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STATE AND TRENDS OF

carbon pricing

1818 H Street NW, Washington, DC 20433
Telephone: 202-473-1000
Internet: www.worldbank.org

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The World Bank task team responsible for this report was composed of Joseph Pryor, Ashia Bio Sawe, Shreya Rangarajan, Harikumar Gadde, Mustafa Ozgur Bozcaga, Anthony Mansell, Alejandra Mazariegos, Jia Jun Lee, Jacob Junghun Lee, Conrad Buffier, Helen Guyes, and Aurora Maria Sarah Silitonga.

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PMI PARTNERSHIP FOR MARKET IMPLEMENTATION

Ecosystem Marketplace A FOREST TRENDS INITIATIVE

ICAP International Carbon Action Partnership

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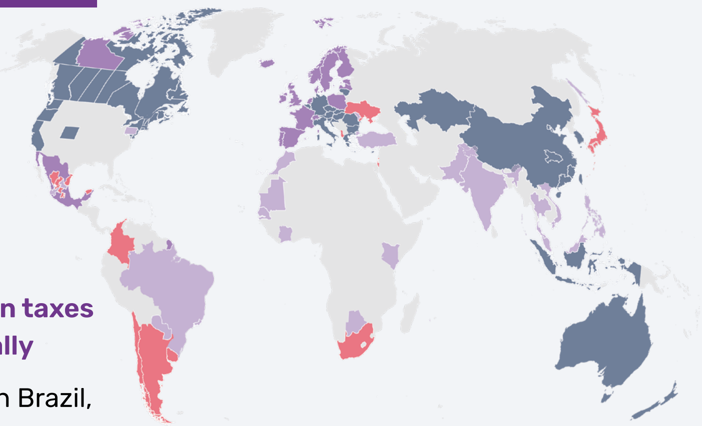
Abbreviations and acronyms

BCA	Border carbon adjustment mechanism
CBAM	Carbon border adjustment mechanism
CCP Framework	The Integrity Council for the Voluntary Carbon Market's Core Carbon Principles Framework
CDM	Clean Development Mechanism
CER	Certified emission reduction
COP29	2024 Conference of the Parties of the United Nations Framework Convention on Climate Change
CORSIA	Carbon Offsetting Reduction Scheme for International Aviation
ETS	Emissions trading system
GDP	Gross domestic product
GHG	Greenhouse gas
I4CE	Institute for Climate Economics
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ICVCM	The Integrity Council for the Voluntary Carbon Market
IEA	International Energy Agency
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
ITMO	Internationally transferred mitigation outcome
LPG	Liquefied petroleum gas
MIGA	Multilateral Investment Guarantee Agency
MLN	Million
NDCs	Nationally determined contributions under the Paris Agreement
OBPS	Output-based pricing system
OECD	Organisation for Economic Cooperation and Development
OTC	Over the counter
PACM	Paris Agreement Crediting Mechanism
REDD+	Reducing Emissions from Deforestation and Forest Degradation
tCO_2e	Metric ton of carbon dioxide equivalent
TREES	The REDD+ Environmental Excellence Standard
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States dollar
VAT	Value-added tax
VCS	Verra's Verified Carbon Standard

State and Trends of Carbon Pricing 2025

CARBON PRICING

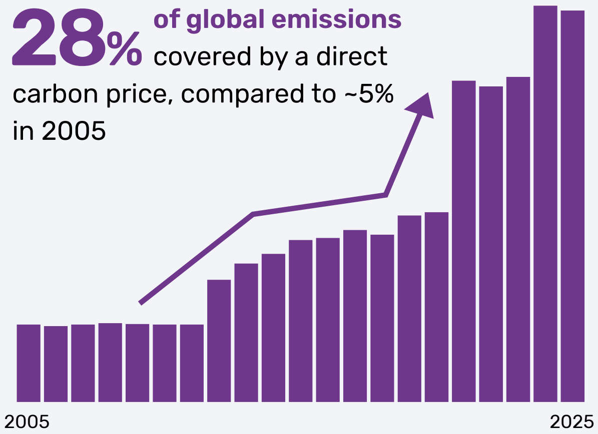


80

emissions trading systems and carbon taxes implemented globally

Plus ETSs planned in Brazil, India, and Türkiye

28% **of global emissions** covered by a direct carbon price, compared to ~5% in 2005



USD 100+ billion

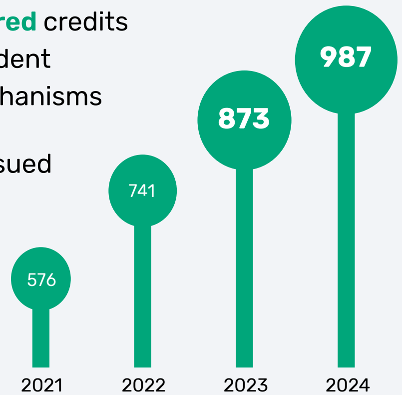
in revenues raised for second consecutive year

Over **50%** of revenue was used to support environmental, infrastructure, and development projects

CARBON CREDIT MARKETS

~1 **billion unretired** credits from independent crediting mechanisms

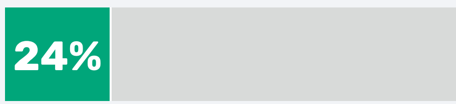
2⁄3 are from credits issued before 2022

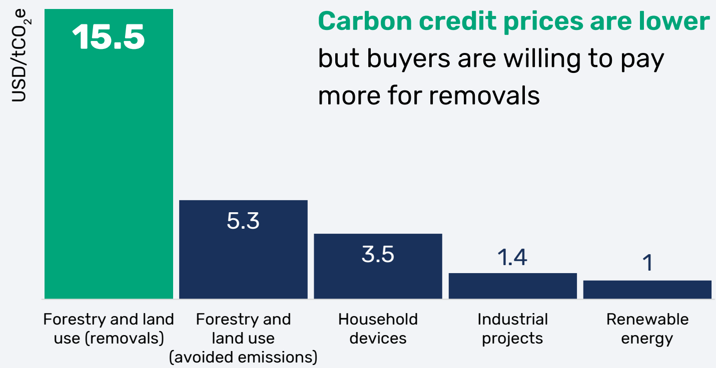


~3x **more domestic compliance retirements**

in 2024, compared to 2023

In 2024, almost **a quarter** of global credit retirements were to meet domestic compliance obligations





Carbon credit prices are lower but buyers are willing to pay more for removals

Foreword

Governments today face immense fiscal pressure amid a complex and uncertain economic environment. Low economic growth projections and rising volatility in trade and financial markets are placing additional pressures on public budgets. These converging pressures are not only threatening fiscal resilience but also undermining development gains.

In this context, carbon pricing offers a powerful tool. It can mobilize finance and secure development outcomes even during periods of uncertainty. It mobilizes domestic revenue, drives efficiency and innovation, and attracts international finance—all while helping countries advance climate and development goals. It's a pragmatic solution at a time when resources are tight, and ambitions are high.

We saw continued momentum over the past year, particularly among large middle-income economies. China's expansion of carbon pricing brought three gigatons of greenhouse gas (GHG) emissions under its emissions trading system. Today, around 28% of global emissions are covered by a direct carbon price and economies representing nearly two-thirds of global economic output have implemented either a carbon tax or emissions trading system. More countries, including Brazil, India, and Türkiye, are moving forward with domestic carbon pricing frameworks. Others, including Zambia, Tanzania, Paraguay, and Viet Nam, are positioning themselves to participate in international carbon markets.

Carbon markets are also increasing globally. Carbon credit markets play multiple roles. They support climate commitments, lower the cost of new technologies, and finance nature-based solutions like forest restoration. But they do more than just carbon savings; they deliver development dividends in terms of more affordable energy access, cleaner cooking fuels, and healthier forests, to name just a few.

We are also seeing innovation. The emergence of new insurance products—including a political risk guarantee issued by our Multilateral Investment Guarantee Agency—are helping de-risk investments in international carbon markets and support private sector participation.

The private sector plays a critical role. Companies are increasingly subject to compliance requirements under new and expanding carbon pricing schemes. To scale impact, there is a growing demand for safe, efficient, and interoperable transaction infrastructure to incentivize more private sector revenues.

