The Climate Action Monitor 2025

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BETTER POLICIES FOR BETTER LIVES

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Preface

This year is an important one for global climate action. Under the Paris Agreement, countries are expected to submit updated Nationally Determined Contributions (NDCs) with targets for 2035. These updates provide an opportunity to realign national efforts with the level of ambition necessary to meet agreed climate goals. Yet, the emission reduction pledges for 2030 remain insufficient. Significant gaps persist between commitments, national actions and the emission reductions needed to place the world on a track to meet Paris Agreement objectives.

According to the OECD Climate Actions and Policies Measurement Framework, global climate action expanded by just 1% in 2024 – confirming a slowdown in progress observed since 2021. This loss of momentum can no longer be attributed solely to disruptions from the COVID-19 pandemic or economic shocks. It reflects deeper structural barriers to implementation and pressures on climate commitments in many countries. Persistent disparities in action across countries risk heightening competitiveness concerns and carbon leakage, ultimately undermining the overall progress of global mitigation efforts.

Building on the OECD's multidisciplinary expertise, the International Programme for Action on Climate supports countries in strengthening climate action through comparable, harmonised data and evidence-based policy analysis. The Climate Action Monitor draws on these data to assess progress, identify good practices and help governments design and implement more effective strategies to accelerate alignment with the Paris Agreement goals.

By strengthening implementation, improving policy coherence and deepening international co-operation, we can raise the ambition in global climate action and restore momentum in achieving faster, more effective progress towards emissions reduction. The OECD will continue to support its members and partners in translating robust data and analysis into effective climate policy action.

Mathias Cormann

OECD Secretary-General

Foreword

Under the International Programme for Action on Climate (IPAC), *The Climate Action Monitor* provides an overview of countries' greenhouse gas emissions, emissions targets, climate-related hazard impacts and climate policy action.

Launched in 2021 at the OECD Ministerial Council Meeting and overseen by the OECD Environment Policy Committee and its Working Party on Environmental Information (WPEI), IPAC tracks progress towards achieving net-zero greenhouse gas emissions and building a more resilient economy by 2050. To this end, IPAC equips governments with an indicator dashboard and analytical reports to evaluate and assess climate action using official and validated data. While coverage is still evolving, the priority is to develop a coherent set of indicators to support the transition to net zero.

IPAC builds on OECD research and develops new datasets and indicators in collaboration with organisations such as the International Energy Agency, the International Transport Forum, the Nuclear Energy Agency, and the UNFCCC, to capture the environmental, economic, and social dimensions of climate impacts and government responses.

This report, prepared by Rodrigo Pizarro, Mikaël J.A. Maes, Daniel Nachtigall, Laura Smith, and Louise Sieg with inputs from Jessie Algar, building on data collected by Edoardo Falchi, Max Böhringer, Carla Bertuzzi, Constantin Mengersen, Elena Rick-Spearman, Federico Drogo, Andrzej Suchodolski, Bopha Chun and Pinhas Zamorano. The work was carried out under the supervision of Nathalie Girouard, Head of the Environmental Performance and Information Division in the OECD Environment Directorate. Natasha Cline-Thomas, Beth Del Bourgo and Catherine Bremer provided communications and publication support. Gabriella Scaduto-Mendola ensured administrative support and prepared the document for publication.

The authors would like to thank OECD colleagues for their helpful comments on a previous version of the paper, including Max Bohringer, Enrico Botta, Margot Duluk, Ivan Hascic, Sirini Jeudy-Hugo, Elisa Lanzi, Kilian Raiser, Mikaela Rambali, Simon Touboul, Sarah Miet, Andrzej Suchodolski, Julia Wanjiru, and Frédérique Zegel. As well as the detailed comments from country delegations including Australia, Canada, Costa Rica, Germany, Luxembourg, the United Kingdom and the United States.

The OECD gratefully acknowledge the financial support for this publication and other IPAC outputs from Bulgaria, Croatia, Finland, France, Israel, Italy, Japan, Korea, Latvia, Luxembourg, New Zealand, Switzerland, the United Kingdom.

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Reader's guide

This report presents the fifth edition of *The Climate Action Monitor*, an annual OECD publication prepared under the International Programme for Action on Climate (IPAC). It provides an overview of countries' climate action building on the IPAC Dashboard of climate-related indicators, as well as other key research from the OECD, International Energy Agency, International Transport Forum, and Nuclear Energy Agency, as well as other organisations and international data sources.

IPAC reviews key trends and assesses progress in countries' climate policies, presenting key indicators in the IPAC Dashboard. In so doing, it complements and supports climate policy analysis across OECD countries, such as Environmental Performance Reviews and Economic Surveys which form the core of the OECD peer review process, as well as the monitoring frameworks of the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement.

IPAC focuses on developing country-level indicators for 52 countries and the EU-27 as a bloc. The countries covered under IPAC are presented below.

	38 OECD Member countries	14 OECD partner countries
OECD Member countries	Australia, Austria, Belgium, Canada, Chile, Colombia, Costa Rica, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Türkiye, United Kingdom, and the United States	
Key Partner economies		Brazil, People's Republic of China, India, Indonesia, and South Africa
Accession candidate countries		Argentina, Brazil, Bulgaria, Croatia, Indonesia, Peru, Romania, and Thailand
Others		Saudi Arabia, Malta, and the European Union

Note: While the Russian Federation is not covered by IPAC, the country is included in totals as part of IPAC's global monitoring effort. Brazil and Indonesia are both OECD Key Partner countries and accession candidate countries.

This report presents data for countries covered under IPAC referred to collectively as OECD and OECD partner countries. Some indicators are not available for all countries or for all years. In such cases, the report highlights these gaps or provides preliminary estimates to ensure comprehensive aggregates. For example, annual greenhouse gas emissions from OECD partner countries were estimated. Details on data availability and methodologies are provided in notes and the Annexes.

The Climate Action Monitor follows the OECD Pressure-State-Response environmental indicator model (OECD, 2023[1]) and relies on a set of indicators developed with methodologies approved by OECD members and updated annually (Maes et al., 2022[2]) (Maes et al., 2025[3]) (Nachtigall et al., 2022[4]) (Pizarro et al., 2024[5]).

Visuals to present GHG Emission Trends and Targets (GETT) indicators

To support the assessment of targets, this edition includes updated visuals to present the GETT indicators (Pizarro et al., 2024[5]). These visuals aim to make the indicators easier to interpret, without changing their underlying methodology:

- *NDC Delivery Gap*: This visualisation presents the distance to target indicator (Pizarro et al., 2024[5]) between 2023 and 2030. It estimates the difference in GHG emissions in 2023 compared with the emissions implied by a linear trajectory from 2019 to countries' 2030 NDC targets. It thus illustrates how far countries are from achieving their NDC targets.
- *2050 Target Consistency Gap*: This visualisation presents the distance to target indicator (Pizarro et al., 2024[5]) considering the expected emissions in 2030 and 2050. It compares NDC 2030 targets with the emissions implied by a linear pathway to countries 2050 emission targets (or implied target to that year, since some countries have targets beyond 2050, such as 2060). It highlights the degree of alignment between current NDCs and long-term targets.

Broadened indicators and coverage

- *Forward-looking climate-hazard projections* (Maes et al., 2025[3]): extends the coverage of climate hazards across key domains up to the year 2100 (relative to 1995-2014), presenting projected impacts across multiple climate scenarios and time horizons, highlighting the scale of future climate risks.
- *Expanded climate policy coverage* (Nachtigall et al., 2022[4]): the 2025 edition of the Climate Actions and Policies Measurement Framework (CAPMF) broadens its scope from 56 to 87 policies and from 51 to 97 jurisdictions (96 countries plus the EU-27). The new policy scope includes policies related to the waste and agriculture, forestry, and land-use (AFOLU) sectors, climate-related financial policies as well as new subsidies for low-carbon technologies (e.g. tax credits for renewables), regulatory instruments, information tools and green public procurement policies. The new countries covered are: in the Americas (Grenada, Honduras, Paraguay, Saint Lucia, Saint Vincent and the Grenadines), Middle East and North Africa (Egypt, Iran, Morocco, United Arab Emirates), Asia (Azerbaijan, Brunei, Cambodia, Lao PDR, Malaysia, Myanmar, Pakistan, Philippines, Singapore, Timor-Leste, Viet Nam), Sub-Saharan Africa (Angola, Benin, Botswana, Burkina Faso, Cabo Verde, Cameroon, Cote d'Ivoire, Ethiopia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Mali, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, The Gambia, Togo, Uganda, United Republic of Tanzania, Zambia).

Structure of the Monitor

To continue tracking key trends, while deepening analysis, from 2025 each edition will rotate content with changing thematic focus alongside the annual indicator set. In 2025, the Monitor features an in-depth review of extreme temperature impacts (Chapter 2) and sectoral or regional climate action (Chapter 3). Over a three-year cycle, this structure allows for a comprehensive analysis of climate hazards and policy areas, while the IPAC Dashboard ensures the continuity of annual reporting.

Looking ahead, IPAC will continue to refine datasets, strengthen methodologies, and adapt indicators to support countries in designing effective climate policies tailored to their specific institutional, economic, and social contexts.

References

Maes, M. et al. (2022), “Monitoring exposure to climate-related hazards: Indicator methodology and key results”*, OECD Environment Working Papers*, No. 201, OECD Publishing, Paris, https://doi.org/10.1787/da074cb6-en. [2]

Maes, M. et al. (2025), “Monitoring exposure to future climate-related hazards: Forward-looking indicator results and methods using climate scenarios”*, OECD Environment Working Papers*, No. 264, OECD Publishing, Paris, https://doi.org/10.1787/b9ba6ee0-en. [3]

Nachtigall, D. et al. (2022), “The climate actions and policies measurement framework: A structured and harmonised climate policy database to monitor countries’ mitigation action”*, OECD Environment Working Papers*, No. 203, OECD Publishing, Paris, https://doi.org/10.1787/2caa60ce-en. [4]

OECD (2023), *The Climate Action Monitor 2023: Providing Information to Monitor Progress Towards Net-Zero*, OECD Publishing, Paris, https://doi.org/10.1787/60e338a2-en. [1]

Pizarro, R. et al. (2024), “GHG Emission Trends and Targets (GETT): Harmonised quantification methodology and indicators”*, OECD Environment Working Papers*, No. 230, OECD Publishing, Paris, https://doi.org/10.1787/decef216-en. [5]

Executive summary

Climate risks are intensifying. In 2025, record heatwaves, floods, droughts and wildfires highlighted the growing vulnerability of societies and economies. Signs are becoming more evident that ecosystems may be fast approaching critical climate tipping points, including changes in ocean circulation and sea ice decline. Meanwhile, climate-related disasters are already causing escalating social and economic costs, with damages of over USD 328 billion and 16 000 recorded deaths in 2024 across the world. These developments underscore the urgent need for adaptation, particularly in more vulnerable countries, but also the importance of ambitious and effective mitigation action.

Global greenhouse gas (GHG) emissions reached a record high of 55 Gt CO_2e in 2023, leaving the world off track to meet the 1.5°C and 2°C temperature goals. While some progress has been achieved, and the Paris Agreement has been critical in this, current commitments remain insufficient and implementation gaps persist.

Current Nationally Determined Contributions (NDCs, 2030) are not aligned with 2050 targets and only 17.7% of global emissions currently covered by national net zero pledges are enshrined in legally binding legislation. The forthcoming set of 2035 NDCs (NDC 3.0) provides a critical opportunity to raise ambition and credibility.

The OECD's Climate Actions and Policies Measurement Framework (CAPMF) shows that global climate action expanded by only 1% in 2024, continuing the slowdown since 2021. This can no longer be explained by the COVID-19 pandemic or the subsequent economic crisis: it reflects a loss of momentum in implementing effective policy responses. There is clear evidence of a global climate action implementation gap.

Progress in climate action in 2024 was not uniform across countries, sectors and policy instruments. While progress was recorded in emissions trading systems, transport-related policies (e.g. new phase outs of internal combustion engines), and carbon neutrality targets; other market-based instruments, such as carbon pricing, remain less used and cover less than half of global emissions. Other positive developments included higher government spending on low-carbon research and development as well as regulations such as updated building codes and accelerated phase outs of coal plants.

Sectoral challenges remain significant. Fossil fuel use in electricity and heat and transport, continue to drive emissions, with only limited progress in shifting towards cleaner alternatives. Although electric vehicle uptake and internal combustion engine phase-outs are advancing, transport emissions remain high and overall policy action lags compared to other sectors despite recent progress.

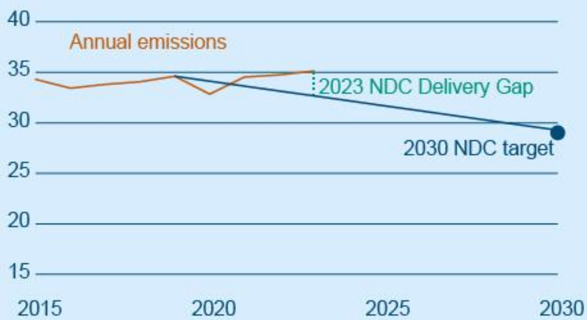
National climate action requires tailored approaches, reflecting diverse countries circumstances, including income levels, structural factors and institutional capacity. Nevertheless, decoupling emissions from economic and population growth is central to long-term climate mitigation. Developing countries require support to ensure that economic growth is increasingly decarbonised.

The global response to climate change remains insufficient. Stronger policies, faster implementation, and legally binding measures are urgently needed to close the ambition and delivery gaps. The cost of inaction is rising, with increasing economic losses, social inequalities and environmental damages.

Key facts and figures

OECD and OECD partner countries are not on track to deliver their 2030 NDCs

Total GHG emissions including LULUCF, OECD and OECD partner countries, Gt CO_2e



In 2023, total emissions were 8% above the level required to be on track for 2030 NDCs revealing an NDC Delivery Gap.

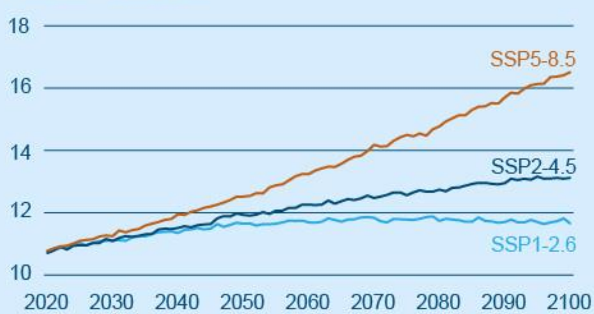
OECD and OECD partner countries' 2030 NDCs are not aligned with long-term targets

Total emissions including LULUCF, OECD and OECD partner countries, Gt CO_2e

To align with 2050 targets, 2030 emissions must be 16% lower than current pledges. The 2035 NDCs provide a key opportunity to raise ambition and credibility.

A very high emissions scenario could push global warming close to 6°C

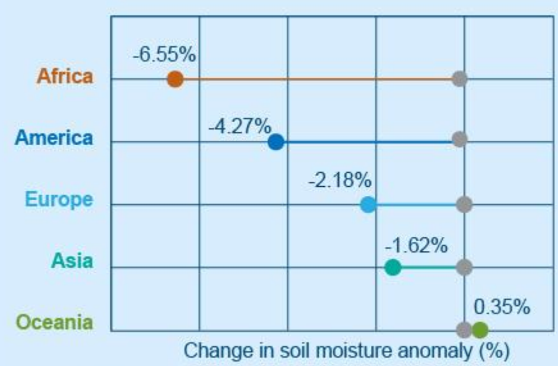
Global mean surface air temperature across emissions scenarios, 2020-2100



Under very high emission scenarios, global temperatures could rise up to 6°C by 2100, highlighting the steep costs of delayed action.

Droughts are worsening across most regions

Soil moisture anomaly (% change), 2020-2024 vs. 1981-2010



Four out of five continents show marked declines in soil moisture, signalling rising drought risks for agriculture.

Global climate action is losing momentum

Adopted policies by stringency level,CAPMF-covered countries, 2010-2024, total number adopted

Global climate action (measured as a combination of adopted policies and their stringency) expanded only 1% in 2024, confirming the slowdown observed since 2021.

Uneven climate action across countries risks undermining global mitigation efforts

Climate action (0-10); OECD, non-OECD G20, other non-OECD, 2010-2024

Differences in the pace of climate action across countries may affect competitiveness, and increase carbon leakage, reducing the overall effectiveness of global mitigation efforts.

1. How far are countries from achieving national and global mitigation objectives?

The year 2025 is critical to align global action with a sustainable greenhouse gas (GHG) emission pathway as countries are expected to submit their Nationally Determined Contributions for 2035 (NDC 3.0). The Paris Agreement, designed to limit global warming to well below 2ºC and to pursue efforts to limit warming to 1.5°C by the end of the century, has been pivotal in advancing global climate mitigation action (UNFCCC, 2015[1]). Since the ratification of the Paris Agreement, commitments by the global community have contributed to reducing the projected global warming by the end of the 21st century from 3.7–4.8°C to an estimated 2.4–2.6°C (UNEP, 2024[2]). Yet, current commitments are still not ambitious enough to achieve the temperature goals, and even these are not being fully implemented.

NDC 3.0 offers a critical opportunity for countries to raise ambition and importantly to align these commitments with 2050 net-zero targets. However, increased ambition alone is not enough – countries must also ensure that their pledges translate into concrete action. Currently, countries are not on track to meet their existing – and insufficiently ambitious – commitments. With global emissions continuing to rise, and climate action slowing, the world remains off course to achieve both the 2030 targets and longer-term net-zero commitments.

National climate action requires tailored approaches, as countries face diverse challenges shaped by differences in sectoral emissions profiles, income levels, and structural factors. Nevertheless, the potential impacts of climate change are devastating and unless countries recognise the urgency of action, the consequences for vulnerable communities, the global economy and ecosystems will be enormous.

1.1. Global GHG emissions reached an all-time high in 2023

In 2023, global GHG emissions reached around 55 Gt CO_2e,[1] marking a 1.7% increase from 2022 and about 3% higher than in 2015 (including international bunkers and a Land Use, Land-Use Change and Forestry (LULUCF) adjustment). Country-based GHG emissions including LULUCF reached 46 Gt CO_2e in 2023, increasing by 1.5% compared to 2022. Unless otherwise specified, this chapter refers to country-based emissions including LULUCF.

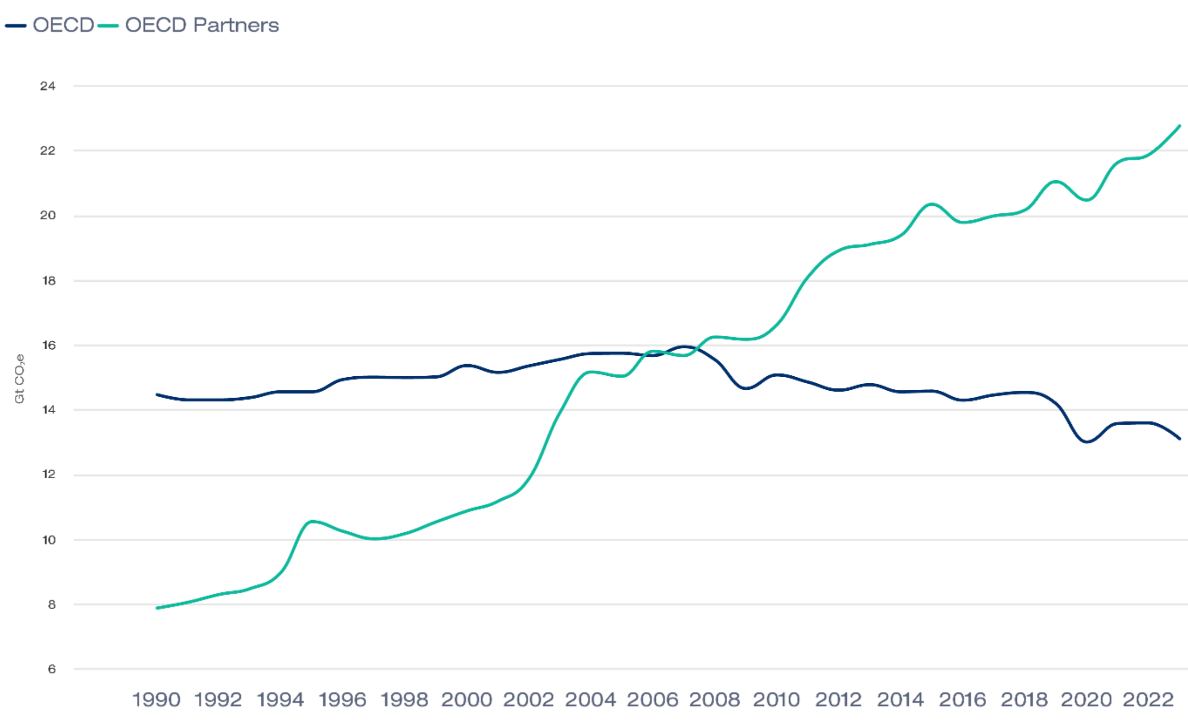
Together, emissions from OECD and OECD partner countries account for around 78% of total country-based emissions, underscoring their central role in global decarbonisation efforts (Figure 1.1). As a group, OECD countries have maintained a downward emissions trajectory since their peak in 2007, falling by 3.6% between 2022 and 2023, and by 10% since 2015, reaching around 13.1 Gt CO_2e. In contrast, emissions in OECD partner countries continue to rise – up 12% since 2015 and 4.1% since 2022 – reaching around 22.8 Gt CO_2e. In many partner countries emissions remain closely linked to economic growth, reflecting different stages of development and energy transitions.

Emissions in both OECD and OECD partner country groups are driven largely by major emitters. Between 2022 and 2023, emissions fell in several large OECD economies. Driven by expansions of renewable energy, significant decreases were recorded in Germany (-10.1%) and the European Union (-9.0%) (European Commission, 2024[3]). Several OECD partner countries also saw decreases, including Thailand (-2.2%) and Argentina (-1.6%). However, emissions increased in several of the largest emitting OECD partner countries. Notably, the People's Republic of China (hereafter "China") – accounting for approximately 30% of country-based emissions – saw an estimated increase of around 5%. Significant rises were also observed in India (+7.5%) and Saudi Arabia (+2.3%), while Brazil, Indonesia, and South Africa experienced more moderate increases.

The continued growth of emissions in many OECD partner countries should be viewed in the context of lower average per capita emissions compared with many OECD countries as well as ongoing economic and demographic growth. Aligning pathways to the Paris Agreement temperature goals will require aligning decarbonisation efforts with broader development priorities, particularly in emerging economies. Over time, economic growth will need to be increasingly decoupled from GHG emissions, supporting development that is consistent with climate goals and reduces the risks of future climate-related damages (OECD/UNDP, 2025[4]).

Figure 1.1. GHG emissions continue to grow in OECD partner countries

Total emissions including LULUCF, OECD and OECD partners, Gt CO_2e, 1990-2023



Source: OECD calculations based on Common Reporting Tables (CRT) submitted by countries to UNFCCC and PRIMAP-hist (Gütschow et al., 2016[5]) (Cárdenas Rodríguez et al., 2024[6]).

1.2. Countries are not on track to meet their 2030 NDCs

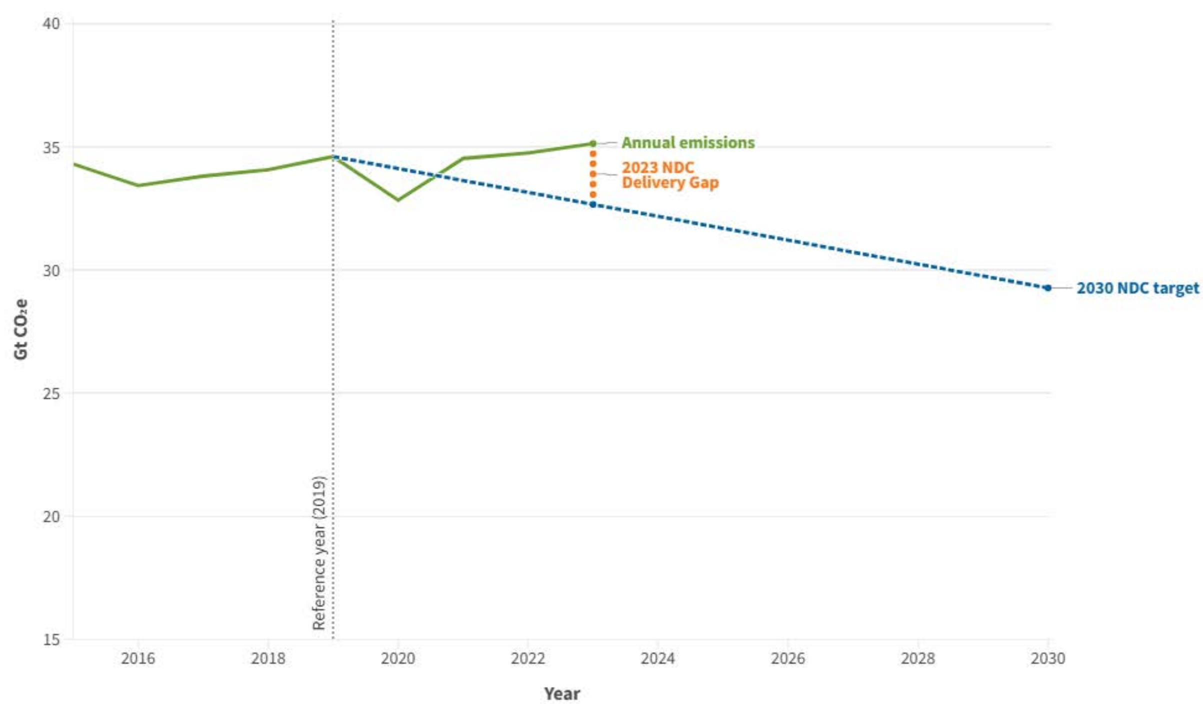
A decade after the Paris Agreement, countries face challenges in aligning their emissions with the reductions pledged in their 2030 Nationally Determined Contributions (NDCs). The NDC Delivery Gap provides a benchmark for assessing progress. It measures the difference between actual emissions in 2023 and the estimated emissions for the same year implied by a linear reduction trajectory from 2019[2] to 2030. A larger gap indicates that additional efforts will be required for countries to meet their targets.

In 2023, OECD and OECD partner countries together recorded a combined NDC Delivery Gap of around 2.5 Gt CO_2e. To align with the aggregate emissions implied by 2030 NDCs, this group of countries would need to cut emissions by an additional 8%. The size of the gap varies across groups. OECD countries recorded an NDC Delivery Gap of 0.8 Gt CO_2,[3] representing around 6% of their current emissions. By contrast OECD partners recorded a larger NDC Delivery Gap of 1.7 Gt CO_2e, around 8% of current emissions (Figure 1.2).

As the NDC Delivery Gap widens, the likelihood of meeting 2030 targets declines, with implications for the global temperature goals of limiting warming to 1.5°C or even 2°C. Closing this gap is therefore essential: not only to reduce near-term emissions, but also to build momentum and credibility to achieve longer-term NDCs and net-zero targets.

Figure 1.2. OECD and OECD partner countries are not on track to deliver their 2030 NDCs

Total emissions including LULUCF (2015-2023), IPAC countries, Gt CO_2e



Note: To calculate IPAC aggregate targets, individual countries' targets were harmonised across sectors and gases. Further details are provided in the methodology section. Saudi Arabia is not included in the IPAC target since its 2030 NDC target cannot be quantified.
Source: Emissions are based on OECD calculations using Common Reporting Tables (CRT) submitted by countries to UNFCCC and PRIMAP-hist (Gütschow et al., 2016[5]) (Cárdenas Rodríguez et al., 2024[6]). Targets are IPAC estimates which convert NDC submissions to the UNFCCC to common units (Pizarro et al., 2024[7]).

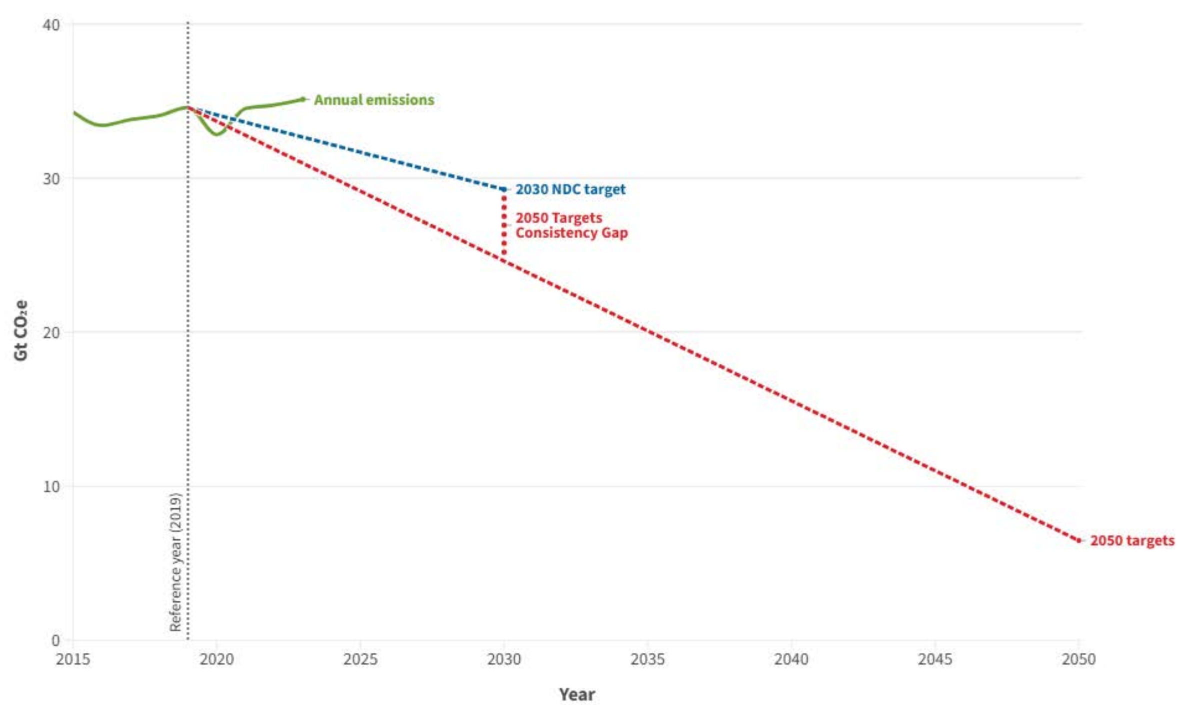
1.3. Current NDCs are misaligned with long-term commitments and net zero

While the NDC Delivery Gap demonstrates that countries are not on track to meet their 2030 targets, a critical second question is whether these near-term pledges are aligned with countries' own long-term commitments and global net zero emissions. This issue is especially relevant since countries are reassessing their ambition in the context of the NDC 3.0. Due in 2025, and covering the 2035 horizon, this round of NDCs provides countries the opportunity to align short- and long-term targets.

A clear misalignment persists between near-term NDCs and long-term 2050 targets. While many OECD and OECD partner countries have pledged net-zero emissions by mid-century, their current NDCs do not reflect a trajectory consistent with these goals. This misalignment is captured by the 2050 Targets Consistency Gap. Across countries covered by IPAC, this gap accounts for around 4.6 $GtCO_2e$ for 2030 – approximately 16% of aggregate NDC emission target – indicating that even full implementation of current NDCs would leave countries off-track for their own mid-century commitments (Figure 1.3). An even greater misalignment persists when countries, whose net-zero targets goes beyond 2050 (e.g. China and India), are adjusted to 2050.

Figure 1.3. OECD and OECD partner countries' NDCs are not aligned with net zero

Total emissions including LULUCF (2015-2023), IPAC 2030 NDC and net-zero target estimate, IPAC countries, Gt CO_2e



Note: To calculate IPAC aggregate targets, individual countries' targets were harmonised across sectors and gases. Further details are provided in the Methodology section. Saudi Arabia is not included in the IPAC target since its 2030 NDC target cannot be quantified.
Source: Emissions are based on OECD calculations using Common Reporting Tables (CRT) submitted by countries to UNFCCC and PRIMAP-hist (Gütschow et al., 2016[5]) (Cárdenas Rodríguez et al., 2024[6]). Targets are IPAC estimates which convert submissions to the UNFCCC to common units (Pizarro et al., 2024[7]).

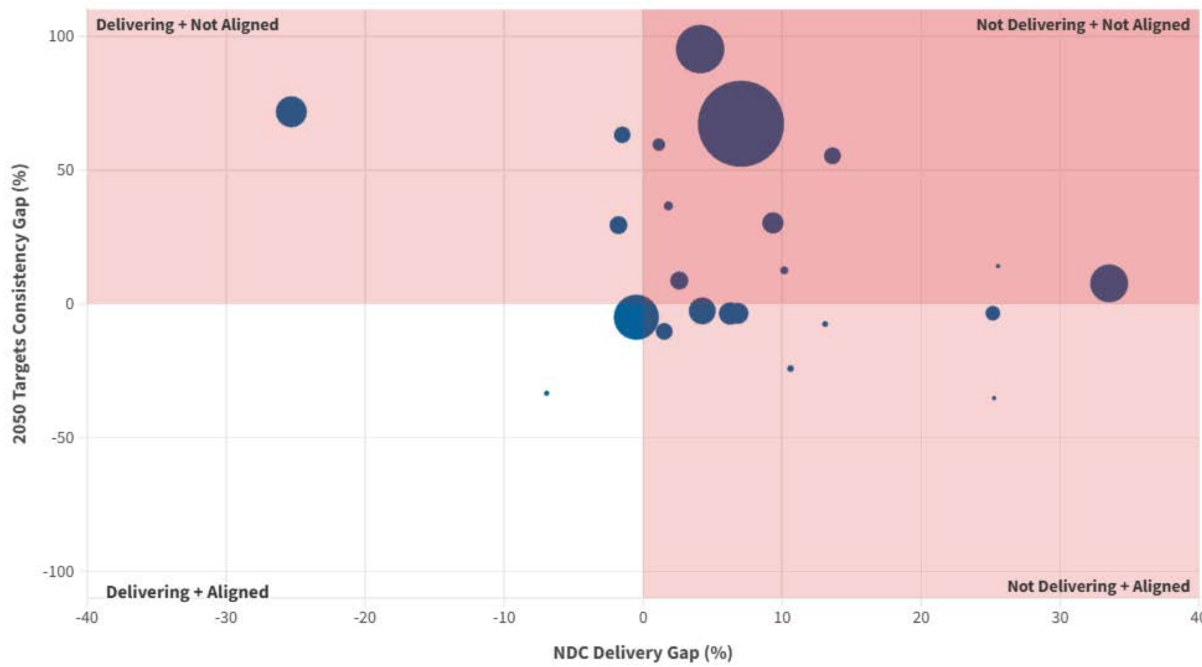
The upcoming set of 2035 NDCs presents a critical opportunity to close the 2050 Targets Consistency Gap by increasing ambition to ensure that the emissions trajectory is aligned with countries' 2050 targets. Due in 2025, and covering the 2035 horizon, this round of NDCs allows countries to align short- and medium-term targets with their 2050 commitments. Among the thirteen countries covered by IPAC that have submitted a 2035 NDC, less than half have proposed targets consistent with their own long-term target trajectories (see Box 1.1). This continued misalignment is even more concerning than in 2030, given the shrinking window to course-correct before 2050. Without increased ambition and accelerated climate action, countries risk missing mid-century targets. It is therefore critical for countries to use this round of NDCs as an opportunity to increase ambition and ensure a credible, consistent trajectory toward their long-term net-zero commitments.

