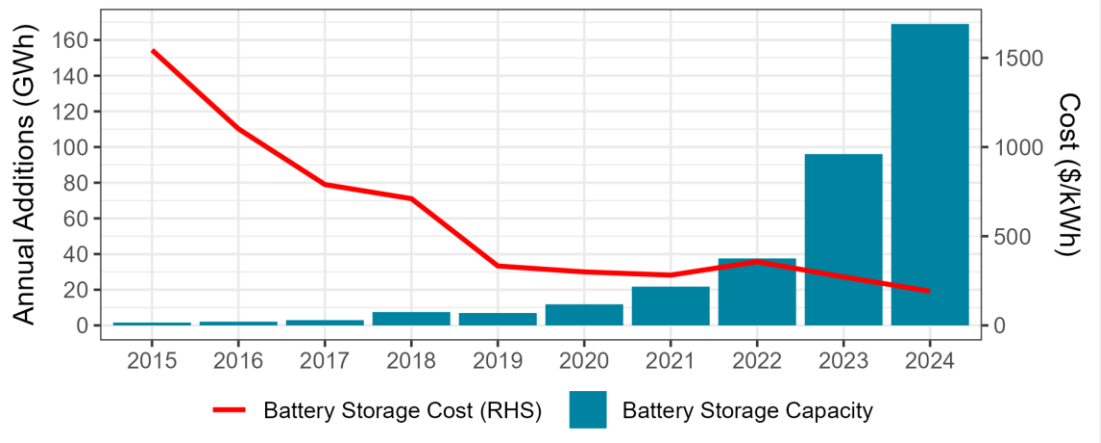
In 2023, 79% of global renewable generation occurred in three regions: Asia (45% of total), Europe (18%) and North America (16%). The share of renewables in global electricity generation has risen from 23% in 2015 to 30% in 2023. Growth in output is highest in Asia (97% increase) since 2015.



Source: Own calculations using IRENA [Link]

Rapid rise in global grid battery storage capacity and declines in cost
B.4 | Global Grid Battery Capacity (Annual Additions) and Costs, 2015-2024

Large-scale grid batteries are required to balance rising shares of intermittent renewables. With significant cost declines (from $1,544/kWh in 2015 to $300/kWh in 2020), grid battery installations have risen dramatically. 169GWh of battery capacity was installed in 2024, up 76% on 2023.



Source: IRENA [Link]
Notes: Costs are in 2024 USD per kWh (usable)

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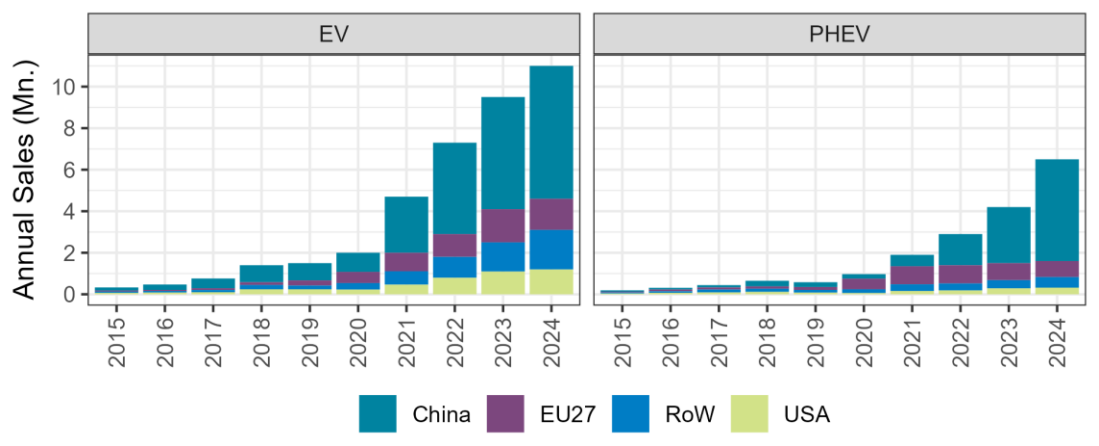
Rising global EV and PHEV sales, 22% of total in 2024, led by China
B.5 | Global EV and PHEV Sales, 2015-2024

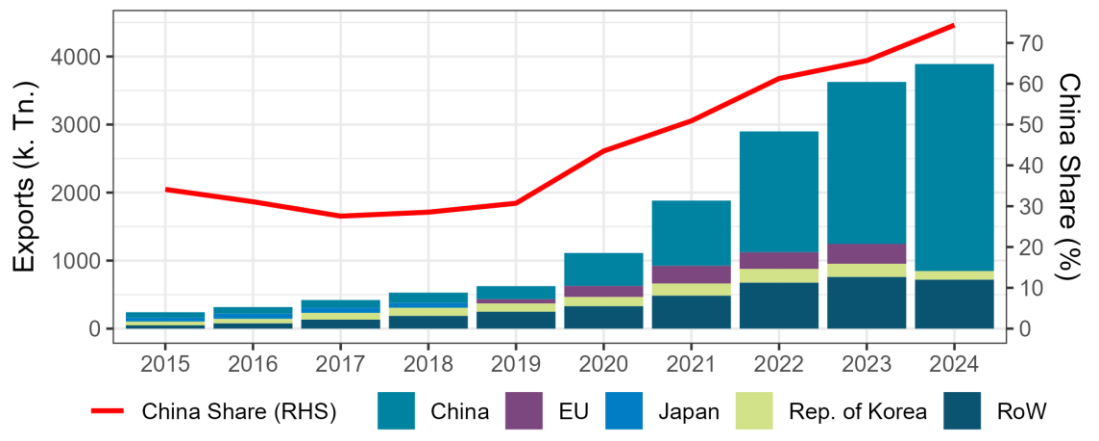
Global electric vehicle (EV) and plug-in hybrid electric vehicle (PHEV) sales have risen from 3Mn. units in 2020 to 17.5Mn. units in 2024. EV/PHEVs now account for 22% of global car sales (2024), with China dominating the global market – 65% of global sales (and 38% market share within China).



Source: IEA Global EV Outlook [Link]

Green technology supply chains are becoming increasingly concentrated
B.6 | Global Lithium-Ion Battery Pack Exports, 2015-2024

China plays a leading and increasing role in the supply of transition technologies, from mineral mining, mineral refining and manufacturing. For lithium-ion battery pack exports, China's rising dominance is very clear, increasing from 34% of global exports in 2015 to 74% in 2024.



Source: Own calculation using UN Comtrade Database [Link] for Lithium-ion battery packs

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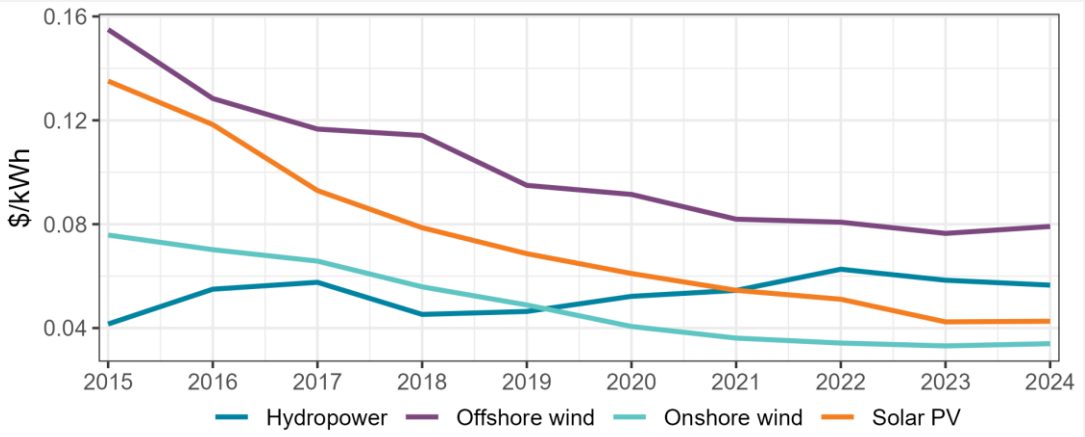
Cost of installing renewables declining rapidly
B.7 | Renewable Levelised Cost of Energy (LCOE) – Weighted Global Average, 2015-2024

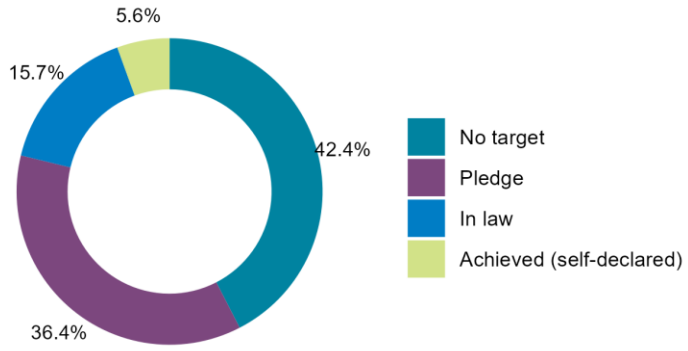
Between 2015 and 2024, the "Levelised Cost of Energy" (minimum electricity price for a renewable installation to break even) for solar, onshore wind and offshore wind fell by 68%, 55% and 49%, respectively. IRENA analysis [Link] shows that the LCOE for onshore wind and solar are now lower than geothermal ($0.06/kWh).



Source: IRENA [Link]
Notes: The Levelised Costs of Energy (LCOE) is the energy price required for a generator to break even. Costs are in 2024 USD per kWh. See IRENA [Link] (Annex 1) for LCOE methodology.

Minority of countries have enshrined net zero targets into law
B.8 | Share of Countries with Net Zero Targets, 2025

As of August 2025, 42% of countries have not committed to net zero emissions targets by or before 2050. Of those with pledges, 27% of countries have enshrined these targets into law.



Source: OECD Climate Action Dashboard [Link]
Notes: Data valid as of August 2025

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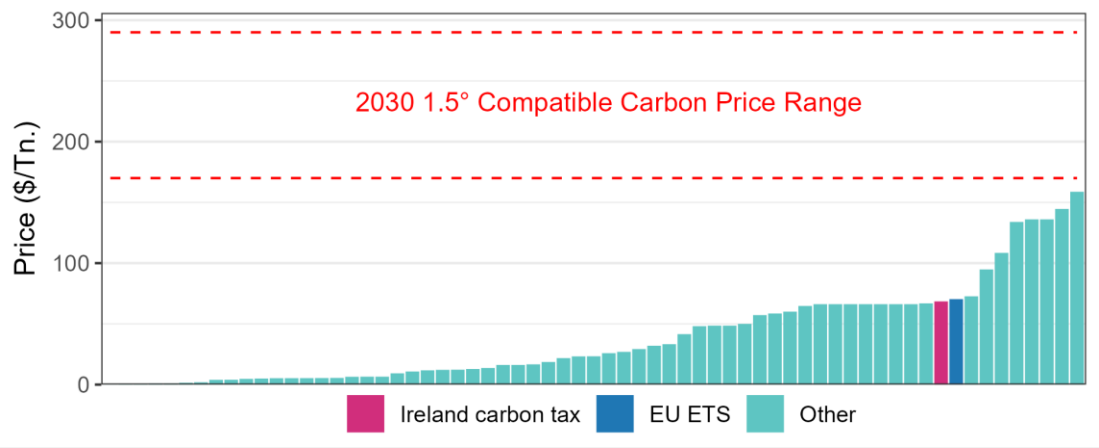
Carbon price levels are insufficient to maintain safe global temperature rises
B.9 | National Nominal Carbon Prices in 2025 Versus IPCC 2030 1.5°C Compatibility Range

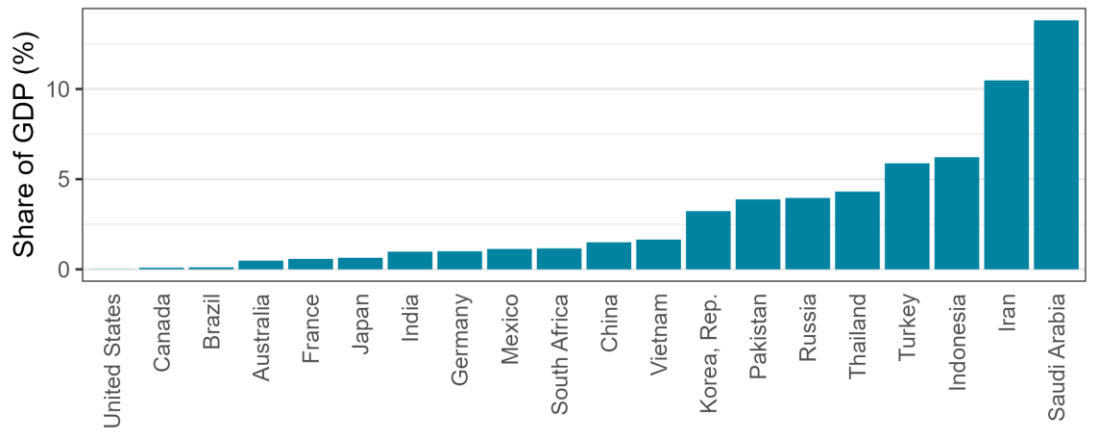
The IPCC estimate that the marginal abatement cost of carbon would need to reach $170-290/Tn. CO_2 in 2030 (in 2015 prices) to limit warming to 1.5°C. At present, the nominal price of all global taxation and emission trading schemes (ETS) are considerably below this level.



Source: World Bank [Link] and target from IPCC [Link][1]
Notes: Prices valid on 1/04/2025. When 2025 data unavailable, latest reported year was used. Systems include prices from emissions trading systems (ETS) and direct carbon taxes.

Global governmental support for fossil fuels $1.3 trillion in 2022
B.10 | Explicit Subsidies as a Share of GDP – Top 20 Emitters, 2022

Chart B.10 shows fossil fuel subsidies as a percentage of GDP for the top 20 global emitters (representing 75% of global GHGs). Explicit subsidies set prices below cost or give producer support. In 2022, total global subsidies for fossil fuels were $1.3Tn. For context, Ireland's direct subsidies (not shown) totalled €891Mn. in 2024, representing 0.29% of national income.