The growth from fewer than 10 instruments in 2005 to 80 today is a reminder of global progress on direct carbon pricing. For over 20 years, the State and Trends of Carbon Pricing report series has provided an important global pulse check–offering rigorous, evidence-based insights into policies and market developments. The World Bank seeks to provide knowledge that can drive development and scale impactful solutions. I hope this year's report continues to inform action, inspire innovation, and strengthen partnerships across public and private sectors.

Axel van Trotsenburg

Senior Managing Director
World Bank

Executive Summary

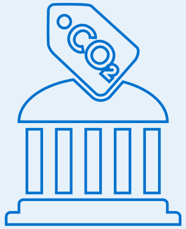
CARBON PRICING

All large middle-income economies have either implemented or are considering direct carbon pricing

- There are 80 carbon taxes and emissions trading systems (ETSs) in operation worldwide—a net increase of five over the last 12 months.
- Brazil, India, and Türkiye have met key milestones to facilitate ETS implementation, while Colombia and Indonesia expanded coverage.
- Most new and planned instruments are ETSs. While designs vary, many governments including India have selected a rate-based approach.

Expansion of carbon taxes and ETSs has increased the proportion of global emissions and economic output being subjected to a direct carbon price

- The expansion of China's ETS to industrial sectors has increased global direct carbon pricing coverage from 24% to around 28%.
- The economies that have implemented either a carbon tax or an ETS make up almost two-thirds of global gross domestic product.
- Over half of global emissions from the power sector and almost half of the industry sector face a direct carbon price.
- Coverage in other sectors is lower, with agricultural emissions remaining unpriced.



Direct carbon pricing continues to mobilize over $100 billion for public budgets

- Carbon prices held relatively steady in real terms, but with variation across jurisdictions.
- Carbon revenue in 2024 was lower than 2023, largely due to lower prices in large ETSs, such as the EU and the UK, but it was over three times higher than a decade ago, in real terms.
- Over half of carbon revenues generated in 2024 were earmarked towards environment, infrastructure, and development projects—a slight increase compared to previous years.

CARBON CREDIT MARKETS

Global carbon credit retirements increased due to a short-term spike in demand for compliance purposes

- The private sector continues to lead demand for carbon credits through voluntary and domestic compliance markets, emphasizing the role of carbon markets in channeling private capital toward decarbonization projects.
- Compliance retirements in 2024 were almost three times the 2023 level. Most were from companies looking to meet their multi-year compliance obligations under the California and Québec ETSs.
- Voluntary buyer preferences shifted toward nature-based removal and clean cooking projects.
- The first phase of international aviation's Carbon Offsetting and Reduction Scheme for International Aviation commenced in 2024, but despite some initial sales, uncertainties remain for both supply and demand.

There is a growing surplus of unretired credits in the market

- Global supply of credits declined slightly, but supply trends varied across categories, with issuances from nature-based removal projects increasing compared to 2023.
- The pool of unretired carbon credits from independent crediting mechanisms increased to almost 1 billion tons. Most of these unretired credits are relatively old (issued before 2022) and are from forestry and land use or renewable energy projects.
- Governmental crediting mechanisms, such as the Australian Carbon Credit Unit Scheme and the Kazakhstan Crediting Mechanism, accounted for just over 10% of total global credit issuances.

Credit prices softened slightly, but with observed premiums for specific credit types

- Nature-based removal credits attracted premiums and high forward prices, suggesting voluntary buyers are willing to pay more for these credits relative to alternative credit types.
- A positive correlation is also emerging between prices and carbon credit ratings from proprietary ratings providers.
- Credits eligible for use in international compliance markets command a price premium compared to credits eligible for use in voluntary markets.

CHAPTER 1

Introduction

CHAPTER 1

Introduction

1.1 Governments continue to advance carbon pricing and markets in the context of broader economic, financial, and social considerations

The global economy is slowing amid a sharp escalation of trade tensions and a highly uncertain global policy environment. Earlier expectations of stabilization in global economic activity in 2025 following years of overlapping shocks have been derailed by heightened policy uncertainty, financial market volatility, and large shifts in the international trade policy environment. As noted in the World Bank's *Global Economic Prospects* report, global growth is projected to slow this year to 2.3%, remaining well below the pre-pandemic 10-year average of 3.1%.[1] This subdued outlook is driven by increased trade barriers, elevated uncertainty, and deteriorating confidence. At the same time, rising global public debt, expected to approach 100% of global gross domestic product (GDP) by 2030, continues to strain economies, contributing to financial instability.[2]

Climate change places further pressure on economic and development outcomes. More frequent and severe extreme weather events are damaging infrastructure, driving up the costs of disaster recovery, and disrupting supply chains. These events divert resources from critical areas, such as health, education, and employment, disproportionately affecting low-income communities and economies.[3] In addition, asymmetrical policy responses create risks for economies. For example, changes to the global policy landscape, the rapid introduction of new technologies, and shifts in consumer and investor preferences are disrupting existing markets and supply chains. This can undermine countries' competitiveness, economic growth, and fiscal sustainability, including through a heightened potential for stranded assets and large shifts to the tax base.[4] If not managed effectively, the risks posed by climate change can undermine economic stability and development, increase uncertainty, and further weaken long-term economic growth prospects.

Countries are using carbon pricing to work toward multiple policy objectives. In addition to using direct carbon pricing as a tool to meet emissions reduction targets (see Box 1), governments have broader objectives. Carbon pricing is a potential source of revenue for fiscally constrained governments. With an expected contractionary fiscal environment in the coming years, raising domestic revenue with positive job and growth impacts will become increasingly important.[5] For instance, in Mexico, 11 state governments have introduced carbon pricing, with revenue mobilization being a contributing driver. Beyond carbon pricing as a revenue stream, governments are also adopting carbon pricing alongside regulatory standards, green industrial policies, and social welfare programs to deliver structural changes. For example, the European Union Net-Zero Industry Act, introduced in 2024, complements the EU Emissions Trading System (ETS) in supporting decarbonization in hard-to-abate industries, while in Norway, tax incentives combined with carbon pricing have resulted in electric cars accounting for nearly all new car sales. Finally, Israel has implemented a carbon tax to address the unpriced carbon externality and supplementary measures to improve the efficiency of domestic industry.[6]

BOX 1

Effectiveness of emissions trading systems and carbon taxes

Carbon pricing is widely recognized as an important tool to incentivize low-carbon economic growth. The theoretical basis for carbon pricing is well-established: Increasing the price of emission-intensive goods and services relative to low-carbon alternatives creates an incentive for companies and individuals to move to low-carbon options. The effectiveness of carbon pricing is increased where price signals are stable, predictable, and enduring, helping to guide long-term investment decisions.

However, measuring the real-world effectiveness of carbon pricing has historically been challenging. Because carbon pricing often operates alongside other policies and broader economic factors, it can be difficult to isolate its impact. For example, other policies such as fuel excise taxes and fuel subsidies influence the price signal passed through the economy (see Box 6 in chapter 2). Determining the counterfactual scenario (i.e., what emissions would have been without carbon pricing) is equally complex because other factors, such as business cycles and technological progress, also influence emissions over time. Research has also been constrained by the relatively recent adoption of carbon pricing—starting in Finland in the 1990s—as well as the prevalence of low initial price levels and limited coverage. Researchers have begun to overcome the challenges in measuring the effectiveness of carbon pricing, and there are more carbon pricing instruments in operation to feed into researchers' evaluations. Recent research efforts are also using new and innovative techniques, including machine-learning-assisted meta-analysis; advancements in econometric methods; and innovations in establishing counterfactual scenarios.