1.4. Most countries face climate ambition and implementation challenges

Figure 1.4 illustrates the position of individual countries, covered under IPAC, in terms of their alignment with their 2030 NDC and 2050 commitments. The horizontal axis presents the NDC Delivery Gap where positive values represent the size of the NDC Delivery Gap. The larger the value, the greater the distance between current emissions and a linear trajectory towards the countries own NDC target. It should be viewed as an indicator of implementation or lack thereof. The vertical axis presents the 2050 Targets Consistency Gap, where positive values represent the size of the distance from the 2030 NDC target to the estimated emissions needed in 2030 to stay on track with 2050 targets. It should be viewed as an indicator of ambition. Only a small share of global emissions are in the bottom-left quadrant which represents countries that are both on track to meet their NDC 2030 target and aligned with their 2050 pledge. Only about 9% of emissions from IPAC covered countries (6% of global emissions) are in this quadrant (bottom-left), while more than 58% of emissions (43% of global emissions) fall in the top-right quadrant meaning that NDCs are not being delivered nor aligned with 2050 targets.

Figure 1.4. Few countries are on track to achieve their NDCs and most are not aligned with 2050 commitments

NDC Delivery Gap (Percentage of 2023 emissions), 2050 Targets Consistency Gap (Percentage of 2030 NDC target emissions). Bubble size represents 2023 emissions



Note: The EU-27 is treated as a single entity due to its collective NDC target. Country-level targets are maintained according to the gas and sectoral scopes specified of each country's NDC. Saudi Arabia is not included in the IPAC target since its 2030 NDC target cannot be quantified. The United States is not presented. Countries with extreme values (±40% for the NDC Delivery Gap or ±110% for the 2050 Targets Consistency Gap) have been omitted as outliers.
Source: Calculations are based on OECD estimates using Common Reporting Tables (CRT) submissions to the UNFCCC and PRIMAP-hist (Gütschow et al., 2016[5]) (Cárdenas Rodríguez et al., 2024[6]). Targets are expressed in common units consistent with UNFCCC submissions. Further details are provided in the Methodology section.

Box 1.1. NDC 3.0: Raising ambition for 2035 targets

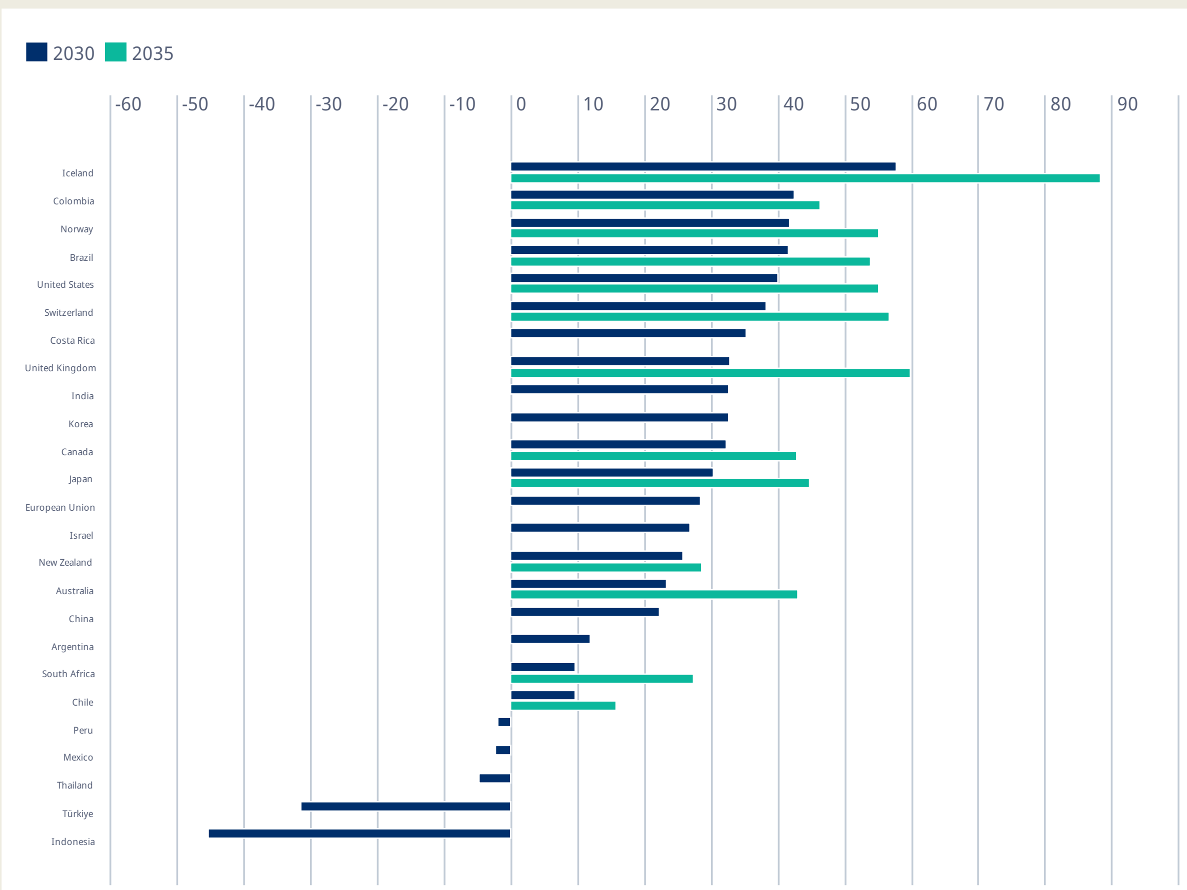
The year 2025 marks a pivotal moment for climate action, as countries are due to submit updated NDCs with targets to 2035. This is the first submission round informed by the Global Stocktake which provided evidence that current pledges fall short of pathways consistent with the Paris Agreement temperature goals or net-zero pathways.

The 2035 NDCs present an opportunity not only to strengthen ambition but to link climate action with sustainable economic growth (OECD/UNDP, 2025[4]). Recent OECD/UNDP analysis shows that enhanced NDCs can outperform business-as-usual scenarios, once climate damages are considered economic benefits are even larger (Chapter 2).

Progress to date has been limited. As of October 2025, only 64 Parties have submitted their NDC 3.0 and 13 countries covered under IPAC (Figure 1.5). IPAC harmonises countries' 2030 and 2035 mitigation targets in physical units, facilitating evaluation and monitoring (Pizarro et al., 2024[7]).

Figure 1.5. Implied percentage reduction in GHG emissions from 2023 to NDC targets

Percentage change relative to 2023 emissions (%), IPAC countries



Note: A positive value indicates a reduction in emissions compared to 2023 levels, and a larger positive value corresponds to lower projected emissions. The EU-27 is treated as a single entity due to its collective NDC target. Country-level targets are maintained according to the gas and sectoral scopes specified in each country's NDC. Further details are provided in the Methodology section.
Source: Targets are IPAC estimates which convert NDC submissions to the UNFCCC to common units (Pizarro et al., 2024[7]).

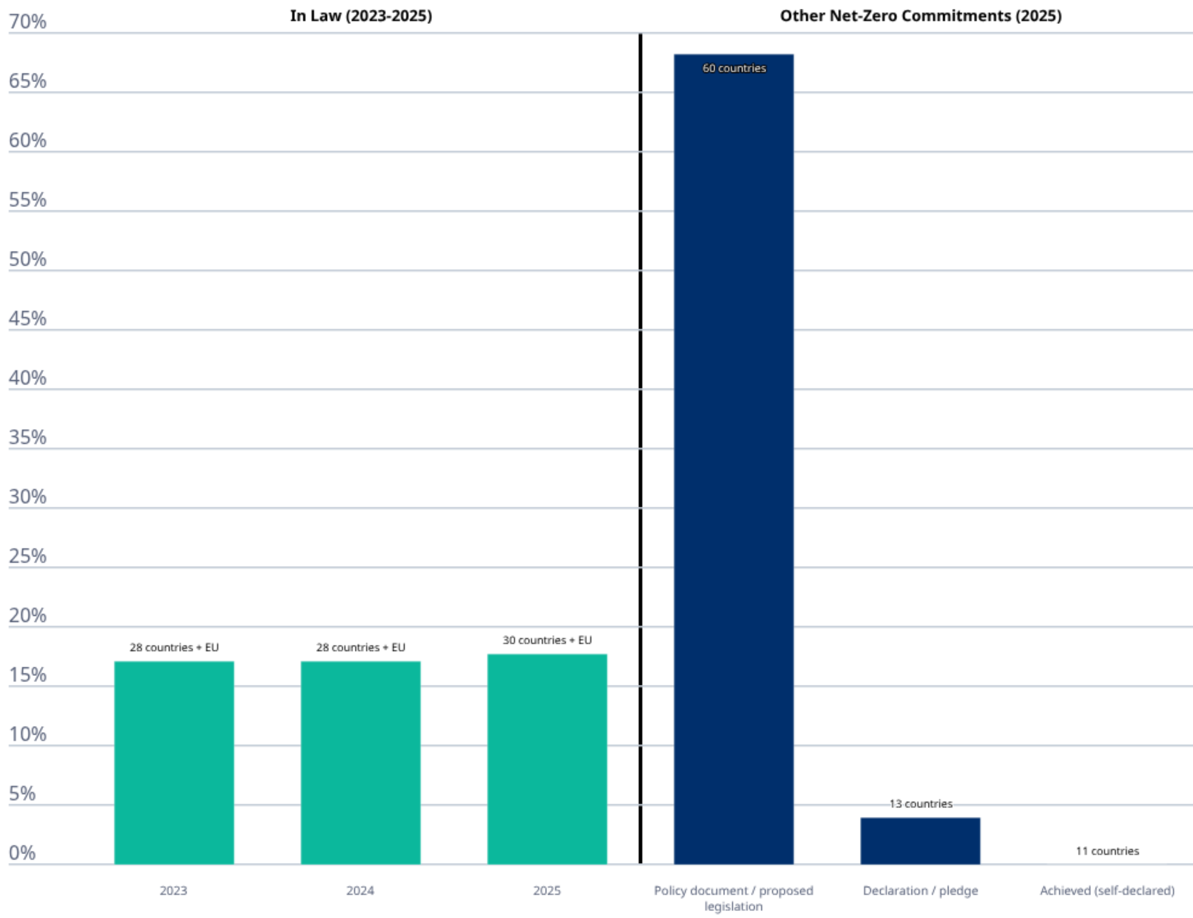
1.5. Only 18% of GHG emissions, covered by net-zero targets, are backed by legally binding commitments

As of September 2025, 114 countries and the European Union – together accounting for 92% of country-based emissions – have adopted net-zero targets.[4] However, the scope and timing of existing net-zero commitments varies considerably. Not all pledges cover all greenhouse gases and sectors, nor are they uniformly set for 2050. For instance, China and India have set net-zero targets for 2060 and 2070 respectively, while Uruguay's target is limited to CO_2. As a result of both the absence of commitments in some countries and delayed targets in others, the aggregate global GHG emissions trajectory implied by net-zero commitments by 2050 remains above the 1.5-2°C range.

Due to gaps in implementation and the absence of enforceable commitment even these pledges may not be met. Most countries have pledged net-zero targets through policy documents, such as Long-Term Low Emissions Development Strategies (LT-LEDS), NDCs or non-binding declarations.[5] Although the number of countries pledging net-zero emissions has increased in recent years, only 30 countries and the EU (27 Parties)[6] – representing 17.7% of global GHG emissions – have enshrined their targets into law (Figure 1.6). Progress has stagnated with the share of global country-based emissions covered by legally binding net-zero targets increasing only by 0.5% since 2024 with only Moldova and Ukraine putting new legislation into force.[7] Embedding net-zero targets in legally binding frameworks is important to ensure accountability and secure long-term implementation.

Figure 1.6. Global GHG emissions under a net-zero target law plateau at 17.7%

Number of countries with a net-zero pledge by type and their share of global emissions (%), in law (2023-2025)



Note: Net-zero targets, climate neutrality, carbon neutrality and zero carbon are all considered as a net-zero pledge. The EU commits to net zero by 2050 for the whole EU region. To avoid double counting, emissions for individual EU countries that have adopted net-zero commitments are not considered, they are covered by total EU emissions identified in the bar "in law". This figure also includes commitments with target years beyond 2050 - such as 2060 for China and 2070 for India.
Source: IPAC Net-Zero Tracker; OECD (2024), IPAC Dashboard, https://www.oecd.org/climate-action/ipac/dashboard.

1.6. GHG emission reduction commitments remain inconsistent with the Paris Agreement temperature goals

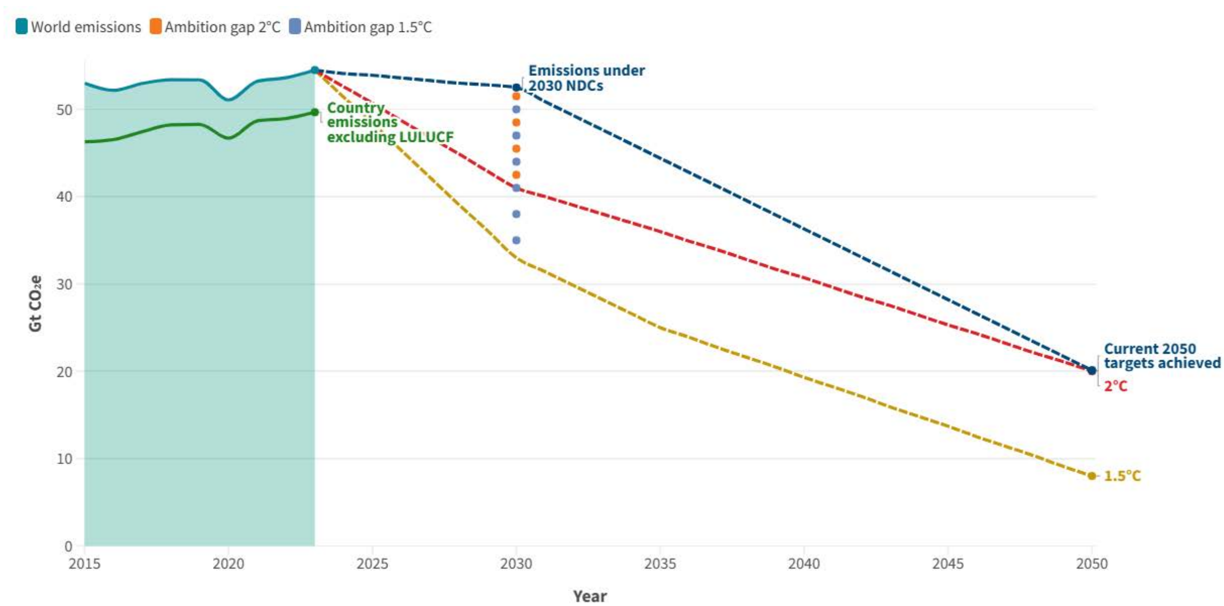
Ambitious mitigation commitments and their effective implementation are essential for meeting the Paris Agreement temperature goals. The NDC Delivery Gap illustrates the persistent challenges in achieving pledged reductions. Looking ahead, the full delivery of current NDCs, and countries 2050 commitments for all countries would still not be sufficient to align with pathways limiting warming to 1.5°C and 2°C. This shortfall is often referred to as the ambition gap. To meet these goals, global GHG emissions, including bunkers and a LULUCF bookkeeping adjustment[8] (55 Gt CO_2e), would need to fall by at least 40% for 1.5°C and by 25% for 2°C by 2030 (Figure 1.7) (UNEP, 2024[2]). Moreover, bridging the ambition gap will also require enhanced international cooperation on finance, technology transfer, and capacity-building to ensure equitable participation in global mitigation efforts.

The aggregate emissions reductions committed by OECD and OECD partners in their 2030 NDC targets is just 5.5 Gt CO_2e, around 16% compared to 2023 levels[9], with OECD countries targeting a 30% emission reduction and OECD partner countries 7%.[10] Since these countries account for 78% of aggregate country-level emissions, they play a critical role in closing the global ambition gap and achieving the Paris Agreement temperature goals. Given their economic structures and development levels, mitigation targets and trajectories across OECD and partner countries should be interpreted in light of respective national circumstances. However, total efforts still remain well below the scale required to be consistent with the temperature goals.

While international aviation and shipping and LULUCF sinks play important roles, achieving the Paris Agreement temperature goals ultimately depends on countries significantly increasing their climate ambition – making the submission of NDC 3.0 a critical moment. Given the guiding principle of the Paris Agreement of *common but differentiated responsibilities*, (CBDR), capacities and national circumstances, the exact emissions reduction commitment of individual countries will differ, but to be on a sustainable trajectory consistent with the 1.5°C and 2°C temperature goals of the Paris Agreement, countries would need to commit to an aggregate emissions in 2035 of approximately 17 $GtCO_2e$ for the 1.5°C temperature goal and 28 $GtCO_2e$ for 2°C.[11] This implies an emission reduction of between 39-63% compared to 2023 levels.

Figure 1.7. Global NDC and net-zero targets fall short of Paris Agreement goals

Total emissions including LULUCF (2015-2023), NDC and net-zero targets and IPCC estimated targets consistent with PA goals, Global, Gt CO_2e



Note: World emissions include national inventories plus international bunkers and a LULUCF adjustment to account for differences in reporting methods. Unlike other figures that use country-reported emissions including LULUCF, this figure calculates emissions including LULUCF by combining country-based emissions excluding LULUCF with a separate LULUCF bookkeeping adjustment. The estimate found in (UNEP, 2024[2]) for projected emissions in 2030 under Unconditional NDCs has been proportionally adjusted to align with the world emissions estimate.
Source: Historical emissions are based on OECD calculations using Common Reporting Tables (CRT) submitted by countries to UNFCCC and PRIMAP-hist (Gütschow et al., 2016[5]) (Cárdenas Rodríguez et al., 2024[6]). The 2050 targets estimate is based on IPAC calculations outlined in the Methodology section. The 2030 NDC target and temperature pathways are from (UNEP, 2024[2]).

Continued momentum for net-zero pledges in international aviation and shipping

Recent years have seen growing momentum to decarbonise international aviation and maritime transport - two sectors that account for 2.5% and 2% of global energy-related CO_2 emissions respectively (IEA, 2025[8]) (IEA, 2023[9]). In 2022, the International Civil Aviation Organization (ICAO) adopted a net-zero carbon emissions target for international aviation by 2050, supported by mechanisms such as the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) (Chapter 3). Building on this, the ICAO requested member states to submit State Action Plans detailing their national strategies toward this goal by 2024. By June 2025, 150 states – representing over 99% of international air traffic – had done so (ICAO, 2025[10]).

In 2023, member states of the International Maritime Organization also committed to reach net-zero emissions "by around 2050" for the international maritime sector (IMO, 2023[11]). In April 2025, the IMO's Marine Environment Protection Committee approved a draft Net-Zero Framework – including a global emissions pricing mechanism and fuel standards – for adoption by October 2025 and enforcement from 2027 (IMO, 2025[12]).

While net-zero pledges in international aviation and shipping provide welcome signals of intent, they risk remaining aspirational without immediate action and innovation. Both sectors are hard-to-abate and are currently off track with the IEA's Net Zero Emissions by 2050 Scenario (IEA, 2023[13]). Aligning with a net-zero pathway requires a rapid and large-scale deployment of low-carbon fuels such as green hydrogen and synthetic fuels. Simultaneously, more effective global carbon markets and pricing mechanisms are needed (Wetterberg, Lanzi and Gómez, 2025[14]), alongside strong regulatory signals to drive investments in infrastructure and fleet transformation.

1.7. Fossil fuel reliance in heat production and transportation continues to drive emissions

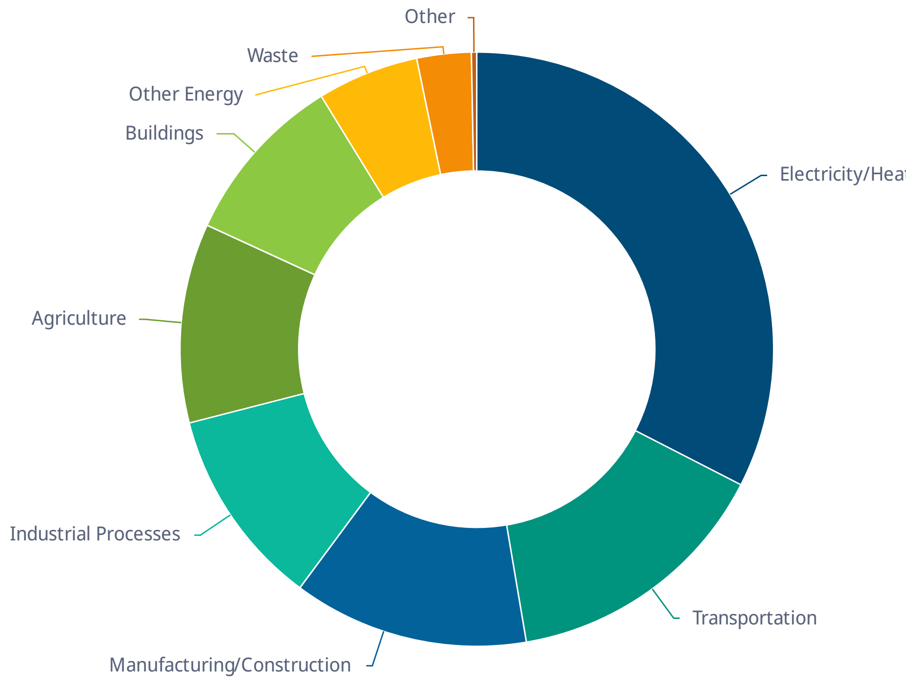
Identifying the sources of emissions is fundamental to designing effective climate mitigation strategies (Chapter 3). These sources differ widely across countries, depending on factors such as the level of development, natural conditions, available resources, distance to markets, economic sectors, energy resources and land-use patterns (see Box 1.2, on a discussion on LULUCF emissions).

Despite progress in decarbonising electricity and heat generation, this sector remains the largest source of emissions in OECD and OECD partner countries (33%), reflecting a continued reliance on fossil fuels. Emissions from the transport sector follows, accounting for 15% of total emissions while agriculture and buildings contribute 11% and 6%, respectively. Emissions from manufacturing industries and construction and industrial processes account for 13% and 11%, driven in part by China's significant emissions in the manufacturing sector (Figure 1.8).

These aggregate percentages mask substantial cross-country variation in emissions sources, highlighting the need for tailored policy approaches. Even within the OECD there is significant heterogeneity in sectoral emissions profiles. For instance, Japan's emissions are concentrated in energy and industrial processes, whereas agriculture emerges as a key sector for mitigation for Sweden (14%) and Costa Rica (20%) (OECD, 2025[15]) (OECD, 2025[16]) (OECD, 2023[17]). The IPAC Dashboard provides country-specific data to support more detailed analysis (OECD, 2025[18]). Carbon dioxide is the predominant GHG, accounting for approximately 80% of emissions (OECD, 2024[19]).

Figure 1.8. Electricity/heat and transportation account for the largest shares of GHG emissions

Emissions by sector, percentage, OECD and OECD partner countries, 2023



Note: Sectoral breakdown follows IPCC categories. The Buildings category includes residential and commercial fuel use, classified under Energy.
Source: OECD calculations based on Common Reporting Tables (CRT) submitted by countries to UNFCCC, PRIMAP-hist (Gütschow et al., 2016[5]) (Cárdenas Rodríguez et al., 2024[6]) and IEA database of GHG emissions.

Alongside static sectoral shares, examining changes over time is crucial for identifying where emissions are falling and where further policy intervention is needed. Since 2015, OECD countries have reduced emissions in most sectors, especially electricity and heat generation (-21%) and manufacturing and construction (-20%). Transport emissions, however, remained constant in OECD countries and rose in partner countries, highlighting the sector's hard-to-abate nature (Chapter 3). OECD partner countries saw increases in most sectors with electricity and heat (+37%) and industrial processes (+30%) experiencing the largest increases. These two sectors also account for the largest absolute shares of emissions in partner countries (36% and 16%), making their growth particularly concerning (Table 1.1).

Table 1.1. OECD countries advance in all sectors except transport, OECD partner countries see increases in most sectors

Relative changes in %, 2015 and 2023 levels (Gt CO_2e), OECD and OECD partner countries

Sector	OECD		OECD partners	
	Relative change 2015-2023 (%)	2023 level (Gt CO_2e)	Relative change 2015-2023 (%)	2023 level (Gt CO_2e)
Electricity/Heat	↓ 21%	3.9	↑ 37%	8.4
Transportation	↑ 0%	3.5	↑ 20%	2.1
Agriculture	↓ 1%	1.5	↑ 4%	2.5
Buildings	↓ 10%	1.3	↓ 13%	0.8
Manufacturing/Construction	↓ 20%	1.4	↓ 13%	3.7
Industrial Process	↓ 5%	1.1	↑ 30%	2.9
Waste	↓ 2%	0.5	↑ 14%	0.7

Note: Emissions follow IPCC categories. The Buildings category includes residential and commercial fuel use, classified under Energy.
Source: OECD calculations based on Common Reporting Tables (CRT) submitted by countries to UNFCCC, PRIMAP-hist (Gütschow et al., 2016[5]) (Cárdenas Rodríguez et al., 2024[6]) and the IEA database of GHG emissions.

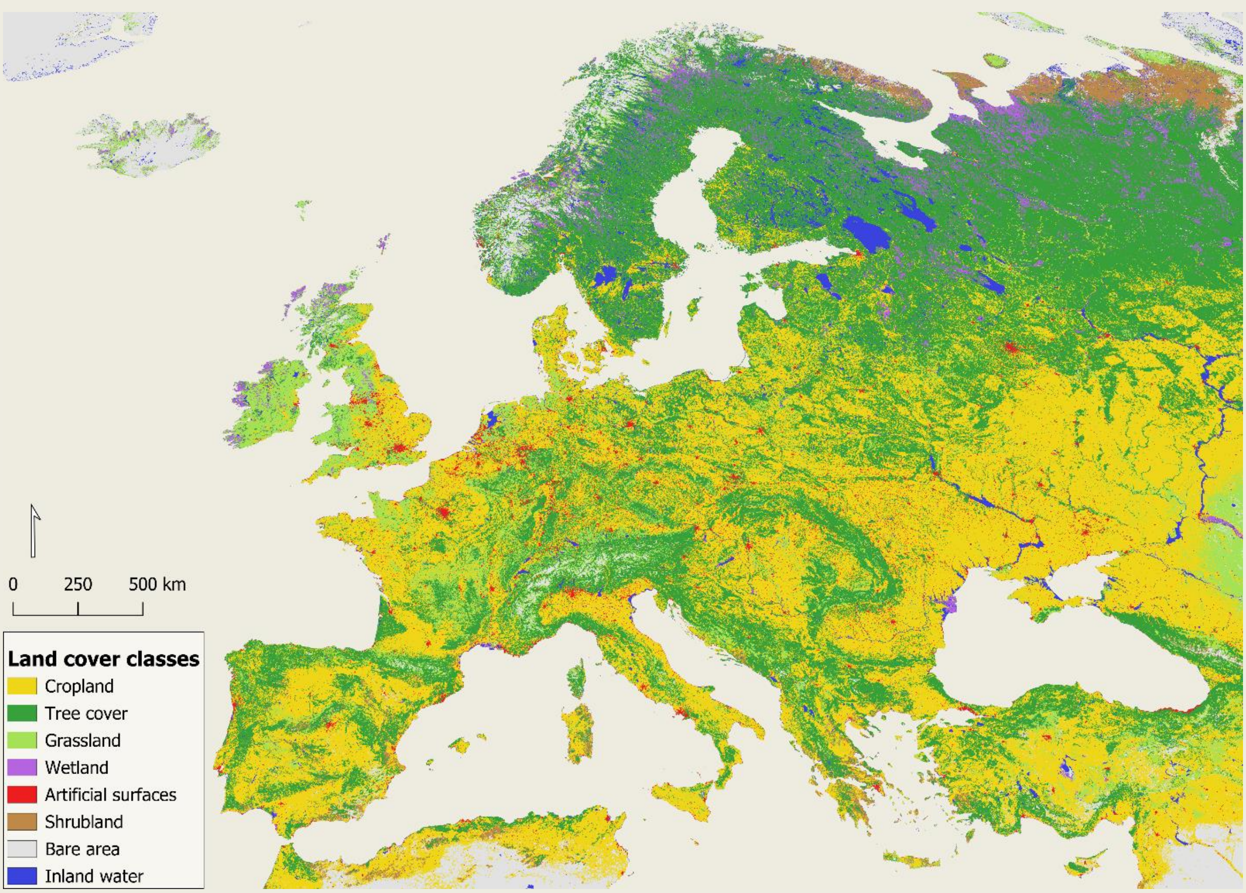
Box 1.2. LULUCF: A critical but uncertain component of global emissions

The Land Use, Land-Use Change and Forestry (LULUCF) sector is central to many countries' climate pledges and plays a key role in limiting global warming to 1.5°C or 2°C. Yet, its contribution to global emissions remains highly uncertain. National inventories often report LULUCF as a net sink, while global assessments applying the IPCC's method estimate it as a net emissions source (IPCC, 2023[20]). The discrepancy is large, amounting to approximately 7 Gt CO_2e per year, close to one sixth of world emissions in 2023.

This uncertainly complicates both the achievement and tracking of climate goals. Many countries rely on LULUCF to offset emissions in other sectors and this role is expected to grow as mitigation needs increase. However, the assumption that LULUCF consistently functions as a sink carries significant risk. Beyond mitigation, the LULUCF sector also supports wider environmental objectives such as adaptation and biodiversity. Land-based solutions, including ecosystem restoration, can deliver multiple co-benefits.

Advances in Earth observation (EO) technologies are improving the accuracy and transparency of LULUCF monitoring (Tesnière, Maes and Haščič, 2024[21]). Ongoing OECD work on measuring emissions from carbon stock changes using EO data complements these international efforts.

Figure 1.9. Land cover as shown by Earth observation data in Europe



Source: OECD (2025), "Land cover and land cover change", OECD Environment Statistics (database).

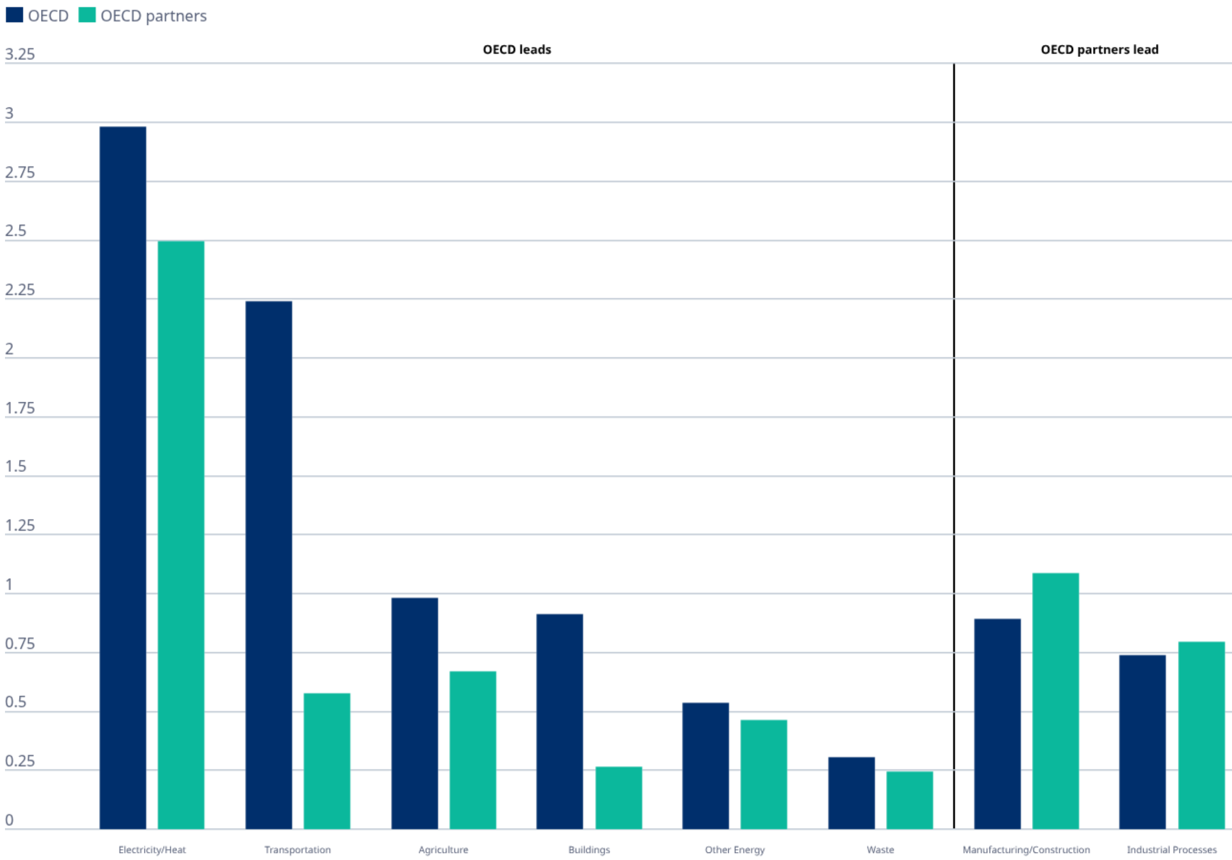
1.8. OECD countries have higher per capita emissions across sectors than OECD partners, except in manufacturing and industry

Sectoral emission shares must be interpreted with care, as they reflect the relative importance of emissions within a country’s overall emissions profiles, rather than absolute levels. While sectoral emissions provide insights into domestic decarbonisation priorities, they can be misleading when comparing mitigation challenges across countries or regions. In such cases, per capita sectoral emissions serve as a valuable complement, offering deeper insights into a country’s capacity to reduce emissions by adopting best practices. For example, in many Latin American countries, transport often appears as the dominant source of emissions. This can lead to the assumption that the region faces a major transport-related challenge. However, this prominence is due to comparatively low emissions from other sectors, such as energy and industrial processes, thanks to widespread use of hydropower and limited heavy industry. This has important implications for mitigation potential, which can be better understood through per capita sectoral emissions.

Per capita emissions in OECD countries are almost double those of OECD partner countries and this disparity is reflected across sectors. OECD countries emit more per capita in nearly every sector – especially transport and buildings – reflecting the need to address energy-intensive lifestyles and infrastructure such as widespread car use and high heating and cooling demands. Conversely, reflecting the emergence of new industrial sectors and ongoing transition efforts, OECD partner countries have higher per capita emissions in industrial sectors due to their role as global manufacturing hubs. This contributes to higher emissions per unit of GDP (Figure 1.10), reinforcing the need for low-carbon growth strategies and cleaner industrial technologies.

Figure 1.10. OECD countries have higher per capita emissions across sectors than OECD partners, except in manufacturing and industrial processes

GHG per capita (2023), OECD and OECD partner countries, t CO_2e



Note: Per capita sectoral emissions are calculated by summing the emissions from each sector across all countries within a group, then dividing by the total population of that group. Sectoral breakdown follows IPCC categories. The Buildings category includes residential and commercial fuel use, classified under Energy.
Source: OECD calculations based on Common Reporting Tables (CRT) submitted by countries to UNFCCC, PRIMAP-hist (Gütschow et al., 2016[5]) (Cárdenas Rodríguez et al., 2024[6]) and the IEA database of GHG emissions.