Source: World Bank [Link] and CSO [Link]
Note: Figures are in USD, constant prices (2021). GNI* used for Ireland

[1] Riahi, K., R. Schaeffer, J. Arango, K. Calvin, C. Guivarch, T. Hasegawa, K. Jiang, E. Kriegler, R. Matthews, G.P. Peters, A. Rao, S. Robertson, A.M. Sebbit, J. Steinberger, M. Tavoni, D.P. van Vuuren, 2022: Mitigation pathways compatible with long-term goals. In IPCC, 2022: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.005

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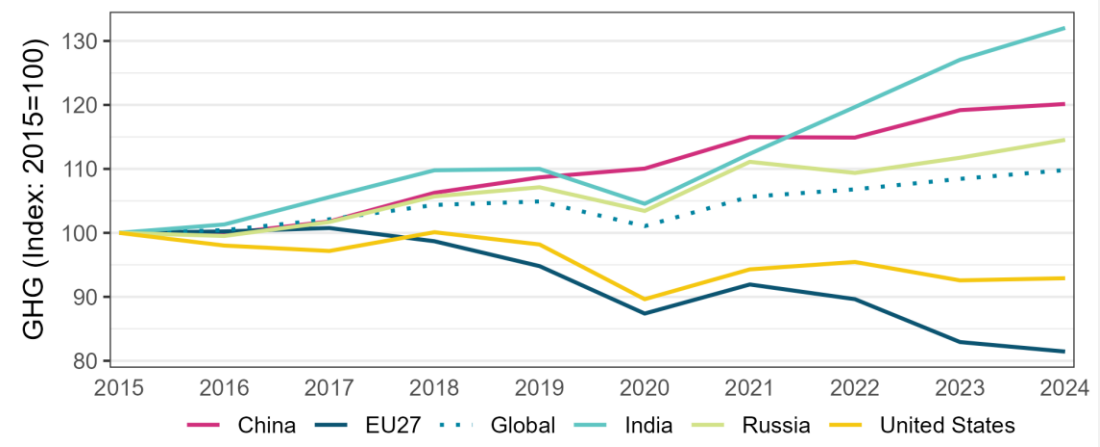
Global emissions increasing despite progress, but reductions in EU and USA

B.11 | Annual Global Emissions (Index, 2015 = 100) by Country/Region, 2015-2024

Total global GHG increased 1.3% in 2024 and is 10% higher than 2015. For the top five emitting countries/regions (covering 60% of global GHG), differing trends are evident, with reductions in the EU (down 19%, 2024 Vs. 2015) and the US (down 7%) but increases in India (up 32%), China (up 20%) and Russia (up 15%).



Source: JRC, EDGAR [Link]

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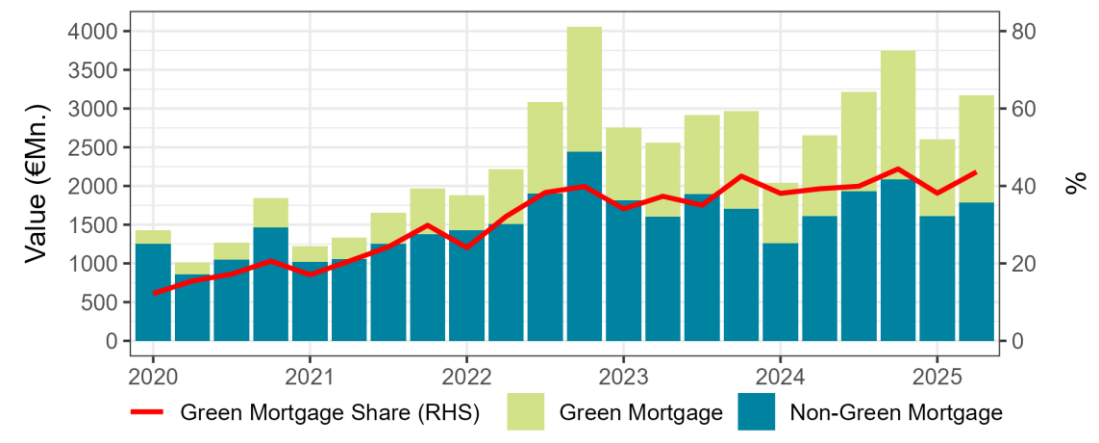
Part C: Irish Financial Sector

Green Mortgage growth to end-2022, stable at around 40% since
C.1 | Green Share of Mortgage Originations, 2020-2025

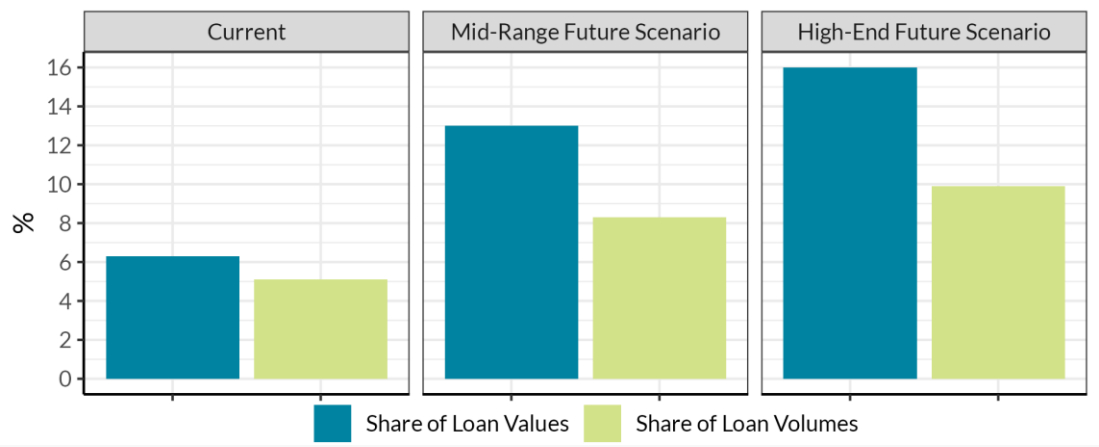
Green Mortgages provide borrowers with lower interest rates on energy efficient properties (typically for BER rating of "B3" or higher). The share of these Green Mortgages increased from 15.5% in Q2 2020 to 43.6% in Q2 2025.



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

Bank lending exposed to flood risk with risks projected to increase in future
C.2 | Share of Business Loans at Risk of Flooding, June 2022

The Office of Public Works (OPW) provide flood maps for a selection of flood risk scenarios. Using these flood scenarios, future changes in the connection between flood risk and bank lending can be quantified. Under future scenarios, the share of loans at risk increases sharply.



Source: Shahabi Ahangarkolaee et al. (2025), *Measuring Flood Risk in Business Lending* [Link].
Notes: based on 1% Annual Exceedance Probability for fluvial and coastal

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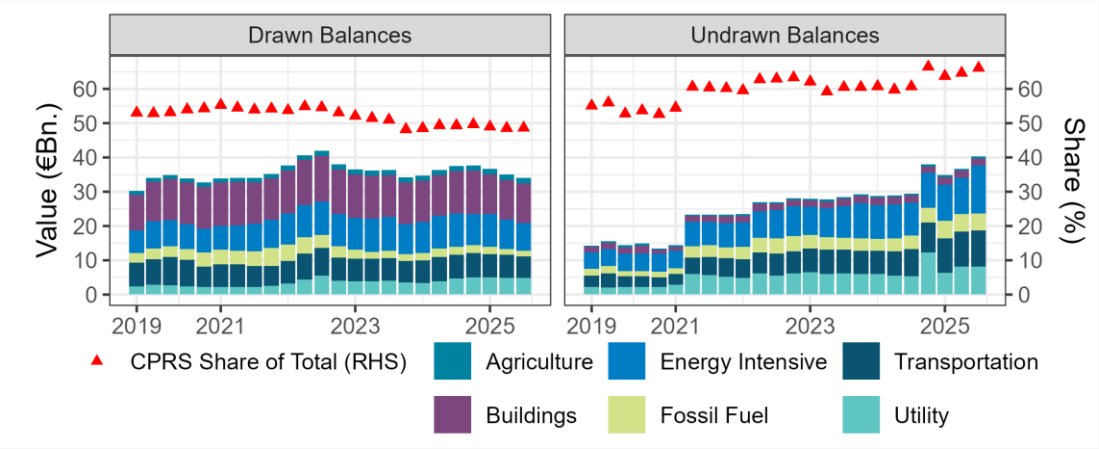
High banking sector exposure to climate policy relevant sectors (CPRS)
C.3 | Bank Loan to CPRS, Q4 2019 – Q3 2025

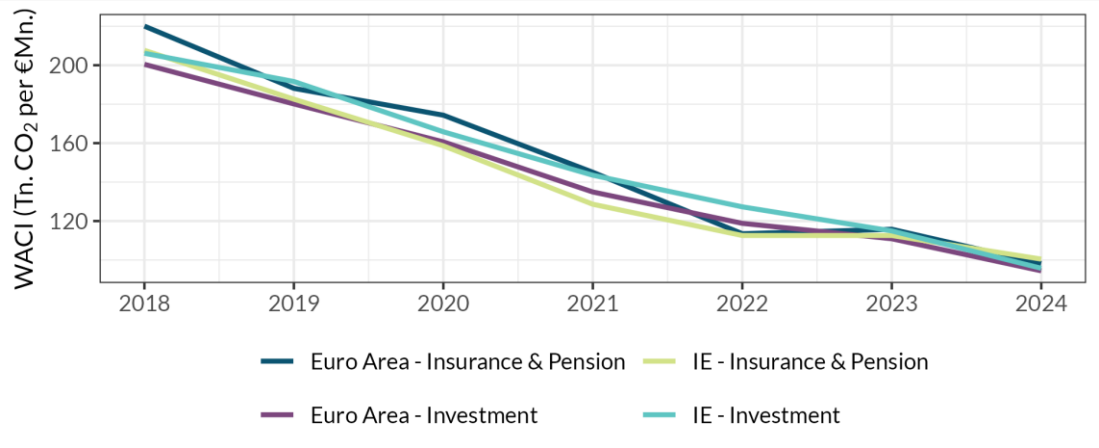
Chart C.3 presents drawn and undrawn balances to corporates operating in Climate Policy Relevant Sectors (CPRS). The CPRS share of drawn balances has remained constant at about 49% throughout the first three quarters of 2025. As of Q3 2025, undrawn CPRS balances were 66.1%.



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 investment/insurance/pension funds decline steadily
C.4 | Investment/Insurance/Pension Funds Scope 1 Emissions, 2018-2024

Chart C.4 displays the exposure of the Investment Funds and Insurance 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-2024 using the WACI indicator. In both Ireland and across the Euro Area, the WACI for both sectors has declined over 51% from 2018 to 2024.



Source: ECB [Link] WACI indicator [Link]
Notes: WACI defined as tonnes of CO_2 per €Mn. revenue. Chart created using results from ECB's balanced panel at the group-level. Indicator includes both domestic and non-domestic exposures. Data are adjusted for inflation and exchange rates.

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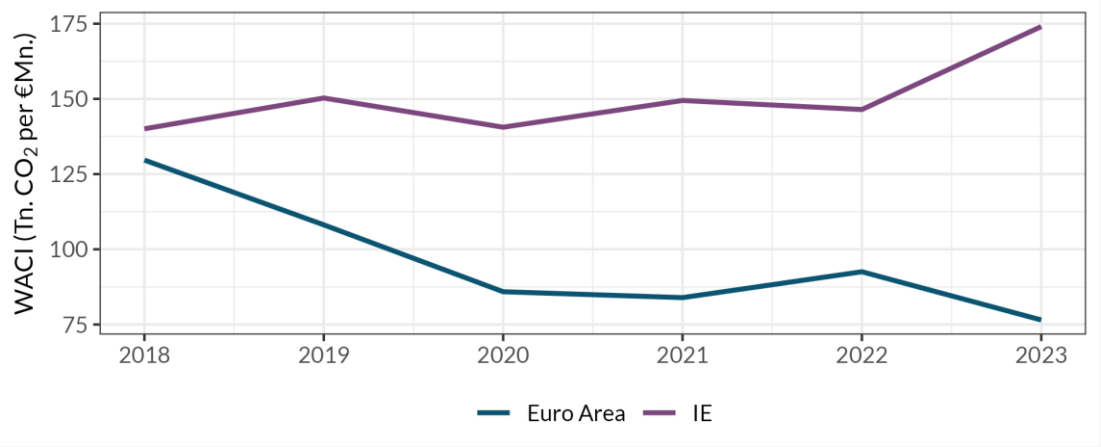
CO_2 intensity of Irish bank loans diverges significantly from Euro Area average
C.5 | Lending to NFCs by Irish-Resident and EA-Resident Banks, 2018-2023

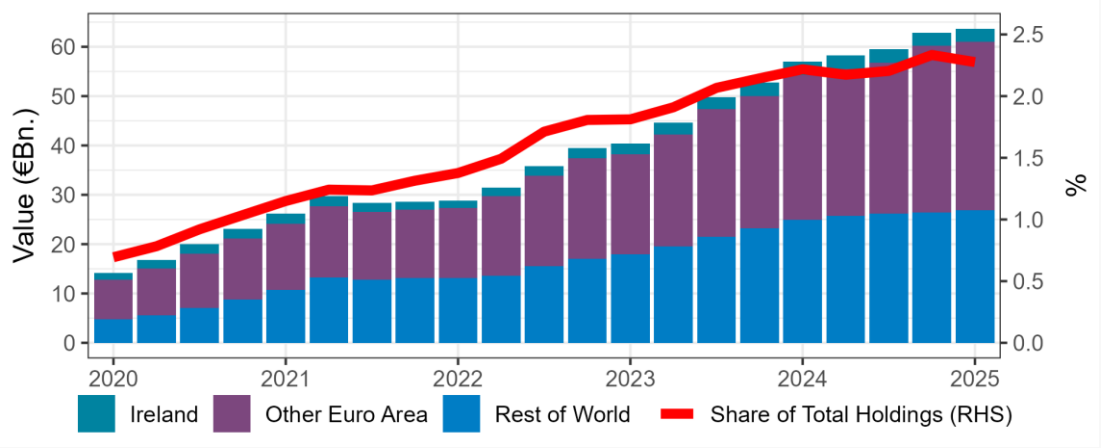
Chart C.5 displays the exposure of the banking sector to NFCs' Scope 1 emissions based on banks' outstanding volume of loans to NFCs using the WACI indicator. The WACI in Ireland has increased 18.8% from 2022 and was more than double the Euro Area average in 2023.



Source: ECB [Link] WACI indicator [Link]
Notes: chart created using results from ECB's balanced panel at the group-level. Indicator includes both domestic and non-domestic exposures. Data are adjusted for inflation and exchange rates.

Green bond holdings increasing, but at a slower rate over past year
C.6 | Green Bond Holdings of Irish Residents by Issuer Region, Q3 2020–Q3 2025

Chart C.6 presents green bond holdings by Irish resident investors, by the region of issuer. As of Q3 2025, €63.7 billion of green bonds were held. While growth has been strong since 2022, the share of green bonds has remained constant at roughly 2.2% since Q3 2024.