Recent large-scale empirical studies evaluated the effectiveness of carbon pricing instruments. Three large-scale studies conducted in 2024 provided robust empirical evidence reinforcing the theoretical foundation of carbon pricing as a tool to drive emissions reductions. Colmer et al. (2024) found that French manufacturing firms regulated by the EU Emissions Trading System reduced emissions by an average of 14% between 2005 and 2007 and 16% between 2008 and 2012 as a result of the policy.[7] Martinsson et al. (2024) found that without carbon pricing, Sweden's emissions from manufacturing in 2015 would have been about 30% higher.[8] Döbbeling-Hildebrandt et al.'s (2024) meta-analysis of studies of 21 carbon pricing policies found that at least 17 of the policies produced emissions reductions of between 5% and 21%.[9] Ultimately, the emissions reductions delivered by a carbon pricing instrument depend on a range of factors, including carbon price levels, the specific sectors covered, and access to affordable abatement opportunities.[10]

Carbon pricing can deliver outcomes beyond emissions reductions. The World Bank's report *Quantifying the Development Benefits of Carbon Pricing* summarizes some of these broader outcomes.[11] For example, by reducing fossil fuel combustion, carbon pricing can deliver cleaner local air and water, which leads to better human health outcomes. It can also reduce road congestion and traffic accidents.[12] Additional potential outcomes include enhanced energy and food security, increased efficiency of national tax systems, higher labor productivity and thus economic growth through replacing inefficient taxes, and government revenue that can be directed towards countries' individual objectives.[13]

Carbon pricing coverage has continued to expand globally, and empirical evidence of its effectiveness continues to grow, demonstrating the importance of its role in countries' climate policy mixes. While carbon pricing may not be a silver bullet, it is an important tool available to jurisdictions to strengthen their ability to address broader economic and environmental challenges and facilitate the global transition to net zero emissions.

New approaches are needed to mobilize finance, particularly for emerging markets and developing economies. The Independent High-Level Expert Group on Climate Finance estimates that by 2030 there will need to be a global investment of USD 6.3 to 6.7 trillion per year to support decarbonization, build resilience to rising impacts of climate change (including extreme weather), and protect nature and biodiversity.[14] Around USD 2.4 trillion of this must go toward emerging markets and developing economies other than China. Meeting this increased investment requires additional financial resources from governments (USD 800–900 billion), businesses (USD 1–1.18 trillion), and other international or multilateral sources (USD 490–610 billion). For governments, mobilizing additional revenue through effective taxation and strategic public finance management will be key to creating the fiscal space necessary to meet broader development priorities.

While carbon pricing helps generate public revenue, carbon credit markets can mobilize private capital and channel public finance. Carbon credit markets have an important role in raising private capital. They have the potential to act as a vehicle to channel private capital to development projects that reduce or remove emissions from the atmosphere. This includes, for example, planting new forests and promoting technology adoption in low-income countries, such as the use of clean cookstoves. For example, an estimated USD 14 billion was raised in Q1–Q3 of 2024 toward developing new carbon credit projects globally, with the highest share dedicated to nature-based removal projects.[15] The recent agreement on international carbon markets at the 2024 Conference of the Parties of the United Nations Framework Convention on Climate Change (COP29) in Baku, Azerbaijan, could help advance market participation and has the potential to stimulate greater investment flows to low-income countries. This agreement provides clarity on the rules for cross-border transfers of carbon credits under Article 6 of the Paris Agreement. With the agreement in place, focus will transition to operationalization, which will require building countries' capacities—from setting up institutional and regulatory frameworks to deploying market infrastructure, such as registries. The confirmation of UN-administered carbon markets has opened an alternative avenue for market participation, which is significant given the increased scrutiny over the integrity of voluntary carbon markets in recent years.

1.2 Scope of the report

As with past years', this report covers the state and trends of direct carbon pricing instruments and carbon markets. The report is intended to serve as a snapshot of ETSs, carbon taxes, and carbon pricing mechanisms (see Box 2). It includes developments up until April 1, 2025, with a focus on developments in the previous 12 months. It provides information on observable metrics, such as prices, coverage, and revenues, and how these have changed over time. The report is not intended to provide a critique or normative assessment of policy choices. Chapter 2 explores key trends in carbon taxes and ETSs, while chapter 3 examines carbon crediting mechanisms, including voluntary and international carbon markets. The annexes provide additional detail, including on the definitions and methodology used in this report. Additional information, including the data underpinning this report, is available on the World Bank's *Carbon Pricing Dashboard*.

This report covers the state and trends of direct carbon pricing instruments and carbon markets

BOX 2

What is carbon pricing?

Carbon pricing seeks to align the costs of consuming carbon-intensive fuels or using carbon-intensive processes with the social costs of those activities. The *State and Trends of Carbon Pricing* report focuses on direct carbon pricing instruments, which are those policies that aim to reduce GHG emissions by providing a price signal explicitly linked to emissions. The report focuses on three main instruments (which are not mutually exclusive):

- **Emissions trading systems**, where a government places a limit, or cap, on the amount or intensity of GHG emissions generated by covered entities. Entities must surrender emission units (or "allowances") to cover their emissions within a compliance period. Companies can trade allowances with other covered entities, and the price is mainly determined by the market.
- **Carbon taxes**, where a government levies a fee on covered entities for their GHG emissions. Under a carbon tax, the government sets the price of emissions (the tax rate), by taxing either the amount of emissions produced or the carbon content of fuels.
- **Carbon crediting mechanisms,** where tradable credits are generated through voluntary activities that reduce emissions through either *avoidance or reduction* (preventing GHG emissions from entering the atmosphere—like capturing methane from landfills before it is released), or removal (taking GHGs from the atmosphere, for example through sequestering carbon through afforestation). This report covers domestic and international as well as compliance and voluntary carbon credit market activities.

In contrast to *direct* carbon pricing, *indirect* carbon pricing instruments (such as fuel excise taxes and fossil fuel subsidies) change the price of products associated with carbon emissions, but are not explicitly linked to GHG emissions. While this report does not focus on indirect carbon pricing, Box 6 in chapter 2 provides insights on examples of indirect carbon pricing in Latin America. "Carbon pricing" in this report refers to direct carbon pricing unless otherwise stated.

In this report, "internal carbon pricing" refers to an estimate of GHG emission costs used internally by companies as a strategic planning tool to identify climate-related revenue opportunities and risks, drive energy efficiency, and inform capital investment decisions.

Further information on definitions can be found in Annex C.

CHAPTER 2

Carbon taxes and emission trading systems

CHAPTER 2

Carbon taxes and emission trading systems

Carbon pricing now covers around 28% of global GHG emissions, with 43 carbon taxes and 37 ETSs in place. Jurisdictions comprising almost two-thirds of global GDP have a direct carbon price in place and the largest middle-income economies, including Brazil, China, India, Indonesia, and Türkiye have implemented or are moving toward implementing carbon pricing. Carbon prices have remained relatively flat across most jurisdictions. Despite a slight reduction in carbon pricing revenues, globally ETSs and carbon taxes continued to generate over USD 100 billion.

2.1 Progress in key economies and planned scope expansions have increased global coverage and have primed the pipeline for future increases

Carbon pricing now covers around 28% of global GHG emissions, with increased coverage largely due to China's national ETS expanding beyond the power sector. The last 12 months saw several announced extensions to existing carbon pricing instruments, increasing covered emissions to almost 15 billion metric tons of carbon dioxide equivalent emissions (tCO_2e) out of the global total of just over 52 billion tCO_2e. As a result, the proportion of global GHG emissions covered by a direct carbon price increased from 24% to 28% (Figure 1). The most significant addition was the expansion of China's national ETS to cover cement, steel, and aluminum, increasing gross coverage by around 3 billion tCO_2e. Liabilities apply retrospectively to these new sectors from January 1, 2024, with compliance requirements ramping up over two years. Colombia also advanced its carbon pricing framework through expanding its national carbon tax beyond liquid and gaseous fossil fuels to also include coal combustion, with facilities included at a progressively increasing rate. These developments demonstrate the flexibility of carbon pricing to ratchet up over time, both through increasing carbon price levels and through expanding coverage to new sectors. This flexibility is important as governments continue to balance a range of policy objectives.