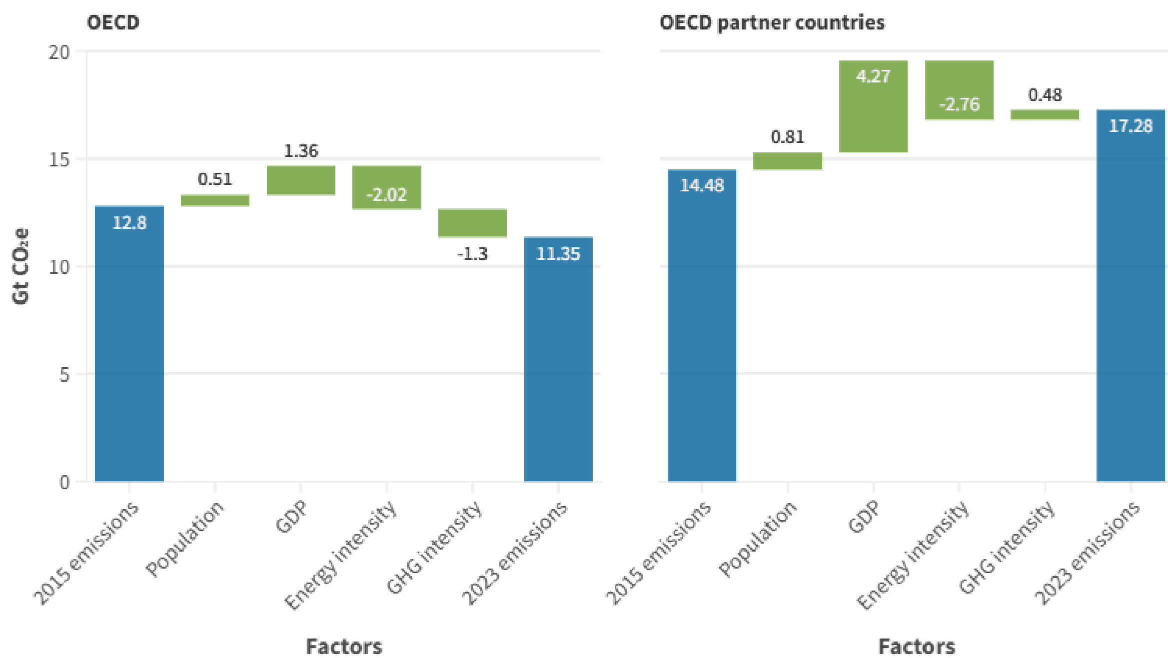
1.9. Economic growth drives emissions in OECD partner countries

Decoupling emissions from economic and population growth is central to long-term climate mitigation. Greenhouse gas emissions are influenced by several factors, but they tend to rise with increasing GDP or population growth and decline with improvements in energy efficiency or shifts toward cleaner energy sources. The Kaya identity provides a useful framework for analysing trends in energy-related GHG emissions, which account for most global emissions (Box 1.3) (Figure 1.11).

Decomposing emissions trends into their underlying factors reveals contrasting trajectories between OECD and OECD partner countries. Figure 1.11 decomposes the emissions trends into the four key factors of the Kaya identify. Since 2015, OECD countries have reduced emissions by improving energy efficiency and shifting to cleaner energy, alongside continued economic and population growth. In contrast, emissions in OECD partner countries have risen. Population growth and strong economic growth outweigh improvements in energy efficiency. Worryingly, despite record-high renewable energy deployment, GHG intensity of energy has increased, reflecting a resurgence in coal-fired power generation amid the global energy crisis (Koilakou, Hatzigeorgiou and Bithas, 2024[22]). This trend highlights the potential and imperative to reduce emissions in OECD partner countries including through international cooperation by accelerating the decarbonisation of energy systems as these countries experience economic development.

Figure 1.11. Gains in energy efficiency and clean energy surpass growth in OECD countries, but not in OECD partner countries

Emissions from energy (2015, 2023), OECD and OECD partner countries, Gt CO_2e



Note: Emissions were decomposed using the Kaya Identity. OECD calculations were used to estimate total final energy consumption for Peru and Saudi Arabia.
Source: OECD calculations based on Common Reporting Tables (CRT) submitted by countries to UNFCCC and PRIMAP-hist (Gütschow et al., 2016[5]) (Cárdenas Rodríguez et al., 2024[6]); IEA, World Energy Balances, IEA, Paris..

Complementing this structural decomposition, the Drivers section of the IPAC Dashboard presents economy-wide indicators that provide additional information on country-specific drivers of emissions including energy use, material use, land use and cover, transport and mobility, and other economic drivers which can be used to inform targeted climate mitigation policies (OECD, 2025[18]).

Box 1.3. Decomposing changes in emissions using the Kaya Identity

The Kaya Identity provides a useful framework for decomposing changes in energy-related greenhouse gas (GHG) emissions, helping policymakers identify which underlying factors contribute most to emissions trends and where mitigation efforts will be the most effective (IPCC, 2023[23]). When applied to two periods (e.g., 2015 and 2023, as shown in (Figure 1.11), the Kaya Identity breaks down the change in emissions into four components:

$$\Delta\%GHG = \Delta\%P + \Delta\%\left(\frac{GDP}{P}\right) + \Delta\%\left(\frac{E}{GDP}\right) + \Delta\%\left(\frac{GHG}{E}\right)$$

Where:

P = Population

GDP/P = GDP per capita

E/GDP = Energy intensity of GDP

GHG/E = GHG intensity of energy

This decomposition focuses on energy-related emissions, which account for more than three-quarters of global GHG emissions. It does not include emissions from other sectors such as agriculture which are not directly tied to energy use and economic activity. While all gases are converted to CO_2e, the majority are carbon dioxide.

By linking changes in energy-related emissions to structural factors and policies (Chapter 3), decomposition supports effective policy development by identifying sources of progress and areas needing further action. For example, an emissions reduction attributed to a lower GHG intensity could reflect successful efforts accelerate the deployment of renewables. Conversely, weak decreases in energy efficiency could signal mitigation potential though energy renovations or demand-side policies. It also reveals the extent to which countries have decoupled emissions from population and economic growth.

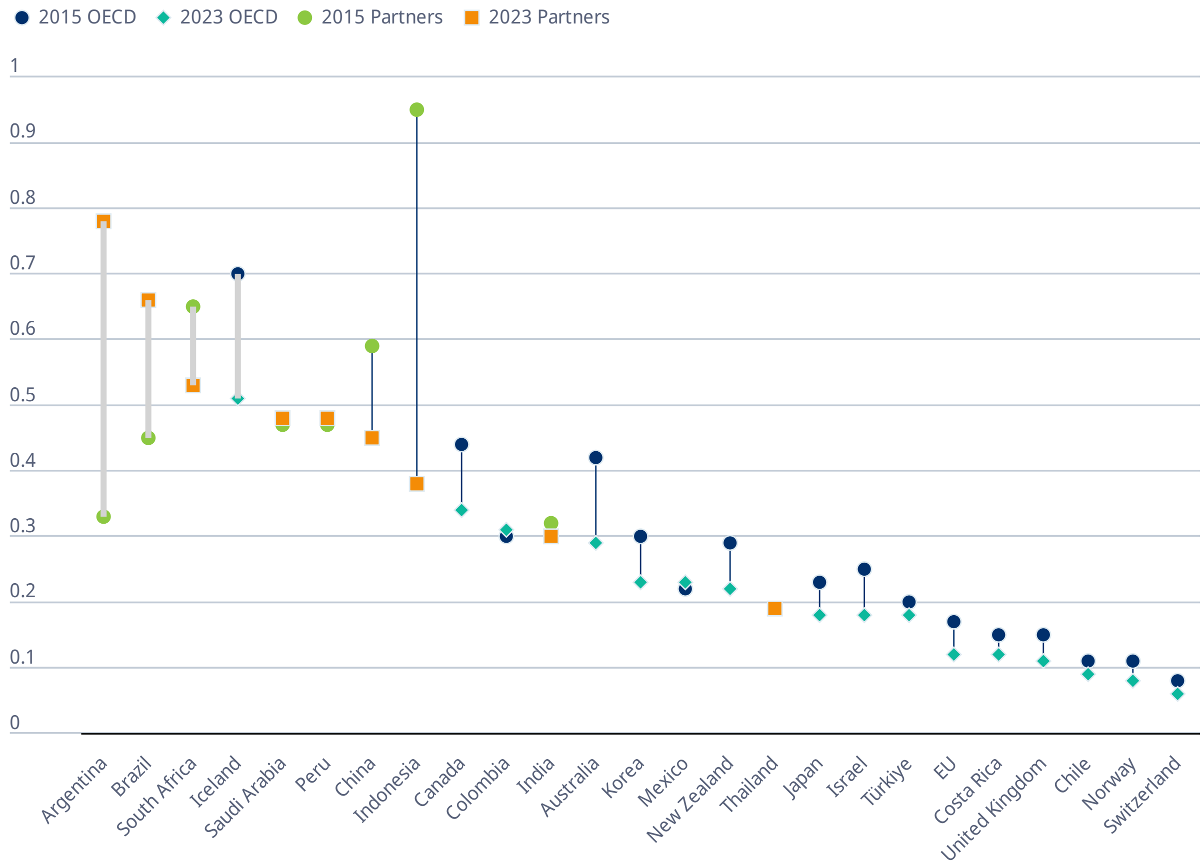
To measure countries' progress of decoupling, two complementary indicators are used: GHG emissions per unit of GDP (emissions intensity) and GHG emissions per capita.

Despite progress, OECD partner countries have potential and need to lower emissions intensity

Emissions intensity remains high in OECD partner countries. Since the adoption of the Paris Agreement, most OECD and OECD partner countries have reduced their GHG emissions per unit of GDP (Figure 1.12). However, despite some progress, OECD partner countries still emit, on average, twice as much as OECD countries to generate the same level of economic output (OECD, 2024[19]). This is particularly significant as many OECD partner countries are undergoing economic expansion (Figure 1.11). Without further reductions in emissions intensity, continued growth in these economies could lead to a substantial rise in global emissions.

Figure 1.12. GHG emissions intensity remains high in OECD partner countries

GHG intensity per unit of GDP (2015, 2023), OECD and OECD partner countries, t CO_2e per 1000 USD, constant prices PPP



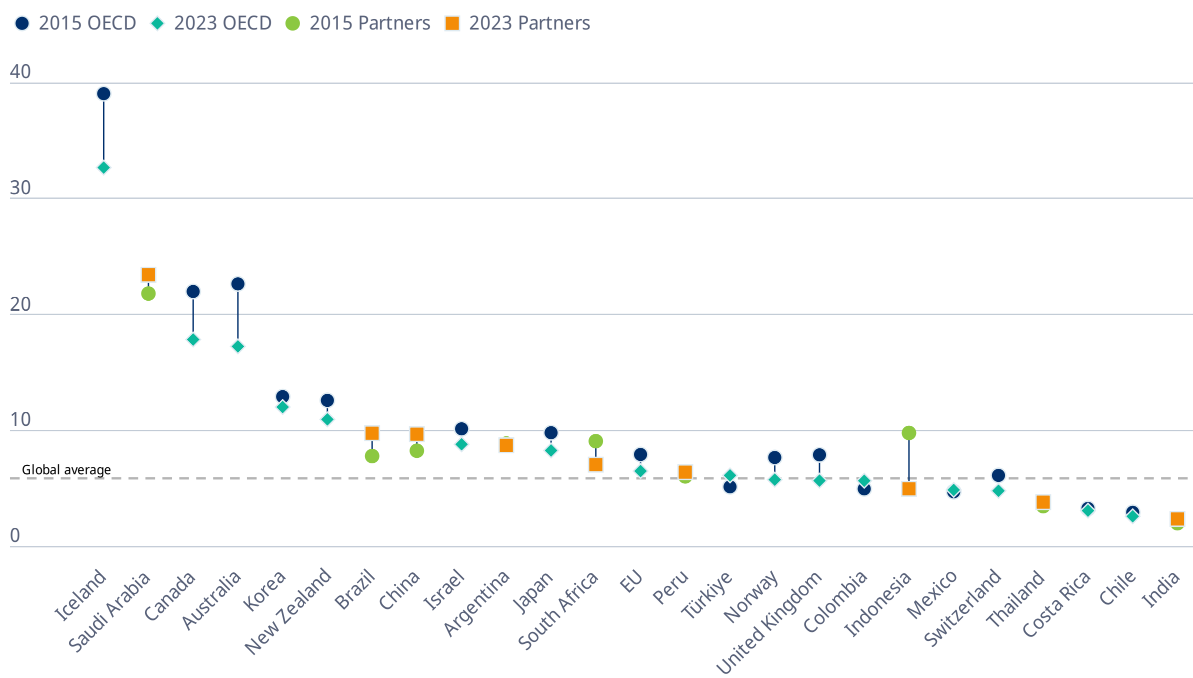
Source: OECD calculations based on Common Reporting Tables (CRT) submitted by countries to UNFCCC and PRIMAP-hist (Gütschow et al., 2016[5]) (Cárdenas Rodríguez et al., 2024[6]). OECD National Accounts.

Per capita emissions in many OECD countries exceed the global average

Despite progress since the Paris Agreement, per capita emissions in several OECD countries remain above the global average. While countries like the United Kingdom have successfully reduced their per capita emissions below this threshold (5.4 tCO_2e), others - such as Australia and Canada - still emit approximately three times more per person. This disparity is tied to income levels, with high-emitting households concentrated in wealthier nations (UNEP, 2024[2]). Meanwhile, per capita emissions in emerging economies like China and Brazil have risen, driven by rapid economic growth (Figure 1.13). However, some of the observed reductions in territorial per capita emissions may be due to the outsourcing of carbon-intensive production (Figure 1.14).

Figure 1.13. Per capita emissions in many OECD countries exceed the global average

GHG per capita (2015, 2023), OECD and OECD partner countries, t CO_2e



Source: OECD calculations based on Common Reporting Tables (CRT) submitted by countries to UNFCCC and PRIMAP-hist (Gütschow et al., 2016[5]) (Cárdenas Rodríguez et al., 2024[6]).

1.10. GHG emissions are embedded in trade

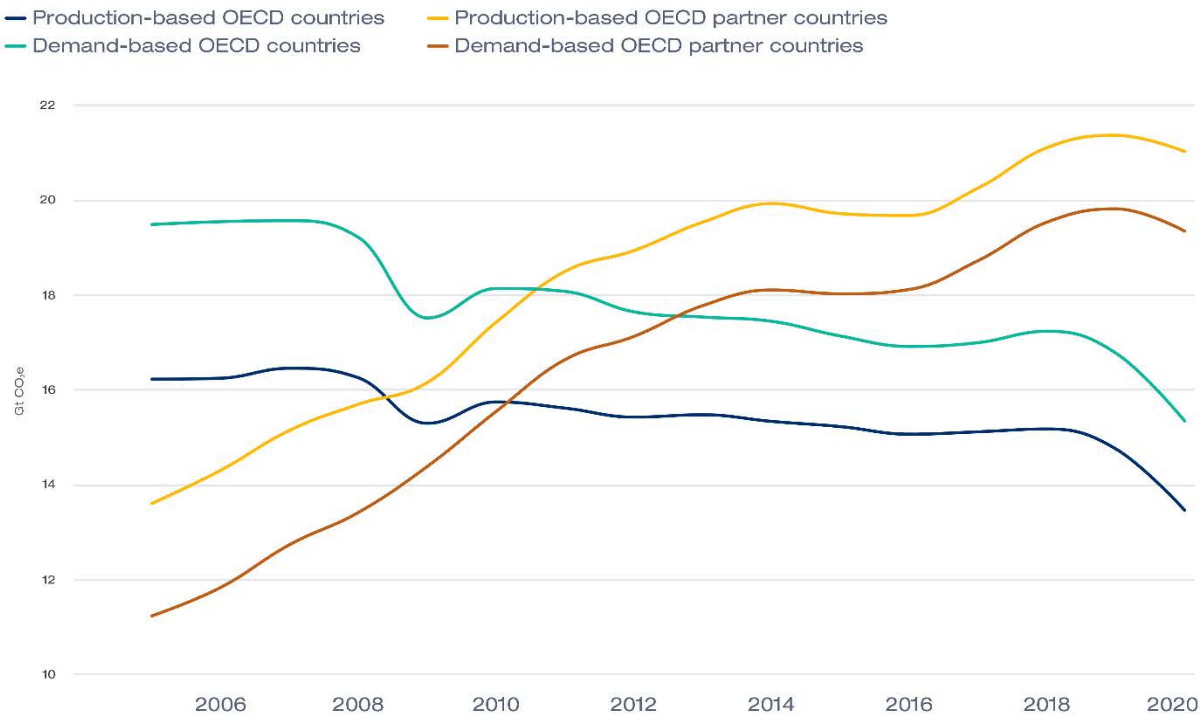
While the Paris Agreement requires individual countries to meet their targets, it is important not to lose sight that the ultimate objective is to reduce global emissions. Measuring territorial emissions of individual countries can mask emission offshoring where carbon-intensive production is shifted to lower-income or less-regulated countries. This presents a challenge for assessing actual ambition (Figure 1.14), as climate commitments rely on national inventories which do not consider emissions embedded in trade. Monitoring consumption- and production-based emissions helps determine whether countries are genuinely reducing emissions or merely outsourcing them.

In OECD countries, both consumption- and production-based emissions peaked in 2007 and have been declining since. However, consumption-based emissions remain significantly higher, suggesting continued reliance on imported goods that generate significant emissions, in effect exporting emissions to other countries – particularly OECD partner countries. In contrast, OECD partner countries' production-based emissions exceed those based on consumption. This divergence underscores the need to consider global supply chains when monitoring and evaluating countries' climate action and mitigation efforts.

Alongside consumption- and production-based emissions, complementary tools such as carbon footprint indicators available on the IPAC Dashboard and carbon intensity metrics can offers insights into emissions outsourcing (Box 1.4).

Figure 1.14. OECD countries drive GHG emissions in OECD partner countries through their demand for imported goods

Production- and demand-based GHG emissions, OECD and OECD partner countries, Gt CO_2e, 2005-2020



Note: Production-based emissions are calculated using the residence principle and reflect GHG emissions from a country's domestic economic activities and households. Demand-based emissions include both direct emissions from households and indirect upstream emissions associated with the final consumption of goods and services.
Source: OECD (2024), "Green growth", OECD Environment Statistics (database).

Box 1.4. Addressing carbon leakage risks by using interoperable carbon intensity metrics

The Inclusive Forum on Carbon Mitigation Approaches (IFCMA) is supporting the development of interoperable carbon intensity metrics as essential tools for identifying carbon leakage risks. These metrics quantify the greenhouse gas emissions associated with the production of goods and services. To enable standardised comparisons of emissions performance across jurisdictions, carbon intensity metrics must be interoperable. Interoperable metrics provide the data backbone for emissions standards and border carbon adjustment mechanisms, such as the European Union (EU) Carbon Border Adjustment Mechanisms (CBAM). Applying carbon intensity metrics, such policies can be implemented to disincentivise emissions outsourcing and align trade flows with the goals of the Paris Agreement.

Source: (OECD, 2025[24]).

References

Cárdenas Rodríguez, M. et al. (2024), "National greenhouse gas emission inventories, filling the gaps in official data", *OECD Environment Working Papers*, No. 252, OECD Publishing, Paris, https://doi.org/10.1787/f19f1663-en. [6]

European Commission (2024), *EU greenhouse gas emissions fell by over 8% in 2023, driven by impressive growth in renewable energy*, https://ec.europa.eu/commission/presscorner/detail/en/ip_24_5605. [3]

Friedlingstein, P. et al. (2025), "Global Carbon Budget 2024", *Earth System Science Data*, Vol. 17/3, pp. 965-1039, https://doi.org/10.5194/essd-17-965-2025. [25]

Gütschow, J. et al. (2016), "The PRIMAP-hist national historical emissions time series", *Earth System Science Data*, Vol. 8/2, pp. 571-603, https://doi.org/10.5194/essd-8-571-2016. [5]

ICAO (2025), *State Action Plans and Assistance*, https://www.icao.int/environmental-protection/state-action-plans-and-assistance. [10]

IEA (2025), *Aviation*, https://www.iea.org/energy-system/transport/aviation. [8]

IEA (2023), *International Shipping*, https://www.iea.org/energy-system/transport/international-shipping. [9]

IEA (2023), *Tracking Clean Energy Progress 2023*, IEA, Paris, https://www.iea.org/reports/tracking-clean-energy-progress-2023. [13]

IMO (2025), *IMO approves net-zero regulations for global shipping*, https://www.imo.org/en/mediacentre/pressbriefings/pages/imo-approves-netzero-regulations.aspx. [12]

IMO (2023), *Revised GHG reduction strategy for global shipping adopted*, https://www.imo.org/en/mediacentre/pressbriefings/pages/revised-ghg-reduction-strategy-for-global-shipping-adopted-.aspx. [11]

IPCC (2023), "Agriculture, Forestry and Other Land Uses (AFOLU)", in *Climate Change 2022 - Mitigation of Climate Change*, Cambridge University Press, https://doi.org/10.1017/9781009157926.009. [20]

IPCC (2023), "Industry", in *Climate Change 2022 - Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, Cambridge, UK and New York, NY, USA, https://doi.org/10.1017/9781009157926.013. [23]

Koilakou, E., E. Hatzigeorgiou and K. Bithas (2024), "Social and economic driving forces of recent CO2 emissions in three major BRICS economies", *Scientific Reports*, Vol. 14, https://doi.org/10.1038/s41598-024-58827-9. [22]

OECD (2025), *IPAC Dashboard*, https://www.oecd.org/en/data/dashboards/climate-action-dashboard.html. [18]

OECD (2025), *OECD Environmental Performance Reviews: Japan 2025*, OECD Environmental Performance Reviews, OECD Publishing, Paris, https://doi.org/10.1787/583cab4c-en. [15]

OECD (2025), *OECD Environmental Performance Reviews: Sweden 2025*, OECD Environmental Performance Reviews, OECD Publishing, Paris, https://doi.org/10.1787/91dcc109-en. [16]

OECD (2025), "Towards interoperable carbon intensity metrics: Assessing monitoring, reporting and verification systems", *Inclusive Forum on Carbon Mitigation Approaches Papers*, No. 9, OECD Publishing, Paris, https://doi.org/10.1787/b185bcfa-en. [24]

OECD (2024), *The Climate Action Monitor 2024*, OECD Publishing, Paris, https://doi.org/10.1787/787786f6-en. [19]

OECD (2023), *OECD Environmental Performance Reviews: Costa Rica 2023*, OECD Environmental Performance Reviews, OECD Publishing, Paris, https://doi.org/10.1787/ec94fd4e-en. [17]

OECD/UNDP (2025), *Investing in Climate for Growth and Development: The Case for Enhanced NDCs*, OECD Publishing, Paris, https://doi.org/10.1787/16b7cbc7-en. [4]

Pizarro, R. et al. (2024), "GHG Emission Trends and Targets (GETT): Harmonised quantification methodology and indicators", *OECD Environment Working Papers*, No. 230, OECD Publishing, Paris, https://doi.org/10.1787/decef216-en. [7]

Tesnière, V., M. Maes and I. Haščič (2024), "Monitoring land cover change to understand biodiversity pressures: Indicator methodology and key findings", *OECD Environment Working Papers*, No. 254, OECD Publishing, Paris, https://doi.org/10.1787/441a7a6c-en. [21]

UNEP (2024), *Emissions Gap Report 2024: No more hot air … please! With a massive gap between rhetoric and reality, countries draft new climate commitments*, United Nations Environment Programme, https://doi.org/10.59117/20.500.11822/46404. [2]

UNFCCC (2015), *The Paris Agreement*, United Nations Framework Convention on Climate Change Secretariat, Geneva. [1]

Wetterberg, K., E. Lanzi and N. Gómez (2025), "Exploring governments' efforts to shape carbon credit markets: Possible actions to enhance integrity", *OECD Environment Working Papers*, No. 263, OECD Publishing, Paris, https://doi.org/10.1787/0bafe9af-en. [14]

Notes

[1] In this year's edition of the Climate Action Monitor, the calculation of world emissions had methodological changes with respect to previous editions given the availability of new official data sources. In particular, the main data source now used for GHG emissions are the Common Reporting Tables (CRT) submitted by parties to the UNFCCC. World emissions are calculated as the sum of country-based total emissions excluding LULUCF, international bunkers (aviation and maritime shipping) from the IEA GHG emissions

data matching the energy module of 2006 IPCC Guidelines, and a LULUCF bookkeeping adjustment based on the approach outlined in (UNEP, 2024[2]) and data from (Friedlingstein et al., 2025[25]). Further details are provided in the methodological note in Annex B.

[2] 2019 was chosen as the base year to calculate the trajectory because most countries committed to their 2030 targets in 2020 and used emissions data from the previous year, 2019, for their projected emissions trajectory, and also this was before the COVID-19 pandemic which temporarily and extraordinarily reduced emissions.

[3] For target and gap calculations, the EU-27 is treated as a single entity due to its collective NDC. This bloc is categorised under the OECD group rather than OECD partners, as 23 of its member states are part of the OECD, accounting for 96% of the EU's total emissions. The remaining EU countries not currently in the OECD are Bulgaria, Croatia, Cyprus, Malta, and Romania – though Bulgaria, Croatia, and Romania are OECD accession candidate countries.

[4] Countries that introduced new net-zero targets this year are Mongolia (pledge) and Micronesia (policy document).

[5] There are differences with other databases that also aim to identify the number of countries that have pledged net-zero targets. One of these is an IEA database, which presents differences with respect to some countries, in particular Comoros, Kenya, Liechtenstein, Madagascar, Mexico, Micronesia, Moldova, Mongolia, Niue, Paraguay, Vatican City (which IEA does not cover), and Morocco, Romania, Chinese Taipei (which IPAC does not cover).

[6] Australia, Austria, Canada, Chile, Colombia, Denmark, EU (27), Fiji, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Japan, Korea, Liechtenstein, Luxembourg, Maldives, Moldova, New Zealand, Nigeria, Norway, Portugal, Slovenia, Spain, Sweden, Switzerland, Ukraine and the United Kingdom.

[7] Slovenia also adopted a Climate Law with a binding net-zero target; however, its emissions are covered under the EU-wide binding target.

[8] In this report, to present NDC targets including national LULUCF emissions, as is the usual convention, an adjustment is performed to be consistent with (UNEP, 2024[2]): subtracting national inventory-based LULUCF emissions and adding global LULUCF bookkeeping emissions. This reflects the varying methodologies countries use to estimate LULUCF emissions from managed versus unmanaged lands. To ensure consistency, UNEP estimates global emissions by aggregating GHG emissions from national inventories excluding LULUCF and then adds a global estimate of GHG emissions from LULUCF for managed lands – a process referred to as a "bookkeeping" adjustment.

[9] GHG emissions inventories are compiled following territory- and production-based emissions principles. This means that, in most countries' cases, total GHG emissions does not include emissions from international transport. In addition, emissions from consumption of products produced in other territories or emissions from transporting these products are not included.

[10] In the IPAC Dashboard, GHG emissions targets are presented in scope defined by the countries' NDCs (including or excluding LULUCF, gases, AR GWP) for aggregation; an adjustment was made to have a common scope considering all gases.

[11] The estimates of 36 $GtCO_2e$ (below 2°C) and 25 $GtCO_2e$ (around 1.5°C) for 2035 global total GHG emissions are comprised of: country-based emissions excluding LULUCF, international bunkers (aviation and shipping), and a LULUCF bookkeeping adjustment. To estimate country-based emissions excluding LULUCF in 2035, international bunkers and the bookkeeping adjustment are subtracted from the global total. However, because NDCs are typically expressed as country-based emissions including LULUCF, a projected 2035 LULUCF value - based on country inventory data - is added to country-based emissions excluding LULUCF. This provides an estimate of the aggregate emissions level that countries should target in their 2035 NDCs to align with the temperature goals.

2. How vulnerable are countries to climate risks?

2.1. Climate-related hazards are projected to intensify

In 2025 the world again faced a series of severe climate impacts including deadly flooding events, record-breaking heatwaves, and prolonged droughts. Such extreme weather events are becoming increasingly frequent and intense, with serious consequences for economies, ecosystems, human health and societies. Without stronger action to reduce global greenhouse gas emissions, these impacts will worsen, amplifying risks and challenges for communities worldwide. As climate-related hazards and disasters escalate, countries must accelerate and scale up adaptation efforts to protect vulnerable populations and critical infrastructure and build economic resilience. The growing severity of disruptions underscores the need to raise climate ambition in line with the Paris Agreement temperature goals (Chapter 1) and to implement effective climate policies (Chapter 3).

Scientific evidence suggests that the planet may be approaching major climate tipping points, thresholds beyond which irreversible and abrupt changes in Earth systems could occur (OECD, 2022[1]) (OECD, 2024[2]). Since 2015-2016 major environmental changes have been observed including the shifting of Southern Ocean Circulation potentially reversing direction (Silvano et al., 2025[3]), as well as a marked decline in Antarctic Sea ice extent increasing CO_2 emissions to the atmosphere from CO_2-rich deep water. The latest IPCC report (IPCC, 2023[4]) indicates how close we are to these critical thresholds may have been underestimated suggesting that the slowing or collapse of the Atlantic Meridional Overturning Circulation (AMOC) could occur within the coming decades (Aðalgeirsdóttir et al., 2024[5]). Given the Southern Ocean's connection with other major ocean circulations, including the AMOC, these findings raise concerns of the likelihood and proximity of climate tipping points.[1]

Such a disruption would have significant effects on the climate, including extreme winter cooling in northwestern Europe, shifts in tropical rainfall patterns that could trigger droughts in West Africa and Central America, and accelerated sea-level rise (IPCC, 2023[4]). The acute and near-term risk of crossing climate tipping points highlights the need to deepen our understanding of climate-related hazards and their evolution over time to support effective policy responses.

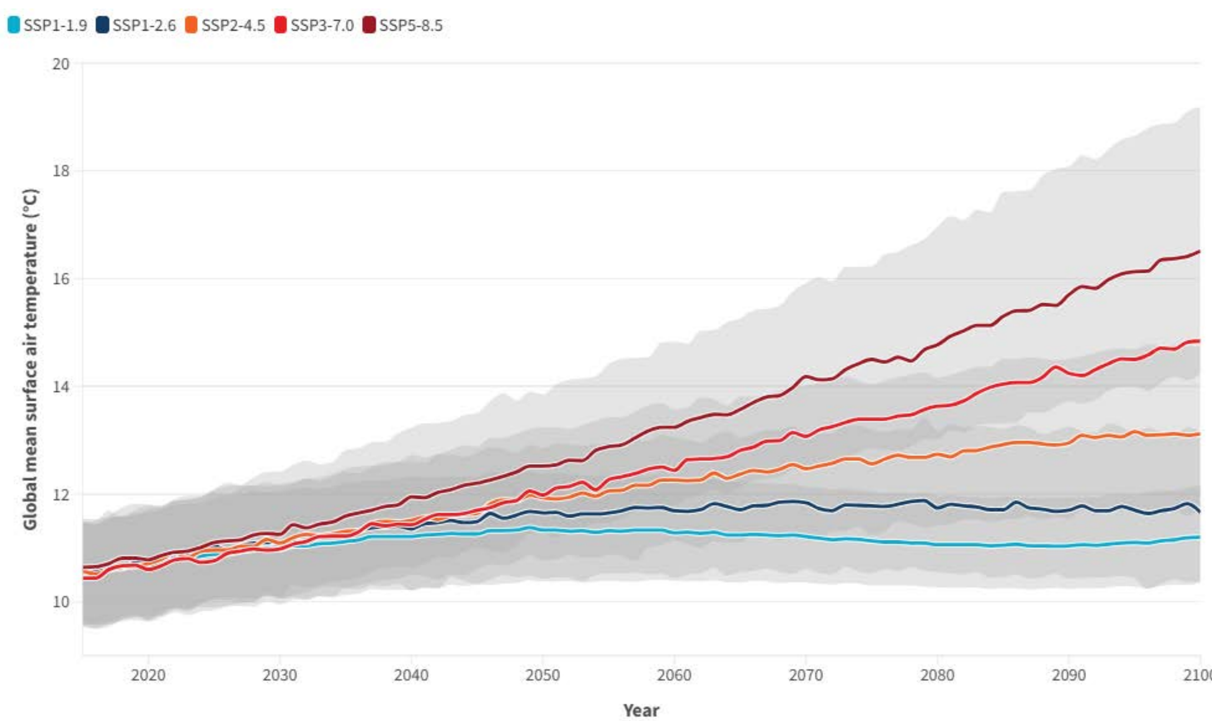
To help policymakers respond to escalating climate risks, IPAC has developed a set of indicators that track the evolution of climate-related hazards over time. The indicator set assesses both the historical and projected exposure to hazards such as extreme temperature and precipitation, droughts, wildfires and floods (OECD, 2025[6]). They are developed using a variety of Earth observation (EO), remote sensing (RS) and other techniques, made available by leading organisations, such as the ESA and NASA, which adhere to national and international guidelines for developing climate data.[2] These indicators contribute to the evidence base for informed climate resilience planning and policy development.

A major advancement in 2025 Edition of Climate Action Monitor is the expansion of the climate-related hazard and exposure indicators to include projections up until 2100, comprising anomalies for the 2030s, 2050s, 2070s and 2090s relative to the 1995-2014 baseline (Maes et al., 2025[7]).[3] These indicators show an alarming results: global average temperatures are set to rise substantially over all climate scenarios (Figure 2.1). By the end of the century projections indicate an approximately 6°C difference in global mean temperature between the very low- and very high-emissions scenarios, underscoring the possibility of enormous impacts and risks. These indicators enable IPAC to offer information, at both national and subnational levels, on how climate-related hazards and disasters may evolve throughout the century. Drawing on this expanded perspective, this chapter presents an integration of both historical and forward-looking indicators. This dual approach provides insights not only into events that have shaped recent decades but also into the future risks. Forward-looking data can also support the design of long-term adaptation strategies and resilience planning.

To ensure in-depth coverage across the wide range of available indicators, the 2025 edition of the Climate Action Monitor introduced a three-year rotation on in-depth analysis of core hazard domains. These include extreme temperature, extreme precipitation, and drought. This edition provides a detailed focus on extreme temperatures, alongside concise updates on other hazard domains, including precipitation, droughts, flooding, wildfires, and wind threats. Future editions will focus will on different core hazard domains, ensuring that over a three-year cycle, each receives an in-depth analysis while all others continue to be tracked and reported in summary form. The full set of country-level indicators on climate-related hazard remains available in the IPAC Dashboard.

Figure 2.1. Forward-looking indicators forecast that average temperatures will increase substantially across different climate scenarios

Global mean surface air temperature from very low to very high-emissions scenarios, 2015-2100



Note: Only the median value of the multi-model ensemble is visualised here. However, the 10th and 90th percentile uncertainty ranges of the multi-model ensemble are available on the OECD Data Explorer.
Source: OECD (2025), “Climate-related hazards: Projected exposure to extreme temperatures”, OECD Environment Statistics (database).

2.2. Extreme temperatures across and within countries are reaching critical levels

Global temperatures are reaching critical thresholds. The year 2024 was the warmest on record and marked the first calendar year to surpass Paris Agreement's 1.5 °C target above pre-industrial levels (WMO, 2025[8]; C3S and ECMWF, 2025[9]). This alarming milestone concluded a decade (2015–2024) of the ten hottest years ever recorded, increasing the risk of crossing irreversible climate tipping points. Beyond rising global average temperatures, exposure to heat stress is not evenly distributed. Countries with high exposure often have limited capacity to adapt, deepening global inequalities. Projections show that regions with both high- and low-exposure will experience worsening heat stress, with significant subnational variations. These trends underscore the need for locally tailored adaptation strategies.