Source: CBI Statistics Division [Link]

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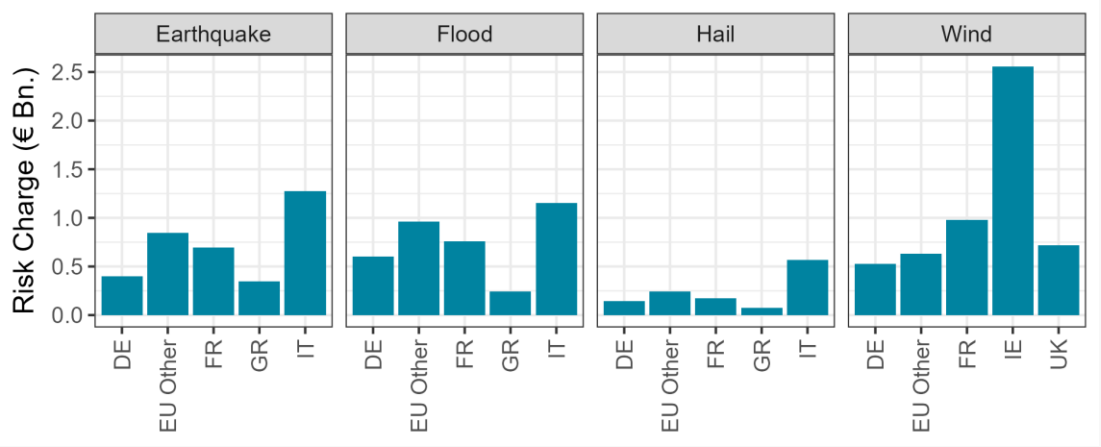
Physical risks in insurance sector mainly non-domestic
C.7 | Natural Catastrophe Risk Charge, 2024

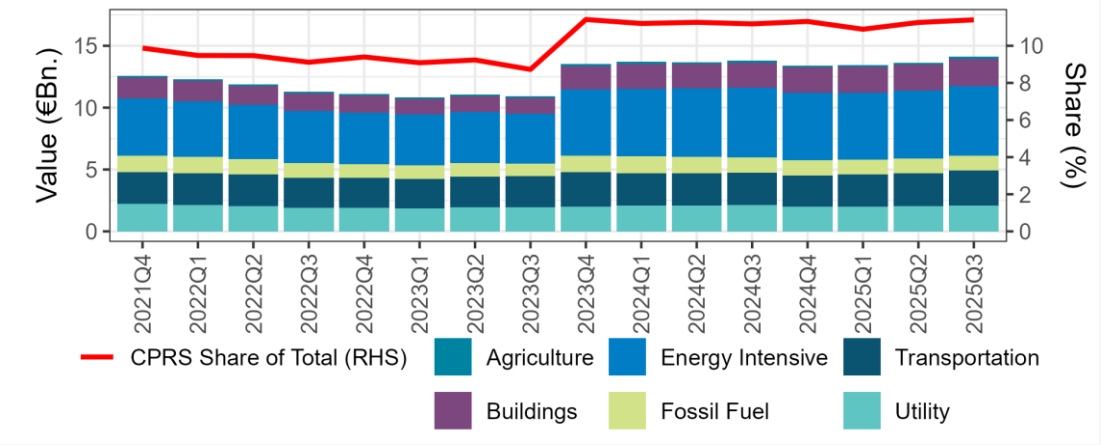
Chart C.7 displays the capital charges ("Gross Risk" charge) associated with the main natural catastrophe perils for the Irish Insurance sector. Values reflect expected losses associated with 1-in-200-year events in each region. Domestic windstorms are associated with the largest risk charge for Irish regulated firms; this peril corresponds with a Gross Risk charge of €2.6 billion. Overall, 82% 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.

Over one-tenth of insurance sector assets in climate policy relevant sectors
C.8 | Insurance Sector Investment Exposure to CPRS, Q4 2021 – Q3 2025

Chart C.8 displays the aggregate value of the insurance sector's non-linked investments that are exposed to Climate Policy Relevant Sectors (CPRS). As of Q3 2025, the Irish Insurance Sector held €14.1Bn of assets in CPRS, representing 11.4% 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.

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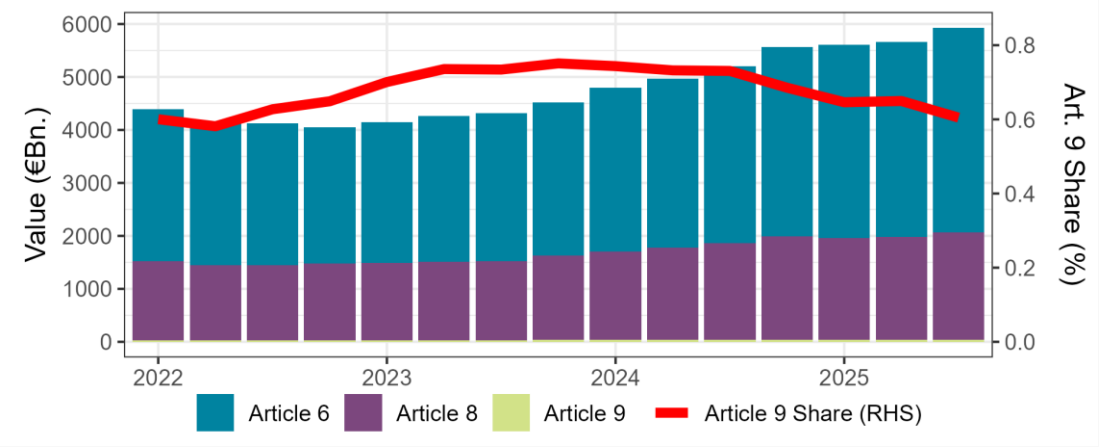
Funds promoting ESG represent less than 1% of assets
C.9 | Total Assets by SFDR Classification, Q1 2022 – Q3 2025

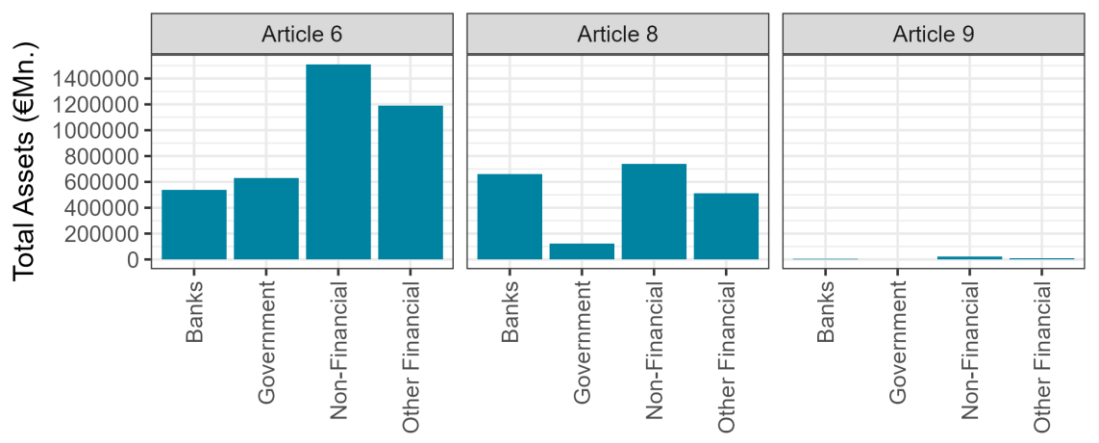
The growth of assets under management (AUM) of Investment and Money Market Funds are displayed by Sustainable Financial Disclosure Regulation (SFDR) Article 6, 8 & 9 classifications. Article 9 products, which pursue sustainable investment as their primary objective, remain below 1% of total AUM. Article 8 products, which promote environmental or social characteristics represent 34.2%. Article 6 products do not prioritise sustainability and account for 65.2% of total AUM.



Source: Central Bank of Ireland, Statistics [Link]

Non-Financial Corporations largest investment sector across all SFDR funds
C.10 | Total Assets by SFDR Fund Classification and Holding Sectors, Q3 2025

Sustainability-aligned funds (Article 8 & 9) totalling nearly €2.07Tn. and representing 35% of total AUM at the end of Q3 2025. Non-financial corporations are the largest investment sector for all SFDR funds, accounting for 36% of Article 8 funds and 58% of Article 9 funds. Non-sustainability linked funds (Article 6) remain the largest cohort by AUM between the three classifications, totalling to €3.87Tn. and representing 65% of total AUM.



Source: Central Bank of Ireland, Statistics [Link]

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Box 1: Climate Policy – A Year in Review

Wendy Disch

Developments in Climate Change Policy across Europe

Europe has been warming twice as fast as the global average. The latest data show that Europe is experiencing temperatures 2.4°C above pre-industrial (1850-1900) levels compared to the global increase of 1.35°C (Copernicus). In the face of the climate emergency, Europe continues to strive for achieving its climate goals. Emissions in the EU declined 2.5% from 2023 to 2024. From 1990 levels, emissions have declined 37% while the economy is 71% larger. If the EU and member states can deliver the investment and actions required to follow through with their existing and planned policy measures, the EU will be on track to meet its 2030 climate target (European Commission, 2025).

The European Climate Law adopted in 2021 sets out Europe's commitment to decrease greenhouse gas emissions by 55% by 2030 and to reach net zero emissions by 2050. There are three main pillars to support the 2030 targets: The EU Emissions Trading System, The Effort Sharing Regulation (ESR) and The Land Use, Land Use Change and Forestry (LULUCF) Regulation.
Table B1.1 summarises the main climate-relevant developments in 2025.

Table B1.1: Recent Developments in EU Climate Policy

Policy	Summary
Clean Industrial Deal including Omnibus Simplification	The European Commission announced the deal in early 2025, with an emphasis on supporting industrial decarbonisation while maintaining EU competitiveness. Key elements of the deal include clean technologies, investment certainty, and energy-intensive industries. (Link). The Deal also includes ten omnibus proposals, which include major changes to simplify the Corporate Sustainability Reporting Directive, the Corporate Sustainability Due Diligence Directive and taxonomy. (Link).
2040 Climate Targets	The European Parliament and Council reached a provisional agreement on a 2040 target of a net reduction in greenhouse gas emissions by 90% relative to 1990 levels. The EU also submitted its Nationally Determined Contribution (NDC) ahead of COP30, with an indicative 2035 target of 66.25% to 72.5% on the path towards net zero by 2050. (Link)
Carbon Border Adjustment Mechanism (CBAM)	CBAM ensures equal carbon costs between EU and non-EU producers by imposing a price on carbon emitted during the production of carbon-intensive goods that enter the EU. (Link)
Postponement of Emission and Trading System (ETS2) (Buildings & Transport)	The European Commission proposed adjustments to delay the new carbon market launching from 2027 to 2028. ETS2 will apply to emissions from fuel combustion in buildings, road transport and additional sectors. (Link)
Transport & Automotive Sector Adjustments	The EU has set emission performance standards for new passenger vehicles in order to tackle road transport emissions. The 2025 announcements to transport decarbonisation reinforce electrification and efficiency improvements across the fleet. (Link)

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Aviation – ReFuelEU	This EU policy aims to reduce lifecycle emissions from EU aviation by gradually increasing the share of sustainable aircraft fuel (SAF) blended into the conventional aviation fuel supplied at EU airports. (Link)

Developments in Climate Change Policy in Ireland

EU member states, including Ireland, have aligned national targets relating to climate change, biodiversity loss and pollution with European policies. 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 2025 (CAP25) sets the framework for achieving these goals. CAP25 is the fourth 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.

As detailed in Section D, total emissions are set to exceed the carbon budget through 2030 and a number of sectors are projected to exceed their ceilings. Progress reports from the European Commission highlight that Ireland is expected to have excess emissions under the ESR and is not on track to meet targets for the LULUCF sector. While an acceleration in action will be required to meet targets, Ireland has succeeded in reducing emissions nearly 25% from 2005 to 2024.

Table B1.2: Recent Developments in Irish Climate Policy

Policy	Summary
Offshore Wind Planning (South Coast DMAP)	The Government announced the designation of maritime areas to accelerate offshore renewable deployment in order to support large-scale wind generation critical to 2030 targets. (Link)
Renewable Heat Obligation Bill	The Bill introduces mandatory renewable heat use across sectors to reduce fossil fuel reliance in heating. (Link)
Small-Scale Renewable Price Guarantees	Provides guaranteed pricing for micro and small renewable electricity generators in order to encourage household and community-level wind and solar projects. (Link)
Biomethane Strategy	This strategy sets a framework for scaling biomethane production and use by supporting emissions reduction in heat, transport, and agriculture. (Link)
Renewable Transport Fuel Policy (2025–2027)	The fuel policy increases blending of renewable fuels in petrol and diesel thereby reducing lifecycle emissions from road transport. (Link)
National Climate Change Risk Assessment (NCCRA)	The EPA produced Ireland's first NCCRA, providing a comprehensive national overview of the potential risks and opportunities posed by climate change and supporting policymakers and adaptation planning (Link).
Sectoral Adaptation Plans	As a part of the National Adaptation Framework, adaptation plans have been published across 13 key sectors to ensure resiliency to the impact of climate change. (Link)

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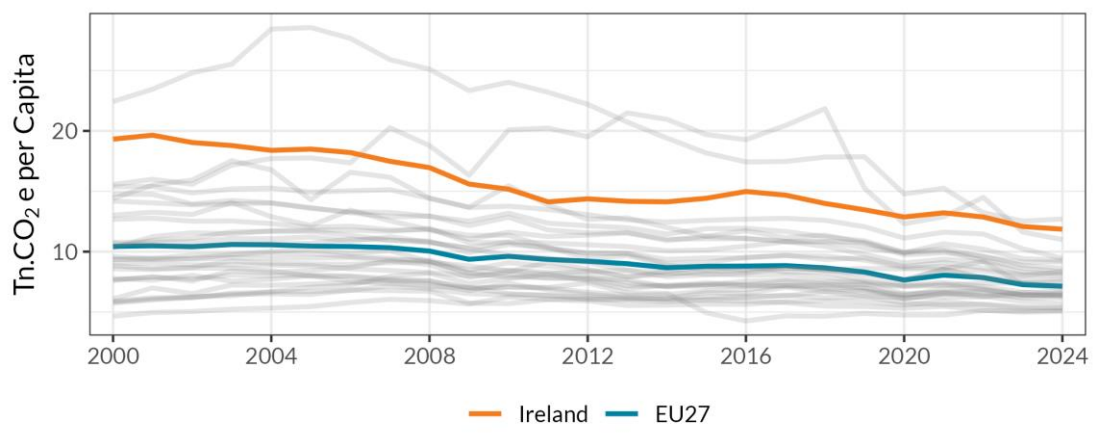
Part D: Irish Economy

Ireland's GHG emissions per capita are second highest in Europe
D.1 | Emissions per Capita by EU Country, 2000 - 2024

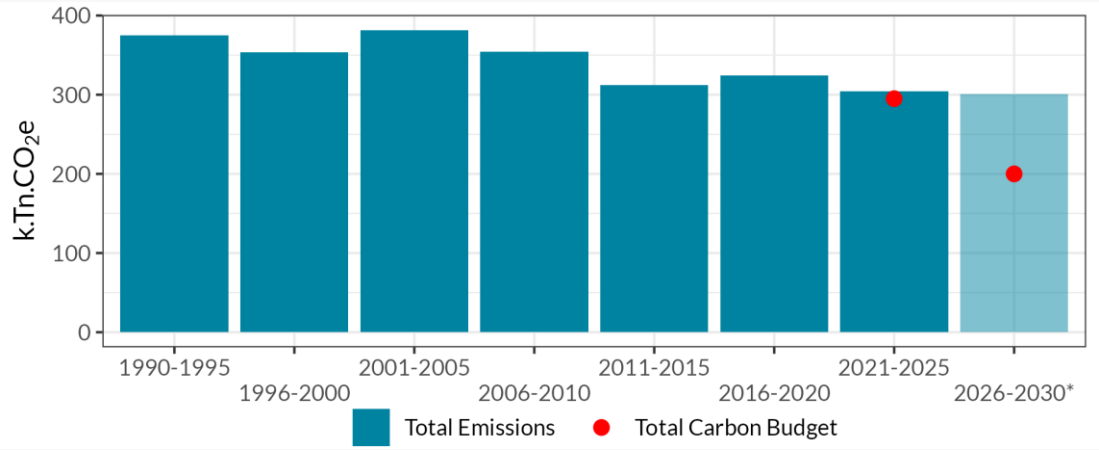
Chart D.1 compares Ireland's GHG emissions (CO_2, methane, nitrous oxide and fluorinated gases) per capita to the rest of the EU. In 2024, Ireland had the second highest emissions per capita (after Luxembourg), with emissions per capita 66.2% higher than the EU average.