The proportion of global GHG emissions covered by a direct carbon price increased from 24% to 28%

Overall, the number of implemented carbon pricing instruments increased slightly with the launch of new and revival of suspended policies, which offset the rollback of carbon taxes in Canada. There are now 80 direct carbon pricing instruments in operation around the world, 37 ETSs and 43 carbon taxes (Figure 2). This represents a net increase of five since April 1, 2024, after accounting for both new and removed policies. Two ETSs have been added to the tally—one newly implemented ETS and one ETS that has been reinstated. The former was implemented by the US state of Colorado, expanding a framework adopted in 2021 to allow for credit creation and trading between covered businesses.[16] The latter was reinstated by the US state of Oregon in January 2025.[17] Three new carbon taxes took effect over the 12 months up to April 1, 2025—a new carbon tax on fuels in Israel and two subnational carbon taxes in Mexico, in Mexico City and Morelos.[18] The year 2024 also saw the commencement of the first compliance period for the carbon fee in Taiwan, China, with liabilities due by May 2026.[19] In addition, Portugal reinstated its carbon tax in September 2024. In Canada, however, new regulations have ended the application of the federal fuel charge, precipitating the elimination of the subnational carbon tax in British Columbia and the Saskatchewan output-based pricing system (OBPS).[20] These movements highlight the importance and impact of the political economy on carbon pricing (Box 3).

FIGURE 1
Share of global greenhouse gas emissions covered by an ETS or carbon tax, 2005–2025

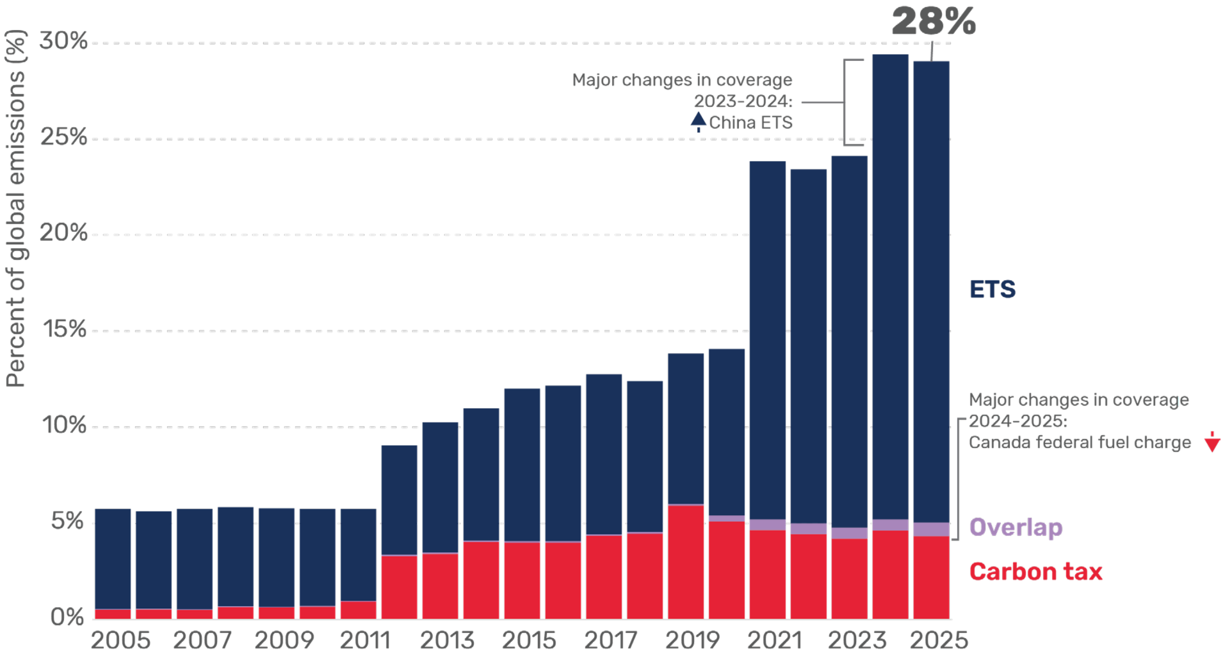
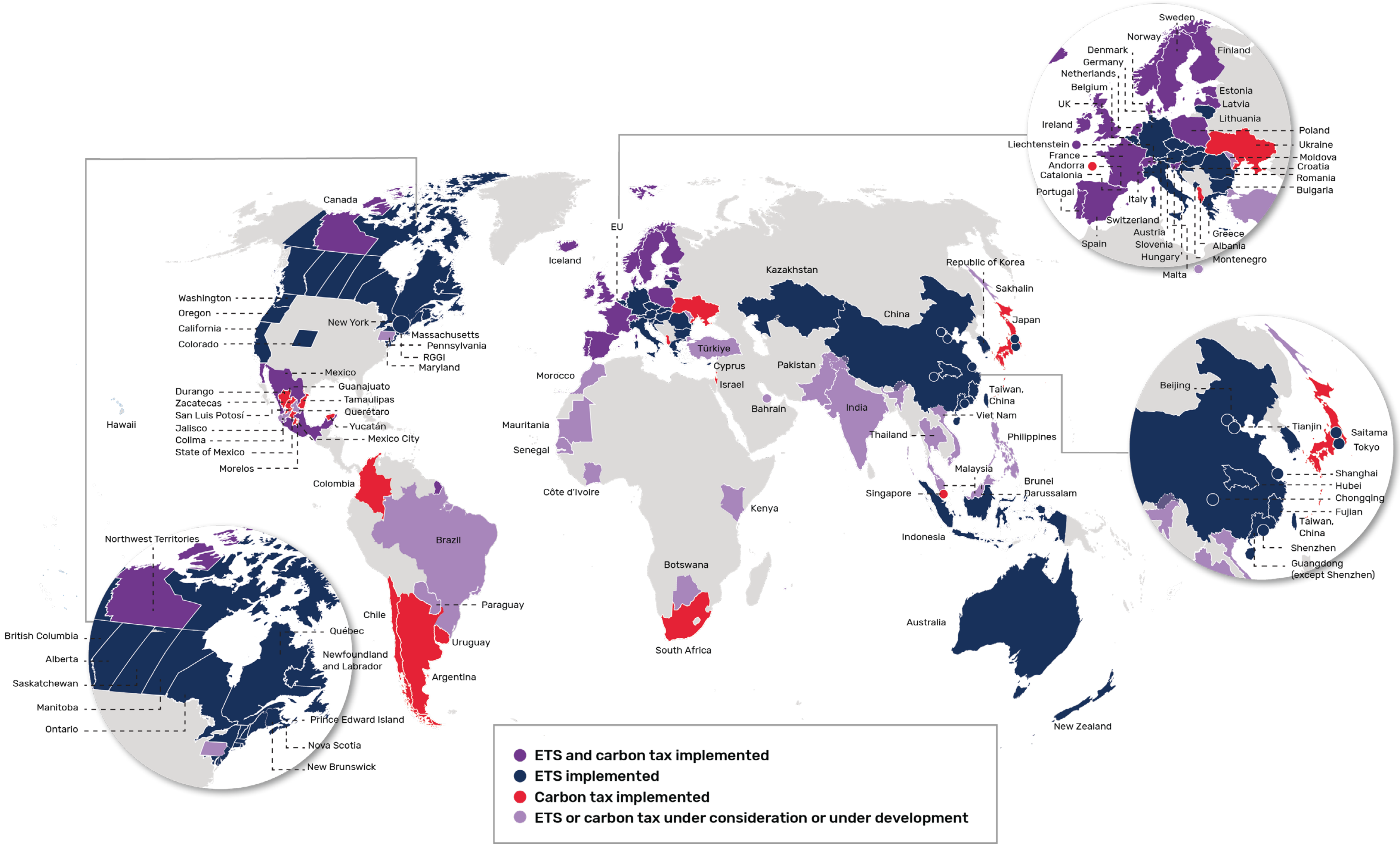


FIGURE 2
Global map of ETS and carbon taxes implemented, under development, or under consideration



BOX 3

The political economy of carbon pricing

Carbon pricing represents one of many policy tools available to governments as they seek to deliver on a number of competing policy objectives, such as emissions reductions, economic development, job creation, poverty alleviation, and fiscal stability. The adoption and durability of carbon pricing policies is influenced by a range of factors, including their perceived effectiveness, fairness, impacts, and distributional effects. This means that in addition to policy design aspects, the political economy (including public sentiment) influences the potential for carbon pricing policies to deliver environmental, economic, and fiscal outcomes.