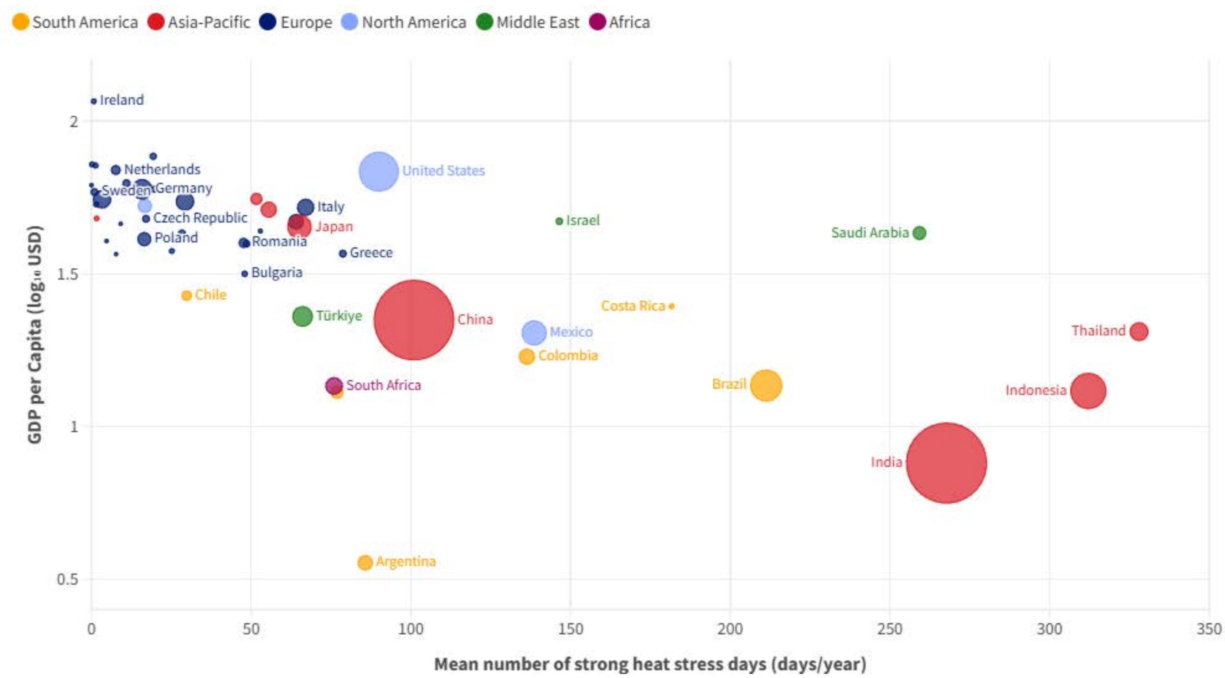
Record-breaking temperatures in 2025 suggest that the previous decades trends will continue, producing severe human and environmental consequences. In Western Europe, June temperatures exceeded 46 °C, contributing to an estimated 2,300 heat-related deaths (Grantham Institute, 2025[10]). India endured one of its deadliest heatwaves on record in April-May, with temperatures exceeding 48 °C (United Nations, 2025[11]). North Africa also experienced exceptional temperatures, with Morocco reaching 47°C in some areas, while several subnational regions in Brazil and Argentina faced temperatures of 10 °C above seasonal norms (NOAA National Center for Environmental Information, 2025[12]). These developments reflect a rapidly warming climate, with mounting human costs, reinforcing the need for robust mitigation and adaptation policies.

Heat stress exposure and adaptive capacity are unevenly distributed. Heat stress is a concept that tries to convey how humans perceive higher temperatures by considering other variables such as humidity (Maes et al., 2022[13]). For example, countries such as Thailand, Indonesia, India, Saudi Arabia, Brazil, Costa Rica and Israel have been historically exposed on average to more than 100 strong heat stress days annually, while most European countries face fewer than 50 (see Box 2.1 for a detailed case for Japan).[4] However, exposure alone does not determine vulnerability, as economic capacity plays a critical role in shaping countries' ability to adapt (Costa and Hooley, 2025[14]).

Countries with high exposure to heat stress often have lower adaptive capacity (Figure 2.2). For instance, India, with the world's largest population, has the highest mean population exposure to heat stress among OECD and OECD partner countries over 267 strong heat stress days annually -measured considering a temperature of at least 32°C as well as humidity, winds and solar radiation - while maintaining one of the lowest GDP's per capita (Figure 2.2). By contrast, most European countries experience fewer number of heat stress days but have a higher GDP per capita – Greece has the highest exposure (79 days), followed by Italy (67) and Spain (65). North American countries show similar levels of population exposure to heat stress days compared to European peers, except for Mexico. These disparities underscore that the most exposed countries are often least equipped to adapt. Without stronger international cooperation, the gap in climate resilience between wealthy and emerging economies will continue to widen, exacerbating global inequalities (UNEP, 2024[15]).

Figure 2.2. Most exposed countries to heat stress often have the least resources to adapt

Population-weighted mean number of strong heat stress days per year (2020-2024 average), GDP per capita (USD, 2024, PPP, log-scaled), OECD and OECD partner countries. Bubble size reflects total population, 2024



Note: GDP per capita is purchasing power parity (PPP) converted, based on 2020 as the reference year. Strong heat stress days are defined here as days where temperatures exceed 32°C, and is based on the Universal Thermal Climate Index, which accounts for temperature, humidity, wind speed and solar radiation.

Source: OECD (2025), "Climate-related hazards: Historical exposure to extreme temperature", OECD Environment Statistics (database). OECD National Accounts.

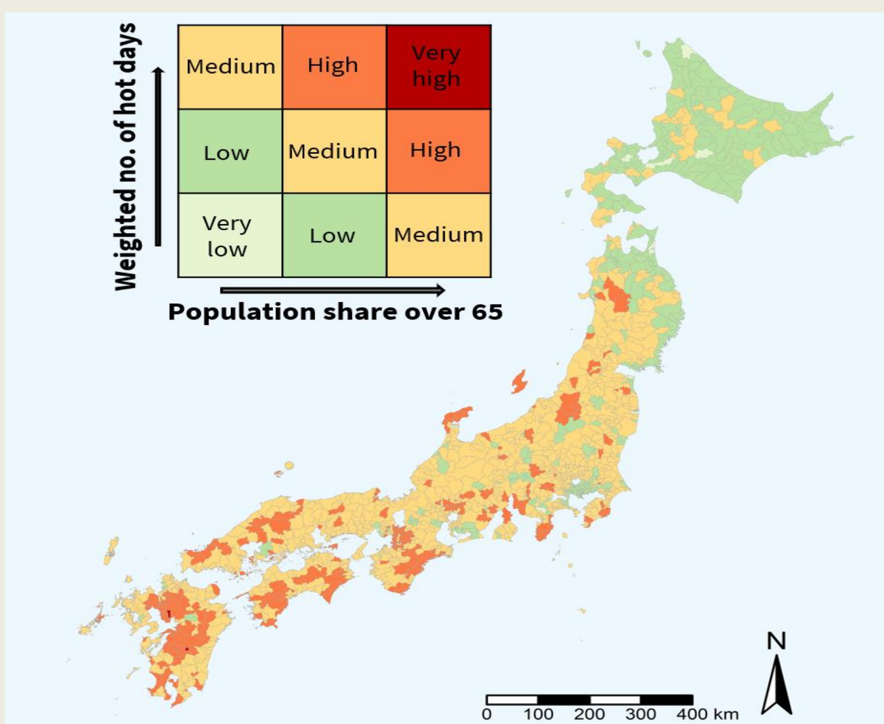
Box 2.1. Vulnerability to extreme heat also varies within populations: The case of Japan

Population risk to adverse impacts from extreme heat is influenced by both environmental and demographic factors. It varies not only across geographical regions but also within populations, particularly in relation to age distribution and levels of exposure. In Japan, more than 60% of the population is already exposed to days exceeding 35°C – one of the highest exposure levels in the OECD (Maes et al., 2022[13]). The public health consequences are clear, with increasing cases of heat-related illnesses and mortality, particularly among the elderly (Ministry of Health, 2024[16]).

One way of identifying areas that are potentially more at risk across a vulnerability dimension is by developing a bivariate covariance indicator between a vulnerability factor and heat exposure, potentially supporting tailored adaptation efforts of regions and populations. For example, Figure 2.3 presents an experimental indicator that accounts for both heat exposure (i.e. yearly number of hot days where maximum temperature is above 30°C) and an important vulnerability factor (i.e. share of people aged 65 or over). This covariance indicator identifies the towns of Nagomi and Yunomae on the Kyushu Island areas as having high heat-elderly risks compared to other places in Japan. However, this does not imply that densely populated areas are at low risk, as large numbers of older residents can lead to high absolute heat-related risk there as well. Similar analyses have been conducted for the Slovak Republic, where districts exposed to high heat are considered more vulnerable if they have a large population above the age of 70 (OECD, 2023[17]).

Figure 2.3. Heat exposure and vulnerability among elderly populations in Japan

Results on the bivariate covariance indicator measured by the share of elderly and elder-weighted number of hot days (>30°C), 2020

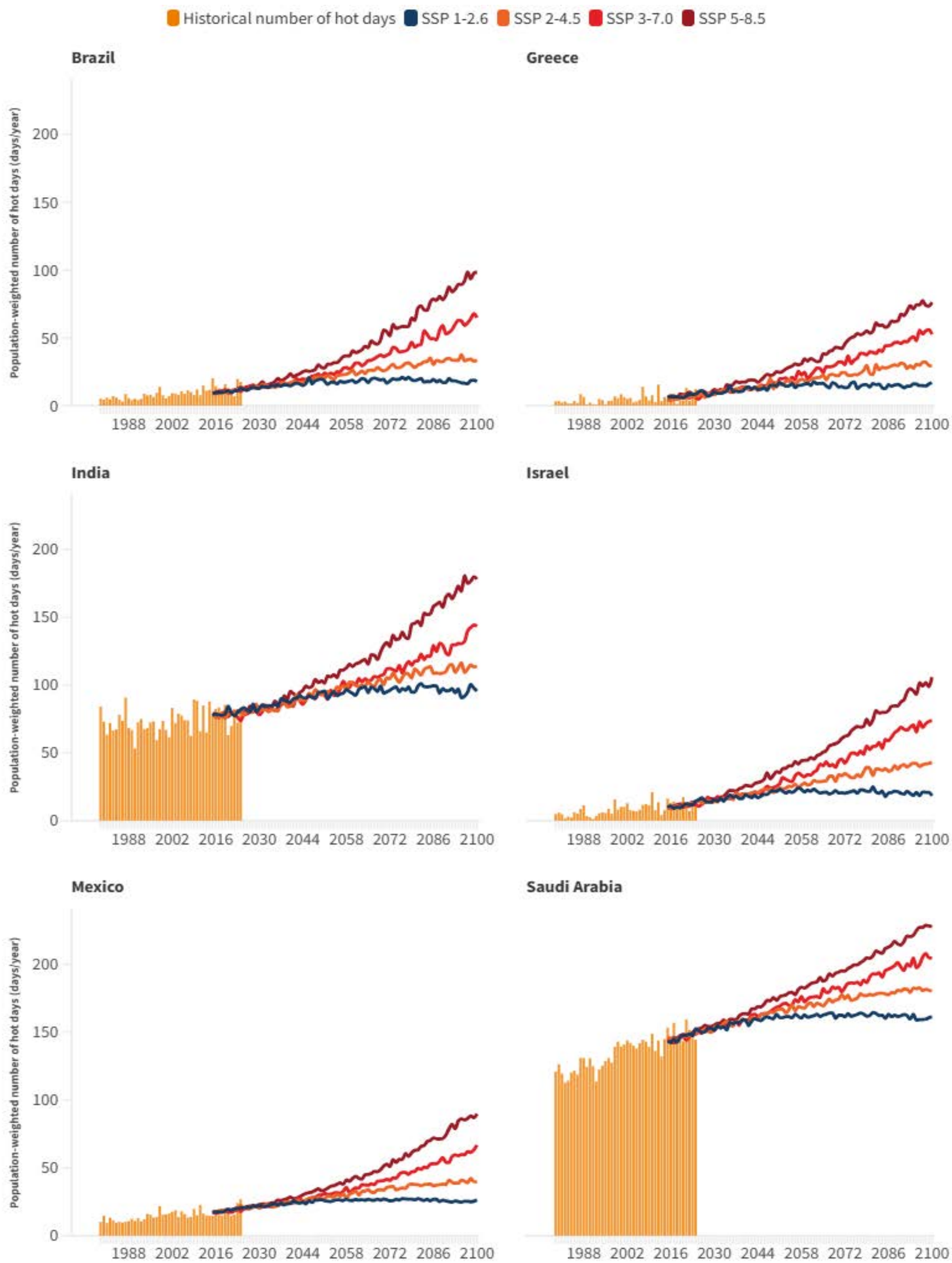


Note: These maps visualise mainland Japan, excluding Okinawa Prefecture and some remote islands from Kagoshima and Tokyo Prefectures. The legend is based on standard deviations (SD), with three categories on each axis benchmarked against the national average using SD. For example: low means 1SD below average share of elderly and 1SD below average count of annual hot day.
Source: OECD (forthcoming), “Vulnerability to environmental hazards: Measurement framework and empirical results: the case of Japan”.

At the global level, all regions will be affected by increasing exposure to extreme heat irrespective of past exposure. By 2100, under an intermediate-emissions scenario, Brazil, Greece, India, Israel, Mexico and Saudi Arabia are expected to be the countries that experience the greatest increase in hot days relative to the climate reference period (Figure 2.4). Hot days are defined here as days where the maximum temperature exceeds 35°C, this is considered a threshold that affects human health (Maes et al., 2022[13]). Although Brazil, Greece, Israel, and Mexico have experienced a comparatively low population exposure in the past, India and Saudi Arabia are already facing relatively high exposure -two to five months of hot days per year (Figure 2.4). Under the high-emissions scenario, Greece could experience an additional 43 hot days, and Israel an additional 61 hot days by 2080-2099, as compared to the climate reference period (Figure 2.4). These projections suggest that a global strategy, albeit with a differentiated adaptation approach, is needed since both historically high- and lower-exposed countries will face escalating risks.

Figure 2.4. Despite differences in historical exposure to extreme heat, countries will need to increase resilience

Population-weighted number of hot days for selected countries under all Tier-1 SSP scenarios, 1979-2024 (historical, as bars), 2015-2100 (projections, as lines)



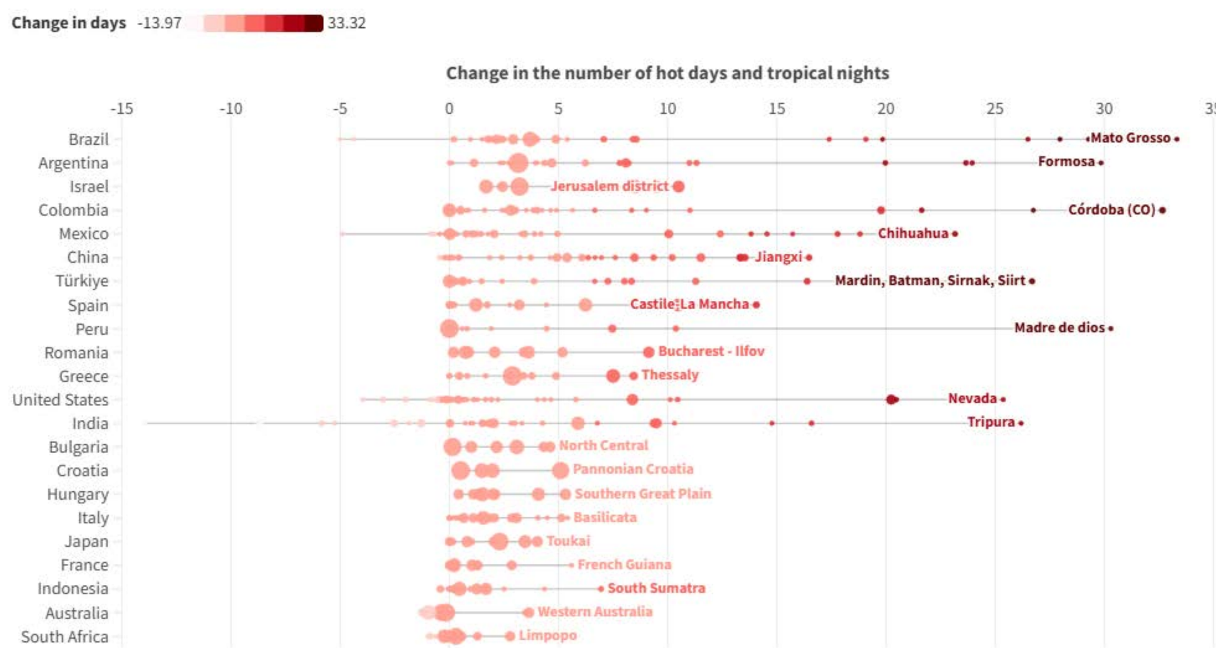
Note: The six countries selected for illustration in this figure are projected to experience the highest increase in the number of hot days for the period 2080–2099 relative to the climate reference period under an intermediate-emissions scenario. A hot day is defined here as days where the maximum temperature exceeds 35°C. In contrast to the heat stress index, the hot day index does not account for factors such as humidity, wind speed or solar radiation. The four Tier-1 Shared Socioeconomic Pathways (SSPs) represent the low to very high-emissions scenarios (i.e. SSP 1-2.6, SSP 2-4.5, SSP 3-7.0 and SSP 5-8.5).

Source: OECD (2025), “Climate-related hazards: Historical exposure to extreme temperature”, OECD Environment Statistics (database). OECD (2025), “Climate-related hazards: Projected exposure to extreme temperature”, OECD Environment Statistics (database).

Subnational variation in exposure reinforces the need for localised adaptation measures. National averages mask significant regional disparities especially in large countries spanning diverse climates. For example, in India changes in exposure range from -14 days in Puducherry to +26 in Tripura, despite a national average of +2.5 days. In Brazil, Mato Grosso has experienced 33 additional hot days and tropical nights, 24 days above the national average. The top four sub-national regions with the greatest increases are concentrated in South America -Mato Grosso (Brazil), Cordoba (Colombia), Madre de Dios (Peru), and Formosa (Argentina) (see Box 2.2 on a detailed case for Brazil). In Europe, Spain leads in projected increases, with Castille-La Mancha experiencing 10 days more than the national average (Figure 2.5). These differences mean that even within the same country, adaptation responses must be tailored to regional conditions and risk levels.

Figure 2.5. Rising hot days and tropical nights disproportionately affect some regions and populations

Change in population-weighted number of hot days (Tmax > 35°C) and tropical nights (Tmin > 20°C) across the OECD and OECD partner countries, 2020-2024 average compared to the climate reference period (1981-2010). Bubble size shows the population share compared to the national total



Note: Countries are ordered by national mean. The following countries are excluded because there is little to no change when compared to the climate reference period: Slovak Republic, Portugal, Great Britain, Austria, Korea, Canada, Sweden, Slovenia, New Zealand, Norway, the Netherlands, Latvia, Luxemburg, Lithuania, Malta, Iceland, Ireland, Finland, Estonia, Denmark, Chile, Switzerland, Belgium, Poland, Germany, Czechia and Costa Rica. Currently, no subnational data is available for Thailand.
Source: OECD (2025), "Climate-related hazards: Historical exposure to extreme temperature", OECD Environment Statistics (database).

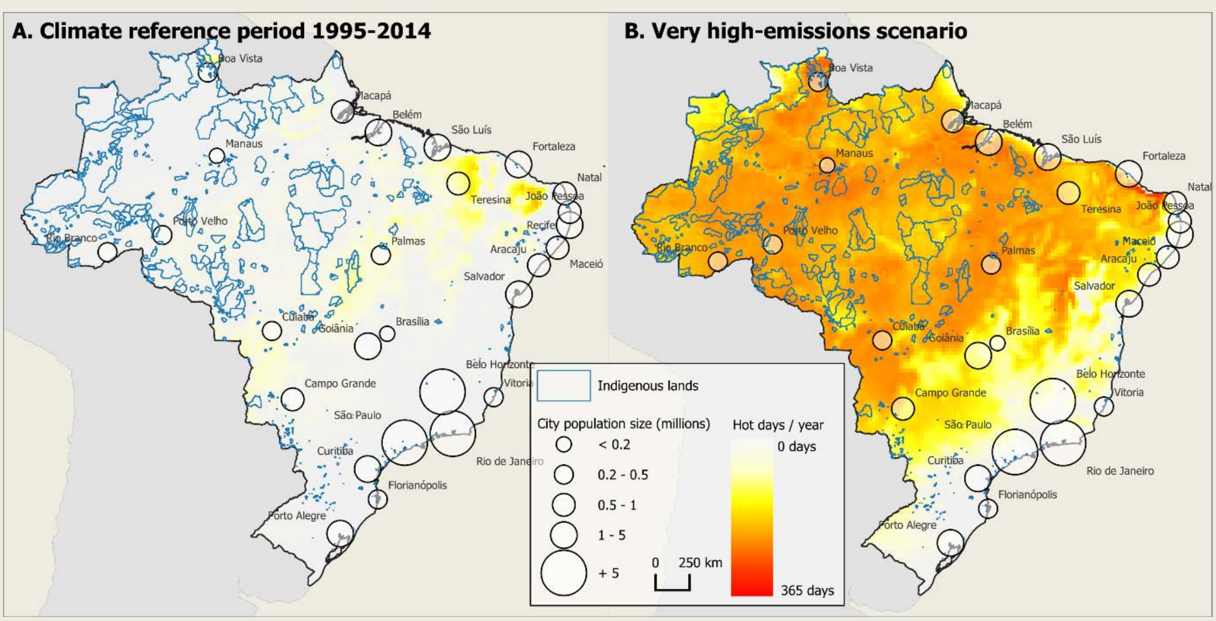
Box 2.2. Large swaths of Brazil are projected to face growing impacts of extreme heat under high-emission scenarios

Brazil is experiencing extreme climate variability, with historic floods occurring just one month before intense and long heatwaves. In early 2025, temperatures reached 44°C in Rio de Janeiro, well above the mid-to-late February normal (Climate Central, 2025[18]). Meanwhile the national heat index, which combines temperature with humidity to determine how humans feel heat, recorded its highest temperature on record hitting 62.3°C in March 2023 (Moreira et al., 2024[19]). These events occurred despite temperate regions normally experiencing milder conditions than Brazil tropical north.

Climate scenarios project that large areas of the country will be experiencing many more months of extreme heat compared to the climate normal. More than 31.9 million people in the north of Brazil are projected to endure an additional 6 months of hot days annually in 2080-2099 compared to the climate normal under a very high-emissions scenario (Figure 2.6). The Amazonian region is projected to be the hardest hit, with a marked increase in extreme heat. Earth system models also project long-term drying trend in large parts of the Amazon rainforest (Ritchie et al., 2022[20]) (OECD, 2022[1]) which will accelerate forest degradation (Duffy et al., 2015[21]), with increase risks for all communities living in the region, including vulnerable populations on indigenous lands (Figure 2.6).

Figure 2.6. Brazil could face over 200 hot days annually by the end of the century, under a very high emissions scenario

Projections for 2080-2099 with hot days defined as (Tmax > 35°C)



Note: The end of the century is defined as the period from 2080-2099. Projected extreme temperature data in this visualisation represents the median value of the multi-model ensemble, providing reliable climate projections that capture uncertainty of individual models, and are used by IPCC assessments (IPCC, 2021[22]).
Source: OECD (2025), "Climate-related hazards: Projected exposure to extreme temperature", OECD Environment Statistics (database).

2.3. Droughts are deepening risks to agriculture, economies and lives

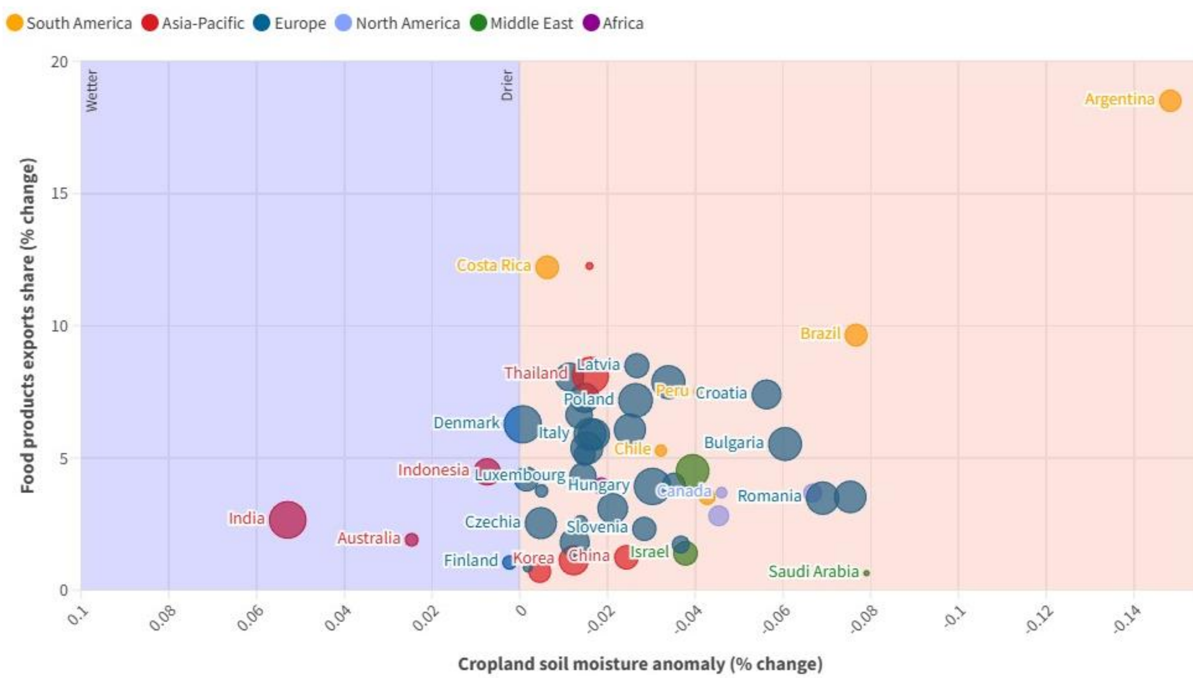
The Earth's shifting heat balance is driving more frequent and severe droughts. Rising temperatures accelerate evaporation, reducing soil moisture and freshwater availability in many regions. Currently, 40% of the world's land area is exposed to increasingly frequent and severe droughts, with the economic cost projected to grow between 3 to 7.5% annually (OECD, 2025[23]). Droughts heighten the risk of wildfires putting pressure on economic sectors and livelihoods particularly in agriculture and water systems within and across countries.

In 2024-2025, severe drought events have had devastating consequences. In Romania, one of the EU's leading cereal exporters, droughts destroyed approximately 2.5 million hectares of staple crops, resulting in nearly USD 2 billion in losses and widespread disruption to rural livelihoods (Reștea, 2024[24]). In Chile, drought-fuelled wildfires claimed 137 lives and caused an estimated USD 1 billion in damages (Dearbail, 2024[25]). These events underscore the rising threat of "hot droughts", where high temperature, low humidity and reduced precipitation, compound to intensify impacts (King et al., 2024[26]). They underscore the need for climate-resilient agricultural practices and disaster prevention methods, including nature-based solutions for fire protection (OECD, 2023[27]).

In recent years, most OECD and OECD partner countries have experienced drier cropland conditions. Trends in soil moisture anomaly reveal growing exposure to drought stress, with heightened implications for key food-exporting economies (Figure 2.7). For example, Argentina, one of the largest food-exporting economy of countries covered under IPAC, experienced its largest soil moisture decline, while Brazil and Costa Rica also face both high export dependence on agriculture and a decrease in soil moisture Figure 2.7). Other high-risk, countries with a high share of cropland include Denmark (71%), India (69%), Hungary (68%) and Thailand (67%), are also at risk - even moderate droughts can disrupt production and food security (OECD, 2025[23]).These patterns highlight the systemic nature of drought risk and the need for proactive, cross-sectoral resilience strategies (OECD, 2025[23]).

Figure 2.7. Economies based on food exports affected by increased exposure to droughts worldwide

Share of food exports (% of total exports, 2018-2022), cropland soil moisture anomaly (% change 2020-2024 compared to 1981-2010), OECD and OECD partner countries. Bubble size reflects cropland share of total land cover, 2022



Note: Cropland soil anomaly describes the cropland soil moisture content of the topsoil layer compared to the climate reference period 1981-2010.

Source: World Integrated Trade Solution system (WITS); Staff estimates, World Bank (WB). OECD (2025) "Climate-related hazards: Historical exposure to droughts", OECD Environment Statistics (database). OECD (2024) “Land cover and land cover change”, OECD Environment Statistics (database).

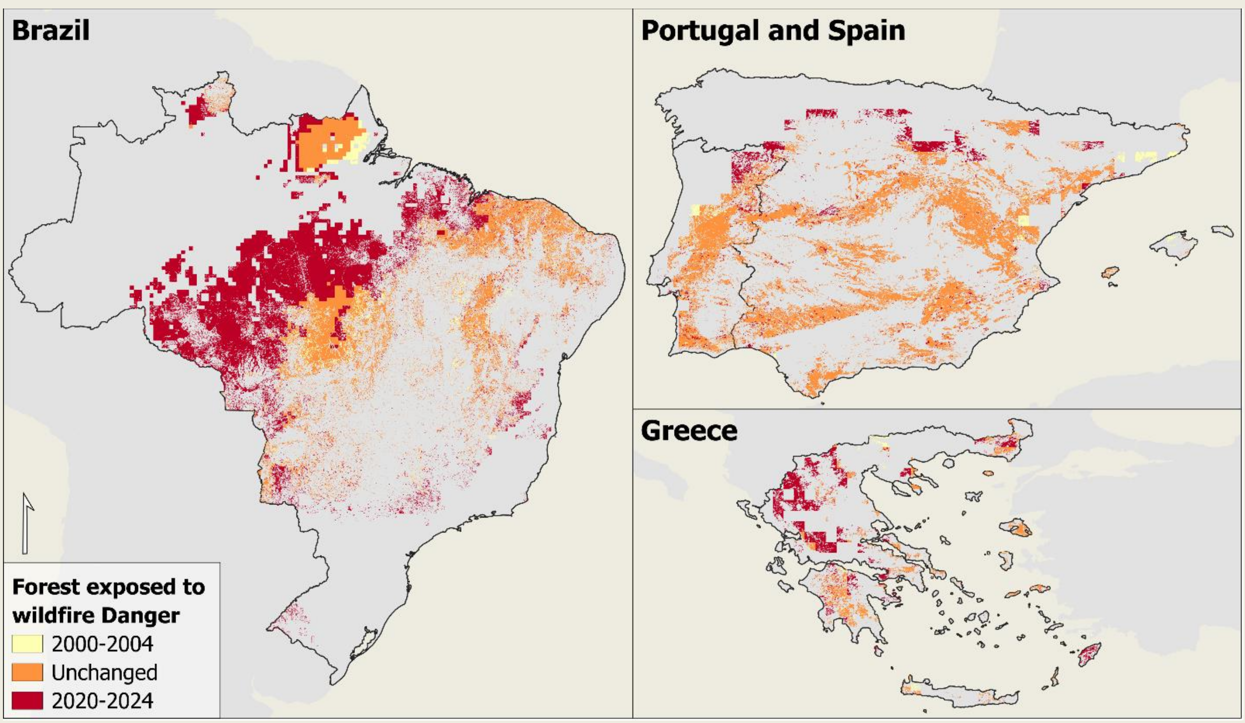
Drought is driving more frequent, intense and prolonged wildfires (see Box 2.3). For example, in 2024-2025 the United States experienced unprecedented fires in the Los Angeles metropolitan area destroying 16,255 structures while another 2,090 structures were damaged, with an estimated total property and capital loss of USD 76-131 billion (Wall, Steinberg and Shew, 2025[28]; Li and Yu, 2025[29]). In 2025, Southern Europe experienced one of its worst wildfire seasons in two decades with an estimated 380,000 hectares burned in Spain and 260,000 hectares in Portugal (Keeping et al., 2025[30]). These events underscore the need for climate adaptation, including resilient infrastructure, sustainable forest and land management, and an enhanced and coordinated wildfire response capacity (OECD, 2023[27]).

Box 2.3 The expanding reach of wildfires: forests and populations at risk

IPAC data reveals a significant increase to wildfire danger in 2020-2024 compared to 2000-2004 (Figure 2.8. Not only have new forest regions become increasingly exposed over the past two decades (red in Figure 2.8), but areas that were already exposed in the early 2000s remain at risk today (orange in Figure 2.8), indicating little progress in reducing long-term vulnerability. Notably, northern Spain, Portugal, Greece and the Amazon show substantial new forest exposure due to increasing temperatures, underscoring the growing geographic spread of wildfire risk. This expansion highlights the need for both mitigation and adaptation strategies to protect ecosystems and nearby populations (OECD, 2023[27]).

Figure 2.8. An increasing amount of forest cover is in areas at risk of wildfires

Forest cover at risk of wildfire danger in 2020-2024, 2000-2004 or both for selected countries



Note: Forests are considered exposed to wildfire danger if they are within regions with a very high or extreme Fire Weather Index.
Source: OECD (2025) "Climate-related hazards: Wildfire exposure", OECD Environment Statistics (database).

2.4. Extreme precipitation is rising puts crops and communities at risk

Rising global temperatures are changing humidity and precipitation patterns. Higher evaporation rates and increased atmospheric humidity levels alter precipitation distribution across regions leading to more intense and frequent extreme precipitation events in some regions and prolonged droughts in others. Some regions now face both effects at different times of the year which heightens the risk and severity of flooding.

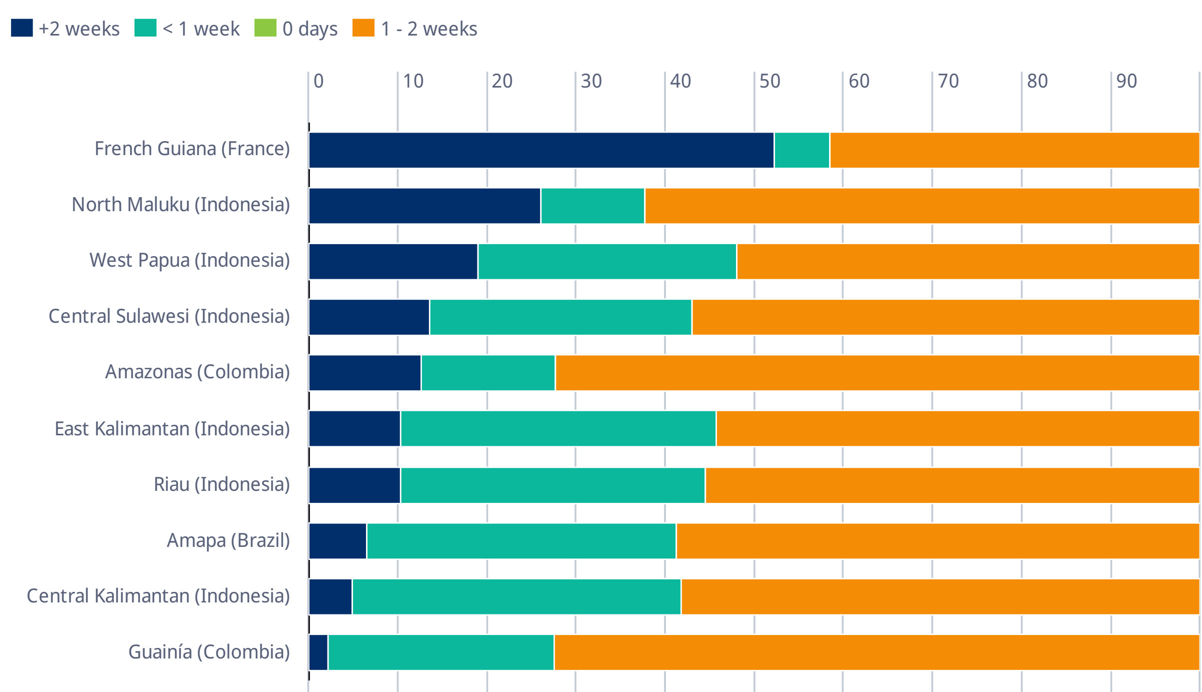
These shifts reflect the complex interaction within the Earth system, where warming not only increases overall atmospheric moisture but also modifies weather patterns across and within regions.

The consequences of extreme precipitation events are increasingly severe, threatening lives, economic stability, and infrastructure. For example, in June 2025, Central Texas suffered catastrophic flash floods, resulting in at least 138 fatalities and widespread destruction (Henson, 2025[31]). Similarly, during the 2024-2025 wet season, the state of Queensland in Australia received one year worth of rainfall in just four days, causing widespread flooding across an area four times the size of the United Kingdom (BOM, 2025[32]). These unprecedented events forced mass evacuations causing extensive economic losses. More than 70% of all land worldwide was exposed to a few days of extreme precipitation events on average across 2020-2024, with 80% of agricultural land exposed.