Source: EDGAR - Emissions Database for Global Atmospheric Research [Link]

Emission projections for 2030 fall far short of climate targets
D.2 | Actual Emissions (1990 – 2024), Projected Emissions (2025 – 2030) and Carbon Budget Ceilings (2021 – 2030) (All Sectors)

The EPA provide projections of national emissions. A carbon budget represents the total amount of GHG that may be released during an agreed period in line with reaching carbon neutrality ("Net Zero") by 2050. For the 2021-2025 period, Ireland is on track to exceed its carbon budget by 3% while projections through 2030 show emissions are likely to exceed the carbon budget by 51%.



Sources: EPA [Link] and Climate Action Plan 2025 [Link]
Notes: Total Emissions for 2025 – 2030 are based on projections by the EPA based on "with existing measures" scenario. Total emissions include the LULUCF sector.

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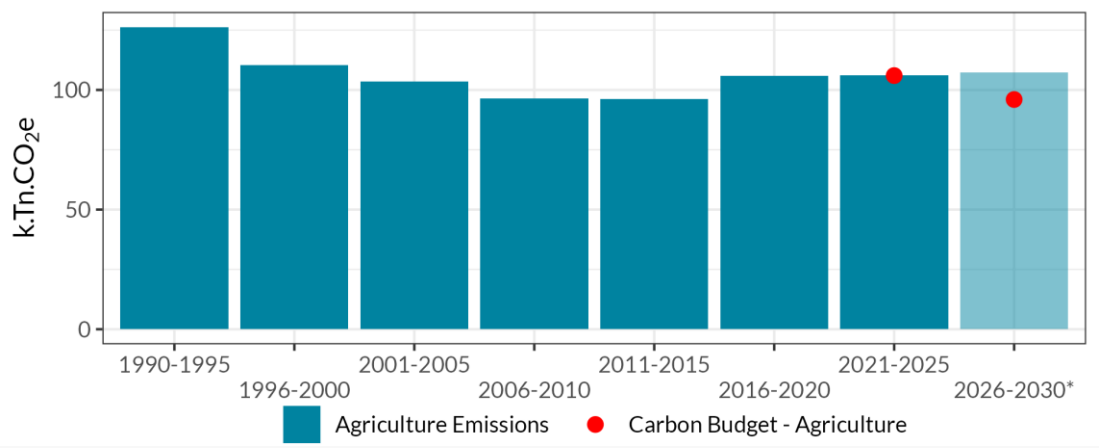
Agriculture and Transport/Storage sectors account for over half of emissions
D.3 | Share of GHG by Sector, EU and Ireland, 2024

Chart D.3 presents the share of GHG by sectors across the EU and in Ireland (2024). Transport and storage accounted for the highest share of emissions by sector in Ireland (30%) compared to 14.4% across the EU. Agriculture is the second-highest emitting sector in Ireland (28.6%).

Sources: Eurostat [Link]
Notes: Energy supply includes electricity, gas, steam and air conditioning supply.

Agricultural emissions projected to increase by 2030
D.4 | Actual Emissions (1990 – 2024), Projected Emissions (2025 – 2030) and Carbon Budget Ceilings (2021 – 2030) (Agriculture)

Ireland's relatively high national emissions in the EU are largely driven by high levels of agricultural activity. The agricultural sector accounts for the highest share of Ireland's GHG and these emissions have failed to decline since 2014 and are projected to increase modestly through 2030. Livestock-related emissions such as manure management and the digestive process of sheep and cattle account for a significant share of agricultural emissions (74% in 2024).



Sources: EPA [Link] and Climate Action Plan 2025 [Link]
Notes: Total Emissions for 2025 – 2030 are based on projections by the EPA based on "with existing measures" scenario.

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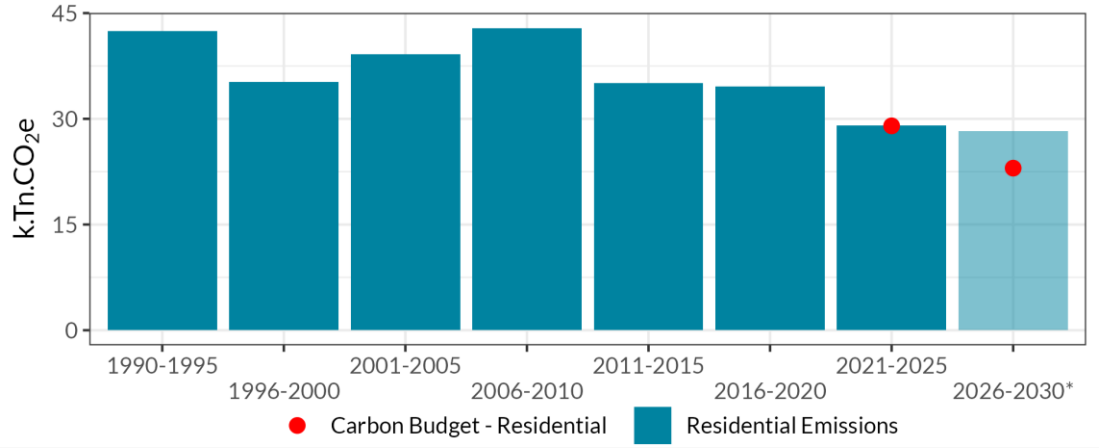
Residential sector emissions declining over time
D.5 | Actual Emissions (1990 – 2024), Projected Emissions (2025 – 2030) and Carbon Budget Ceilings (2021 – 2030) (Households)

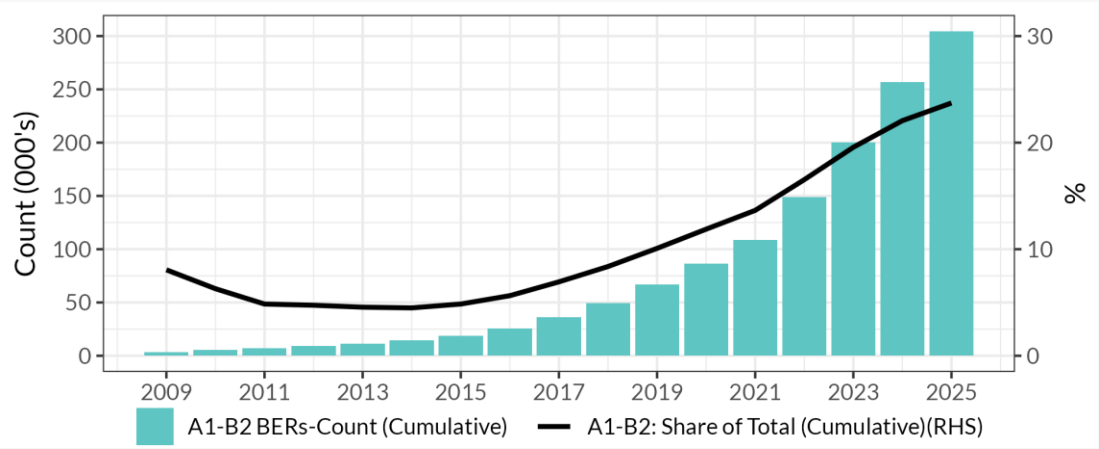
Households are the third-highest emitting sector in Ireland (see Chart D.3). GHG in the residential sector declined 15.9% in the 2021-2025 period compared to 2016-2020. While emissions are projected to decline a further 2.9% in this sector, this will fall short of the target set by the carbon budget.



Sources: EPA [Link] and Climate Action Plan 2025 [Link]
Notes: Total Emissions for 2025 – 2030 are based on projections by the EPA based on "with existing measures" scenario.

Household energy efficiency is rising
D.6 | Cumulative A1 – B2 Domestic Energy Ratings, 2009 - 2025

Buildings represent a significant portion of residential emissions. All property sales and lettings transactions are required to have a Building Energy Rating (BER). Chart D.6 presents the cumulative number of properties with "A1-B2" BERs as well as their share relative to total properties. The share of these energy efficient dwellings has grown significantly over time, representing 23.7% of the cumulative total of all properties assessed from 2009 - 2025.



Source: CSO [Link]
Notes: Data are based on new audits conducted in each year.

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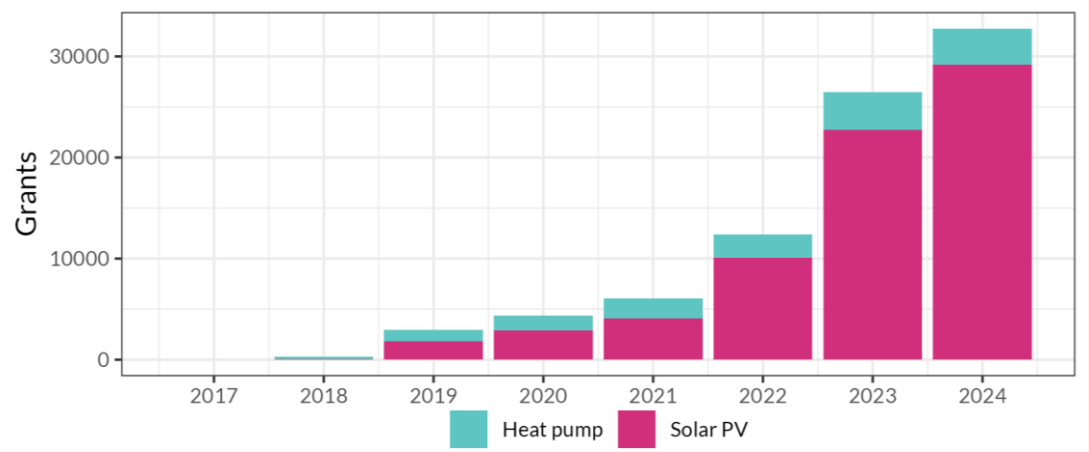
Household grants to improve energy efficiency have increased substantially
D.7 | SEAI Grants by Measure, 2017 - 2024

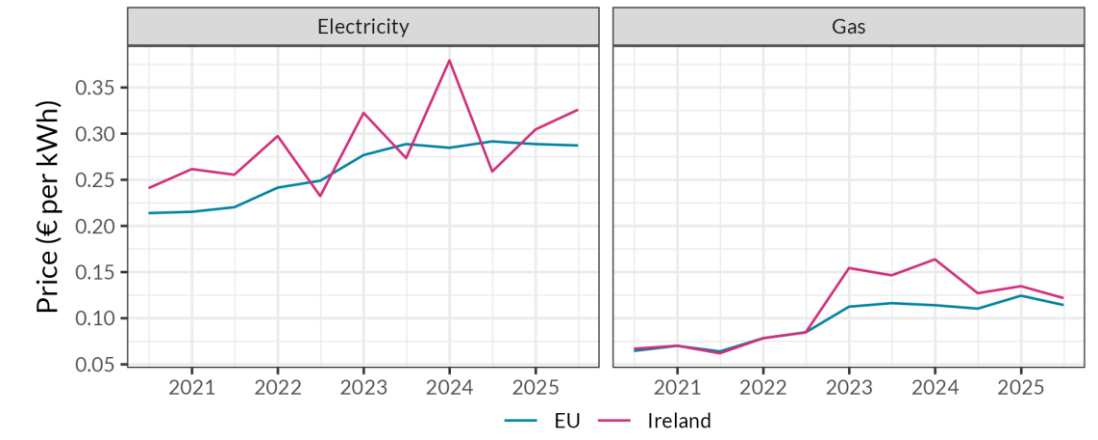
Chart D.7 presents the number of SEAI grants for heat pumps and solar PV since 2017. Residential heat pumps will play a key role in decarbonising residential heating. The *Climate Action Plan* has a target of 680,000 heat pump installations by 2030. Between 2017 and 2024, over 14,400 grants have helped households install heat pumps. Grants for Solar PV have risen significantly since first issued, reaching 74,440 in total from 2018 – 2024.



Source: SEAI [Link]

Residential gas prices begin to converge to Euro Area
D.8 | Electricity and Gas Prices for Households, June 2020 – June 2025

Eurostat publish cross-country residential energy price data on a half-yearly basis. The most recent data (H2 2025) 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 and more volatile than the EU. Electricity and gas prices in Ireland are 13.5% and 6.6% higher than the EU respectively, as of end-June 2025.