Three recent World Bank reports[21] describe how climate policies, including carbon pricing, affect politics, the economy, and society, and vice versa. *Balancing Act* summarizes the challenges and opportunities with advancing carbon pricing, highlighting that policy makers should consider local concerns, industry interests, institutional capacity, and the political landscape as part of policy design and implementation. *Within Reach* emphasizes that while climate policies like carbon pricing can create jobs, these outcomes depend on intentional design choices and the presence of a supportive policy environment. For example, new job creation can be supported through revenue recycling into infrastructure investments and reductions in labor taxes. *Reality Check* highlights that carbon pricing can be compatible with positive economic and social outcomes, as demonstrated by British Columbia's carbon tax, which increased aggregate employment and helped narrow the gap between low- and high-income households through revenue recycling without harming economic growth. Despite these documented positive impacts, the government of British Colombia cancelled the carbon tax on March 31, 2025, citing that "it has become too politically divisive and a distraction from the important issues we are tackling."[22] Such examples highlight that evidence-based assessments of the effectiveness, fairness, and impacts of carbon pricing alone are insufficient to overcome the political economy aspects that affect the success and longevity of carbon pricing policies.

Most major economies, including large middle-income economies, have implemented or are advancing the adoption of carbon pricing, with countries in Asia playing an increasingly significant role. Collectively, countries with carbon pricing in force represent almost two-thirds of global GDP. Canada, China, the EU, Japan, Mexico, and the United Kingdom have all implemented carbon pricing instruments, while several middle-income countries have made substantial progress in the past year (see Table 1). Most of this recent progress has been through the consideration or adoption of ETSs rather than carbon taxes. Brazil approved a law in December 2024 that sets out an ambitious framework for implementing an ETS with links to domestic carbon credits within the next five years. There was also notable progress in Türkiye, where a proposed climate law was submitted to Parliament. The draft law sets out the legal framework for Türkiye's response to climate change, including its ETS, with the potential for a pilot phase to commence in 2026.[23] The Indian government established regulations in mid-2024 for its planned ETS, which will target emissions intensity reductions in India's industrial sector.[24] Both India and Türkiye are progressing rate-based ETSs, where total emissions are not capped but individual entities are allocated a performance benchmark that serves as a limit on their net emissions. Rate-based ETSs offer additional flexibility in managing future growth uncertainty as well as international competitiveness concerns. In East Asia, new policies are advancing for both ETSs and carbon taxes: Thailand's cabinet approved a carbon tax; Malaysia announced its intention to fast-track the introduction of a carbon tax for the energy and iron and steel industries by 2026; and the Philippines' House of Representatives proposed a bill that would establish an ETS.[25]

The drivers for the increasing interest in carbon pricing are diverse. While decarbonizing economies and achieving international commitments remains paramount, broader motivating factors are also driving action. As highlighted in chapter 1, jurisdictions are employing carbon pricing as a fiscal tool and are using it as a policy lever to help manage broader economic issues, including those presented through the introduction of border carbon adjustments (Box 4).

Countries with carbon pricing in force represent almost two-thirds of global GDP

TABLE 1
Carbon pricing developments in key emerging economies

Brazil	In December 2024, Brazil formally approved a law to establish the Brazilian Greenhouse Gas Emissions Trading System. The ETS is set to cover large facilities in all sectors except for agriculture and is expected to be operational in five years. The ETS also establishes a process to facilitate the use of carbon credits to meet ETS liabilities and a process for determining whether credits can be transferred internationally under Article 6 of the Paris Agreement.
China	In March 2025, China confirmed the expansion of the national ETS to include the steel, cement, and aluminum sectors. This change was implemented retrospectively with compliance requirements commencing from January 1, 2024. This expansion brings 1,500 additional entities under the national ETS regulation, covering an additional 3 billion tCO_2e. As a result, the total coverage of the national ETS has increased to around 8 billion tCO_2e, which represents over half of China's total GHG emissions.
India	In July 2024 the Indian government adopted detailed regulations for its planned Carbon Credit Trading Scheme, a rate-based ETS covering an initial nine energy-intensive industrial sectors. The program will issue carbon credit certificates to covered facilities that outperform an emissions intensity benchmark. A domestic voluntary carbon crediting program is also being developed, which would issue carbon credits for activities and emissions sources not covered by the ETS.[26] On March 28, 2025, India's Ministry of Power announced the approval of eight crediting methodologies, including for renewable energy, green hydrogen production, industrial energy efficiency, and mangrove afforestation and reforestation.[27] The gradual transition from the current market-based energy efficiency program Perform, Achieve, and Trade scheme to these new programs is set to begin in 2025.
Indonesia	The scope of Indonesia's rate-based ETS was expanded in 2024 to include additional grid-connected coal-fired power generation facilities with generation above 25 megawatts. This expansion means covered power plants increased from 99 to 146. A second expansion is planned for 2025 to also cover natural gas generators and power plants that are not connected to the grid.
Türkiye	Türkiye submitted its Climate Law Proposal to Parliament in February 2025. The draft law provides the legal framework to establish Türkiye's ETS and governance arrangements through a Carbon Market Board. The details of the ETS will be outlined in regulations. The initial pilot phase of the ETS is expected to commence in 2026.

Brazil formally approved a law to establish the Brazilian Greenhouse Gas Emissions Trading System

BOX 4

Border carbon adjustment mechanisms

Border carbon adjustment mechanisms (BCAs) are policy instruments that impose a carbon price at the border on the emissions embodied in certain carbon-intensive goods imported from other jurisdictions. The main objective of a BCA is to equalize the carbon price levied on imported goods with the carbon price charged on domestically produced goods (through a carbon tax or an ETS) to level the playing field and prevent carbon leakage. BCAs are relatively novel, but a conceptually similar approach has been implemented in California for over a decade, which applies its carbon price to imported electricity. The EU's Fit for 55 legislative package includes the first transnational example of a BCA, the EU's Carbon Border Adjustment Mechanism (CBAM).