Agricultural systems are vulnerable to extreme precipitation events with exposure varying widely across regions (Box 2.4). IPAC indicators reveal that 29 out of 50 OECD and OECD partner countries experienced, on average, at least one week of extreme precipitation on cropland annually between 2020 and 2024 (OECD, 2025[6]). However, the degree of exposure differs significantly: over 40% of Indonesia's cropland is exposed to extreme precipitation, compared to less than 1% in Czechia. The top ten subnational regions across OECD and OECD partner countries with the highest cropland exposure are predominantly located in tropical zones and include French Guiana (France), North Maluku (Indonesia) and Amazonas (Colombia) (Figure 2.9). While these regions exhibit the highest shares of exposure, larger countries such as China have greater absolute cropland areas affected. This uneven exposure highlights the need for location-specific adaptation strategies, particularly in tropical and high-risk regions.

Figure 2.9. Tropical regions face the highest cropland exposure to extreme rainfall

Share of cropland (%) exposed to n number of weeks of extreme precipitation for selected regions in OECD countries, 2020-2024 average



Note: The ten large subnational regions selected for illustration are the regions with the highest cropland share exposed to a minimum of 1 week or more of extreme precipitation. The frequency of extreme precipitation is measured as the number of days where daily precipitation values exceed the 99th percentile over the climate reference period (1981-2010) (EEA, 2021[33]).
Source: OECD (2025), "Climate-related hazards: Historical exposure to extreme precipitation", OECD Environment Statistics (database).

Box 2.4 Measuring progress in adapting the agricultural sector to climate risks

In the face of significant subnational variability in climate-related hazards - such as extreme precipitation and drought - countries face challenges in tracking their progress on climate adaptation in agriculture. However, measuring sectoral progress is essential for building resilience, as effective climate risk management requires robust monitoring systems (OECD, 2024[34]). To support this, recent OECD work proposes a framework for assessing adaptation progress across four key dimensions:

1. **Exposure** of agricultural production to climate-related hazards
2. **Adoption** of resilient agricultural practices to reduce vulnerability
3. **Impacts** of climate change on agricultural outputs
4. **Enabling conditions** that support agricultural adaptation

This methodology supports the development of 17 sector-specific indicators, offering tools to assess achievements and gaps in agricultural resilience. These indicators can guide policy design, investment decisions, and the prioritisation of adaptation measures, helping countries tailor their responses to local climate risks and strengthen resilience in the agricultural sector.

Source: OECD (2025), "Measuring progress in adapting the agricultural sector to more variable and extreme weather conditions: Framework, indicator methodology and results".

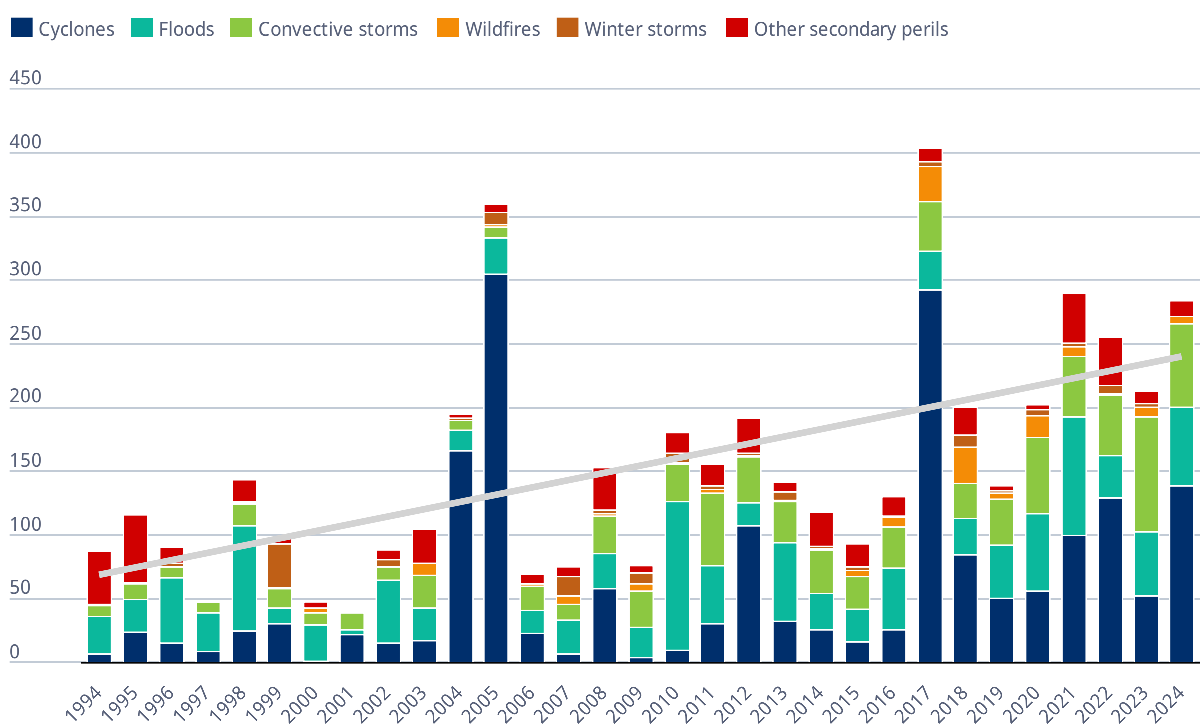
2.5. Economic losses and mortality from climate-related disasters reveal systemic vulnerabilities

Climate-related hazards become natural disasters when they overwhelm a community's ability to manage, causing widespread damage and disruption. Natural disasters cause substantial economic damages and loss of life, primarily through sudden extreme weather events such as cyclones, convective storms or flash floods. In 2024, total economic losses in the world due to climate-related natural disasters reached USD 328 billion, up from USD 303 billion in 2023 (Swiss Re Institute, 2025[35]). Of these, approximately 43% of total economic losses are insured, and global insurance losses will continue to grow at 5 – 7 % annually (Swiss Re Institute, 2025[35]), placing an increasing strain on the economy and broader society. Beyond the economic losses, disasters cause devasting human costs, with more than 16 000 deaths and more than 167 million people affected by natural disasters in 2024 alone, an affected population greater than that of Japan. (CRED, 2025[36]). These figures underscore the need to shift from reactive disaster response to proactive resilience planning.

The cumulative cost of climate-related disasters such as storms, flood and wildfires are growing. Between 1994 and 2024, OECD and OECD partner countries experienced an upward trend in cumulative economic losses (Figure 2.10). The increase was particularly pronounced in OECD countries, with some exceptional years showing spikes in damages; for instance, in 2005 and 2017, cyclones alone caused cumulative losses exceeding USD 270 billion in the United States. This upward trend in climate-related losses suggests that there is a need to proactively invest in resilience (OECD, 2025[37]). Investments in disaster risk reduction can reduce reconstruction costs five to sevenfold (European Investment Bank, 2024[38]). Therefore, as the severity and frequency of climate-related disasters increase, countries should increase disaster risk reduction as a cost-effective approach to reduce future economic losses.

Figure 2.10. Economic losses from climate-related natural disasters rose steadily over three decades

Cumulative economic losses (USD billion, 2024 prices), OECD and OECD partner countries, 1994-2024



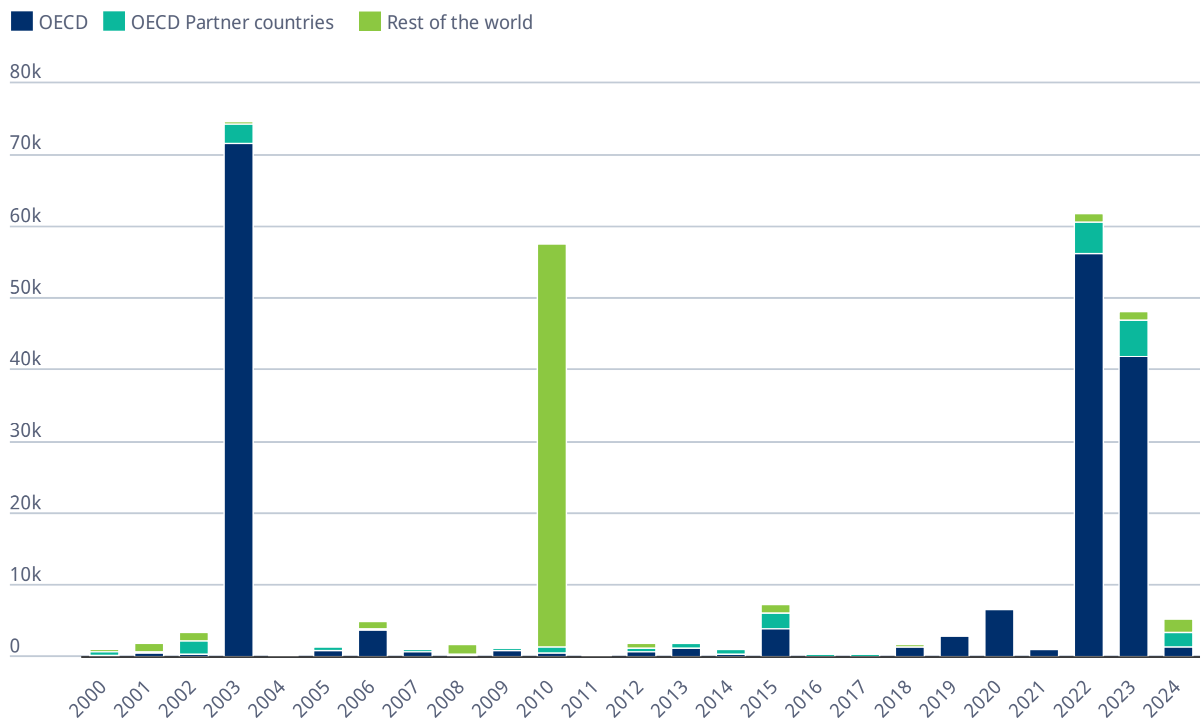
Note: The category "Other secondary perils" includes droughts and landslides. The category "Earthquakes" is excluded from this figure since this are not considered a natural disaster that is influenced by climate change.
Source: OECD calculations based on data provided by Swiss Re (Sigma database. All rights reserved).

Mortality from climate-related disasters – especially extreme heat – reveals critical gaps in climate risk planning, particularly in protecting vulnerable populations. For example, in late June to early July 2025, a severe heatwave swept across Western Europe resulting in widespread impacts. A recent study estimated that over 2 300 people died of heat-related causes across 12 European cities (Bird et al., 2025[39]). In London alone, approximately 260 heat-related deaths were recorded, with 65% of those deaths attributed to climate change, effectively tripling the death toll relative to a non-warming baseline (Bird et al., 2025[39]).

Sharp spikes in extreme years of mortality from climate-related disasters reveal weaknesses in preparedness and response systems. These figures reflect confirmed deaths attributed to extreme temperatures by reporting authorities – though attribution criteria vary across jurisdictions. OECD countries experienced high mortality in 2003 (71 000 deaths), 2022 (56 000 deaths), and 2023 (41 000 deaths), which were particularly deadly due to prolonged and intense heatwaves (Figure 2.11)[5]. These deadly heatwaves are directly observable in IPAC data on climate-related hazards (see OECD Data Explorer). These events confirm that even in wealthier countries resilience planning remains insufficient, as the impacts of extreme heat are largely preventable through public health and multisectoral interventions and measures to support vulnerable populations (WHO, 2024[40]).

Figure 2.11. Heat waves drive year-to-year surges in extreme temperature deaths

Deaths due to extreme temperatures, OECD and OECD partner countries and rest of the world, 2000-2024



Note: Extreme temperatures include heat waves, cold waves and extreme winter conditions. Deaths refer to the confirmed number of fatalities directly attributed to extreme temperatures by reporting authorities. The criteria used to link deaths to extreme temperatures vary between reporting authorities. They do not include excess deaths, which compare observed mortality during an event with the expected baseline.
Source: OECD calculations based on data from EM-DAT, CRED / UCLouvain, 2025, Brussels, Belgium – https://www.emdat.be/.

These figures likely underestimate the true human toll, as spatial gaps, underreporting, and inconsistencies in disaster databases remain pervasive, particularly in emerging economies (Moriyama, Sasaki and Ono, 2018[41]). Closing these data gaps is essential to improve climate risk assessments and support adaptive measures to reduce mortality.

Climate-related disasters are causing escalating economic losses and significant losses of life, and projections from organizations such as the Swiss Re Institute suggest that these risks will intensify throughout this century (Swiss Re Institute, 2025[35]).However, the extent of economic and human impacts is not solely determined by the severity of the hazards themselves – they depend on adaptive capacity and resilience measures in place (UNDRR, 2025[42]). Therefore, countries must prepare for increasing risks by strengthening disaster preparedness, reducing vulnerability, and investing in long-term resilience to protect lives and livelihoods.

References

Aðalgeirsdóttir, G. et al. (2024), *Open Letter by Climate Scientists to the Nordic Council of Ministers*, https://en.vedur.is/media/ads_in_header/AMOC-letter_Final.pdf (accessed on 7 July 2025). [5]

Bird, J. et al. (2025), *UK and European heatwave 2025*, Grantham Institute, London, https://www.imperial.ac.uk/grantham/publications/all-publications/uk-and-european-heatwave-2025.php (accessed on 17 July 2025). [39]

BOM (2025), *Australia's 2024–25 northern wet season*, Australian Government Bureau of Meteorology. [32]

C3S and ECMWF (2025), *Global Climate Highlights 2024*, Copernicus Climate Change Service and European Centre for Medium-Range Weather Forecasts, https://climate.copernicus.eu/global-climate-highlights-2024 (accessed on 19 August 2025). [9]

Climate Central (2025), "Climate change fuels record February heat in Brazil ahead of Carnival", *Climate Shift Index Alert*. [18]

Costa, H. and J. Hooley (2025), "The macroeconomic implications of extreme weather events", *OECD Economics Department Working Papers*, No. 1837, OECD Publishing, Paris, https://doi.org/10.1787/5e24a2d8-en. [14]

CRED (2025), *2024 Disasters in Numbers*, Centre for Research on the Epidemiology of Disasters, Brussels, https://files.emdat.be/reports/2024_EMDAT_report.pdf (accessed on 17 July 2025). [36]

Dearbail, J. (2024), "Chile arrests firefighter for blaze that killed 137", *BBC News*. [25]

Duffy, P. et al. (2015), "Projections of future meteorological drought and wet periods in the Amazon", *Proceedings of the National Academy of Sciences*, Vol. 112/43, pp. 13172-13177, https://doi.org/10.1073/pnas.1421010112. [21]

EEA (2021), *Europe's changing climate hazards — an index-based interactive EEA report*, European Environment Agency, Copenhagen. [33]

European Investment Bank (2024), *94% of Europeans support measures to adapt to climate change, according to EIB survey*, https://www.eib.org/en/press/all/2024-406-94-of-europeans-support-measures-to-adapt-to-climate-change-according-to-eib-survey. [38]

Grantham Institute (2025), *Climate change tripled heat-related deaths in early summer European heatwave*, Imperial College London Grantham Institute, London, https://www.imperial.ac.uk/grantham/publications/all-publications/climate-change-tripled-heat-related-deaths-in-early-summer-european-heatwave.php (accessed on 19 August 2025). [10]

Henson, B. (2025), "'Deadliest in generations': The Texas floods are the latest in a disturbing pattern", *Yale Climate Connections*. [31]

IPCC (2023), *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, Intergovernmental Panel on Climate Change, Geneva, https://doi.org/10.59327/IPCC/AR6-9789291691647. [4]

IPCC (2021), *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, Intergovernmental Panel on Climate Change, Geneva, https://doi.org/10.1017/9781009157896. [22]

Keeping, T. et al. (2025), *Extreme fire weather conditions in Spain and Portugal now common due to climate change*, Word Weather Attribution, https://www.worldweatherattribution.org/extreme-fire-weather-conditions-in-spain-and-portugal-now-common-due-to-climate-change/ (accessed on 18 September 2025). [30]

King, K. et al. (2024), "Increasing prevalence of hot drought across western North America since the 16th century", *Science Advances*, Vol. 10/4, https://doi.org/10.1126/sciadv.adj4289. [26]

Li, Z. and W. Yu (2025), "Economic Impact of the Los Angeles Wildfires", https://www.anderson.ucla.edu/about/centers/ucla-anderson-forecast/economic-impact-los-angeles-wildfires#:~:text=In%20summary%2C%20the%20total%20property,losses%20estimated%20at%20%2445%20billion. (accessed on 20 August 2025). [29]

Maes, M. et al. (2022), "Monitoring exposure to climate-related hazards: Indicator methodology and key results", *OECD Environment Working Papers*, No. 201, OECD Publishing, Paris, https://doi.org/10.1787/da074cb6-en. [13]

Maes, M. et al. (2025), "Monitoring exposure to future climate-related hazards: Forward-looking indicator results and methods using climate scenarios", *OECD Environment Working Papers*, No. 264, OECD Publishing, Paris, https://doi.org/10.1787/b9ba6ee0-en. [7]

Ministry of Health, L. (2024), *Deaths from heat stroke (Vital Statistics)*, https://www.mhlw.go.jp/toukei/saikin/hw/jinkou/tokusyu/necchusho23/. [16]

Moreira, A. et al. (2024), "Atmospheric Conditions Related to Extreme Heat and Human Comfort in the City of Rio de Janeiro (Brazil) during the First Quarter of the Year 2024", *Atmosphere*, Vol. 15/8, p. 973, https://doi.org/10.3390/atmos15080973. [19]

Moriyama, K., D. Sasaki and Y. Ono (2018), "Comparison of Global Databases for Disaster Loss and Damage Data", *Journal of Disaster Research*, Vol. 13/6, pp. 1007-1014, https://doi.org/10.20965/jdr.2018.p1007. [41]

NOAA National Center for Environmental Information (2025), *Monthly Global Climate Report for April 2025*. [12]

OECD (2025), *Fast-tracking Net Zero by Building Climate and Economic Resilience: A Summary for Policymakers*, OECD Publishing, Paris, https://doi.org/10.1787/f2c22c96-en. [37]

OECD (2025), *Global Drought Outlook: Trends, Impacts and Policies to Adapt to a Drier World*, OECD Publishing, Paris, https://doi.org/10.1787/d492583a-en. [23]

OECD (2025), *IPAC Dashboard*, https://www.oecd.org/en/data/dashboards/climate-action-dashboard.html. [6]

OECD (2024), *Measuring Progress in Adapting to a Changing Climate: Insights from OECD countries*, OECD Publishing, Paris, https://doi.org/10.1787/8cfe45af-en. [34]

OECD (2024), *The Climate Action Monitor 2024*, OECD Publishing, Paris, https://doi.org/10.1787/787786f6-en. [2]

OECD (2023), “Adaptation measurement: Assessing municipal climate risks to inform adaptation policy in the Slovak Republic”, *OECD Environment Policy Papers*, No. 35, OECD Publishing, Paris, https://doi.org/10.1787/dad34bb3-en. [17]

OECD (2023), *Taming Wildfires in the Context of Climate Change*, OECD Publishing, Paris, https://doi.org/10.1787/dd00c367-en. [27]

OECD (2022), *Climate Tipping Points: Insights for Effective Policy Action*, OECD Publishing, Paris, https://doi.org/10.1787/abc5a69e-en. [1]

Reștea, K. (2024), “Costurile secetei. Estimările fermierilor: Pagubele ar putea depăși 2 miliarde de euro la nivel național/ Se așteaptă creșteri de prețuri la pâine, ulei, carne și lactate”, *Economedia*. [24]

Ritchie, P. et al. (2022), “Increases in the temperature seasonal cycle indicate long-term drying trends in Amazonia”, *Communications Earth & Environment*, Vol. 3/1, p. 199, https://doi.org/10.1038/s43247-022-00528-0. [20]

Silvano, A. et al. (2025), “Rising surface salinity and declining sea ice: A new Southern Ocean state revealed by satellites”, *Proceedings of the National Academy of Sciences*, Vol. 122/27, https://doi.org/10.1073/pnas.2500440122. [3]

Swiss Re Institute (2025), *Sigma natural catastrophes: insured losses on trend to USD 145 billion in 2025*, Swiss Re Management Ltd., Zurich, https://www.swissre.com/institute/research/sigma-research/sigma-2025-01-natural-catastrophes-trend.html (accessed on 17 July 2025). [35]

UNDRR (2025), *Global Assessment Report on Disaster Risk Reduction 2025: Resilience Pays: Financing and Investing for our Future*, United Nations Office for Disaster Risk Reduction, Geneva. [42]

UNEP (2024), *Adaptation Gap Report 2024: Come hell and high water - As fires and floods hit the poor hardest, it is time for the world to step up adaptation actions*, United Nations Environment Programme, https://doi.org/10.59117/20.500.11822/46497. [15]

United Nations (2025), “Extreme heat is breaking records worldwide: UN weather agency”, *UN News*. [11]

Wall, T., M. Steinberg and D. Shew (2025), “Community-led rebuilding after the LA wildfires”, *Nature Sustainability*, Vol. 8/4, pp. 326-326, https://doi.org/10.1038/s41893-025-01531-x. [28]

WHO (2024), *Heat and health*, https://www.who.int/news-room/fact-sheets/detail/climate-change-heat-and-health. [40]

WMO (2025), *State of the Global Climate 2024*, World Meteorological Organization, Geneva, https://library.wmo.int/idurl/4/69455 (accessed on 19 August 2025). [8]

Notes

[1] In climate science, a tipping point is a critical limit beyond which the climate system shifts rapidly, often irreversibly, into a different state. For example, the Greenland ice sheet could melt past a threshold where its loss becomes self-perpetuating, contributing to sustained sea level rise over time.

[2] Data sources include ESA's Copernicus programme, NASA's MODIS and Landsat missions, and other recognised repositories. Methodologies follow established standards such as the IPCC's framework for climate data quality assurance, ensuring temporal consistency, spatial comparability, and scientific reproducibility.

[3] These projections are based on Coupled Model Intercomparison Project (CMIP6) covering four Tier-1 Shared Socio-economic Pathways (SSPs) with an additional Tier-2 SSP providing detailed assessments of climate responses across different emissions trajectories.

[4] IPAC employs data on strong heat stress days where temperatures exceed 32°C to assess population exposure to climate extremes. This is calculated using the Universal Thermal Climate Index, which accounts for temperature, humidity, wind speed, and solar radiation.

[5] The Emergency Events Database (EM-DAT) remains a critical resource for tracking mortality and injury from natural disasters offering key insights into the human toll of climate-related hazards.

3. How far did countries' climate action progress?

Achieving the Paris Agreement temperature goals requires effective and timely climate policy action. Yet, current Nationally Determined Contributions (NDCs) and net-zero targets remain insufficient to limit global warming to 1.5°C or 2°C, revealing a persistent ambition gap. Even more worrying, many existing commitments are not on track to be delivered, pointing to an NDC Delivery Gap (Chapter 1). Bridging these gaps will require a significant step-up in ambition and action. In 2024, however, climate policy action (henceforth climate action) expanded by only 1%, continuing the slow pace of the last two years.

This chapter draws on the Climate Actions and Policies Measurement Framework (CAPMF) complemented with other sources to assess key developments in countries' climate action in 2024. Developed under the International Programme for Action on Climate (IPAC), the CAPMF tracks the evolution of climate policies across countries and time. The 2025 edition significantly enhanced the scope, covering 87 policies across 97 jurisdictions (96 countries and the EU-27 as a bloc), up from 56 policies across 51 jurisdictions in earlier editions (see Box 3.1). While the coverage has expanded, the key policy trends remain largely consistent, reinforcing both the validity of earlier findings and the urgency of stronger climate action.

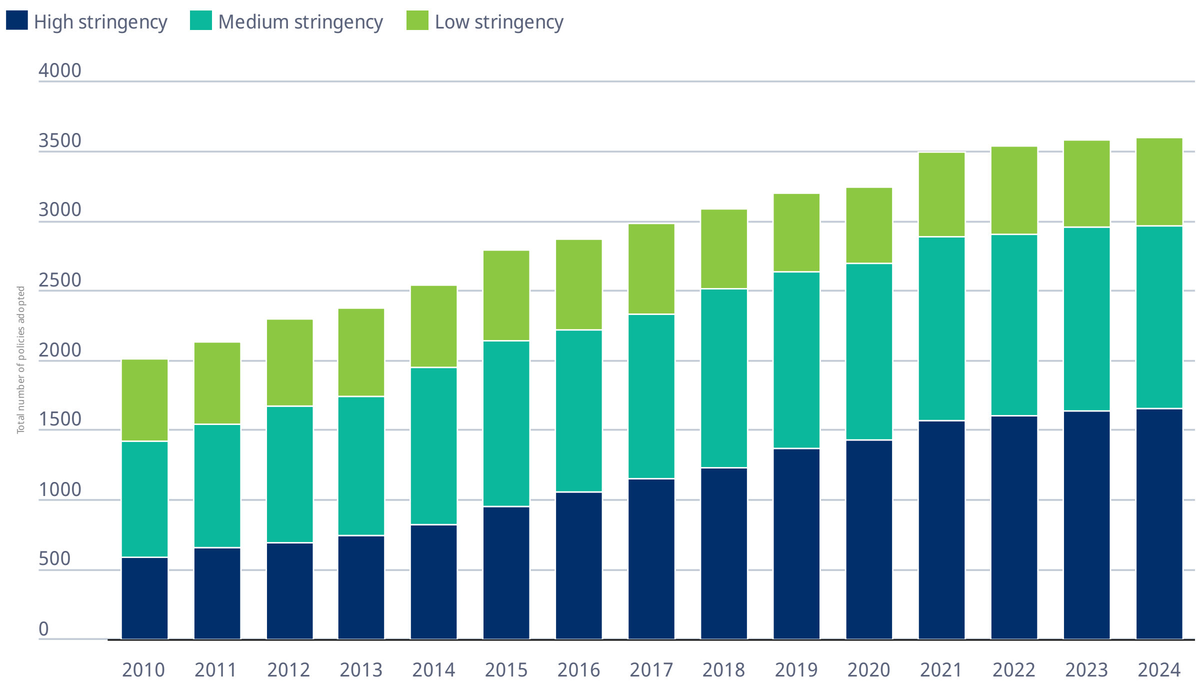
The 2025 edition of the Monitor also introduces a new structure, featuring an in-depth review of a different sector and region each year, alongside an overview of key policy trends. For 2025, the focus is on the transport sector and on the Latin America and the Caribbean (LAC) region, which includes the host country of COP30. Nevertheless, country-specific and sectoral data on climate action can be found for all countries on the IPAC Climate Action Dashboard.

3.1. Climate action in 2024 expanded only marginally

The CAPMF tracks climate action by considering both policy adoption and policy stringency. In 2024, national climate action across CAPMF-covered countries only expanded by 1% (Figure 3.1) continuing the slow pace observed in 2022 and 2023 (1% and 2%, respectively) (OECD, 2023[1]), (OECD, 2024[2]). This is well below the 10% annual average increase observed between 2010 and 2021.

Figure 3.1. Climate action expanded only marginally since 2022

Adopted policies by stringency level; CAPMF-covered countries; 2010-2024



Source: Based on data from OECD, IEA, ITF, World Bank and others using the methodology of Nachtigall, D. et al. (2022): "The climate actions and policies measurement framework: A structured and harmonised climate policy database to monitor countries' mitigation action", OECD Environment Working Papers, No. 203, OECD Publishing, Paris, https://doi.org/10.1787/2caa60ce-en.

This continued trend is worrying as aggregate emissions' trajectories remain off track to meet NDCs commitments (see Chapter 1). Emissions continue to rise in many countries and are falling too slowly in others, underscoring the need to intensify efforts. While climate action – as defined by the CAPMF – does not directly measure policy effectiveness, evidence suggests a positive link between the expansion of climate action and emission reductions (Nachtigall et al., 2024[3])[1]. Encouragingly, CAPMF data suggests that all countries still have multiple options to strengthen existing policies or adopt new ones.

Box 3.1. The Climate Actions and Policies Measurement Framework 2025 edition

The **OECD Climate Actions and Policies Measurement Framework (CAPMF)** is a climate mitigation policy tracker and database. Its main objective is to monitor how national climate policies evolve and how stringent they are (i.e. the degree to which they incentivise or enable GHG emission reductions)[2]. The CAPMF covers a wide range of climate and climate-relevant policies, including market-based and non-market-based instruments. It is designed to be comparable across countries, enabling both quantitative and qualitative analyses and supporting governments in tailoring policies to meet their climate commitments (Stechemesser et al., 2024[4]) (D'Arcangelo, Kruse and Pisu, 2024[5]).

The 2025 edition significantly broadens the policy and geographical scope, better reflecting countries' diverse policy approaches and enhancing regional coverage. It tracks 272 policy variables - grouped into 87 policies - from 1990 to 2024. This represents a coverage of around 90% of policy instrument types listed in the last IPCC report (IPCC, 2022[6]). Compared with the previous edition, new features include:

- **New sectoral policies**: Agriculture, forestry, land-use (AFOLU) and waste
- **New modules**: climate-related financial policies
- **Extensions to existing modules**: subsidies for low-carbon technologies (e.g. tax credits for renewables), regulatory instruments, information tools and green public procurement policies.

For more details see Annex B.

Source: (Nachtigall et al., 2022[7]) and (Nachtigall et al., forthcoming).

ETSs, new regulations, and updated climate targets drove climate action in 2024

The modest expansion in national climate action in 2024 reflects diverse policy developments across countries, sectors, and policy instruments (Table 3.1). The strongest growth was observed for market-based instruments (see dedicated section below), followed by "targets, governance, and climate data".[3] Key advances included new or more ambitious targets, including the introduction of a net-negative target[4] for 2060 in Germany. Several countries, including the United Arab Emirates (UAE) and Türkiye submitted their long-term low emissions development strategy (LT-LEDS) while others (e.g. Kuwait and Thailand) joined the Kigali Amendment[5] to the Montreal Protocol.

Across policy instrument types, emissions trading systems (ETS) recorded the largest increase in 2024. This was driven mainly by the expansion of the EU ETS to cover maritime transport – identified as the single most important driver of overall climate action in 2024 – and the launch of new ETS in Australia under the Safeguard Mechanism Credits and in some Mexican States. The adoption of performance standards also increased, notably through building codes mandating net-zero buildings in countries such as Iceland. At the sectoral level, transport experienced the largest increase in climate action in 2024, narrowly surpassing the building sector. Examples in progress in climate action include: Ethiopia becoming the first country to ban the sale of new conventional cars starting in 2024. Also, Japan and Malaysia announced new coal phase-out targets for 2035 and 2045, respectively, and Indonesia brought forward its coal exit from 2045 to 2039.

At the regional level, the strongest increases were observed in Western Europe and Canada, followed by the Middle East and North Africa (MENA), Latin America and the Carribean, and Sub-Saharan Africa. Progress in African countries is described in more detail in a forthcoming joint OECD – GGGI – World Bank report. With respect to indvidual countries, progess includes: Australia's new ETS, Israel's participation in MARPOL VI and Singapore's strengthened carbon tax, these underpin the largest country-specific growth in 2024. Among the 97 jurisdictions covered by the CAPMF, 52 registered an increase in climate action, 17 experienced a slight decline, and 28 showed no net change. These groups account for 64%, 10%, and 7% of global GHG emissions, respectively.

Table 3.1. Top drivers of climate action in 2024

Increase in climate action between 2023 and 2024: by dimension

Dimension	Greatest increase	2nd greatest increase	3rd greatest increase
Broad policy category	Market-based instruments	Targets, governance and climate data	Non-market-based instruments
Policy instrument type	Trading systems	Performance Standards	Targets
Policy	Pricing of international emissions	Domestic ETS	Building codes
Sector	Transport	Buildings	AFOLU
Region	Western Europe and Canada	Middle East and North Africa	Latin America and the Caribbean
Country	Australia	Singapore	Israel

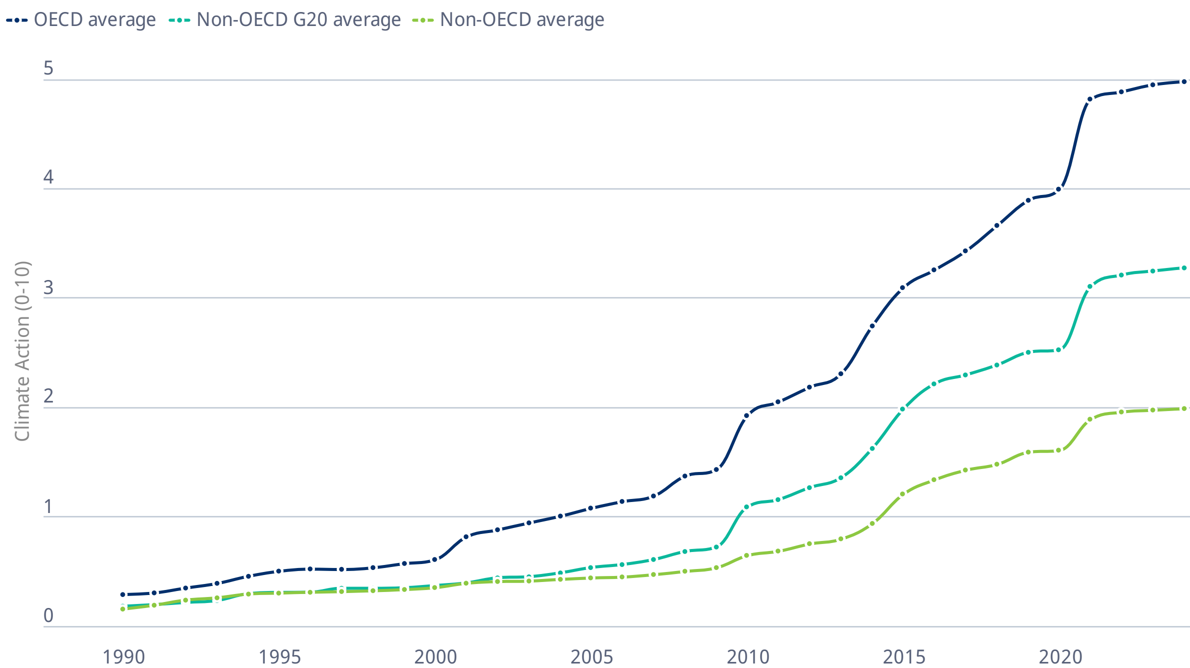
Source: Authors' elaboration based on the CAPMF, see https://www.oecd.org/en/data/dashboards/climate-action-dashboard.html.

Climate action has increased globally over the past decades, though progress remains uneven across regions and countries.

Climate action has followed three distinct trajectories across country groups (Figure 3.2). While climate action grew steadily in all groups until 2020, the pace of increase has largely slowed down since. OECD countries sustained stronger action and achieved the greatest acceleration whereas non-OECD countries progressed more slowly, widening the climate action gap. Among non-OECD countries, a divergence is also visible between G20 and non-G20 economies. The divergence raises concerns on competitiveness and carbon leakage potentially undermining the effectiveness of increased climate action on global emissions reductions. The findings underscore the need for stronger international co-ordination and co-operation to meet national and global climate goals.