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

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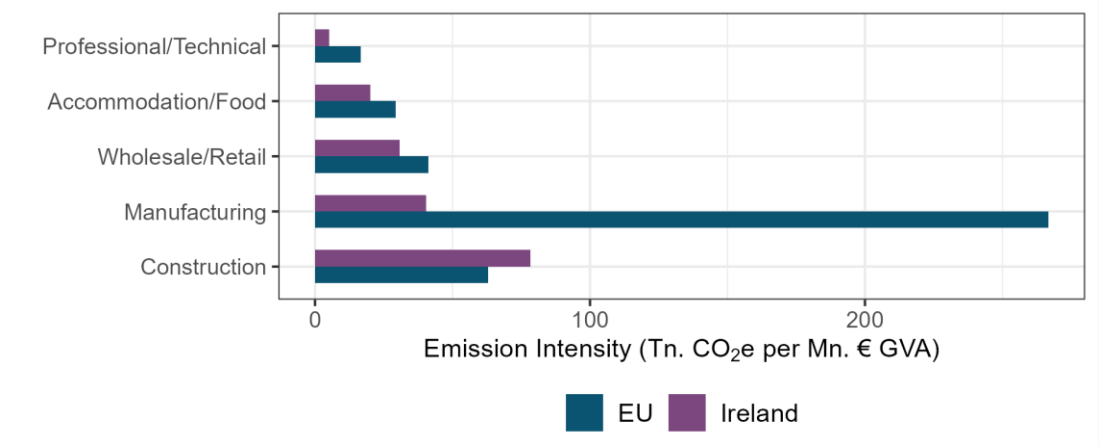
CO_2 intensity of business sectors lower than EU
D.9 | Emission Intensity by Sector GVA, 2024

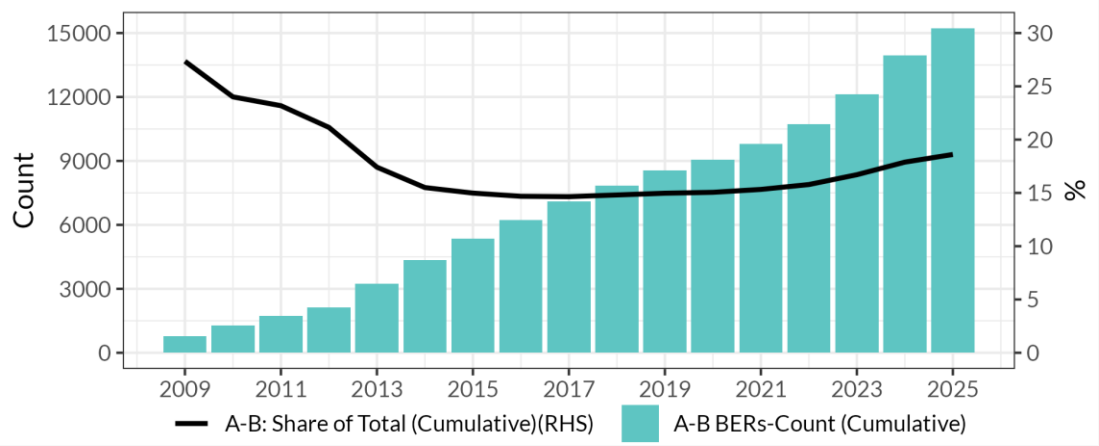
Sectoral emission intensity is measured as the quantity of CO_2 (Scope 1) per €Mn of Gross Value Added (GVA). This is displayed for Ireland's top five emitting business sectors relative to the EU average. CO_2 intensity is lower in Ireland across all sectors, particularly in manufacturing due to significantly smaller shares of heavy (Scope 1-intensive) industry here.



Source: own calculations using Eurostat emissions [Link] and GVA [Link]

Non-residential building energy efficiency lower than residential
D.10 | Cumulative Non-Domestic Building Energy Ratings, 2009 - 2025

Chart D.10 presents the cumulative number of non-residential properties with an A or B BER rating for new audits conducted in each year as well as their share relative to total non-residential properties. The share of energy efficient non-residential properties remains lower than residential properties (shown in Chart D.6). Of audits completed between 2009 – 2025, just 18.6% were of an A or B rating.



Source: CSO [Link]

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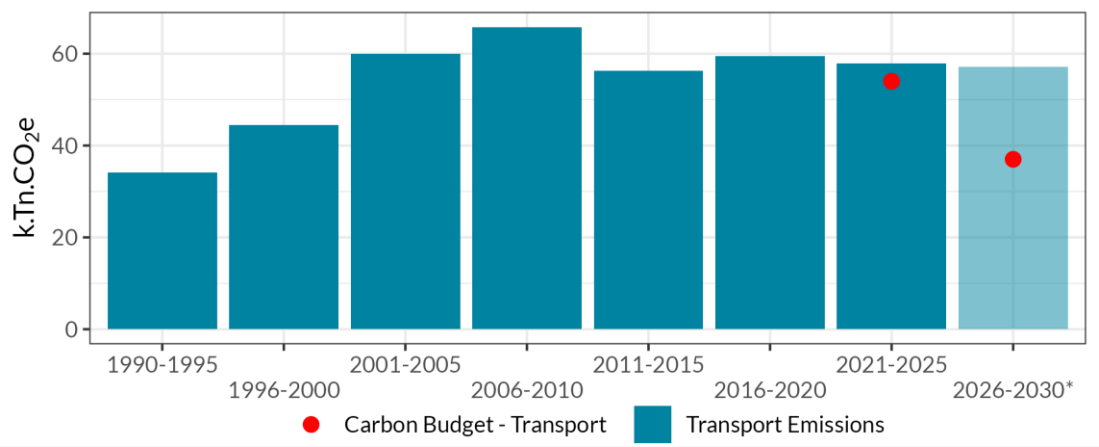
Emissions in transport sector remain stubbornly high
D.11 | Actual Emissions (1990 – 2024), Projected Emissions (2025 – 2030) and Carbon Budget Ceilings (2021 – 2030) (Transport)

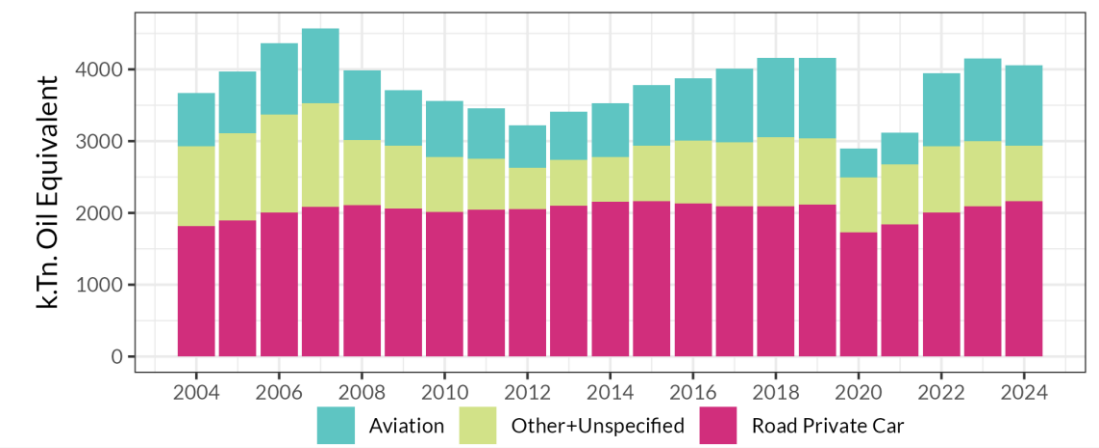
GHG emissions from the transport sector have fallen 12% from their peak in the 2006-2010 period. The targets set by the carbon budgets require a decline of 31.5% between 2021-2025 and 2026-2030. However, projections from the EPA suggest that emissions are likely to fall by just 1.4%.



Source: EPA [link] and Climate Action Plan 2025 [Link]
Notes: Total Emissions for 2025 – 2030 are based on projections by the EPA based on "with existing measures" scenario.

Irish transport emissions dominated by private cars, declines minimal
D.12 | Final Energy by Mode of Transport, 2004 - 2024

Chart D.12 presents final energy by transport type. Private cars account for the majority of road emissions (53.3% in 2024), while aviation accounts for over one-quarter.



Source: SEAI [Link]
Notes: Other + unspecified include: HGV+LGV, rail, public passenger, navigation, fuel tourism (fuel that is bought within the State by private motorists and hauliers but consumed outside the State) and unspecified. Aviation includes international and domestic aviation.

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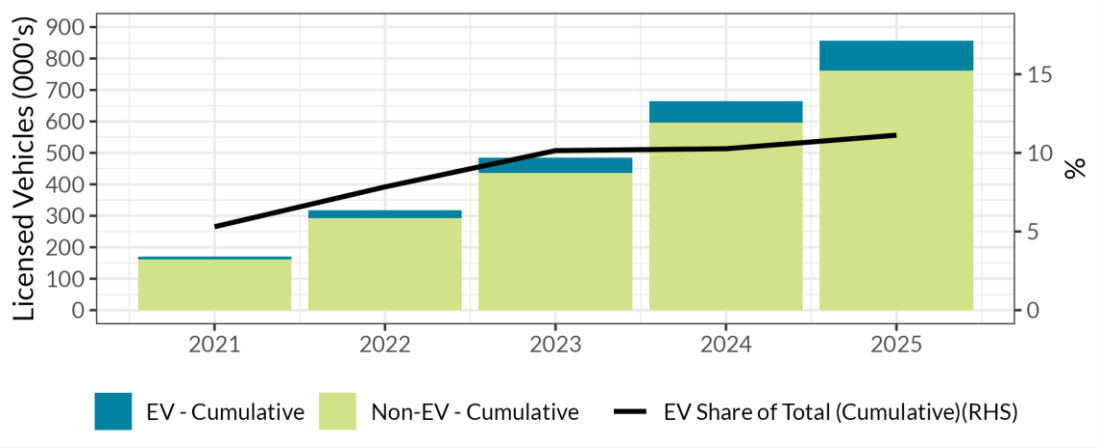
Share of electric vehicles rising but far from target
D.13 | Private Car Licenses by Fuel Type, 2021 - 2025

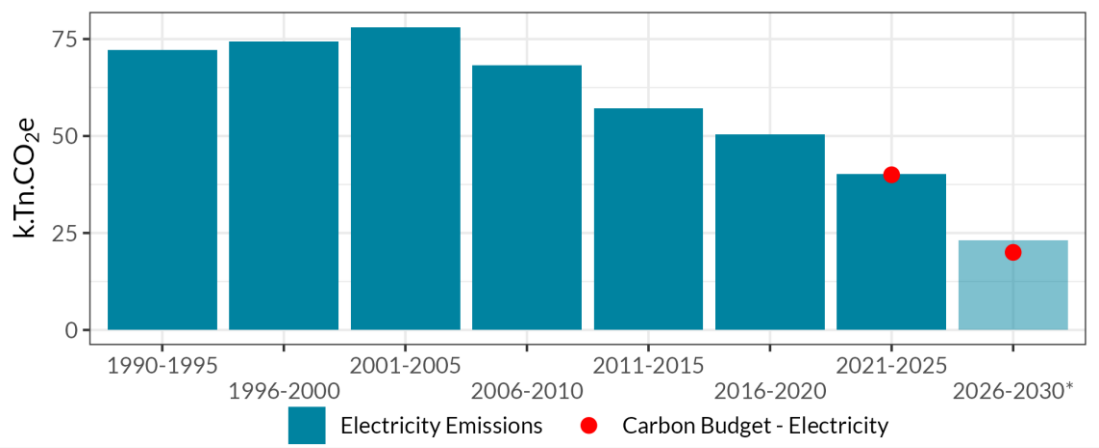
Chart D.13 presents the cumulative number of private cars licensed by fuel type. The number of electric vehicles has grown modestly since 2021, but the cumulative share of electric vehicles relative to all private cars has remained relatively consistent since 2023. Nearly 95,300 electric vehicles have been licensed since 2021. The Climate Action Plan aims for 845,000 private EVs on the road by 2030.



Source: CSO Table TEM27 [Link]
Notes: Data refer to fully electric vehicles.

Energy industry decarbonisation on track
D.14 | Actual Emissions (1990 – 2024), Projected Emissions (2025 – 2030) and Carbon Budget Ceilings (2021 – 2030) (Electricity)

Electricity accounts for 96% of emissions across the Energy Industry (EPA, 2024). Chart D.14 displays progress in emissions reductions across electricity, with the sector largely on track to meet its sectoral emissions ceiling in the first carbon budget.



Source: EPA [link] and Climate Action Plan 2025 [Link]
Notes: Total Emissions for 2025 – 2030 are based on projections by the EPA based on "with existing measures" scenario.

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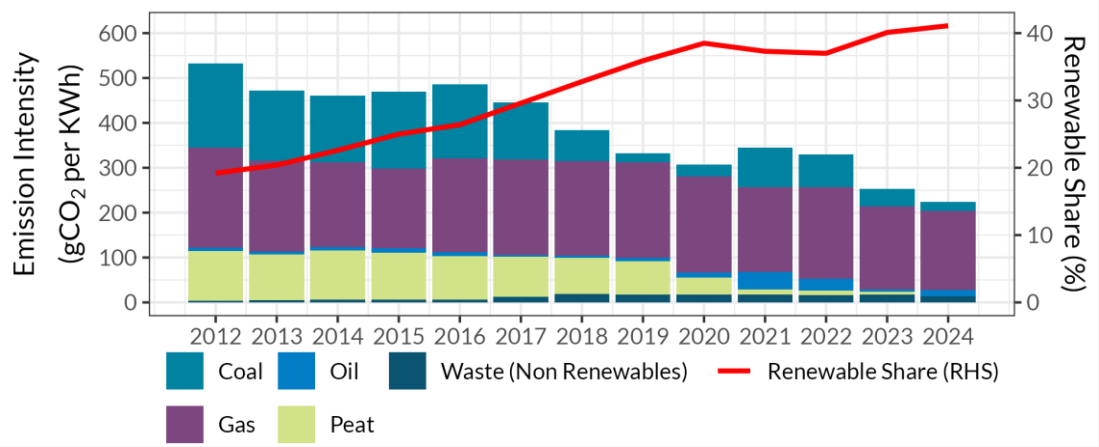
Growth in renewables share of electricity has slowed since 2020
D.15 | GHG per kWh of Electricity Total Consumption by Energy Type, 2012 - 2024

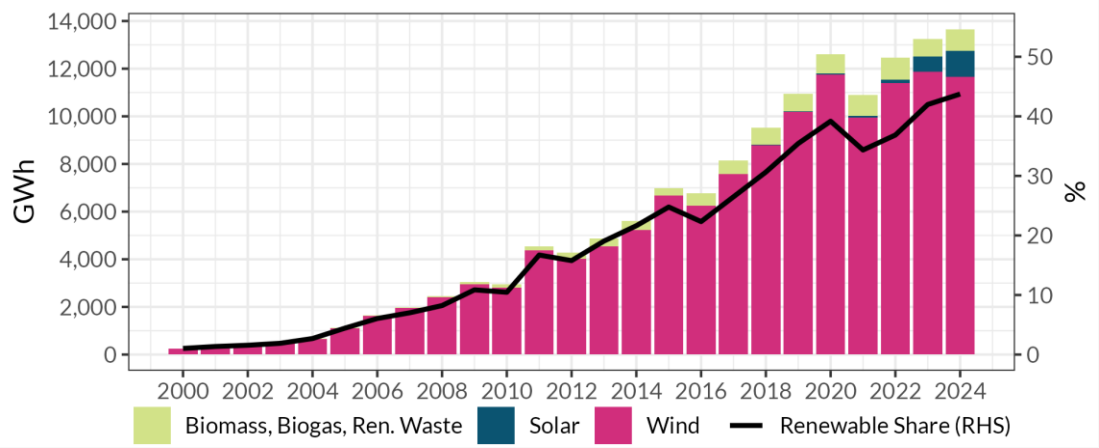
Chart D.15 presents the CO_2 intensity of Irish electricity – measured in grams of CO_2 per kilowatt-hour (the standard unit of electricity) by generation fuel. A large driver in the decline of electricity emissions is the increase in the share of renewables (from 19% in 2012 to 41% in 2024).