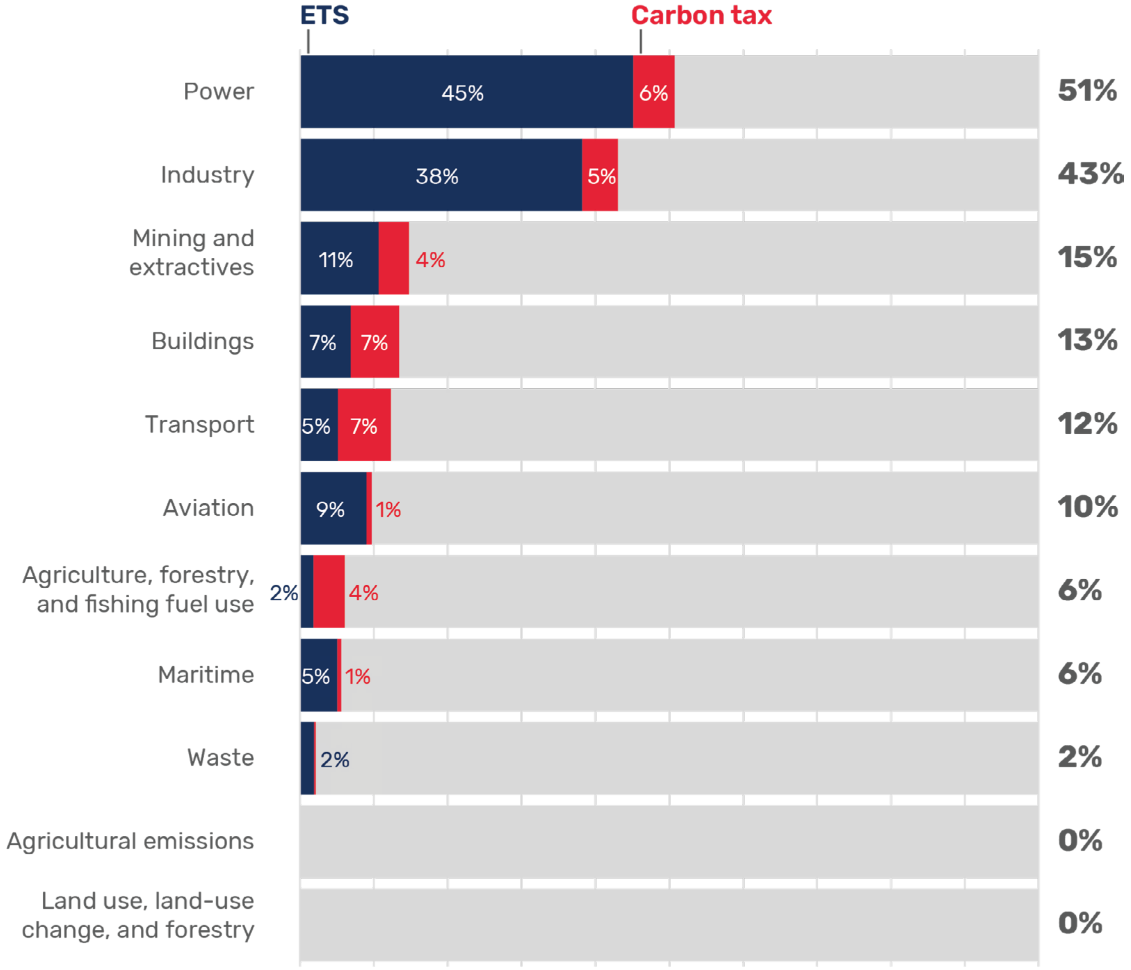
While the EU CBAM is the first of its kind, other economies are considering BCAs. The UK government announced the introduction of its CBAM starting in 2027. In October 2024, it published a response to its CBAM policy design consultation, outlining the scope, mechanics, and impacts of the UK CBAM.[28] Australia, Canada, Japan, and Türkiye have also investigated the possibility of implementing BCAs.[29] Taiwan, China, is developing a CBAM proposal expected to be announced in the middle of 2025.[30] Thailand's draft climate change bill includes provisions on establishing a CBAM similar to the EU CBAM.[31] Chile's 2024 draft sectoral plan included a plan for the Ministry of Economy, Development, and Tourism to study the implementation by 2029 of a BCA for emissions-intensive industries exposed to foreign trade.[32] As noted in the report of the Joint Task Force on Climate Action, Carbon Pricing and Policy Spillovers, while BCAs can help manage leakage, they can also create nontrivial compliance and reporting costs, which could potentially disproportionately adversely affect lower-income countries.[33] This risk can be minimized by streamlining and harmonizing reporting requirements to minimize costs and avoid imposing unintentional barriers to trade.[34]

More countries are exploring policy responses to reduce their exposure to emerging BCAs, including the adoption of carbon pricing. Introducing a domestic carbon price can reduce exposure in two ways: first, by incentivizing improvements in the production efficiency of exported goods; and second, by reducing import charges by demonstrating that a carbon price has already been applied.[i] Growing evidence suggests that the introduction of BCAs is motivating countries to implement carbon pricing and to prioritize carbon pricing in sectors covered by planned BCAs. For example, Türkiye's Medium-Term Program (2023–2025) ties the planned national ETS to the EU CBAM. Israel's decision to adopt a carbon tax cites the need to improve industrial efficiency and references the need to support facilities exposed to international trade.[35] Discussions in Malaysia have cited the potential for a carbon tax on industry as a way of both retaining revenues and creating a level playing field for domestic producers in alignment with the EU CBAM.[36] Viet nam has moved to expedite implementation of its ETS for CBAM sectors, indicating that these sectors will be the first to receive government quotas in 2025 and 2026[37] and China's national ETS coverage expansion has prioritized sectors covered by the EU CBAM.[38]

[i] For example, both the EU and the UK CBAM frameworks include provisions that allow for reduced charges where the associated emissions have already been subject to a carbon price in their country of origin.

Globally, the power sector continues to have the highest levels of carbon pricing coverage with industry a close second due to China's recent scope expansion. Over half of global power sector emissions (which represent almost 30% of global GHG emissions) were covered by a carbon price in 2025. This high level of coverage is largely because almost all ETSs, including those in large economies such as in China, the EU, and Indonesia, cover electricity generation (Figure 3). Power sector decarbonization can enable further emissions reductions downstream as targeted electrification in the industrial and transport sectors would offer emissions reductions when fossil fuels are substituted with lower emissions electricity.[39] However, as shown in the World Bank's *Carbon Pricing in the Power Sector* report,[40] market structure, regulatory frameworks, and decisions about where to position a carbon price in the value chain can limit the potential for carbon pricing to incentivize decarbonization, particularly in the power sector. The expansion of the China National ETS to include cement, steel, and aluminum increased global coverage for the industry sector to over 40%. This is a substantial increase to a diverse and large sector that includes manufacturing and construction and is responsible for around 20% of global GHG emissions.

FIGURE 3
Share of economic sectors' global GHG emissions covered by an ETS or carbon tax



Note: Based on World Bank analysis. Values are not additive due to rounding. Aviation and maritime carbon tax coverage are both less than 1%, waste ETS coverage is 1 %, and carbon tax coverage is < 1%.

ETSs application to road transport and buildings—sectors traditionally not included in ETS frameworks—is expanding

Beyond power and industry, other sectors tend to have lower levels of coverage. Almost 15% of the mining and extractives sector is covered by a direct carbon price. This sector accounts for around 13% of global GHG emissions and includes emissions from ore extraction, natural gas production, and fuel refining. Coverage is highest in the EU ETS due to the inclusion of fuel refining, followed by resource-rich economies such as South Africa, Australia and Canada. Approximately 12% of land transport emissions, which contribute around 13% of global GHG emissions, are covered by a direct carbon price. Buildings show similar coverage at 13% of emissions. Carbon prices in both of these sectors have historically been more commonly applied through upstream carbon taxes on fuels, which can cover smaller, more diffuse emissions sources, like buildings and vehicles. However, ETSs' application to road transport and buildings—sectors traditionally not included in ETS frameworks—is expanding, as noted in the Organisation for Economic Co-operation and Development's (OECD's) *Pricing Greenhouse Gas Emissions 2024*.[41] Many ETSs (e.g., California's and New Zealand's) already apply upstream coverage to these emissions, while the introduction of the EU ETS2 in 2027 will expand the upstream approach currently applied by the Austrian and German ETSs to all EU member states. Domestic aviation emissions coverage stands at around 9%, with a dominant contribution from the EU. Coverage of international aviation and shipping emissions, which fall outside the Paris Agreement framework, continues to advance. International aviation emissions are priced through the Carbon Offsetting Reduction Scheme for International Aviation (CORSIA), a compliance market for carbon credits discussed in chapter 3, and as of April 1, 2025, discussions at the International Maritime Organization regarding GHG emissions pricing for shipping were ongoing.

Other sectors, such as agriculture and waste, remain largely uncovered by carbon pricing. Non-energy agricultural emissions, such as methane from livestock or emissions from the application of fertilizer, produce over 12% of global emissions, but currently remain uncovered by an ETS or carbon tax. Other policies, including carbon crediting, are more typically used to reduce emissions in these sectors. However, Denmark is pioneering a first-of-a-kind carbon tax on livestock and agricultural lime used as a fertilizer. The carbon tax will be implemented gradually, beginning in 2030. It will start at around USD 40 per tCO_2e and rise to over USD 100 per tCO_2e by 2035.[42] The measure includes tax allowances to reduce impacts on farmers. Similarly, only a fraction of global emissions from waste (e.g., landfills and wastewater) face a carbon price, although scope expansions to include waste incineration have been made in Germany and Shenzhen and are being considered in the UK.

Carbon pricing policies continue to incorporate flexibility into instrument design. This includes specific flexibility mechanisms, such as banking and (less frequently) borrowing of emissions allowances, or multi-year compliance periods, to provide businesses with choices regarding if, when, and how to reduce emissions. Other design aspects are aimed at providing greater certainty on the carbon prices, which can help promote confidence in long-term investment decisions. All carbon taxes provide near-term certainty through legislated fixed prices, with some setting out planned rate increases—either linked to inflation (such as Colombia and Poland) or through planned price trajectories (such as Ireland, Singapore, South Africa, and Sweden). ETSs are increasingly adopting design elements to improve price certainty. Almost half have market stability reserves to help manage price extremes, and around 20% have price floors or auction reserve prices. Other jurisdictions, such as Germany and Austria, have implemented a fixed price on a transitional basis. Finally, as discussed in chapter 3, governments are increasingly allowing carbon credits to be used to offset carbon pricing liabilities. Almost two-thirds of ETSs and almost 20% of carbon taxes allow eligible carbon credits as a compliance option.