Figure 3.2. Divergence of climate action risks undermining global mitigation efforts

Climate action (0-10), OECD, non-OECD G20, other non-OECD; 1990-2024

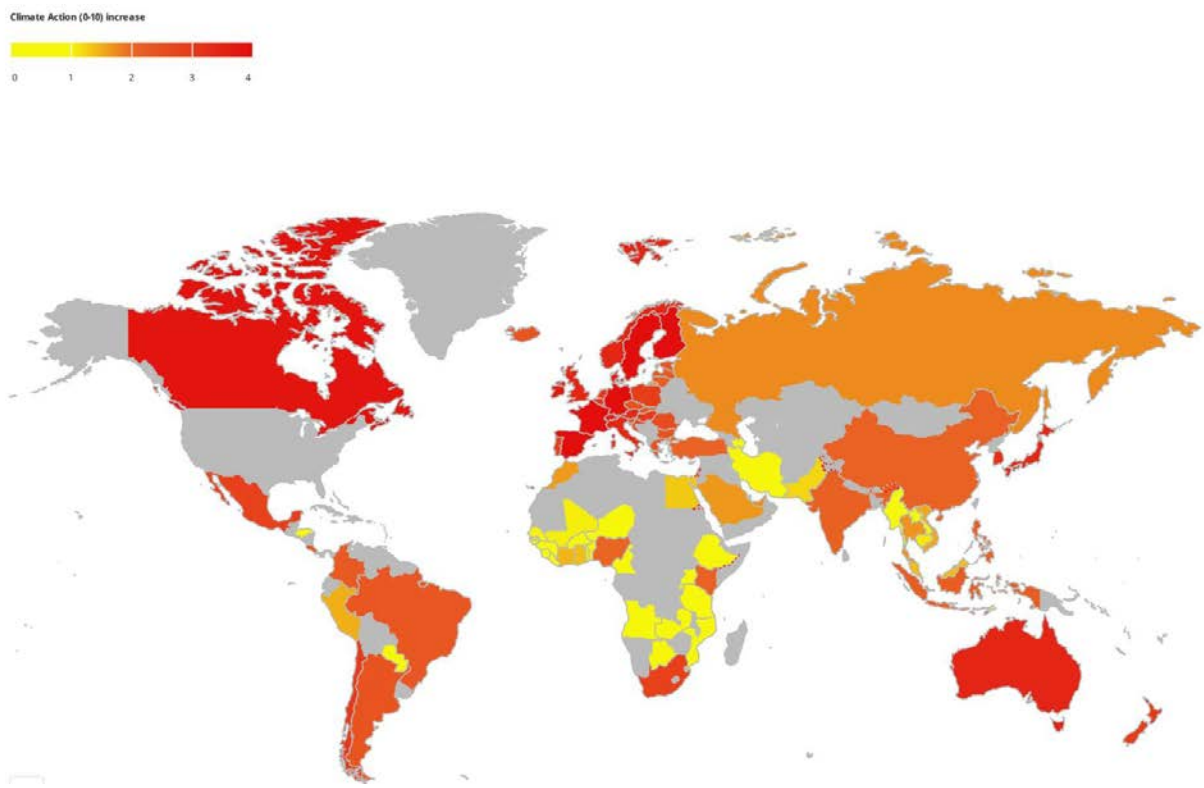


Source: Based on data from OECD, IEA, ITF, World Bank and others using the methodology of Nachtigall, D. et al. (2022): "The climate actions and policies measurement framework: A structured and harmonised climate policy database to monitor countries' mitigation action", OECD Environment Working Papers, No. 203, OECD Publishing, Paris, https://doi.org/10.1787/2caa60ce-en.

Growth in climate action has varied widely across regions and countries (Figure 3.3). Most OECD countries – particularly those in Western Europe, Oceania, East Asia, as well as Israel and Canada – achieved the strongest increases. Eastern European countries and Türkiye also made steady progress, albeit at a slower pace. In contrast, some regions recorded more uneven advances, with a few countries emerging as regional leaders. For instance, Chile, Costa Rica, and Mexico led progress in the Latin America and the Caribbean (LAC) region, whereas South Africa, Singapore and Indonesia stood out in Africa and Southeast Asia, respectively.

Figure 3.3. Growth of climate action varies significantly across countries

Increase in climate action between 2024 and 2010: All countries covered by the CAPMF



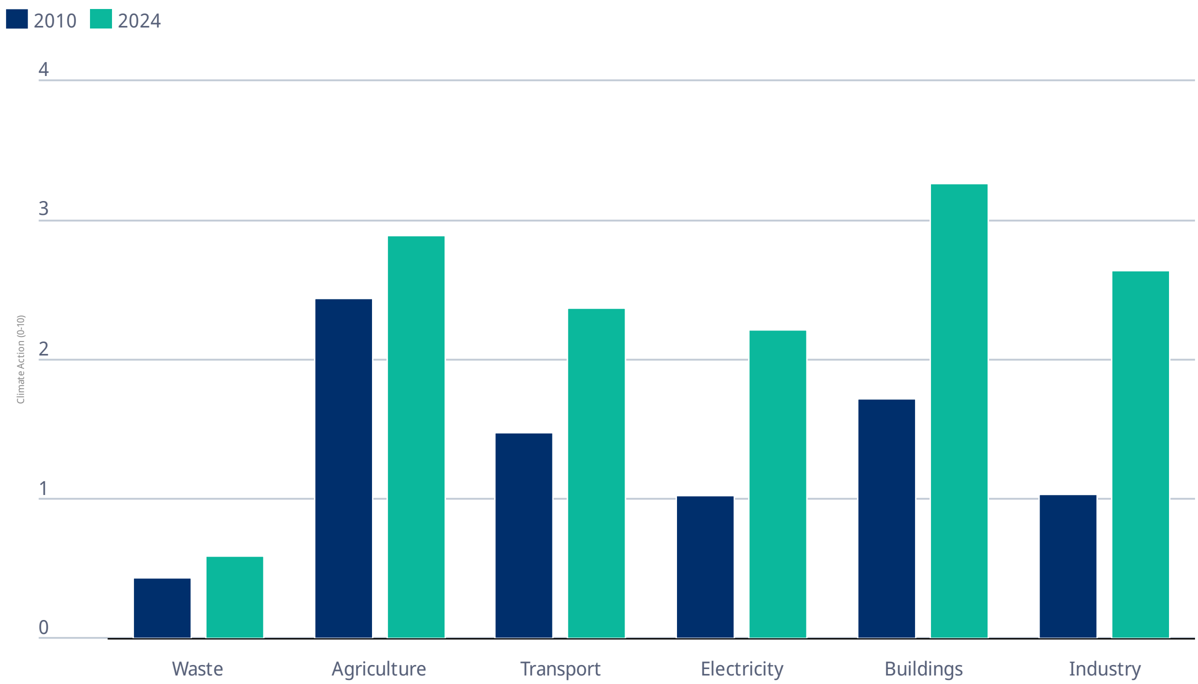
Source: Based on data from OECD, IEA, ITF, World Bank and others using the methodology of Nachtigall, D. et al. (2022): "The climate actions and policies measurement framework: A structured and harmonised climate policy database to monitor countries' mitigation action", OECD Environment Working Papers, No. 203, OECD Publishing, Paris, https://doi.org/10.1787/2caa60ce-en.

3.2. Progress in climate action in AFOLU, waste and transport sectors remained modest

Between 2010 and 2024, climate action in the AFOLU and the waste sectors saw only limited progress Figure 3.4). Both sectors – covered for the first time by the CAPMF (Box 3.1) – lagged behind energy-related sectors such as electricity, transport, buildings and industry. This reflects challenges associated with mitigation in these areas despite agriculture's high vulnerability to climate change (Chapter 1). With emissions from agriculture and waste still rising in many countries (Chapter 2), stronger efforts are needed to reverse the trend. Encouragingly, some countries have begun to act in these sectors: for example, Australia and Germany included waste in their ETSs, and Denmark introduced a pricing mechanism for GHG emissions from agriculture (Box 3.3).

Figure 3.4. AFOLU, waste and transport sectors lag other sectors, underscoring the need for stronger action

Climate action (0-10) by sector: 2010 and 2024, average across all countries covered by the CAPMF



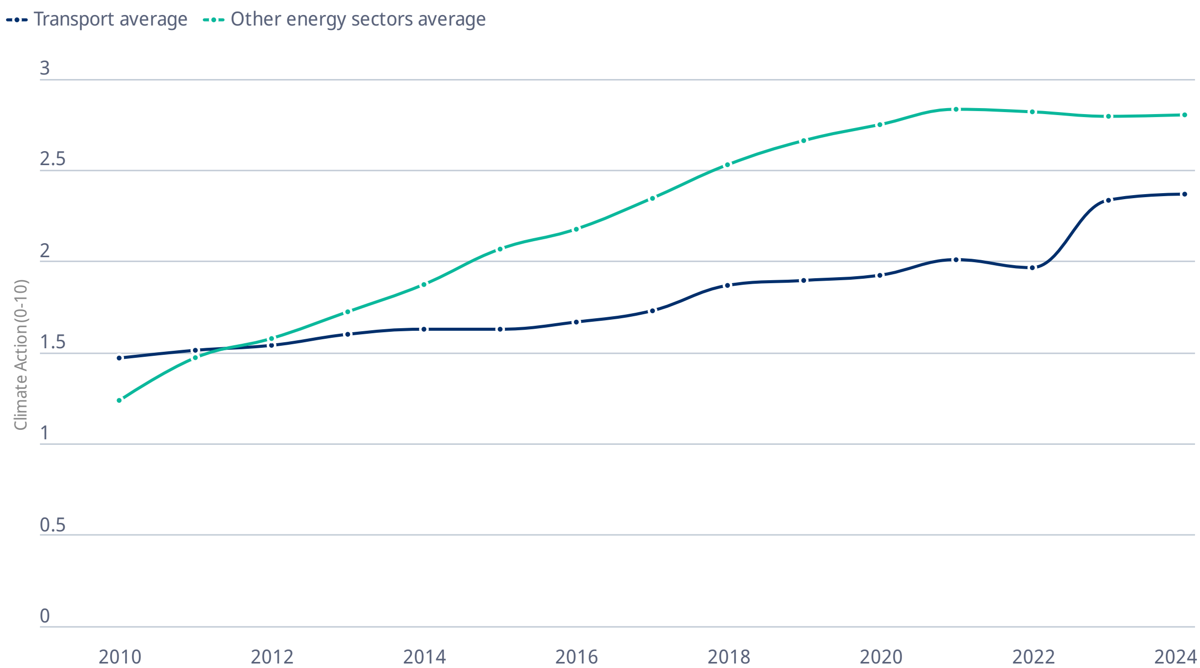
Source: Based on data from OECD, IEA, ITF, World Bank and others using the methodology of Nachtigall, D. et al. (2022): "The climate actions and policies measurement framework: A structured and harmonised climate policy database to monitor countries' mitigation action", OECD Environment Working Papers, No. 203, OECD Publishing, Paris, https://doi.org/10.1787/2caa60ce-en.

3.3. Climate action in the transport sector needs to be ramped up

Climate action in the transport sector remains insufficient. Among the energy sectors, transport experienced the smallest increase in climate action between 2010 and 2024 despite recent progress (Figure 3.5). Yet, transport continues to account for one of the highest per capita emissions in OECD and G20 countries and was among the largest contributors to emissions growth over the period (Chapter 1). The gap between the scale of climate action and the sector's GHG emissions highlights the urgent need for stronger measures. While the CAPMF can produce an initial indication of a potential misalignment, further analysis of country-specific conditions is necessary to provide a more granular picture of the policy landscape.

Figure 3.5. Despite recent action, climate action in the transport sector remains behind other energy sectors

Climate action (0-10): Transport sector and other energy sectors



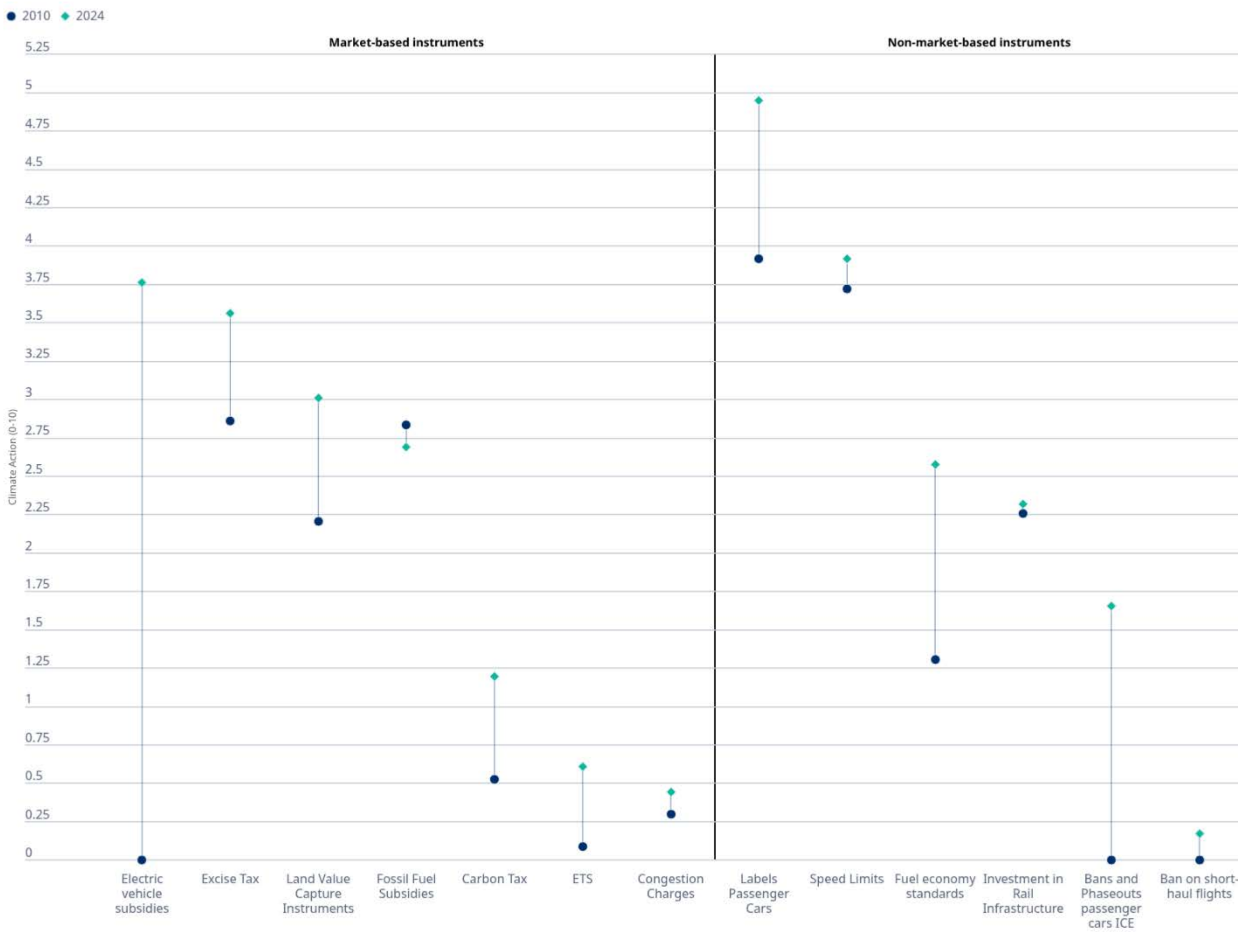
Note: Energy sectors include buildings, electricity, industry and transport.
Source: Based on data from OECD, IEA, ITF, World Bank and others using the methodology of Nachtigall, D. et al. (2022): "The climate actions and policies measurement framework: A structured and harmonised climate policy database to monitor countries' mitigation action", OECD Environment Working Papers, No. 203, OECD Publishing, Paris, https://doi.org/10.1787/2caa60ce-en.

Subsidies for electric vehicles have grown significantly

There is significant variation in the growth and level of climate action across transport-related climate policy instruments (Figure 3.6). Subsidies for electric vehicles (EVs) have driven the largest increase in the sale of EVs which have become increasingly cost-competitive to internal combustion engine (ICE) cars. Many countries have expanded subsidies to accelerate EV adoption, contributing to global EV sales reaching an all-time high in 2024. Nonetheless, EVs represented only 22% of global passenger car sales in that year (Figure A.3).

Figure 3.6. EV subsidies dominate growth in transport climate action, but overall progress remains uneven

Climate action (0-10): Transport-related policy instruments: 2010 and 2024

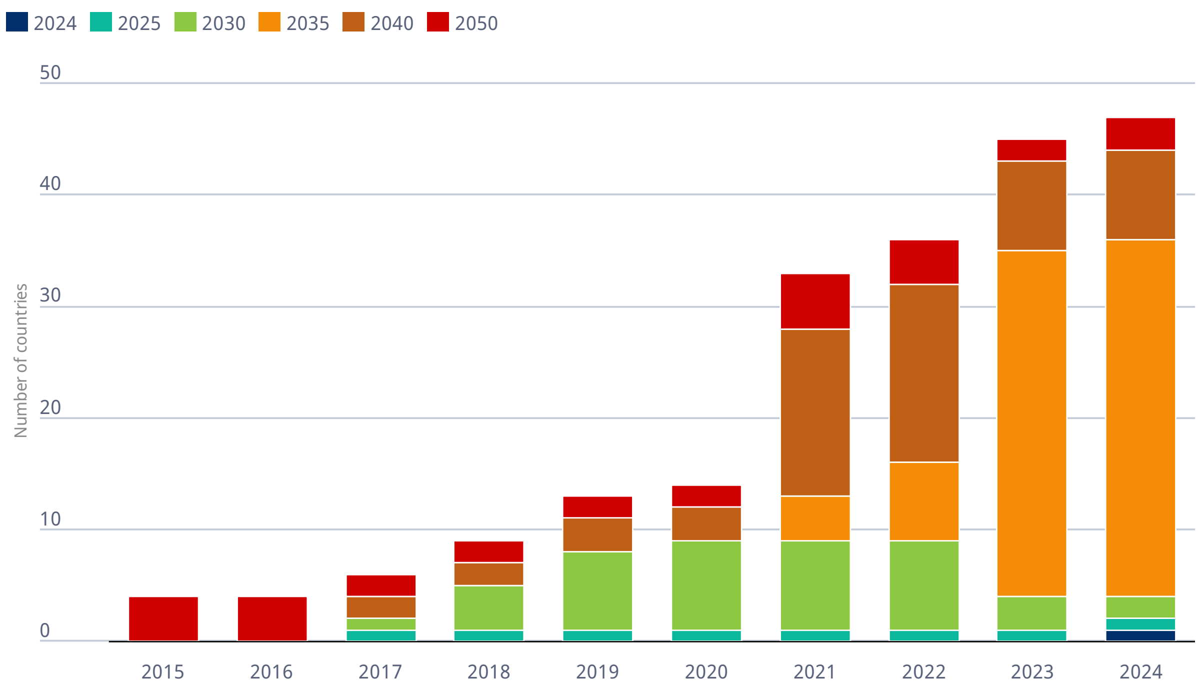


Source: Based on data from OECD, IEA, ITF, World Bank and others using the methodology of Nachtigall, D. et al. (2022): "The climate actions and policies measurement framework: A structured and harmonised climate policy database to monitor countries' mitigation action", OECD Environment Working Papers, No. 203, OECD Publishing, Paris, https://doi.org/10.1787/2caa60ce-en.

Countries are increasingly complementing EV incentives with measures to curb the attractiveness of ICE cars. Many countries have introduced time-bound phase outs of ICE vehicle sales, a policy instrument that experienced the second largest growth in climate action between 2010 and 2024. First adopted in 2015, these policies set clear target dates for phasing out ICE car sales, improving technology certainty and guiding investment in research and production (Figure 3.7). However, most bans will become effective only in 2035 or later, risking to lock-in fossil-intense assets. Yet, there are some notable exemptions, for example, Norway's 2017 target to end ICE car sales by 2025 has brought EV sales to almost 90% in 2024. Similarly, Ethiopia banned imports of ICE cars in 2024 to cut reliance on oil imports and preserve foreign currency reserves.

Figure 3.7. Bans on ICE passenger cars are rising, but most will become effective from 2035 only

Bans on passenger cars with ICE by target year: 2015-2024; all countries covered by the CAPMF



Source: CAPMF data collection: Nachtigall, D. et al. (2022): “The climate actions and policies measurement framework: A structured and harmonised climate policy database to monitor countries' mitigation action”, OECD Environment Working Papers, No. 203, OECD Publishing, Paris, https://doi.org/10.1787/2caa60ce-en.

Progress in other transport-related climate policy instruments has been more limited. Notable gains were achieved through fuel economy standards and labelling, which improved the fuel efficiency of ICE cars, and helped reduce GHG emissions from the incumbent technology. By contrast, less progress was observed for pricing instruments, such as carbon taxes, excise taxes and ETSs. Public investments in rail infrastructure and congestion pricing also showed little growth. Although the number of cities with congestion pricing schemes increased from 8 in 2010 to 16 in 2024, such measures remain rare in most countries.

Both congestion pricing and public transport investment are crucial to incentivise shifts to more sustainable transport modes (OECD, 2025[8]). Transport-related fossil fuel support increased slightly between 2010 and 2024, reinforcing reliance on fossil-fuel-based mobility. This increase was especially pronounced during the 2022-2023 energy crisis, though support levels are expected to decline in the coming years.

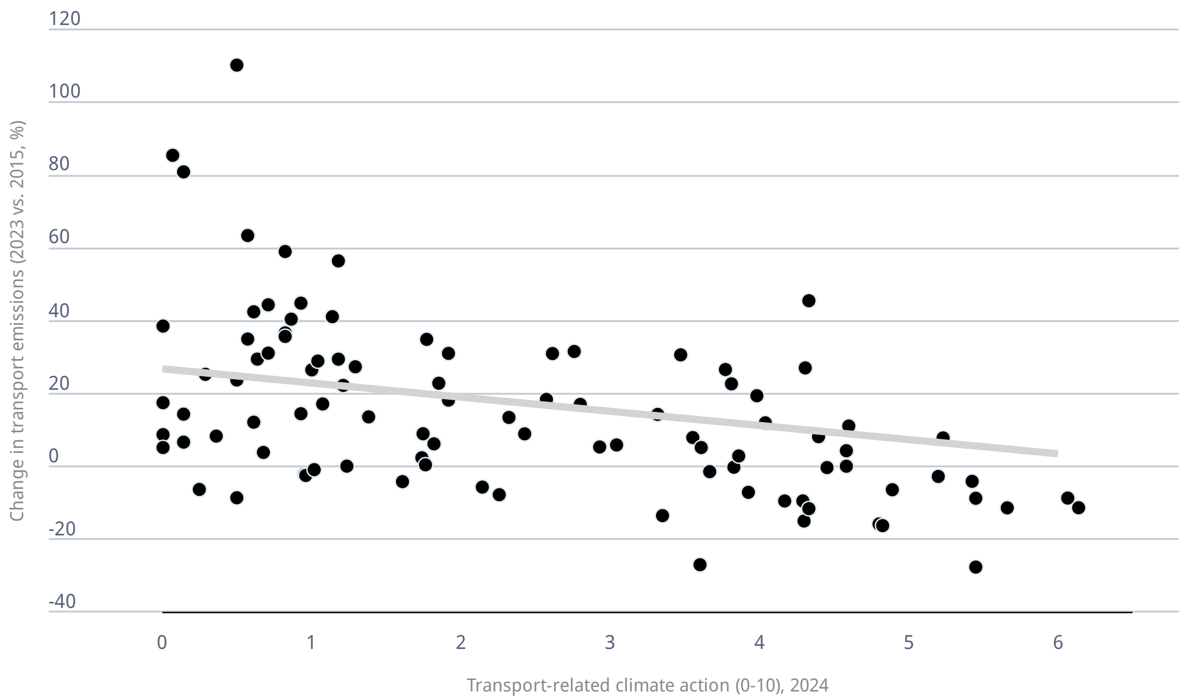
Stronger climate action is associated with reduced transport emissions

Countries with more ambitious transport-related climate action in 2024 generally succeeded in reducing transport emissions (Figure 3.8). Among the ten countries with the highest transport-related climate action in 2024, only one experienced an increase in transport emissions between 2015 and 2024. By contrast, nine out of the ten countries with the lowest level of climate action still recorded emissions growth.

The transport sector is often described as hard-to-abate due to rising mobility demand and limited technological alternatives. These factors complicate the implementation of effective mitigation strategies. While the relationship shown here is descriptive, it suggests that stronger climate action can help reverse emission growth despite such challenges. Further research is needed to assess the effectiveness of specific mitigation policies. A recent study also offers insights on targeted policy interventions in the transport and other sectors (Box 3.2).

Figure 3.8. Stronger climate action is linked to lower transport emissions growth

Transport-related emissions and climate action, all countries covered by the CAPMF, 2015-2023 and 2024



Source: Based on data from OECD, IEA, ITF, World Bank and others using the methodology of Nachtigall, D. et al. (2022): "The climate actions and policies measurement framework: A structured and harmonised climate policy database to monitor countries' mitigation action", OECD Environment Working Papers, No. 203, OECD Publishing, Paris, https://doi.org/10.1787/2caa60ce-en.

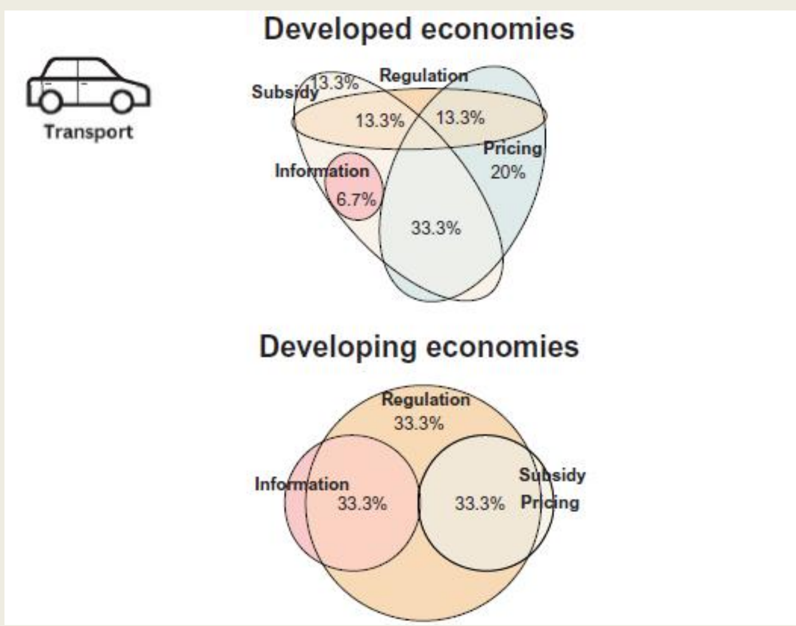
Box 3.2. Effective strategies to reduce transport emissions

Policymakers need to know which policies are most effective to meet the Paris Agreement temperature goals. This is especially true for transport, where emissions are still rising in most countries. A study led by the Potsdam Institute for Climate Impact Research (PIK) combines the CAPMF data with machine learning to provide the first global, systematic *ex post* evaluation of policies and policy mixes that have led to large emissions reductions or emissions breaks.

The results show that policy mixes are more effective than stand-alone measures (Figure 3.9). Across all sectors, 70% of emissions breaks were linked to a mix of policies, compared to just 30% for stand-alone measures. In the transport sector, almost 95% of breaks were associated with policy mixes. This reflects the sector's complexity, characterised by heterogeneous households rather than profit-maximising firms. Hence, multiple instruments may be warranted to overcome barriers, including financial constraints, limited information, or myopia. For example, the sharp decline in transport emissions in Norway was driven by a mix of financial support for electric vehicles, strong investment in rail infrastructure and regulations such as the ban on new conventional cars from 2025.

Figure 3.9. Policy mixes are more successful in reducing emissions than stand-alone policies

Successful policies and policy mixes in the transport sector



The importance of policy mixes highlights the need for further research. Despite decades of experience with climate policies worldwide, there is still no clear consensus on which policy combinations are more effective, indicating a major policy evaluation gap. Broadening the scope and ensuring comparability of climate policy data, as pursued under the CAPMF and the IFCMA, will be critical to close this gap and provide robust evidence for policy design.

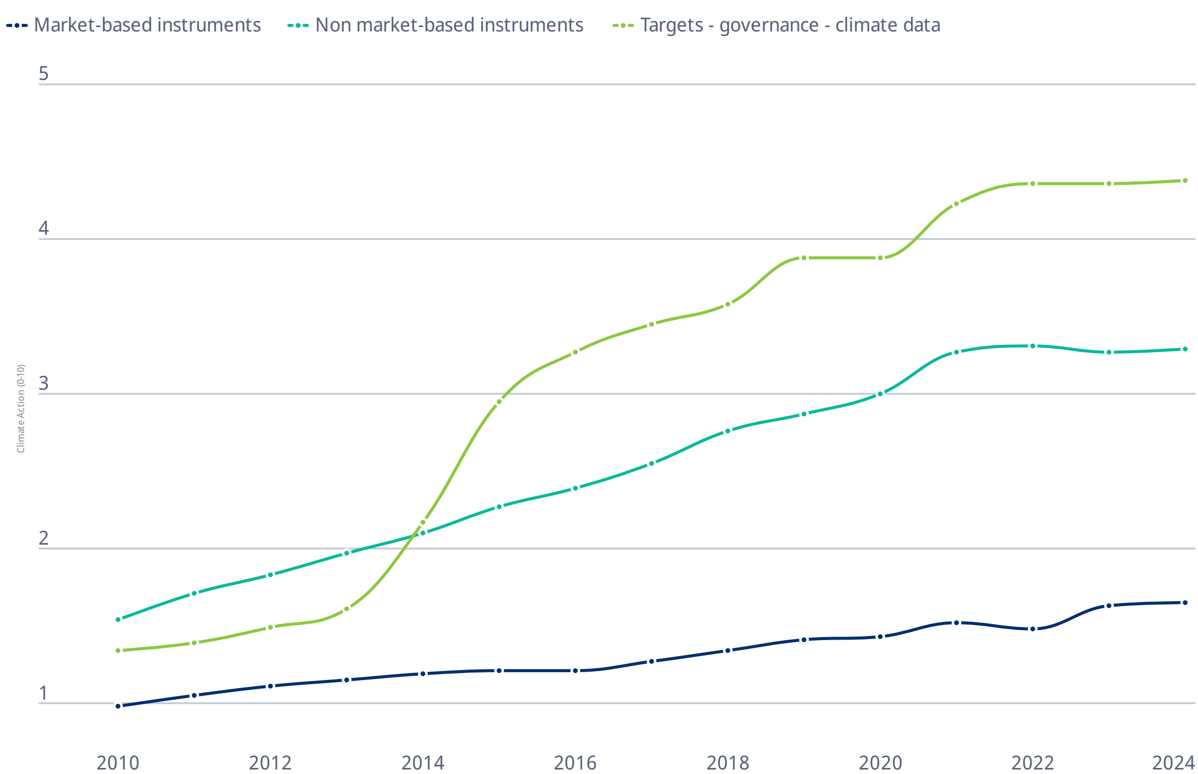
Note: The diagram shows which combinations of policy types are effective in the transport sector, separately for developed and developing countries. Each circle shows the share of successful interventions that involved a specific policy type or combination. The percentages indicate how often each policy setup contributed to success.
Source: (Stechemesser et al., 2024[4]).

3.4. Market-based instruments grew slightly in 2024, but remain less used

The use of market-based instruments (MBIs) increased slightly in 2024 but still lags other types of climate action, including non-market-based instruments (nMBI) such as regulations and information instruments as well as actions related to targets, governance and climate data (Figure 3.10). The expansion of the EU ETS to the maritime sector under the EU's "Fit-for-55" package (European Commission, 2025[9]) was the single most important factor behind this increase. Other positive developments included higher government spending on low-carbon research and development (see below), new ETSs in Australia and some Mexican States, and new congestion pricing schemes, such the one implemented in Kaunas, Lithuania. These gains far outweighed the drop from EUR 83 to EUR 65 in EU ETS permit prices in 2023-2024. More details on non-market-based instruments are provided in the recent IPAC Data Insight.

Figure 3.10. Market-based instruments remain less used despite proven effectiveness

Climate action (0-10) by policy instrument type: All countries covered by the CAPMF, 2010-2024



Source: Based on data from OECD, IEA, ITF, World Bank and others using the methodology of Nachtigall, D. et al. (2022): "The climate actions and policies measurement framework: A structured and harmonised climate policy database to monitor countries' mitigation action", OECD Environment Working Papers, No. 203, OECD Publishing, Paris, https://doi.org/10.1787/2caa60ce-en.

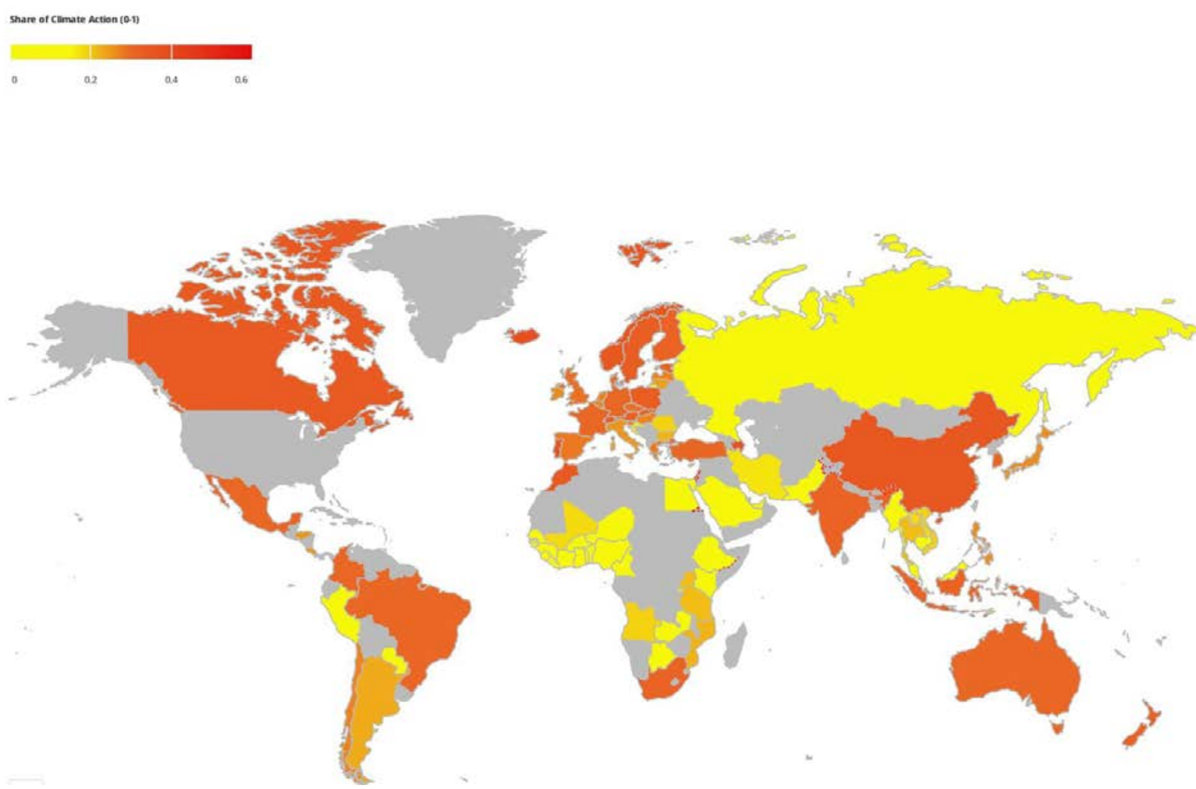
The use of market-based instruments varies significantly across countries

The role of MBIs varies significantly across countries (Figure 3.11), reflecting differences in emissions profiles, institutional capacity and political priorities. For instance, the EU-27, Canada and New Zealand emphasise MBIs, with carbon pricing and environmentally friendly subsidies playing a key role. By contrast, in countries where MBI are less prominent, regulatory measures such as standards and mandates dominate.

While both MBIs and nMBIs can reduce emissions (Stechemesser et al., 2024[4]), (OECD, 2025[10]), MBIs such as carbon pricing are usually more cost-effective. Nevertheless, nMBIs are more widely used and have certain advantages over MBIs: they provide regulatory certainty since measures such as bans, mandates and standards deliver clear and predictable outcomes. Moreover, nMBIs do not impose a visible financial burden on consumers, which can result in higher public acceptance compared to MBIs. Together, MBIs and nMBIs create a more cohesive policy mix to reduce emissions.