Source: SEAI [Link & Link]

Renewables 43.7% of electricity supply, strong growth in solar
D.16 | Gross Electricity Supply by Energy Type, 2000 - 2024

Chart D.16 presents gross electricity production by renewables sources. Increasing renewable energy produced by wind and solar is a target of the Climate Action Plan. While wind is the main source of renewable electricity production (85.3% in 2024), solar has grown rapidly in recent years. In 2024, electricity supply from solar increased 69.1%.



Source: SEAI [Link]

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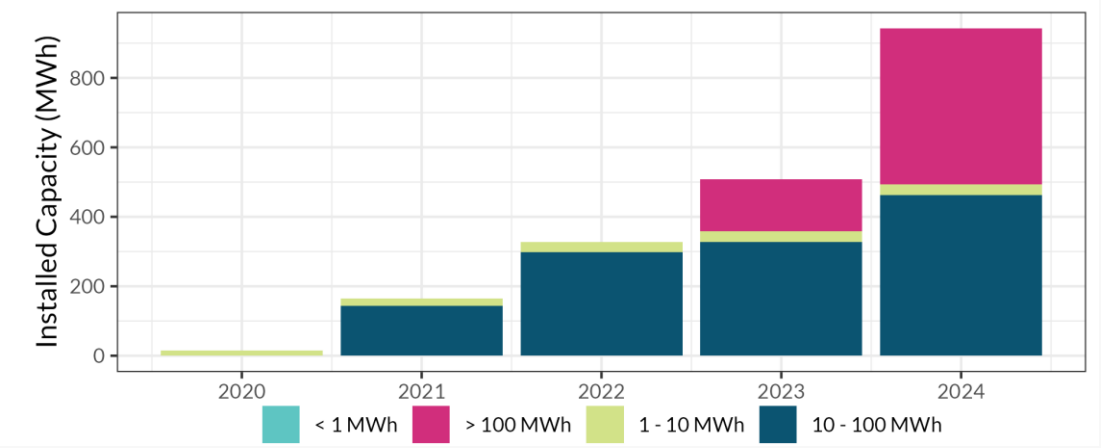
Battery Storage increasing rapidly since 2020
D.17 | Energy Storage Capacity at Year End, 2020 - 2024

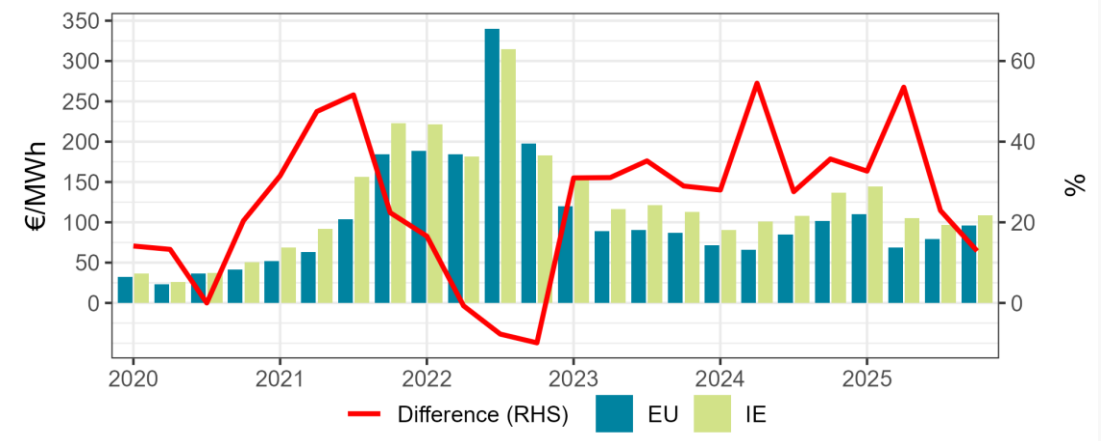
Battery storage capacity is a key enabler of renewables in power generation. Storage allows excess renewable energy to be stored and used later, thereby reducing demand for fossil fuels and contributing to greater grid stability. Battery storage capacity has increased significantly in recent years; >100 MWh tripled from 2023 to 2024, while 10-100 MWh increased 41.2%.



Source: SEAI [Link]

Wholesale energy prices above EU average over time
D.18 | Monthly Wholesale Electricity Prices, Jan 2020 – Dec 2025

Chart D.18 compares wholesale electricity prices in Ireland with the EU average. Irish prices are typical higher. Since 2020, Ireland's monthly wholesale prices have averaged around 25% above the EU average.



Source: Ember [Link]
Notes: Malta, Estonia, Cyprus and Croatia excluded from EU due to data availability.

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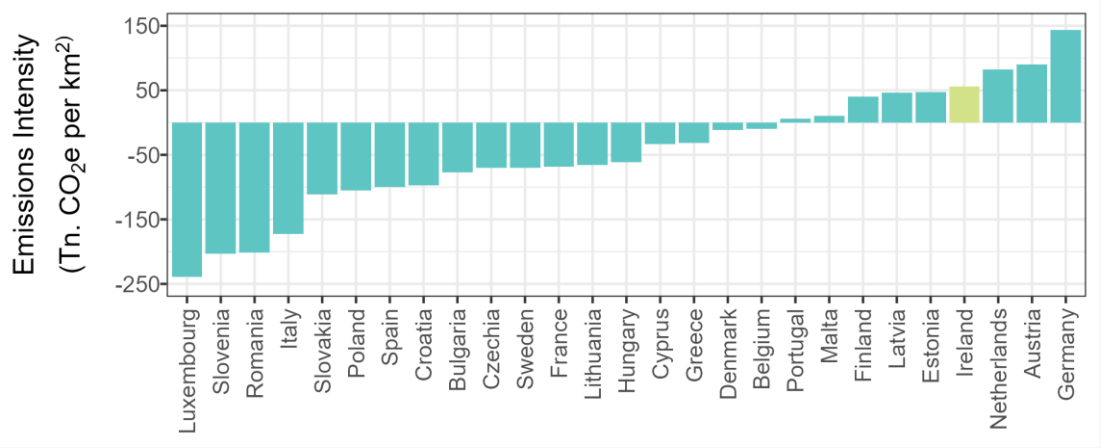
Unlike most EU countries, Ireland's land use sector is a net emitter
D.19 | Net GHG of the LULUCF Sector by Land Area, 2024

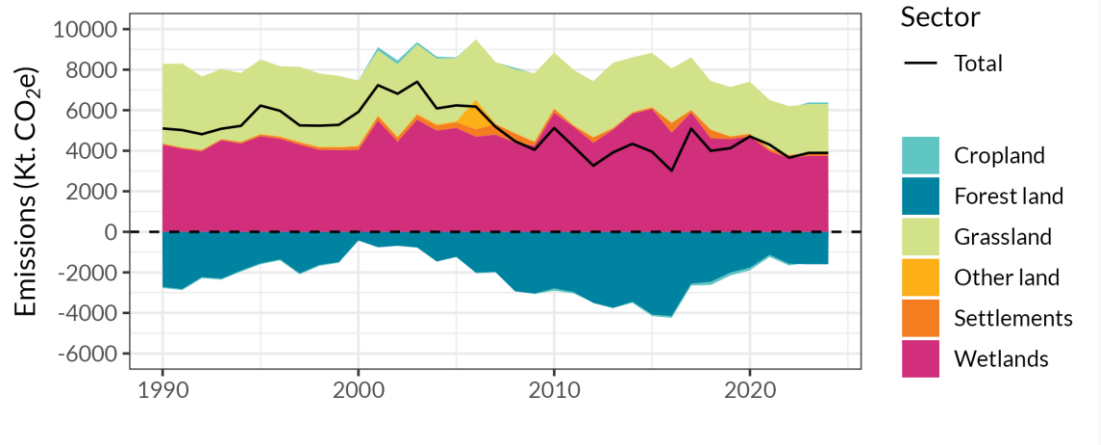
The "land use, land use change and forestry" (LULUCF) sector is critical to meeting climate targets for most countries. Chart D.19 shows the removals and emissions of the LULUCF sector in 2024 scaled by total land area across EU countries. Ireland is one of few countries where the LULUCF sector is a net GHG emitter.



Source: own calculations using total emissions reported by European Environment Agency [Link] and total land area reported by Eurostat [Link]
Notes: Data are based on provisional LULUCF data available as of 15/11/2025

LULUCF emissions driven by grasslands and wetlands
D.20 | Trend in LULUCF, 1990 - 2024

Chart D.20 looks more closely at the sources of emissions in Ireland's LULUCF sector. Ireland has a decreasing carbon sink due to declining rates of forest land. Two main sources of emissions from land are due to draining grasslands, largely for agricultural activities, and extracting peat from wetlands.



Source: EPA [Link]

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Box 2: Rising Energy Burdens – Household Expenditure Trends, 2015-2022.

Derek Lambert and Paul Lyons

Household Budget Survey Records Large Increase in Energy Expenditure

Energy expenditure remains one of the largest expenditure items faced by households and energy affordability remains a significant challenge as Ireland transitions to a low carbon economy. One of the key findings from the 2022/23 CSO Household Budget survey was that the highest percentage increase in expenditure of households (63.7% since last 2015/16 survey) was recorded for "Fuel & Light" which includes expenditure on electricity, gas, oil and solid fuels. This Box provides further insight into the observed energy price inflation by analysing:

1. Which fuel expenditures have increased the most between 2015/16 and 2022/23?
2. Who is most vulnerable to these changes?
3. Are there differences for mortgaged versus non-mortgaged households?

Which fuel expenditures have increased the most?

From Chart 2.1, we can clearly see that the expenditure on electricity (up 74%) accounts for the largest increase in expenditure on energy items over the seven-year period followed by expenditure on gas (up 60%). While household expenditure increased both for their property and their transport, it is the expenditure on their house that increased the most (Chart 2.2).

Chart 2.1: Annual Energy Costs by Fuel, 2015/16 – 2022/23

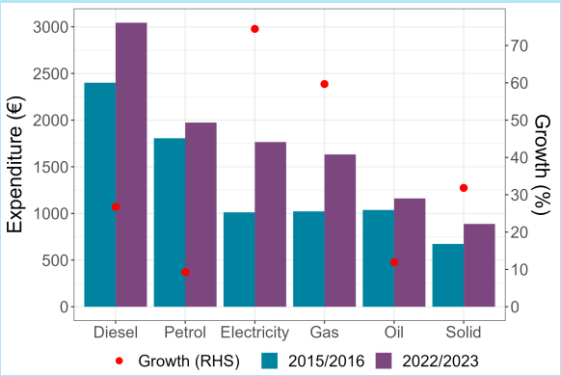
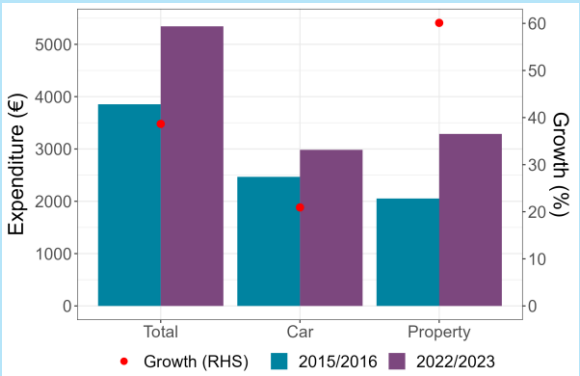


Chart 2.2: Annual Energy Costs by Source, 2015/16 – 2022/23



Source: Household Budget Surveys, 2015/16 and 2022/23
Notes: Mean energy expenditure does not include households which recorded zero weekly expenditure for a particular fuel type. Electricity expenditure in 2022/23 based on weekly amount paid following deduction of applicable electricity account credits.

Who is most vulnerable to these changes?

Previous research from the ESRI (Barrett et al., 2022) has highlighted that, as energy prices increases, it is households on lower incomes that suffer the most. Lower income households spend a larger proportion of their income on energy costs and so are most exposed as energy prices rise. We also find stark differences between mortgaged households and other dwelling types. In fact, over the seven-year period, the energy-to-net-income ratio - a ratio of how much of a household's net income is spent on energy - for mortgaged households decreased as incomes rose more than energy expenditure costs. In contrast, for households in rental accommodation, the proportion of their income being spent on energy costs increased over the period with their energy-to-net-income ratio rising from 9.7% to 12.6% (Chart 2.3).

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Are there differences for mortgaged versus non-mortgaged households?

Such a relative rise in energy-to-income ratios for renters versus mortgaged households puts those households in rental accommodation at greater risk of energy-poverty, defined (in the 2016 strategy to Combat Energy Poverty) as the inability to heat or power a home to an adequate degree. Barrett et al., 2022 follow an expenditure-based metric of energy poverty by measuring the percentage of household disposable income spent on energy services for the home (typically greater than 10 per cent is considered energy poor). Using this definition, we see from Chart 2.4 that the share of households in energy poverty increased the most for rented accommodation households over the seven-year period.

Chart 2.3: Energy to Net Income Ratio (2015/16 – 2022/23)

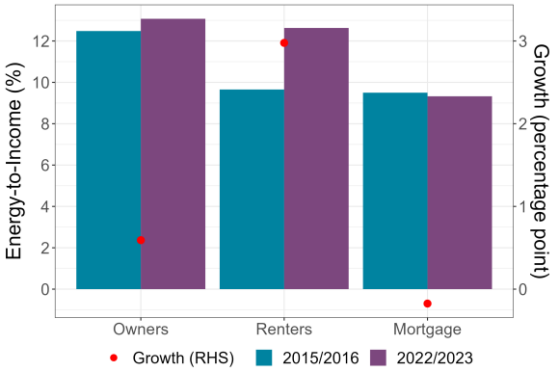
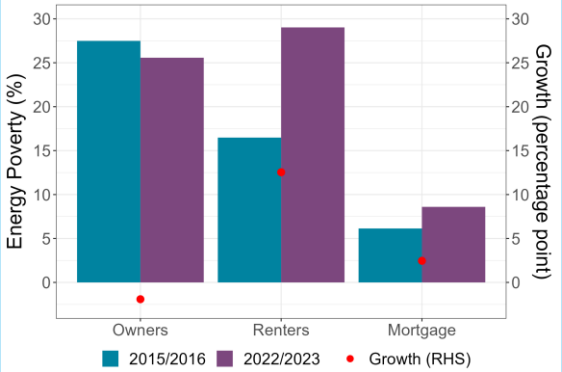


Chart 2.4: Percentage of HHs in Energy Poverty, 2015/16 – 2022/23



Source: Household Budget Surveys, 2015/16 and 2022/23
Notes: 2022/23 HBS survey did not include household income as a continuous variable. Instead, for comparison with 2015/16 wave, use mid-point between six income ranges provided by the data to compute our energy to income ratios.