Governments are increasingly considering rate-based ETSs, which offer flexibility in responding to changing economic conditions. Carbon pricing instruments can also adopt broader policy design elements to help meet jurisdictions' broader policy objectives and account for their specific circumstances. For example, interest in, and adoption of, rate-based ETSs has been growing (Box 5). This includes rate-based ETSs in Australia, China, and Indonesia, as well as Türkiye's proposed ETS. Colorado's recently implemented ETS uses a rate-based approach and has been tailored to meet the state's specific circumstances and to manage the risk of carbon leakage. Colorado is also providing flexibility in its approach to compliance cycles, with some entities initially being permitted to meet their emission liabilities over a three-year period.

Interest in, and adoption of, rate-based ETSs has been growing

BOX 5

The growing role of rate-based emissions trading schemes

Rate-based ETSs are gaining traction, as more countries adopt flexible approaches to manage competitiveness and price impacts while driving decarbonization. Rate-based ETSs differ from cap-and-trade systems in that they do not set an overall cap on emissions. Instead, they regulate emissions relative to output and in some jurisdictions operate in a manner similar to tradable performance standards. Rate-based ETSs set benchmark emissions intensity levels, typically defined as a quantity of emissions per unit of output, such as 2 tCO_2e per ton of steel produced. Each covered entity has an emissions constraint or "baseline," which is calculated by multiplying its output by the benchmark emissions intensity. If a regulated entity's emissions are below its baseline in a year, it can receive credits, and if emissions exceed the baseline, it must acquire and surrender credits equal to its excess emissions. Baselines can decline over time in line with a jurisdiction's emissions reduction targets. Rate-based ETSs are becoming more common, especially in middle-income countries as governments seek to manage competitiveness and price impacts, particularly where future growth and hence demand is uncertain.[43]

A rate-based approach is being used in Australia, Canada, China, and Indonesia. China's national rate-based carbon trading system determines emissions limits based on the technology used by entities. The system is designed to avoid excessively penalizing companies that rely on older technologies, which are often located in poorer regions. It incentivizes the adoption of more efficient technologies but may not encourage a shift in fuel type, as coal and natural gas have separate technology-specific rates.[44] India is developing a nationwide ETS and currently operates an energy efficiency trading scheme called Perform, Achieve and Trade. Companies are assigned an energy-related GHG emission intensity target and earn tradable certificates if they exceed them. These certificates are traded on designated exchanges.[45] Canada's OBPS and Australia's Safeguard Mechanisms are both rate-based systems that set emissions intensity standards for industrial sectors.

Rate-based ETSs provide additional flexibility to businesses, but they provide less certainty on emissions reductions and generally do not generate revenue for governments. Due to the additional flexibility, rate-based systems can support economic growth while maintaining a requirement that entities improve their efficiency over time. Rate-based systems can also protect against carbon leakage—firms do not have an incentive to reduce production domestically to emit under their baseline, lowering the incentive to relocate production to jurisdictions with weaker carbon policies.[46] On the other hand, if benchmarks are differentiated by technology or fuel type, it can be harder for clean firms to compete, since their less-efficient competitors receive higher baseline allocations per unit of the same product. From a macroeconomic perspective, rate-based ETSs automatically adjust to reflect growth in production. This can help manage political economy challenges by preventing high permit prices during economic growth and price drops during recessions. However, the absence of a cap means the level of emissions reductions delivered by a rate-based ETS is less certain than a cap-and-trade. Further, because rate-based ETSs allocate all emissions allowances to covered entities through baseline allocations, they do not generate government revenue (unless coupled with an additional mechanism, such as in Canada, where companies can comply with Canada's OBPS by paying into a public fund).

2.2 Despite inflationary pressures, carbon prices held steady in real terms, but with variation across jurisdictions

Nominal carbon prices increased slightly in the 12 months prior to April 1, 2025. At an individual policy level, there was a range of nominal carbon price changes. Slight nominal price increases were observed in large ETSs, such as in the China, EU, and the Republic of Korea ETSs. Other ETSs, such as in California and New Zealand, saw slight decreases. Several established carbon taxes saw the implementation of planned increases in tax rates, including in Colombia, Denmark, Estonia, Iceland, Ireland, Norway, and South Africa, but most of these were modest. Figure 4 shows the prices as of April 1, 2025, across ETSs and carbon taxes and different degrees of coverage.

Inflation has had varied effects on carbon prices, depending on policy design. In Chile, France, and Spain, tax rates in real terms have fallen over time and thus inflation has eroded the real value of carbon taxes.[ii] Some carbon taxes—for example in Colombia and South Africa—include an automatic adjustment for inflation. There is often a lag in applying the inflation adjustment so the price may see an initial decrease in real terms before the adjustment takes effect. Other countries, such as Singapore, have planned rate rises to increase price incentives even with inflation. Inflation—like other macroeconomic fluctuations—affects ETSs differently from carbon taxes, because ETS prices adjust dynamically based on supply and demand within the emissions cap. Inflation can influence expectations of both supply and demand, but ultimately carbon prices in ETSs align with the ambition reflected in the cap.

Inflation has eroded the real value of carbon taxes

[ii] In its Effective Carbon Rates 2023 report, the OECD observed a reduction in real carbon tax rates in the road transport sector due to a lack of indexation to inflation.