Figure 3.11. Use of market-based instruments varies significantly across countries

Share of climate action related to MBI on total climate action: 0-1, 2024, all countries covered by the CAPMF



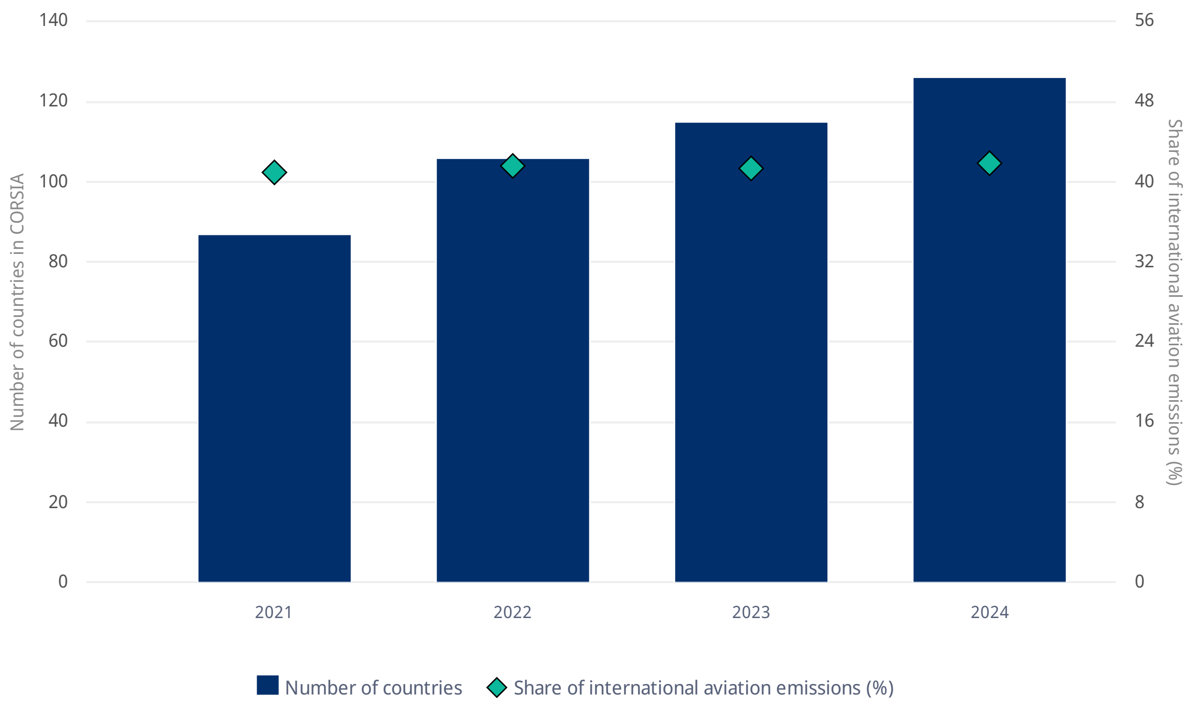
Source: Based on data from OECD, IEA, ITF, World Bank and others using the methodology of Nachtigall, D. et al. (2022): "The climate actions and policies measurement framework: A structured and harmonised climate policy database to monitor countries' mitigation action", OECD Environment Working Papers, No. 203, OECD Publishing, Paris, https://doi.org/10.1787/2caa60ce-en.

Despite recent progress, carbon pricing remains less used, covering less than half of global GHG emissions. In 2023, the average effective carbon rate of emissions covered by a type of carbon pricing – combining carbon taxes, fuel excise taxes and ETS permit prices– was around EUR 17, this represents a slight decrease from 2021 (OECD, 2024[11]).[6] However, this remains well below the benchmark rates of EUR 60 or EUR 120 estimated to be needed by 2030 to decarbonise by mid-century (OECD, 2021[12]), (Kaufman et al., 2020[13]). Moreover, effective carbon rates remain critically low in sectors outside road transport with agricultural emissions currently facing no direct carbon price. Denmark's forthcoming carbon tax marks a significant shift (Box 3.3).

Policies that cover international transport emissions is expanding slowly. International maritime emissions are currently only priced in the EU, while international aviation emissions are increasingly covered through the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) – the first ETS for international aviation. Participation in CORSIA increased from 88 countries in 2021 to 126 in 2024, but the share of international aviation emissions covered only increased from 78 to 80%. Several key emitters have yet to join (Figure 3.12).

Figure 3.12. CORSIA coverage grows, but several key aviation sector emitters do not participate

Participation in CORSIA: Number of countries, Share of international aviation emissions, 2021-2024



Note: The share of international aviation emissions is based on 2022 data - the latest year with confirmed figures. Using 2022 shares across all years ensures that changes in coverage reflect shifts in CORSIA membership rather than fluctuations in emission distribution.
Source: CAPMF data collection: Nachtigall, D. et al. (2022): "The climate actions and policies measurement framework: A structured and harmonised climate policy database to monitor countries' mitigation action", OECD Environment Working Papers, No. 203, OECD Publishing, Paris, https://doi.org/10.1787/2caa60ce-en; IEA, Greenhouse Gas Emissions from Energy, IEA, Paris.

Box 3.3. Denmark pioneers the world's first carbon tax on agricultural emissions

Agriculture accounts for around 35% of Denmark's GHG emissions in 2021, with nearly 90% coming from cattle and swine breeding. Agricultural emissions declined by only 2.9% between 2005-2021, while their share of total emissions is expected to reach 45% by 2030 as other sectors decarbonise. To address this, Denmark launched the "Green Denmark" reform package, centred on the world's first carbon tax on livestock farming.

- From 2030, farmers will pay DKK 120 (EUR 16) per ton of CO_2e, rising to DKK 300 (EUR 40) by 2035.
- Climate-efficient farms can reduce their tax burden by up to 60% through deductions, with subsidies supporting methane-reducing feed additives.

The reform also includes broader measures:

- The Green Area Fund allocates EUR 5.3 billion to reforest 250,000 hectares by 2045 and set aside 140,000 hectares of carbon-rich lowlands by 2030.
- Farm buyouts, compensation schemes, and DKK 10 (EUR 1.3) billion in subsidies for biochar storage technology are also foreseen.

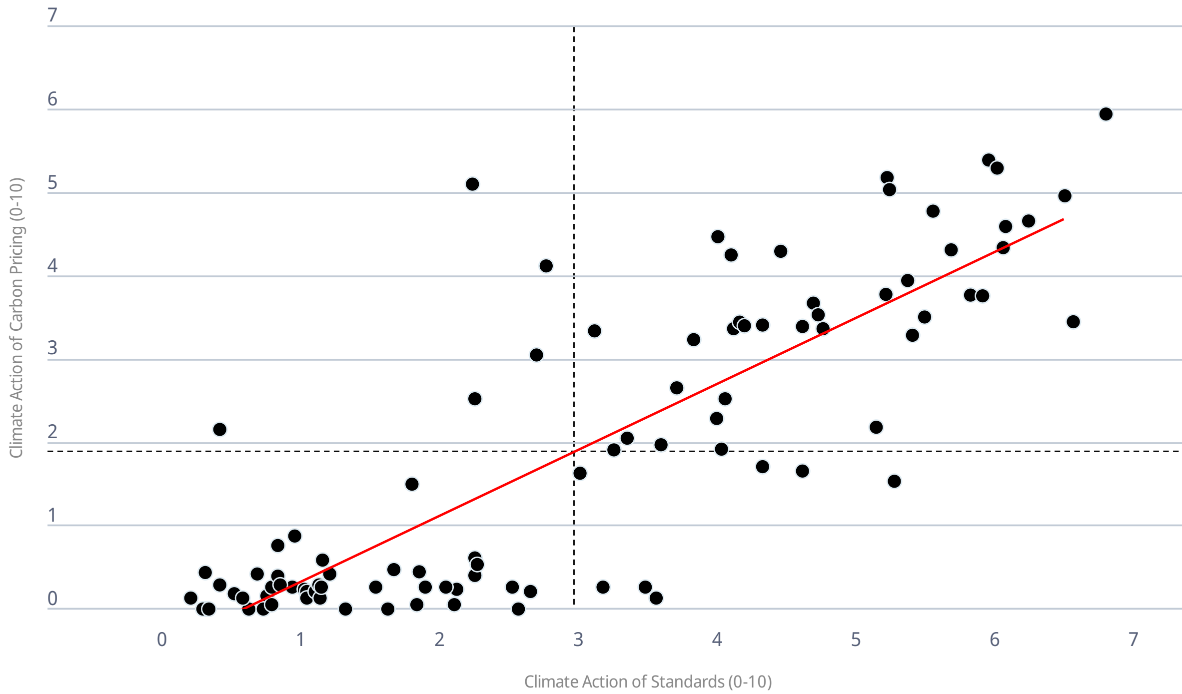
The policy's successful adoption reflects strong tripartite dialogue among government, industry, and civil society, fostering broad consensus for transformative change. Denmark's pioneering carbon tax offers a blueprint for OECD and EU countries, showing how ambitious, socially accepted agricultural reforms can accelerate the transition to climate-smart farming while maintaining the sector's competitiveness.

Source: Based on (OECD, 2024[14]) and (OECD, 2025[15]).

Climate action based on regulations is positively associated with the use of carbon pricing. (Figure 3.13). This suggests that regulations and carbon pricing often co-exist as complementary measures rather than substitutes. By contrast, the link between carbon pricing and other instrument types such as information tools or subsidies is negligible. Although this analysis is descriptive, it suggests that countries with more stringent technology standards (e.g. bans and phase outs of fossil fuel-related activities and internal combustion engines) or performance standards (e.g. air emissions and minimum energy performance standards) also tend to also implement more robust carbon pricing. While carbon pricing provides a market signal to reduce emissions, technology and performance standards incentivise specific actions, such as phasing polluting technologies or strengthening energy efficiency standards.

Figure 3.13. Carbon pricing is strongly linked with regulations

Climate action (0-10) of standards and carbon pricing: All countries covered by the CAPMF, 2024

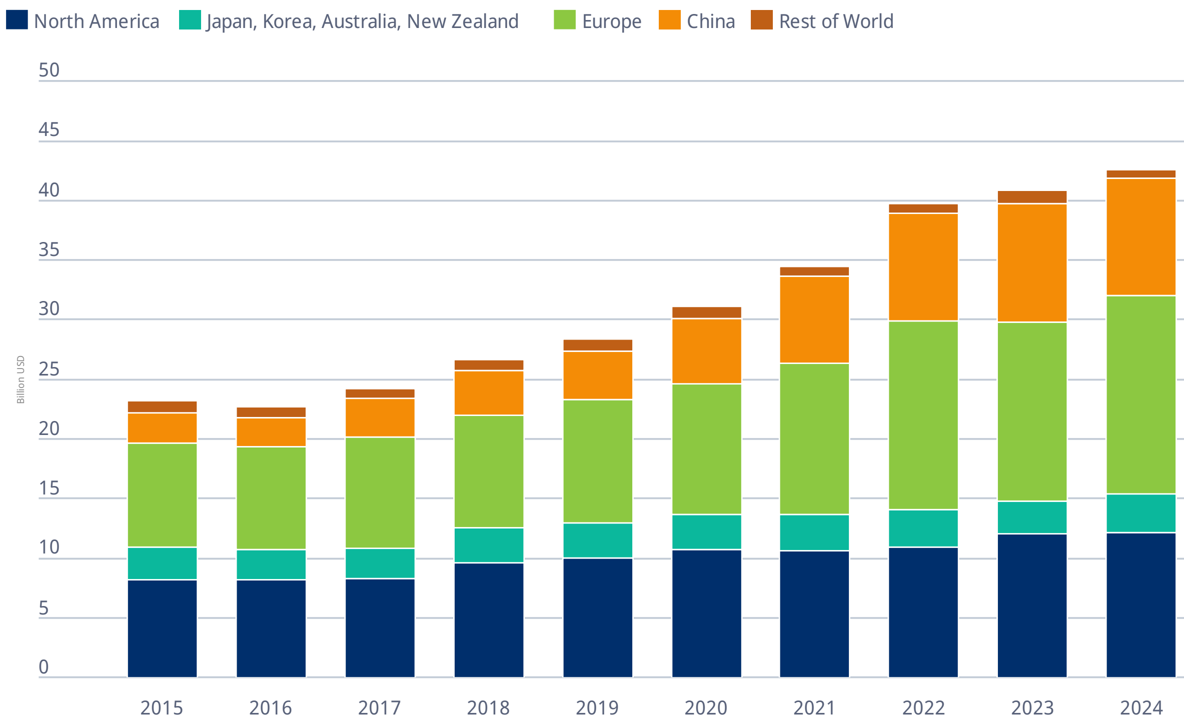


Source: Based on data from OECD, IEA, ITF, World Bank and others using the methodology of Nachtigall, D. et al. (2022): "The climate actions and policies measurement framework: A structured and harmonised climate policy database to monitor countries' mitigation action", OECD Environment Working Papers, No. 203, OECD Publishing, Paris, https://doi.org/10.1787/2caa60ce-en.

Public expenditure on low-carbon energy-related research and development (R&D) reached an all-time high in 2024 (Figure 3.14). While China was a key driver of growth in public R&D spending between 2018 and 2023, Europe emerged as the leading contributor to the increase in 2024. R&D expenditure in Japan, Korea, Australia and New Zealand also increased slightly in 2024 after having fallen in 2023.

Figure 3.14. Record levels of low-carbon R&D investment highlight growing policy commitment

Public expenditure on low-carbon R&D, all countries: 2015-2024



Source: (IEA, 2025[16]): Energy Technology RD&D Budgets, https://www.iea.org/data-and-statistics/data-product/energy-technology-rd-and-d-budget-database-2#data-sets.

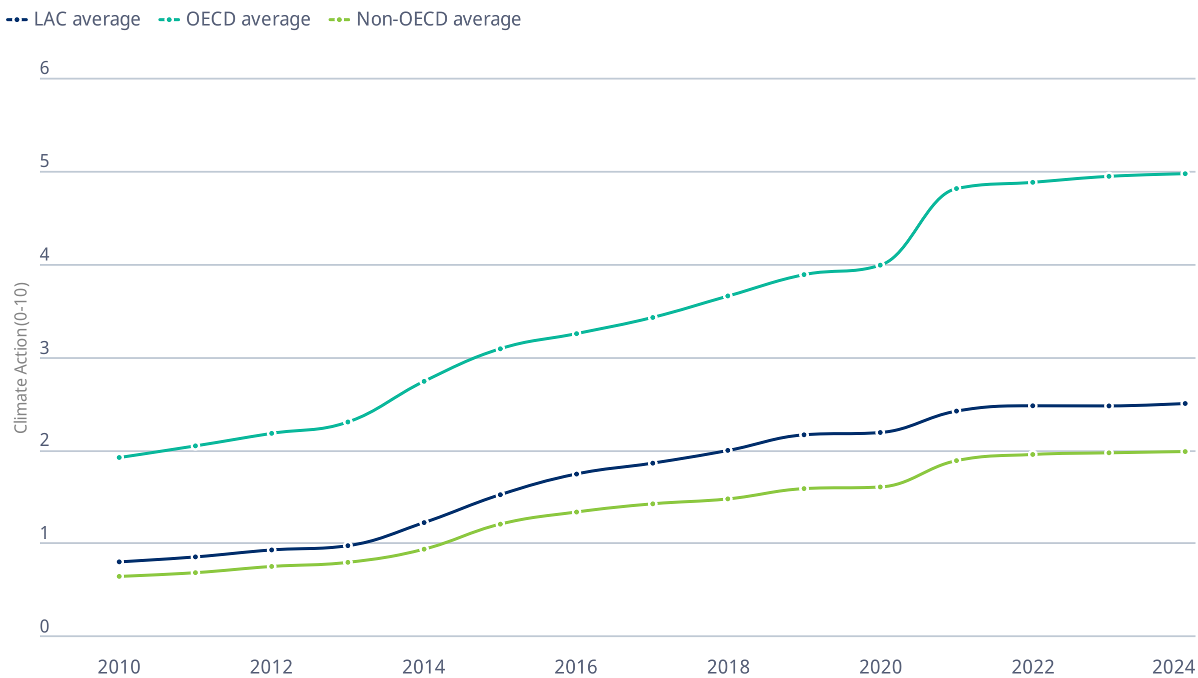
3.5. Climate action in Latin America and the Caribbean only expanded marginally since 2021

Latin American and Caribbean countries represent around 7% of global GDP and 8% of global population while generating around 7% of global emissions. Nevertheless, climate action is especially critical since many countries are experiencing significant climate-related hazards with impacts that directly affect lives and livelihoods. Region-specific challenges related to climate mitigation include relatively high emission reduction costs in relation to national income, as well as high risks associated with potential fiscal and export losses tied to fossil fuels (see the recent IPAC Data Insight on climate action in Latin America).

Climate action in Latin America and the Caribbean (LAC) increased significantly between 2010 and 2021, but the rate of that growth has since slowed significantly (Figure 3.15).[7] As a result, the gap in climate action between LAC countries – based on data from 12 countries of that region – and the OECD widened between 2010 and 2024. While LAC countries outpaced non-OECD countries and many other world regions in advancing climate action between 2010 and 2021, this lead gradually diminished since 2021. This trend was primarily driven by a decline in climate action observed in Central American countries since 2021 (Figure 3.16). Nevertheless, these countries continued to maintain the top position in front of South America and the Caribbean in 2024.

Figure 3.15. Climate action in LAC countries considerably increased up to 2020 but its pace has diminished since

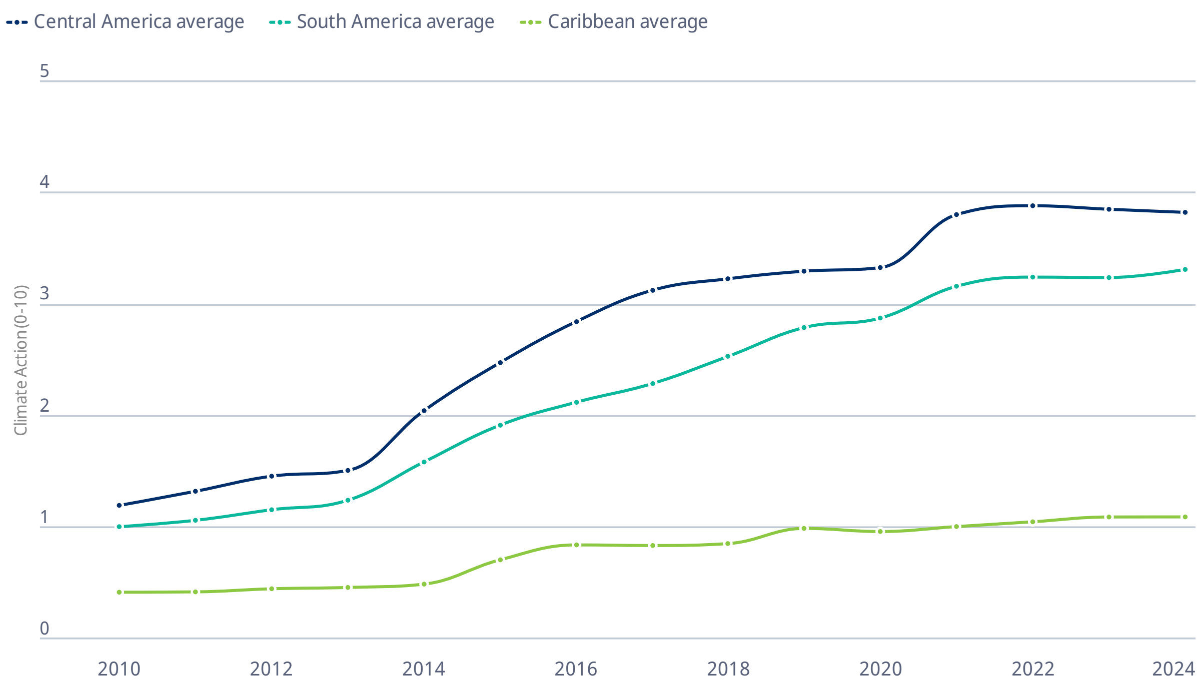
Climate action (0-10): OECD, non-OECD and LAC countries, 2010-2024



Source: Based on data from OECD, IEA, ITF, World Bank and others using the methodology of Nachtigall, D. et al. (2022): "The climate actions and policies measurement framework: A structured and harmonised climate policy database to monitor countries' mitigation action", OECD Environment Working Papers, No. 203, OECD Publishing, Paris, https://doi.org/10.1787/2caa60ce-en.

Figure 3.16. Climate action in Central American countries grew strongest until 2021, but has declined since

Climate action (0-10): LAC countries by selected sub-region, 2010-2024

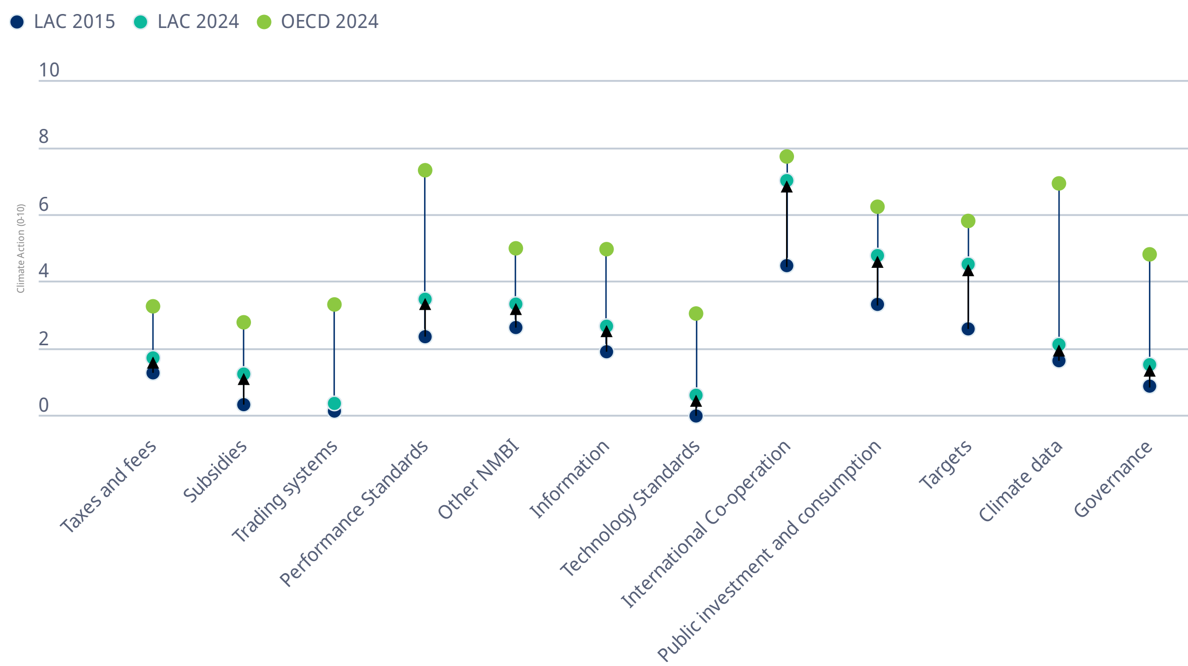


Source: Based on data from OECD, IEA, ITF, World Bank and others using the methodology of Nachtigall, D. et al. (2022): "The climate actions and policies measurement framework: A structured and harmonised climate policy database to monitor countries' mitigation action", OECD Environment Working Papers, No. 203, OECD Publishing, Paris, https://doi.org/10.1787/2caa60ce-en.

Climate action expanded across all policy instrument types between 2015 and 2024, albeit at varying speeds (Figure 3.17). However, by 2024, climate action in LAC did not exceed the OECD average for any instrument type. Since the adoption of the Paris Agreement, LAC countries have made significant progress on nMBIs – mostly driven by performance standards – and actions related to targets, governance and climate data. There has also been some, though limited, progress on MBIs, where the gap on climate action between LAC countries and the OECD average is still most pronounced. The slow progress on MBIs reflects a broader global trend among countries covered by the CAPMF (see Box 3.4 on a regional initiative on carbon pricing). The least progress was observed in "climate data", an important indicator of effective implementation – particularly in areas such as the submission of biannual evaluation reports and GHG emissions accounting, where gaps in reporting and transparency persist.

Figure 3.17. Growth of climate action varies significantly across policy instrument types

Climate action (0-10) by policy instrument type: LAC and OECD average, 2015 and 2024



Source: Based on data from OECD, IEA, ITF, World Bank and others using the methodology of Nachtigall, D. et al. (2022): "The climate actions and policies measurement framework: A structured and harmonised climate policy database to monitor countries' mitigation action", OECD Environment Working Papers, No. 203, OECD Publishing, Paris, https://doi.org/10.1787/2caa60ce-en.

Box 3.4. Carbon Pricing in the Americas (CPA)

Several countries in the Latin America and Caribbean (LAC) region have introduced market-based incentives as part of their climate change mitigation strategies. For instance, 24 countries have identified fiscal measures as tools to support the implementation of their Nationally Determined Contributions (NDCs). While individual countries pursue different instruments to meet their commitments, regional collaboration is essential to fully leverage opportunities under global carbon markets. A well-functioning regional carbon market could help reduce emissions at lower cost, while also enabling LAC countries – which account for only about 7% of global emissions and hold significant forest reserves – to provide offsets and compensation internationally. Such initiatives could unlock resources for investment in clean technologies, support further emissions reductions, and generate productivity gains.

A flagship initiative to foster this collaboration is **Carbon Pricing in the Americas (CPA)**. Since 2018, national and subnational governments, together with non-governmental partners, have been working to coordinate and strengthen carbon pricing efforts across the continent. The CPA emerged from the *Paris Declaration on Carbon Pricing in the Americas*, endorsed in December 2017 by Alberta, British Columbia, California, Canada, Colombia, Costa Rica, Chile, Mexico, Nova Scotia, Ontario, Québec, and Washington.

The CPA was formally launched in April 2018 under the co-chairmanship of Canada and Mexico. At COP26 in Glasgow (2021), most original members, along with additional governments, renewed their commitment through the *Glasgow Declaration on Carbon Pricing in the Americas*, which replaced the Paris Declaration.

By endorsing the Glasgow Declaration, members committed to:

- Implementing or advancing carbon pricing as a central climate policy tool.
- Applying a cost of carbon in public investment decisions.
- Regularly increasing carbon price levels to reflect rising abatement costs and the social cost of carbon.
- Strengthening regional and international cooperation through sharing knowledge and best practices.
- Identifying opportunities to align and link carbon pricing systems and markets across jurisdictions.
- Promoting synergies among existing carbon pricing initiatives and forums active in the Americas.

Current members include:

- *National governments*: Canada, Chile, Dominican Republic, Mexico, Panama, Paraguay.
- *Subnational governments*: Aguascalientes, British Columbia, California, Federal District of Brazil, Guanajuato, Jalisco, Nova Scotia, Pernambuco, Québec, Querétaro, Rio de Janeiro State, Sonora, Yucatán.

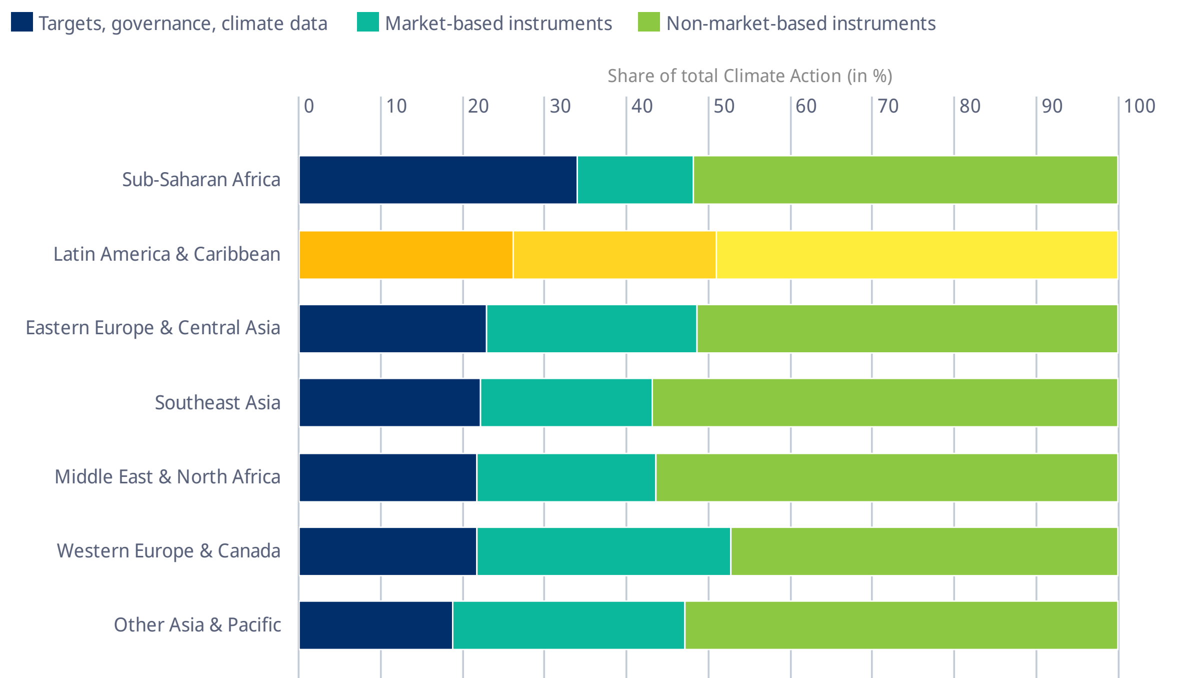
Source: https://carbonpricingamericas.org/about-cpa/.

Latin American and Caribbean countries follow a distinct policy approach

A distinct feature of LACs current policy mix is its strong reliance on climate action related to targets, governance and climate data (Figure 3.18). In 2024, LAC countries recorded the second-highest global share of this policy type at slightly above 26%. This is largely driven by LAC countries having ratified key climate treaties, active participation in major international climate initiatives, and committing to comparatively stringent net-zero targets. To achieve these targets, LAC countries - like most regions outside Western Europe and Canada - prioritise nMBIs over MBIs. However, despite the reliance on nMBIs, there is some evidence that MBIs were more effective in delivering emissions reductions in the region. Based on a systematic ex-post evaluation using the CAPMF, a recent study concluded that 8 of the 11 (or 73%) identified emissions breaks in LAC were associated with the adoption of MBIs (see Box 3.2 for the methodology) (Stechemesser et al., 2024[4]).

Figure 3.18. Latin American countries' reliance on market-based instruments is very limited

Share of climate action by policy type and country group, 2024

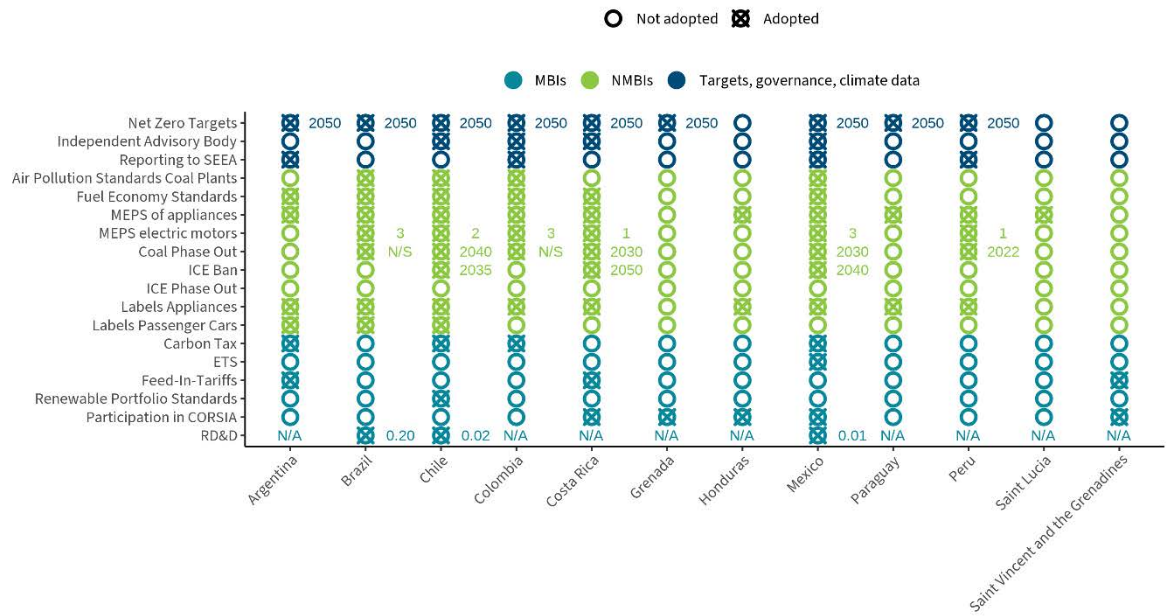


Source: Based on data from OECD, IEA, ITF, World Bank and others using the methodology of Nachtigall, D. et al. (2022): "The climate actions and policies measurement framework: A structured and harmonised climate policy database to monitor countries' mitigation action", OECD Environment Working Papers, No. 203, OECD Publishing, Paris, https://doi.org/10.1787/2caa60ce-en.

LAC countries have implemented a diverse policy mix, as reflected in the CAPMF (Figure 3.19). By 2024, most LAC countries adopted net-zero targets as well as key nMBIs, such as minimum energy performance standards, fuel economy standards and appliance labelling. Some technology standards -such as coal phase outs - are relatively widespread, whereas others, such as bans on the sale of new passenger cars with ICE have only been enacted in a few countries. Notably, no LAC country has yet pledged to phase out passenger cars with ICE. Market-based instruments such as carbon taxes, ETS or feed-in-tariffs are also not yet widely adopted. Mexico remains the only country with an ETS pilot, although ETSs are under discussion in other LAC countries, including Brazil, Chile, and Colombia (ICAP, 2025[17]). Only four out of the ten LAC countries covered by the CAPMF participate in CORSIA.

Figure 3.19. LAC countries have a diverse set of policies in place in 2024

Adoption of key climate policies: 12 LAC countries, 2024



Note: SEEA: System of Environmental-Economic Accounting; MEPS: Minimum Energy Performance Standards; ICE: Internal combustion engine; ETS: Emissions trading scheme, RD&D: Research Development and Demonstration. Numbers refer to target year (Net-zero target, bans and phase outs), IE efficiency class for MEPS of electric motors and the share of public RD&D expenditure on GDP. N/S = not specified. N/A = missing data

Source: Based on data from OECD, IEA, ITF, World Bank and others using the methodology of Nachtigall, D. et al. (2022): "The climate actions and policies measurement framework: A structured and harmonised climate policy database to monitor countries' mitigation action", OECD Environment Working Papers, No. 203, OECD Publishing, Paris, https://doi.org/10.1787/2caa60ce-en.

This chapter examined the evolution of climate action across the world, highlighting the case of Latin America and the Caribbean. It showed that climate action – as measured by the CAPMF – expanded only marginally in 2024, continuing the trend observed in 2022 and 2023. The modest increase reflects diverse policy developments across country groups, countries, sectors, and policy instrument types. The slow progress is concerning, as countries are not on track to reach their current NDCs and, thus, may fail to close the NDC Delivery Gap (Chapter 1), undermining the Paris Agreement goals.

Nevertheless, considerable opportunities remain for all countries to narrow and close the NDC Delivery Gap as can be seen in the country-specific data presented in the IPAC Climate Action Dashboard. Adopting new and strengthening existing policies will be crucial to reduce emissions and bring countries on track to meet their current and more ambitious new NDCs.

Providing comprehensive climate policy data is essential for evaluating countries' mitigation efforts, identifying key policy trends, and fostering both peer learning and analytical work that supports evidence-based policy recommendations. This need is especially critical for developing countries, where emissions continue to rise. Improving climate policy data is therefore vital to better support countries in reaching their emissions targets. The CAPMF and the detailed policy stocktake under the IFCMA represent important initial steps. However, further efforts are required to deliver a comprehensive overview of the global mitigation policy landscape that supports policymakers to make better-informed decisions.