Conclusion:

Using the two most recent waves of the Household Budget Survey, 2015/16 and 2022/23, we find a large increase in energy price expenditure by households over a seven-year period, mainly due to electricity and gas price increases. These changes impact those in rental accommodation relatively more than mortgaged households with the energy-to-income ratio for renters rising from 9.7% to 12.6% over the period while the equivalent for mortgaged households remained broadly similar (9.5% to 9.3%). This increase places households in rented accommodation at a greater risk of energy poverty. These findings highlight how energy price changes have different impacts across energy users, which is an important consideration when designing policy to support Ireland's transition to a low carbon economy.

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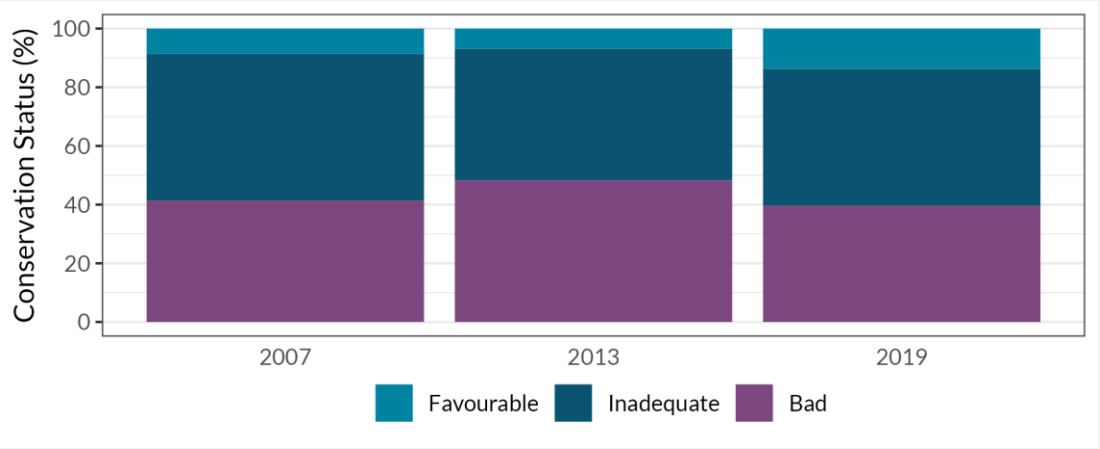
Part E: Nature and Biodiversity

The state of Ireland's nature is very poor
E.1 | Habitats by Conservation Status, 2007-2019

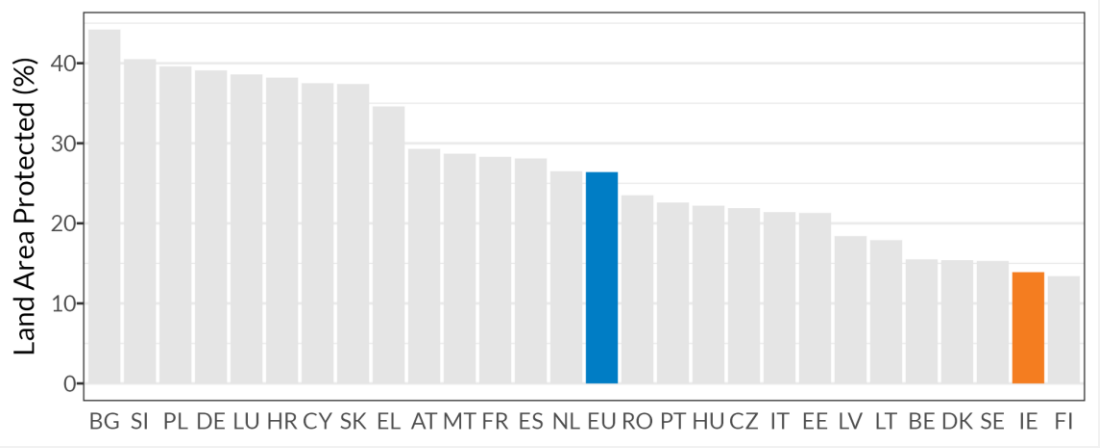
The National Parks and Wildlife Service assess Ireland's habitats using the best available information on the range, area, structure, threats and management of the habitat. As of 2019, 8 habitats were in deemed "favourable", 27 "inadequate", and 23 "bad".



Source: National Biodiversity Indicators [Link]
Notes: indicator used for Article 17 reporting under the EU Habitats Directive to grade the conservation status of habitats

Ireland has the second lowest share of protected land area in EU
E.2 | Percentage of Terrestrial Areas Protected in 2023

The EU biodiversity strategy aims to protect at least 30% of land and sea in Europe through nationally designated sites and Natura 2000 sites. At 14%, Ireland has the second lowest proportion of protected land area in the EU and is considerably below the European average (26%) in 2023.



Source: Eurostat [Link]
Notes: indicator measures the extent of protected areas, comprising nationally designated protected areas and Natura 2000 sites. A nationally designated area is an area protected by national legislation.

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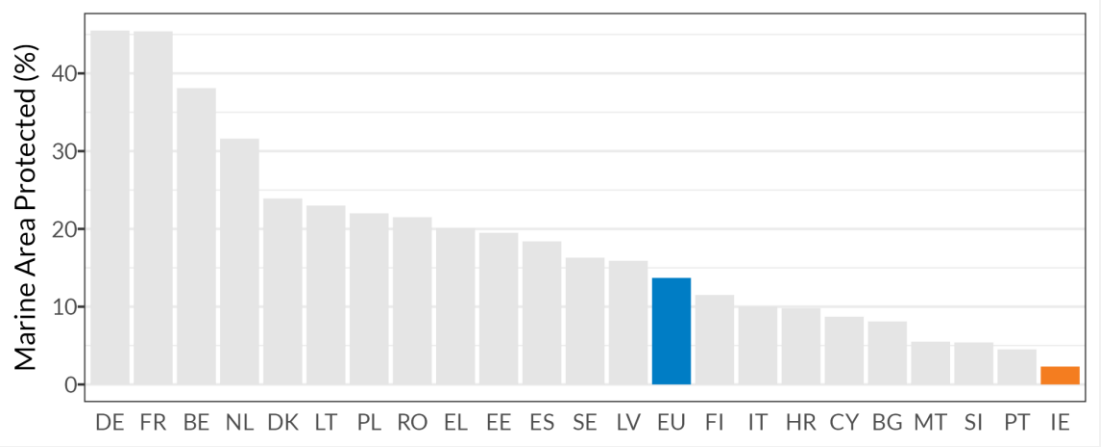
Ireland has the lowest share of protected marine area in EU
E.3 | Percentage of Marine Areas Protected in 2023

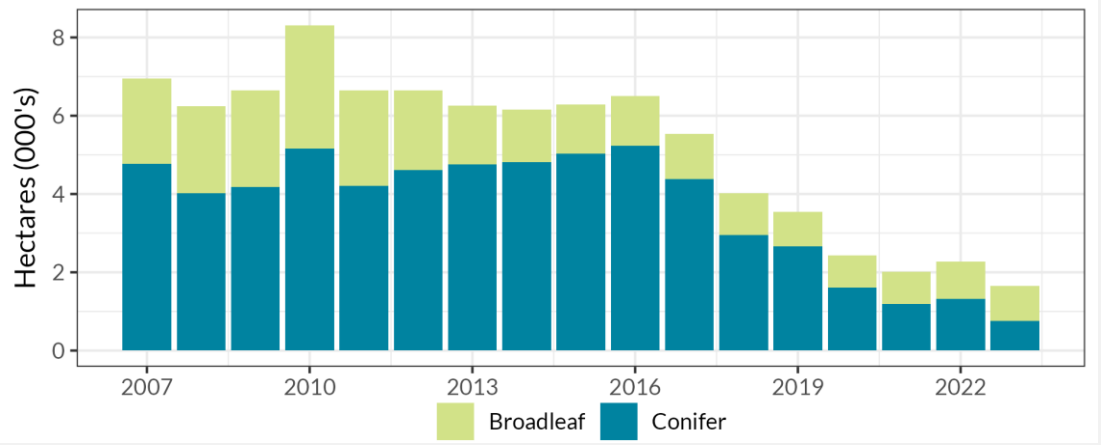
Marine protected areas (MPAs) are biodiversity 'hotspots' which support species and habitats, biodiversity conservation and restoration. In 2023, just 2.3% of Ireland's marine area was designated protected, considerably below the EU average (14%).



Source: Eurostat [Link]
Notes: indicator measures the extent of marine protected areas (MPAs), comprising nationally designated protected areas and Natura 2000 sites. A nationally designated area is an area protected by national legislation.

Afforestation rates declining significantly
E.4 | Afforestation Area by Species, 2007 - 2023

Planting of trees on land not previously under forest (referred to as afforestation) is a significant driver in the growth of total forest areas. Afforestation in Ireland 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]

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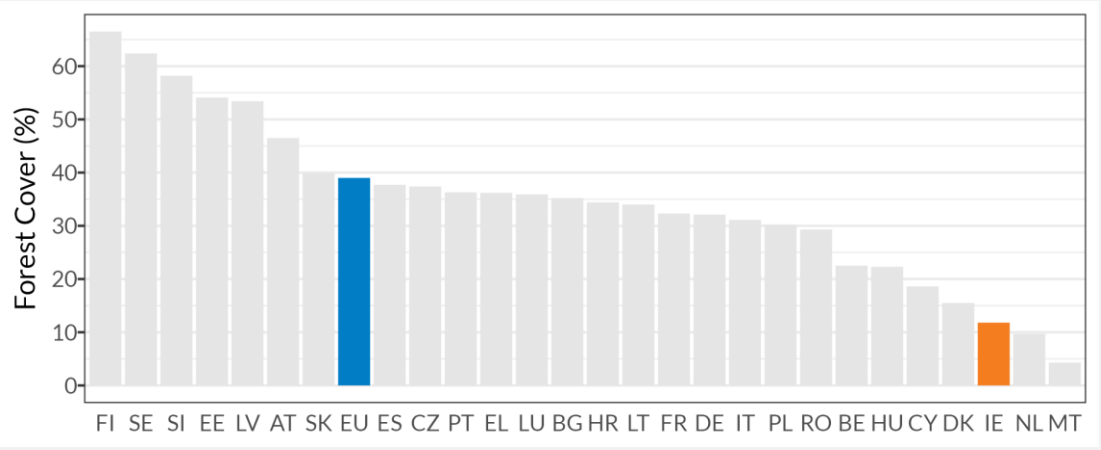
Ireland is the third least forested country in Europe
E.5 | Percentage of Land Area under Forest Cover in 2023

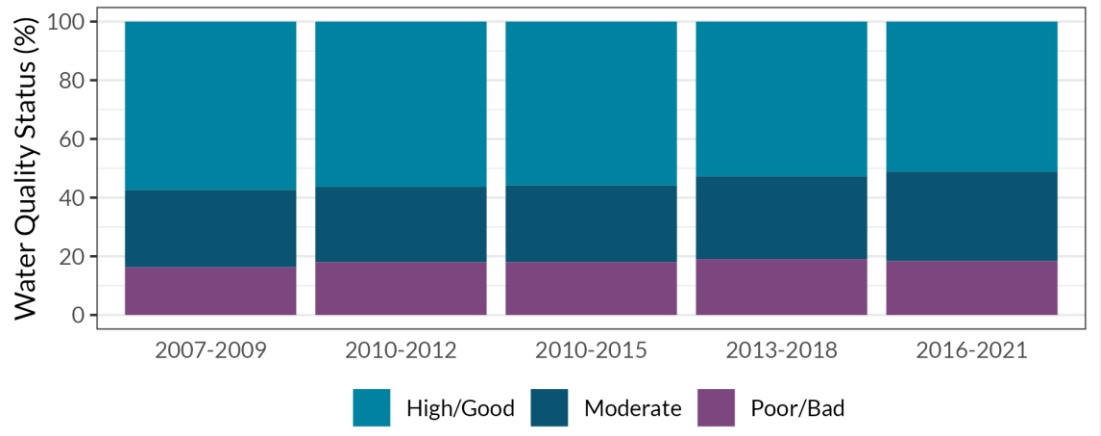
Just 11.8% of Ireland is under forest cover, considerably below the EU average (39%). The EPA estimate that the state would need to plant 8,000 hectares of forest per annum until 2030 to meet climate targets, while only close to 2,000 hectares has been achieved in recent years.



Source: Eurostat [Link]

Most Irish rivers and lakes are in good condition, but slight decline over time
E.6 | Water Quality in Lakes and Rivers, 2007-2021

In the latest period (2016-2021), 51% of Irish rivers and lakes are considered to be in "High/Good" condition. Since 2007, there has been a slight increase in the share with "Poor/Bad" condition (16% to 18%) and a decline in "High/Good" condition (57% to 51%).



Source: National Biodiversity Indicators [Link]
Notes: Assessment of quality is based on the extent of deviation from reference conditions i.e., biological, chemical, and morphological conditions associated with no or very low human pressure [Link].

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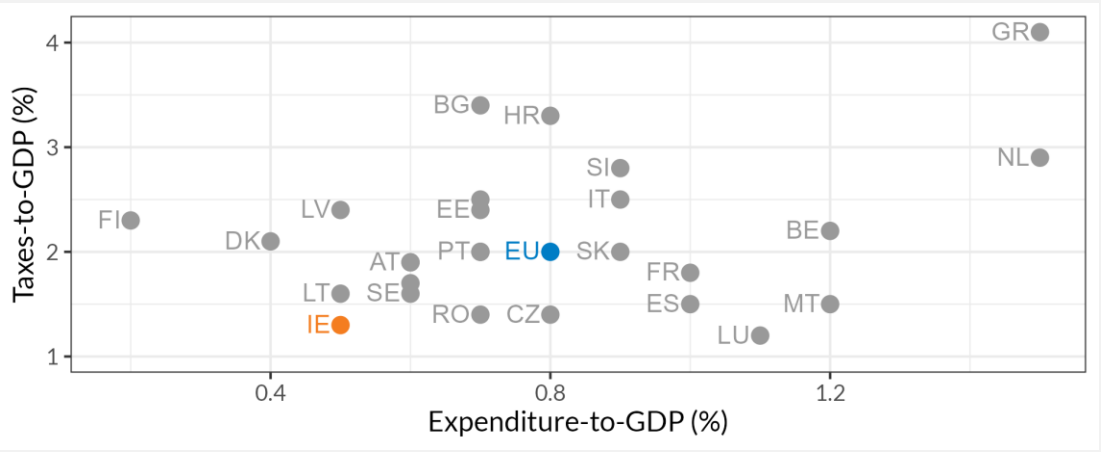
Ireland has relatively low levels of environmental expenditure and taxation

E.7 | Environmental expenditure and taxation as a proportion of GDP, 2023

With just 0.5% of GNI* spent on the protection of nature in 2023, Ireland ranks 3rd lowest (joint with Lithuania and Latvia) in the EU. Environmental taxes are also relatively low (1.3% of GNI*) compared to the EU average (2% of GDP).



Source: Eurostat [Link & Link]

Notes: European taxonomy classifes environmetal protection as spending on waste management, waste water management, pollution abatement, protection of biodiversity and landscapes, research and development on enviromental protection, and environmental protection spending that is not classifed elsewhere. Environmental taxes cover pollution and resources taxes, as well as taxes related to energy and transport.

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Box 3: Data-centre Electricity Use in Ireland: Trends, Challenges, and Future Flexibility

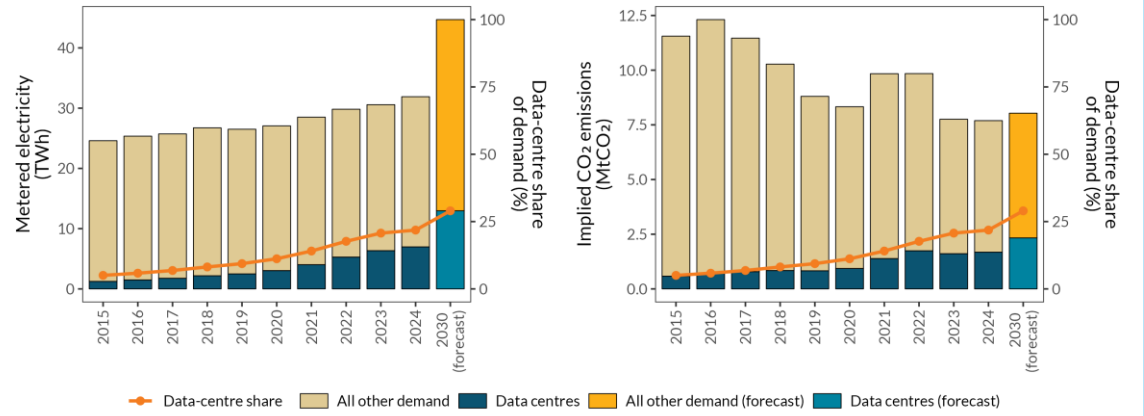
Saeed Shahabi Ahangarkolaee and James Carroll

Ireland has become one of the most data-centre-intensive power systems in Europe (Walsh, 2024). Central Statistics Office releases show that the share of metered electricity consumed by data centres rose from 5 per cent in 2015 to 22 per cent in 2024 (CSO, 2025). Over 2015–2023, total metered electricity demand increased by 24 per cent, with data centres accounting for about 85 per cent of this growth (CRU, 2025); total demand rose further in 2024. At a global level, data centres use around 1–1.5% of all electricity, and demand is rising quickly with the rapid growth in AI and cloud services (IEA, 2025a, b). Looking ahead, recent system studies suggest that data centres and other new digital loads could account for around one-third of Irish electricity demand by the mid-2030s (EirGrid, 2024; Walsh, 2024).

Chart 3.1 and 3.2 show what this implies for national electricity consumption and implied emissions, including 2030 demand forecasts (Eirgrid, 2025). The demand panel shows a sustained rise in data-centre electricity use, with a further step up in the 2030 forecast. The emissions panel converts these electricity volumes into implied CO_2 emissions using grid carbon-intensity factors from SEAI, 2025. The key point is the tension between decarbonisation and demand growth. Carbon intensity is falling, but rapid growth in data-centre load creates a volume effect. As a result, implied emissions linked to data-centre electricity use may remain broadly unchanged or rise if demand grows faster than the decline in carbon intensity.

Chart 3.1: Annual Electricity Demand by Source, Historic and Forecast

Chart 3.2: Annual Implied Emissions by Source, Historic and Forecast



Source: CSO quarterly metered electricity consumption by sector [Link], SEAI data on electricity-related CO_2 and renewable generation [Link], and EirGrid electricity demand forecast [Link].
Notes: (i) For 2030 carbon intensity, we use a simple regression on historic data to link carbon intensity to forecasted renewable electricity generation for that year. These projected intensities are then multiplied by projected data-centre electricity demand to obtain CO_2 emissions. (ii) EirGrid demand data includes data centers and new technology loads (large-scale, non-data center growth in the technology sector).

Charts 3.3 and 3.4 explore historic data centre demand in the context of Ireland's significant growth in intermittent renewable supply. Chart 3.3 shows quarterly generation split into renewable and non-renewable sources. Generation varies across quarters as renewable output depends on weather and seasonality. Looking forward, renewable shares are expected to rise significantly, with targets of 80% renewables for 2030 in the latest Climate Action Plan, 2025. This increase will also imply considerably higher shares of intermittent supply, with associated challenges for balancing the grid (supply matching demand).

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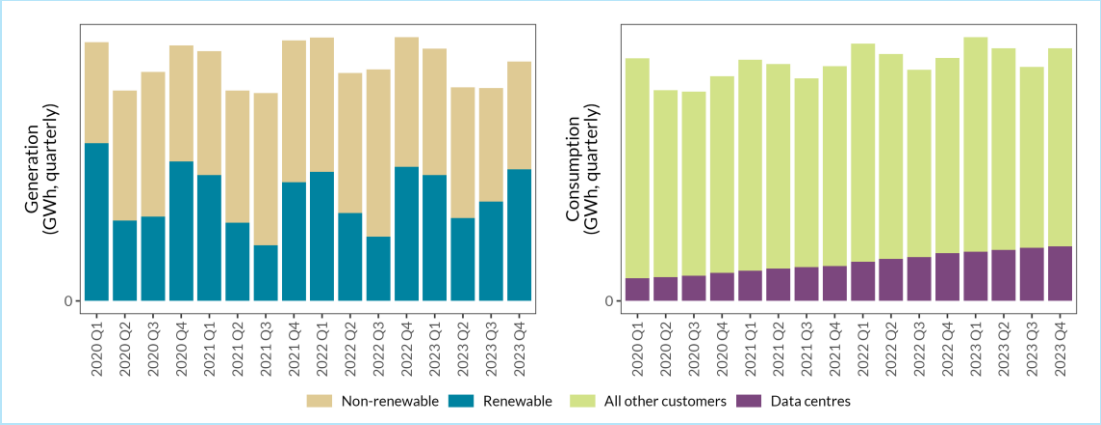
Chart 3.4 shows quarterly metered consumption split into data centres and all other customers. Data-centre demand follows a relatively steady profile with limited seasonal variation. This creates a clear mismatch: renewable generation is variable and seasonal, while the fastest-growing source of demand in Ireland is comparatively flat.

Chart 3.3: Quarterly Electricity Generation by Source

Chart 3.4: Quarterly Electricity Consumption by Source



Source: CSO quarterly metered electricity consumption by sector [Link] and CSO quarterly electricity generation by fuel [Link].
Notes: The difference in totals between generation in Chart 3.3 and metered consumption in Chart 3.3 reflects system losses, station own-use, and differing accounting boundaries, rather than a like-for-like imbalance.

Such mismatch increases the value of flexibility through increased demand-side management (DSM) at data centres. On-site batteries and the use of back-up generation can assist with system-wide intra-day imbalances. However, over longer periods (quarters, for example), the lack of data centre flexibility will necessitate greater use of non-renewable sources and/or imports when renewable supply is low. Higher solar shares in Ireland would also support a more consistent seasonal renewable share profile (inversely correlated with wind).

Conclusion

From an efficiency standpoint, Ireland's temperate climate can mean lower cooling requirements than hotter locations, which may reduce energy intensity for some data centre designs. However, these potential efficiency gains need to be paired with credible flexibility arrangements to align with Ireland's rising renewable shares – such as onsite storage, dispatchable capacity and demand-side measures – together with safeguards to manage national grid imbalances and maintain security of supply.

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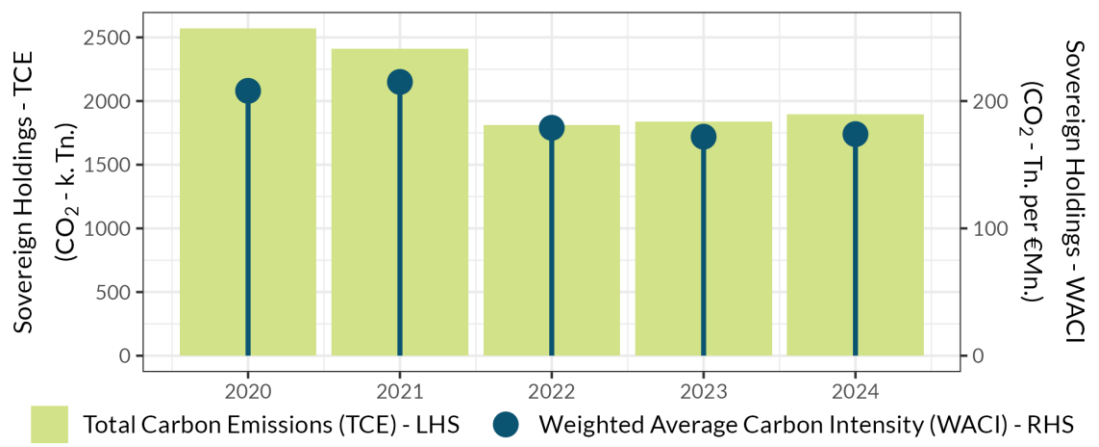
Part F: Central Bank of Ireland Emissions and Investments

Emissions intensity of holdings of sovereign bonds has reduced since 2020
F.1 | Climate Metrics of Central Bank Investment Assets, 2020 - 2024

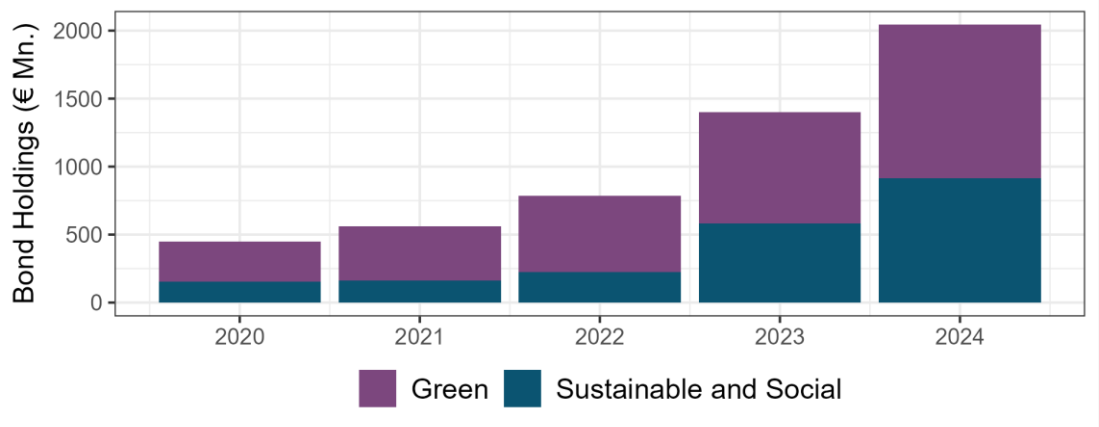
Chart F.1 presents emissions (Scope 1) associated with the Central Bank's sovereign asset holdings for two metrics: total CO_2e emissions (TCE) and weighted average CO_2e intensity (WACI).



Source: Central Bank Financial Markets Division [Link]
Notes: Both metrics are 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 investment in sustainable debt up by almost 50% since 2023
F.2 | Central Bank Holdings of GSS Bonds, 2020 - 2024

The Central Bank invests in sustainable debt (i.e. green, social and sustainability bonds), issued by development banks, supranational organisations, governments and agencies. In 2024 we met our target to allocate €2bn (nominal) to sustainable debt, which helps to finance decarbonisation efforts and support other sustainable projects and activities.



Source: Central Bank Financial Markets Division [Link]

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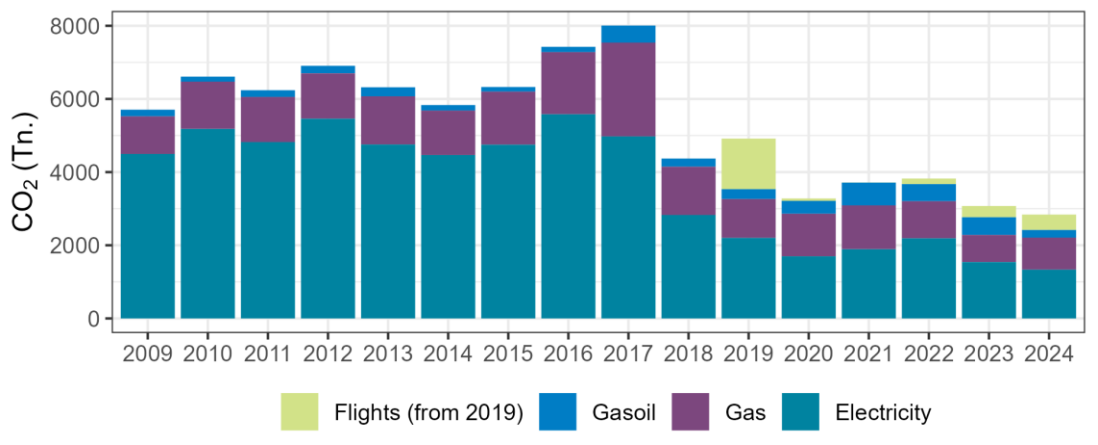
Emissions from Central Bank operations declined 7.6% in 2024

F.3 | Central Bank of Ireland Scope 1 (Gas and Gasoil), Scope 2 (Electricity) and Selected Scope 3 (Flights) CO_2 Emissions, 2009-2024

CO_2 emissions from Central Bank operations in 2024 totalled 2,840 tonnes – electricity (1,333 tonnes), gas (877 tonnes), flights (418 tonnes) and gasoil (211 tonnes). Overall, emissions are down 7.6% in the past year, and 65% since their peak (2017).



Source: Central Bank of Ireland [Link]
Notes: Emission factors from SEAI [Link]. Scope 2 electricity emissions estimated using CO_2 intensity data from SEAI [Link]. Flight emissions estimated using ICAO calculator [Link].

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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 compared to 2018.
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.

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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).

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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.

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