References

COP28 UAE (2023), *Global Renewables and Energy Efficiency Pledge (COP28)*, https://www.cop28.com/en/global-renewables-and-energy-efficiency-pledge. [18]

D'Arcangelo, F., T. Kruse and M. Pisu (2024), "Identifying and tracking climate change mitigation strategies with a cluster-based assessment", *npj Climate Action*, Vol. 3/1, https://doi.org/10.1038/s44168-024-00158-6. [5]

European Commission (2025), *FAQ – Maritime transport in EU Emissions Trading System (ETS)*, https://climate.ec.europa.eu/eu-action/transport-decarbonisation/reducing-emissions-shipping-sector/faq-maritime-transport-eu-emissions-trading-system-ets_en. [9]

ICAP (2025), *Emissions Trading Worldwide: Status Report 2025*, International Carbon Action Partnership, https://icapcarbonaction.com/system/files/document/250612_icap_sr25_june-updates.pdf. [17]

IEA (2025), *Energy Technology RD&D Budgets*, https://www.iea.org/data-and-statistics/data-product/energy-technology-rd-and-d-budget-database-2#data-sets. [16]

IPCC (ed.) (2022), *Climate Change 2022 - Mitigation of Climate Change*, Cambridge University Press, https://doi.org/10.1017/9781009157926. [6]

Kaufman, N. et al. (2020), "A near-term to net zero alternative to the social cost of carbon for setting carbon prices", *Nature Climate Change*, Vol. 10/11, pp. 1010-1014, https://doi.org/10.1038/s41558-020-0880-3. [13]

Kruse, T. et al. (2022), "Measuring environmental policy stringency in OECD countries: An update of the OECD composite EPS indicator", *OECD Economics Department Working Papers*, No. 1703, OECD Publishing, Paris, https://doi.org/10.1787/90ab82e8-en. [19]

Nachtigall, D. et al. (2024), "The Climate Actions and Policies Measurement Framework: A Database to Monitor and Assess Countries' Mitigation Action", *Environmental and Resource Economics*, Vol. 87/1, pp. 191-217, https://doi.org/10.1007/s10640-023-00821-2. [3]

Nachtigall, D. et al. (2022), "The climate actions and policies measurement framework: A structured and harmonised climate policy database to monitor countries' mitigation action", *OECD Environment Working Papers*, No. 203, OECD Publishing, Paris, https://doi.org/10.1787/2caa60ce-en. [7]

OECD (2025), *OECD Environmental Performance Reviews: Sweden 2025*, OECD Environmental Performance Reviews, OECD Publishing, Paris, https://doi.org/10.1787/91dcc109-en. [15]

OECD (2025), "The effects of climate policies on emissions: Evidence from a comprehensive and systematic review of the ex-post empirical literature", *Inclusive Forum on Carbon Mitigation Approaches Papers*, No. 7, OECD Publishing, Paris, https://doi.org/10.1787/ec1f7f0d-en. [10]

OECD (2025), *Transforming Catalonia's Mobility System for Net Zero*, OECD Publishing, Paris, https://doi.org/10.1787/1cac3681-en. [8]

OECD (2024), *OECD Economic Surveys: Denmark 2024*, OECD Publishing, Paris, https://doi.org/10.1787/d5c6f307-en. [14]

OECD (2024), *Pricing Greenhouse Gas Emissions 2024: Gearing Up to Bring Emissions Down*, OECD Series on Carbon Pricing and Energy Taxation, OECD Publishing, Paris, https://doi.org/10.1787/b44c74e6-en. [11]

OECD (2024), *The Climate Action Monitor 2024*, OECD Publishing, Paris, https://doi.org/10.1787/787786f6-en. [2]

OECD (2023), *The Climate Action Monitor 2023: Providing Information to Monitor Progress Towards Net-Zero*, OECD Publishing, Paris, https://doi.org/10.1787/60e338a2-en. [1]

OECD (2021), *Effective Carbon Rates 2021: Pricing Carbon Emissions through Taxes and Emissions Trading*, OECD Series on Carbon Pricing and Energy Taxation, OECD Publishing, Paris, https://doi.org/10.1787/0e8e24f5-en. [12]

Stechemesser, A. et al. (2024), "Climate policies that achieved major emission reductions: Global evidence from two decades", *Science*, Vol. 385/6711, pp. 884-892, https://doi.org/10.1126/science.adl6547. [4]

Notes

[1] The CAPMF should not be used as a performance indicator to rank countries' climate action as its policy scope may not represent adequately the policy approach of some countries. For example, despite its inclusion, information is still limited in sectors such as agriculture, forestry and land use. Furthermore, the CAPMF does not fully capture new innovative instruments or climate actions such as carbon abatement payment or pledges (e.g. Global Renewables and Energy Efficiency Pledge) (COP28 UAE, 2023[18]) nor does it include the ETS II, which will only become fully operational in 2027. Thus, policies included in the CAPMF may not be fully representative of the mitigation approaches of some countries. In terms of interpretation, although previous work has found a positive association between climate action as measured by the CAPMF and emissions reductions (Nachtigall et al., 2024[3]), increasing climate policy action does not necessarily imply a stronger mitigation effect. The effects of increased policy adoption and policy stringency will depend on many factors such as emissions coverage and abatement costs and will likely have different impacts across countries depending on their emission profile, available energy resources, and institutional framework (Nachtigall et al., 2022[7]).

[2] Policy stringency is defined as the degree to which policies incentivise emissions reductions. Following the methodology of the OECD Environmental Policy Stringency Index (Kruse et al., 2022[19]), the CAPMF calculates stringency as a relative concept by assigning a stringency score between 0 (not stringent) and 10 (very stringent) to each policy variable. This is based on the in-sample distribution across all countries and years of the policy variables' level (e.g. tax rate, emissions limit value, government expenditure) (Nachtigall et al., 2022[7]). High stringency values in a particular country do not necessarily suggest the policy is stringent enough to meet its mitigation goals. Rather, it means the policy in this country and year was more stringent compared to all other countries and years.

[3] Importantly, this year's Climate Action Monitor does not yet account for the fact that most countries did not submit their new NDCs in time. Only 15 of the 195 parties to the Paris Agreement met the 10 February 2025 deadline to communicate their 2035 climate plans to the UNFCCC (Chapter 1).

[4] As negative emissions are likely needed to reach the Paris Agreement temperature goals, these targets are critical for sustaining climate action beyond the achievement of net-zero goals by highlighting countries' ambition related to negative emissions.

[5] The Kigali Amendment to the Montreal Protocol is a key international agreement to limit the use and production of hydrofluorocarbons (HFCs) – a group of greenhouse gases many times more powerful than CO_2.

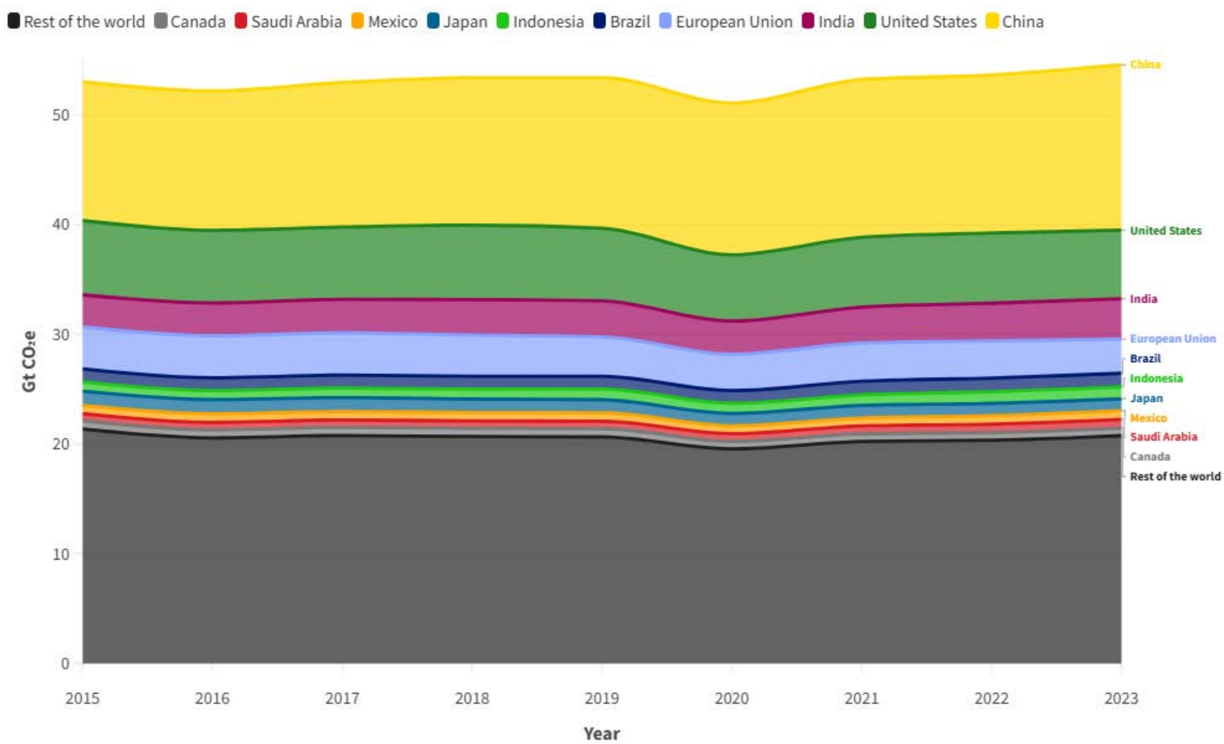
[6] Data is based on 79 countries, covering around 82% of global GHG emissions.

[7] The 12 countries covered in this analysis are Argentina, Brazil, Chile, Colombia, Costa Rica, Grenada, Honduras, Mexico, Paraguay, Peru, Saint Lucia, and Saint Vincent and the Grenadines.

Annex A. Additional figures

Figure A.1. Top ten IPAC emitters and emissions from the rest of the world

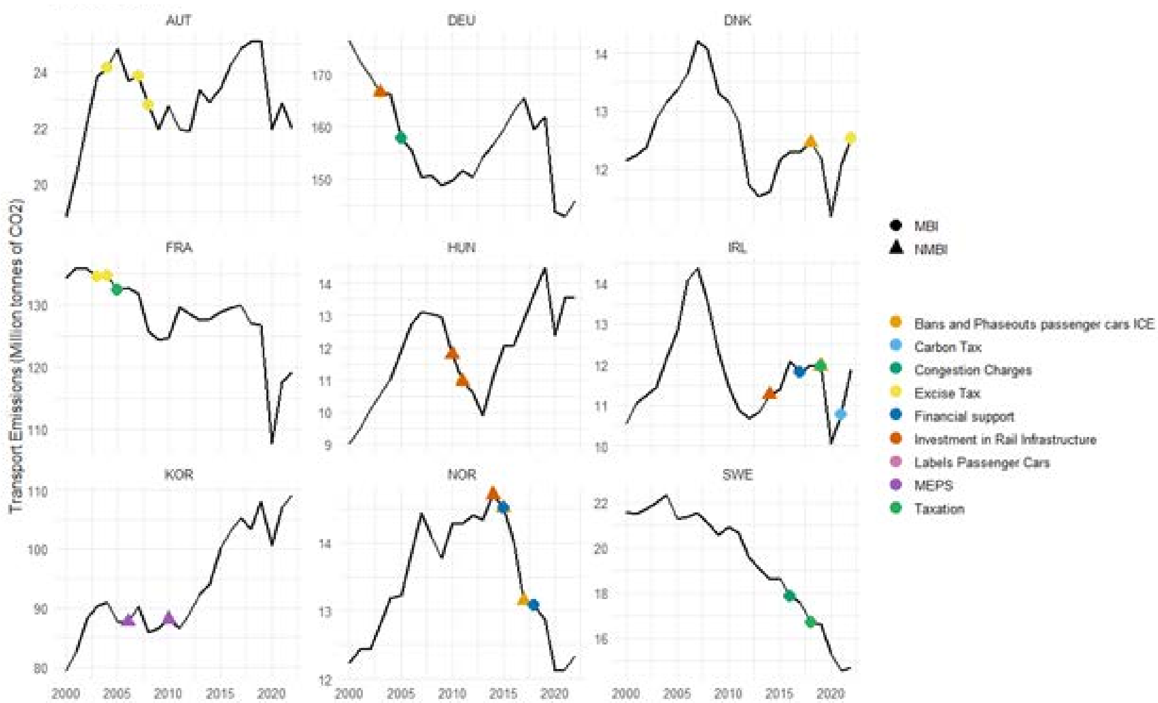
Gt CO_2e, Total including LULUCF, 2023



Note: Rest of the world refers to world emissions minus the top ten emitters among IPAC-covered countries. World emissions include national inventories plus international bunkers and a LULUCF bookkeeping estimate to account for differences in reporting methods. Individual country emissions reflect national inventories excluding LULUCF, as a LULUCF bookkeeping estimate is applied at the global level.
Source: OECD calculations based on Common Reporting Tables (CRT) submitted by countries to UNFCCC and PRIMAP-hist (Gütschow et al., 2016[1]) (Cárdenas Rodríguez et al., 2024[2]); IEA, GHG Emissions from Energy, IEA, Paris

Figure A.2. Successful policy interventions in the transport sector

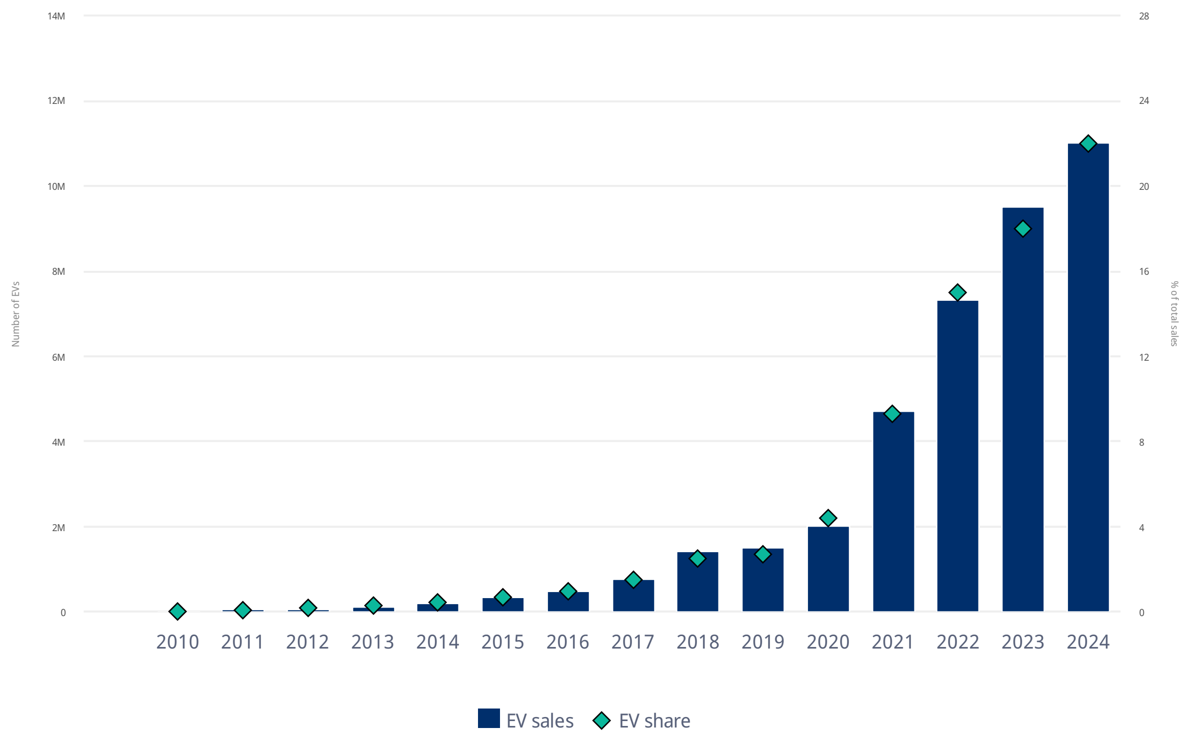
Selected examples



Source: Based on (Stechemesser et al., 2024[3]).

Figure A.3. EV passenger cars sales reached a record-high in 2024

Units sold and percentage of total passenger car sales, all countries, 2010-2024



Source: IEA (2025), Global Electric Vehicle Outlook 2025, https://www.iea.org/reports/global-ev-outlook-2025.

References

Cárdenas Rodríguez, M. et al. (2024), “National greenhouse gas emission inventories, filling the gaps in official data”, *OECD Environment Working Papers*, No. 252, OECD Publishing, Paris, https://doi.org/10.1787/f19f1663-en. [2]

Gütschow, J. et al. (2016), “The PRIMAP-hist national historical emissions time series”, *Earth System Science Data*, Vol. 8/2, pp. 571-603, https://doi.org/10.5194/essd-8-571-2016. [1]

Stechemesser, A. et al. (2024), “Climate policies that achieved major emission reductions: Global evidence from two decades”, *Science*, Vol. 385/6711, pp. 884-892, https://doi.org/10.1126/science.adl6547. [3]

Annex B. Data gaps, methodology and limitations

Chapter 1

Country GHG emissions estimates

Country-level data is based on emissions inventories reported to the United Nations Framework Convention on Climate Change (UNFCCC). This data is compiled using territory-based and production-based principles following the Intergovernmental Panel on Climate Change (IPCC) guidelines. The primary data source is the Common Reporting Tables (CRT) submitted by Parties as of 18 June 2025, supplemented by previous national inventory submissions and OECD Annual Quality Assurance (AQA) questionnaire. Since data is not available for all countries or all years, estimates were used to fill gaps. The data sources and methodology used in this publication are summarised below:

- **OECD Members**: For most OECD countries, GHG emissions data from CRT or other official data sources are available from 1990 to 2022 or 2023. Exceptions include Colombia (1990-2021), Israel (1996, 2003-2022).
- **OECD Partners**: Significant data gaps remain including major emitters. China has provided official data for seven years (1994, 2005, 2010, 2012 and 2014, 2020-2021), while India has presented data for four years (1994, 2000, 2010 and 2016). There are also gaps for Peru (data missing from 1990-1999), Saudi Arabia (data available for eight years between 1990 and 2012), South Africa (eight missing years between 1990 and 2000) and Indonesia (1995-1999 missing).
- Due to these gaps, aggregates presented in this report are based on a combination of official and estimated data.

To address data gaps, the OECD developed a methodology to impute missing values in a consistent manner maintaining alignment with official reports (Cárdenas Rodríguez et al., 2024[1]). The methodology uses the PRIMAP-hist national historical emissions time series (Gütschow, Busch and Pflüger, 2024[2]), which are adjusted to official estimates for imputation. The methodology is as follows:

- If no official data are available, the PRIMAP series is used.
- When two official data points exist, missing values between them are interpolated using PRIMAP trends and rescaled to ensure the interpolated series passes through the official data points.
- For years beyond the range of official data, the PRIMAP level difference is added to the most recent (or earliest) official point.
- Total emissions including land use, land-use change and forestry (LULUCF) is obtained by adding Total emissions excluding LULUCF and LULUCF and estimates. The other sectoral levels are derived by applying sectoral shares to the total emissions estimates.
- Energy subsectors estimates are obtained using shares from the IEA database of GHG emissions estimates matching the energy module of 2006 IPCC Guidelines.

GHG emissions have been converted using Global Warming Potentials from the sixth IPCC assessment report (AR6 GWP) (Forster, 2021[3]).

Global GHG emissions estimates

In the 2025 Monitor edition, the calculation of global GHG emissions undertook two key modifications. First, international bunkers uses data from the IEA database of GHG emissions estimates matching the energy module of 2006 IPCC Guidelines. Second, the LULUCF bookkeeping component uses data from (Friedlingstein et al., 2025[4]) based on the approach used in (UNEP, 2024[5]).

As a results of these adjustments and the integration of additional official GHG data through Common Reporting Tables (CRT), emissions estimates are slightly lower than those published in the previous year. Consequently, both editions of 2024 and 2025 Climate Action Monitor show emissions of 55 Gt CO_2e in their respective latest available years - 2022 and 2023. However, the trend of continuously increasing emissions since 2020 is maintained across editions.

GHG emissions are calculated as:

$$GHG_{World} = Country\ GHG_{Excluding\ LULUCF} + International\ Bunkers\ + LULUCF\ Bookkeeping$$

Table B.1. Detailed estimates of GHG emissions targets for 2030 and 2050 (Gt CO_2e)

	2023	2030	2050
UNEP estimated global emissions under current policies		57 (53-59)*	56 (25-68)*
Global emissions if targets achieved	54.5	52.5 (48.5-54.5)*	20.1 (19.0-21.2)
LULUCF adjustment	7.5	8.1	8.1
- LULUCF bookkeeping (outside inventories)***	3.6	4.2	4.2
- LULUCF inventories (2023 value projected forward)	-3.9	-3.9	-3.9
International bunkers (aviation and maritime)	1.2	0.9	0.0
Total countries (in GHG. Inventories, excl. LULUCF)	49.7		
Total countries (in GHG Inventories incl. LULUCF)		43.5 (39.5-45.5)	12.0 (10.9-13.1)
- IPAC	37.9	29.6	7.5 (6.6-8.5)
o OECD	14.5	9.3	0.7 (0.6-0.8)
o OECD Partners	23.4	20.3**	6.8 (5.9-7.9)
1.5°C Consistent		33 (26-34)	8 (5-13)
2°C Consistent		41 (16-24)	20 (16-24)

Note: *Sourced from (UNEP, 2024[5]). The estimate found in (UNEP, 2024[5]) for projected emissions in 2030 under Unconditional NDCs has been proportionally adjusted to align with the World emissions estimate.
**Excludes Saudi Arabia since its 2030 NDC cannot be quantified.
***Projected values use the average of the last ten years using Global Carbon Budget 2024.

GHG emissions targets

To enable comparison of countries' NDC emissions targets, the OECD developed a methodology to estimate GHG emissions targets for 2030 as physical emissions targets (Pizarro et al., 2024[6]). The methodology is as follows:

If the country NDC target is defined for 2030 in physical terms (i.e. in tonnes of CO_2e), the target is maintained.

Otherwise, targets are put into physical emissions levels for 2030 by applying transformations to country-level data to derive 2030 emissions targets in physical terms; these include adjustments for GDP, population and other transformations presented in (Pizarro et al., 2024[6]).

Countries' NDC targets are not directly comparable due to differences in coverage of sectors, gases and GWP. For comparison, emissions and targets were adjusted to AR6 Global Warming Potential (GWP) and covering all GHGs as follows:

- Physical targets are adjusted to AR6 GWP by multiplying the original target by the ratio of the total 2023 GHG emissions (AR6) over the GHG emissions within the NDC scope.
- GHG emissions outside of scope are imputed. This applies to China only as it uniquely covers CO_2 in its NDC. To this end, non-CO_2 gases are projected within a range.

Global emissions for 2030 were taken from (UNEP, 2024[5]), with the 2030 value used for emissions under unconditional NDCs, and adjusted proportionally to the world emissions estimate use. Emissions in 2050 emissions were projected based on the assumption of countries achieving their net-zero targets as proposed. Emissions for countries without a net-zero target were assumed to be at the same level as 2023, with a range of +/- 10% (e.g. Iran, Azerbaijan and others).

Moreover:

- EU-27 countries were considered as a bloc that reaches climate neutrality by 2050, as per the EU Climate Law; individual countries' targets differ since some do not have a net-zero target.
- Emissions for countries with a net-zero target later than 2050 are estimated based on a linear trajectory to their target year (e.g. China by 2060 and India by 2070) for the calculation of the 2050 Targets Consistency Gap.
- Emissions were adjusted based on differences in LULUCF estimates based on (UNEP, 2024[5]), and these differences were assumed to remain constant through 2050.
- International aviation and shipping are assumed to reach zero emissions by 2050 as per international agreements by the International Air and Transport Association and the International Maritime Organization. This reduction is assumed to be linear from 2023 to 2050.
- 2030, 2035, and 2050 emissions consistent with 1.5°C and 2°C increase pathways are sourced from (UNEP, 2024[5]).

Targets Monitoring

In this edition, visualisations on distance to target indicators based on (Pizarro et al., 2024[6]) are used to provide insights on whether countries are on track to meet their climate targets over different time horizons: the NDC Delivery Gap and the 2050 Targets Consistency Gap. For these calculations, a base year of 2019 was used, the year when countries formulating their NDCs (2.0), prior to the temporary drop in emissions caused by the COVID-19 pandemic. For IPAC aggregates, targets were harmonised to a common sectoral and gas scope. For individual country analysis, targets were kept in the scope defined in each country's NDC. For harmonisation between emissions and targets, all values were converted into AR6 GWP.

These are calculated as follows:

$$Delivery\ Gap \quad = \left(\frac{GHG\ emissions_{2023} - Linear\ trend\ to\ NDC\ target_{2023}}{Linear\ trend\ to\ NDC\ target_{2023}}\right) \times 100$$

$$2050\ Target\ Consistency\ Gap \quad = \left(\frac{NDC\ target_{2030} - Linear\ trend\ to\ 2050\ target_{2030}}{Linear\ trend\ to\ 2050\ target_{2030}}\right) \times 100$$

Chapter 2

The OECD set of indicators is based on historical observational data and forward-looking projected data. The observed historical data has been collected and recorded and goes back as far as 1979 (Maes et al., 2022[7]). Meanwhile, the forward-looking projected data goes up until 2100, comprising anomalies for the

2030s, 2050s, 2070s and 2090s relative to the 1995-2014 climate reference period (Maes et al., 2025[8]). The strength of this year's report lies in the expansion of the indicator set to incorporate forward-looking projections, enabling the reader to look back and forward in time. Historical indicators reflect what has happened, while forward-looking indicators project what will happen.

Notwithstanding, historical and forward-looking indicators are based on different underlying data sources and methodologies. These indicator datasets should therefore be interpreted with caution since these are not directly comparable. Nevertheless, the 46 years of historical data combined with 86 years of forward-looking projections offer the basis for a long-term analysis of climate change, highlighting the exposure of populations, croplands, forests, and urban areas to climate-related hazards. These indicators illustrate an alarming trend: climate change impacts are already visible by analysing historical trends and are projected to worsen in many regions across the world, under various climate scenarios. For a complete description of the methodologies behind historical and forward-looking indicators, please see (Maes et al., 2022[7]) and (Maes et al., 2025[8]).

Information on disaster events and their related costs has limitations due to inconsistent reporting by national governments and in international databases. Loss databases are essential to assess policy and monitor progress, but they are hardly ever mandated by national or supra-national legislation. There are several supra-national framework directives, but they remain vague when it comes to recording losses from disasters; their implementation would hugely benefit from the availability of such information.

No single database offers complete coverage of losses from disaster events. This year's report uses the Swiss Re database on natural catastrophes – an extensive resource that is critical for understanding the impacts and trends associated with such events. It includes detailed data on floods, storms, earthquakes, droughts, forest fires, heat waves, cold waves, frost, hail, tsunamis and other natural catastrophes. For the purposes of this report, focus is given to natural catastrophes linked to climate change; therefore, earthquakes are excluded from the analysis.

Chapter 3

The Climate Actions and Policies Measurement Framework (CAPMF) is an internationally harmonised climate policy database developed by the OECD. It is based on a structured policy typology that tracks a common set of policies with common definitions and harmonised policy attributes on an annual basis.

The 2025 edition significantly enhanced the scope, covering 87 policies across 97 jurisdictions (96 countries and the EU-27 as a bloc) from 1990 to 2024, up from 56 policies across 51 jurisdictions in earlier editions (Figure B.1). The 97 jurisdictions account for around 81% of global GHG emissions including LULUCF. It covers all OECD countries except the United States, all G20 countries and all countries that account for more than 1% of global GHG emissions. The United States has chosen to not include their data in the CAPMF given concerns that the CAPMF does not fully or accurately capture U.S. climate action.

The geographical additions to the CAPMF comprise of countries in the Americas (Grenada, Honduras, Paraguay, Saint Lucia, Saint Vincent and the Grenadines), Middle East and North Africa (Egypt, Iran, Morocco, United Arab Emirates), Asia (Azerbaijan, Brunei, Cambodia, Lao PDR, Malaysia, Myanmar, Pakistan, Philippines, Singapore, Timor-Leste, Viet Nam), Sub-Saharan Africa (Angola, Benin, Botswana, Burkina Faso, Cabo Verde, Cameroon, Cote d'Ivoire, Ethiopia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Mali, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, The Gambia, Togo, Uganda, United Republic of Tanzania, Zambia). Data are drawn from international sources (OECD, IEA, ITF, World Bank) and complemented by partner organisations such as the OECD Sahel and West Africa Club, the World Bank and the Global Green Growth Institute (GGGI).

The 87 climate actions and policies cover around 90% of policies listed in the latest IPCC report (IPCC, 2022[9]). For each policy, the CAPMF measures policy stringency, defined as the degree to which policies incentivise emissions reductions. The CAPMF comprises climate-positive instruments (e.g. carbon taxes), as well as reform of climate-negative measures (e.g. reform of fossil fuel subsidies). The CAPMF also includes some climate-relevant policies such as air pollution standards, i.e. policies whose primary intent is not mitigation, but which have a material effect on emissions. While the focus of the CAPMF is on national climate action, it also includes key subnational policies such as sub-national emissions trading schemes, fuel excise taxes and renewable portfolio standards, which are key in some countries.

For *The Climate Action Monitor 2025* missing policy data in 2024 were substituted by the last observed data in the last five years. This concerns 18% (16 of 87) of the policies captured by the CAPMF. Substituting the imputed data by the actual data once they become available is unlikely to change the key results of Chapter 3. However, some messages may need to be refined, notably as country-level data on fossil fuel subsidies are not yet included.

Despite the enhanced scope, the CAPMF still has some limitations. Since it does not yet cover all countries or all policies, the results should be interpreted carefully. In particular, the results should be interpreted in a descriptive rather than a prescriptive way. The primary focus of the CAPMF is to track the evolution and stringency of mitigation policies over time (1990 to 2024), not to rank government's climate action across countries. Other caveats are discussed in detail in the underlying working paper (Nachtigall et al., 2022[10]). Nevertheless, it remains a unique database offering insights into increasingly complex and diverse climate policy approaches and trends worldwide.

Figure B.1. The policy scope of the CAPMF 2025 edition

Sectoral policies

Sector	Market-based instruments	Non-market-based instruments
Electricity	• Carbon pricing (ETS, carbon and fuel taxes, FFS reform) • RES support (FiT, auctions, RPS, tax credits, capital subsidies)	• Bans and phase outs of coal plants • Air pollution standards coal plants • Planning for renewables • PMR indicators • Grid rules for renewables
Transport	• Carbon pricing (+ sub-national excise taxes) • Congestion charge • EV subsidies • Land value capture instruments	• Fuel economy standards (LDV, HDV, freight rail) • Energy labels • Public rail investment • Motorway speed limits • Bans and phase outs ICE: LDV+HDV • Bans of short-haul flights • PMR for rail and coach
Buildings	• Carbon pricing • Financing mechanisms for EE (e.g. preferential loans for retrofits) • Financial support for renewables	• MEPS appliances • Energy labels appliances + buildings • Building energy codes • Bans+phase outs of fossil heating • Regulation for renewables • Information on utility bills
Industry	• Carbon pricing • Financing mechanisms for EE • Tax credit CCUS	• MEPS industrial motors • Energy efficiency mandates • Labels for electric motors • Awareness for energy saving
AFOLU	• GHG emissions pricing • Fuel taxes for diesel	• Sustainable forest management • Protected areas • Food labels
Waste	• Carbon pricing • FiT for electricity from waste	• Landfill bans and phase outs • Repair labels

Cross-sectoral policies

GHG emission targets
- Net-zero target (e.g. year, coverage, legal status)
- NDC target (e.g. coverage of sectors and GHG)
- Net-negative targets

Government investment
- Public expenditure in RD&D on low-carbon technologies (e.g. energy efficiency, renewables)
- Green public procurement rules

Fossil fuel production policies
- FFS reform for fossil fuel production
- Bans and phase outs of fossil fuel extraction
- Policies to reduce fugitive methane emissions (e.g. restriction on flaring)

Climate governance
- Independent climate advisory body
- Environmental impact assessment

Climate-related financial policies
- Information (e.g. disclosure requirements)
- Prudential policies (e.g. capital requirements)
- Credit allocation
- Issuance of green bonds

International policies

International co-operation
- Participation in key international climate treaties
- Participation in international climate initiatives (e.g. Climate and Clean Air Coalition)
- Reducing emissions from international aviation and shipping (CORSIA + MARPOL VI)
- Environmental provisions in trade agreements

International public finance
- Banning export credits for unabated coal plants
- Banning public finance of fossil fuels abroad

GHG emissions data and reporting
- GHG emissions reporting and accounting (SEEA, GHG inventories)
- Requirements to provide installation-level data
- UNFCCC evaluation of Biennial (Update) Reports
- Submission of key UNFCCC documents (e.g. National Communications)

2022 — Modules included in 2022 edition

2025 — Modules added in 2025 edition

Additions in 2025 edition

Revisions of indicators from 2022 edition

Source: Authors based on (Nachtigall et al., 2022[10]) and (Nachtigall et al., forthcoming).

References

Cárdenas Rodríguez, M. et al. (2024), "National greenhouse gas emission inventories, filling the gaps in official data", *OECD Environment Working Papers*, No. 252, OECD Publishing, Paris, https://doi.org/10.1787/f19f1663-en. [1]

Forster, P. (2021), "The Earth's Energy Budget, Climate Feedbacks and Climate Sensitivity", in *Climate Change 2021 – The Physical Science Basis*, Cambridge University Press, https://doi.org/10.1017/9781009157896.009. [3]

Friedlingstein, P. et al. (2025), "Global Carbon Budget 2024", *Earth System Science Data*, Vol. 17/3, pp. 965-1039, https://doi.org/10.5194/essd-17-965-2025. [4]

Gütschow, J., D. Busch and M. Pflüger (2024), *Gütschow, J.; Busch, D.; Pflüger, M. (2024): The PRIMAP-hist national historical emissions time series v2.6.1 (1750-2023). zenodo. doi:10.5281/zenodo.15016289*. [2]

IPCC (ed.) (2022), *Climate Change 2022 - Mitigation of Climate Change*, Cambridge University Press, https://doi.org/10.1017/9781009157926. [9]

Maes, M. et al. (2022), "Monitoring exposure to climate-related hazards: Indicator methodology and key results", *OECD Environment Working Papers*, No. 201, OECD Publishing, Paris, https://doi.org/10.1787/da074cb6-en. [7]

Maes, M. et al. (2025), "Monitoring exposure to future climate-related hazards: Forward-looking indicator results and methods using climate scenarios", *OECD Environment Working Papers*, No. 264, OECD Publishing, Paris, https://doi.org/10.1787/b9ba6ee0-en. [8]

Nachtigall, D. et al. (2022), "The climate actions and policies measurement framework: A structured and harmonised climate policy database to monitor countries' mitigation action", *OECD Environment Working Papers*, No. 203, OECD Publishing, Paris, https://doi.org/10.1787/2caa60ce-en. [10]

Pizarro, R. et al. (2024), "GHG Emission Trends and Targets (GETT): Harmonised quantification methodology and indicators", *OECD Environment Working Papers*, No. 230, OECD Publishing, Paris, https://doi.org/10.1787/decef216-en. [6]

UNEP (2024), *Emissions Gap Report 2024: No more hot air … please! With a massive gap between rhetoric and reality, countries draft new climate commitments*, United Nations Environment Programme, https://doi.org/10.59117/20.500.11822/46404. [5]

The Climate Action Monitor 2025

The Climate Action Monitor is the flagship annual publication of the OECD's International Programme for Action on Climate (IPAC). Building on the IPAC Dashboard of climate-related indicators, it provides data-driven insights on global climate action and progress towards net-zero targets for 52 OECD Member and partner countries.

The 2025 edition assesses the alignment of Nationally Determined Contributions (NDCs) with 2050 targets, reviews historic and projected climate-related hazards, and tracks key trends in national climate policy action. The findings indicate that, despite some progress, current 2030 greenhouse gas emission reduction pledges remain insufficient to meet the Paris Agreement temperature goals. In the face of accelerating climate-related risks, achieving these targets will require greater ambition in the next round of NDCs, alongside a renewed expansion of national climate action, which has slowed significantly since 2021.

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