FIGURE 4
Prices and coverage across ETSs and carbon taxes, as of April 1, 2025

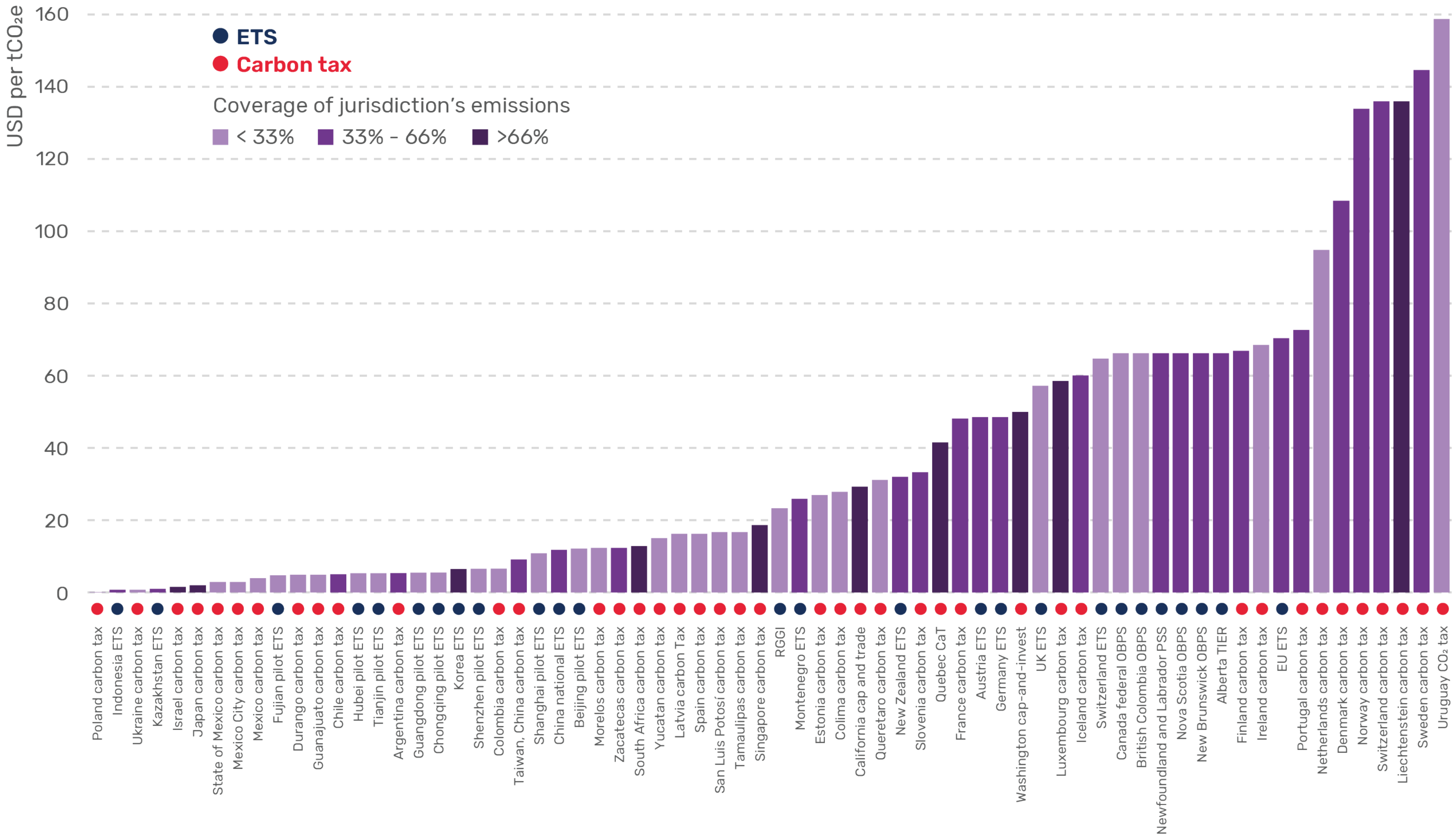
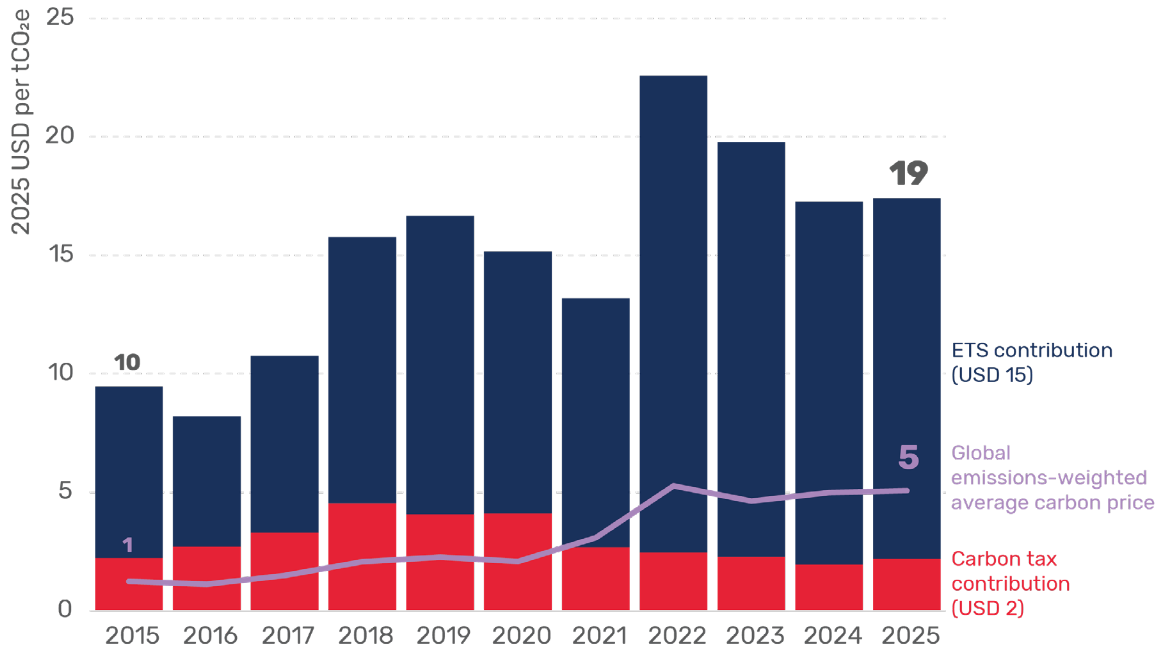


FIGURE 5
Emissions-weighted average carbon prices for covered emissions and global emissions, 2015–2025



Note: The purple line shows the global emissions-weighted average carbon price. This price accounts for all global emissions, including those without a carbon price. Jurisdictions without a carbon price are included in the calculation of the global emissions-weighted average carbon price, but treated as having a carbon price of zero. The global emissions-weighted average carbon price metric provides an indication of global progress of carbon pricing, taking both price and coverage into account. The blue/red bars show average carbon price for implemented instruments. The global emissions-weighted average carbon price provides an estimate of the weighted average carbon price across countries with an implemented ETS or carbon tax. That is, each implemented carbon price is weighted by its contribution to global covered emissions, with covered emissions defined as the total emissions in each jurisdiction that are subject to that jurisdiction's carbon pricing instrument. As a result, the global emissions-weighted average carbon price only accounts for prices in those jurisdictions that have implemented a carbon price—it does not include those jurisdictions without a carbon price. The average carbon price for implemented instruments therefore provides a global snapshot of how carbon prices have changed over time in jurisdictions that have implemented a carbon price.

Average carbon prices have increased over the past 10 years. The average carbon price[iii] for implemented instruments has almost doubled in the past 10 years in real terms—from just above USD 10 per tCO_2e in 2015 to around USD 19 per tCO_2e in 2025 (see Figure 5). The contribution of carbon taxes to these average covered carbon prices has remained relatively stable over this period. The increase was primarily driven by allowance prices in the EU ETS, which saw significant rises over the past 10 years. Recognizing that most global emissions (over 70%) do not currently face a carbon price, Figure 5 also includes a global emissions-weighted average carbon price. This metric accounts for the unpriced emissions in economies without an ETS or a carbon tax and therefore reflects changes in both price and global coverage over time. The *global emissions-weighted* average carbon price in 2025 was around USD 5 per tCO_2e—over four times higher than the value in 2015. Importantly, these carbon pricing metrics provide a useful indication of progress, but they should not be interpreted as a measure of ambition or effort.[47] In addition, as noted in the report of the Joint Task Force on Climate Action, Carbon Pricing and Policy Spillovers, aggregated metrics (at the national or global level) can mask the heterogeneity of carbon prices across jurisdictions, sectors, fuels, and products.[48]

[iii] The average carbon price provides an estimate of the emissions-weighted average carbon price across countries with an implemented ETS or carbon tax. The contribution of each implemented ETS and carbon tax to the average price is determined by the amount of emissions it covers.

The price incentives provided through indirect carbon pricing are often considerably larger than the incentives provided by ETSs and carbon taxes

However, the average direct carbon prices only tell part of the story. Overall, the existing price levels of ETSs and carbon taxes remain below the levels found in the modeled scenarios that achieve global temperature goals, as assessed by several organizations. In 2017, the High-Level Commission on Carbon Prices estimated that direct carbon prices (in 2017 USD) of at least USD 40 to 80 per tCO_2e by 2020 and USD 50 to USD 100 per tCO_2e by 2030 were consistent with limiting temperature rises to well below 2°C.[49] In the 2022 Intergovernmental Panel on Climate Change Sixth Assessment Report, the modeled scenarios that limit warming to 2°C have a marginal abatement cost around USD 90 per tCO_2e (in 2015 USD) in 2030 and USD 210 per tCO_2e in 2050.[50] In the Network for Greening the Financial System's most recent update in November 2024, the scenarios consistent with a transition toward net zero in 2050 have a carbon price (in USD 2010) of around USD 300/tCO_2e by 2035.[51] Any comparison to these benchmark levels must consider the spectrum of pricing and non-pricing policies that can support decarbonization efforts. In relation to pricing policies, indirect carbon prices, such as fuel taxes, provide an important price incentive that is not captured in the direct carbon pricing metrics that are the focus of this report. In most regions, due to the prevalence of fuel excise taxes, the price incentives provided through indirect carbon pricing are often considerably larger than the incentives provided by ETSs and carbon taxes. This is the case in Latin America where several countries have recently reformed fuel taxes. The combination of higher direct carbon prices, the alignment of energy excise taxes with broader fiscal and climate policy, and the elimination of fossil fuel subsidies has resulted in an increase in the total carbon price in Latin America (Box 6).

BOX 6

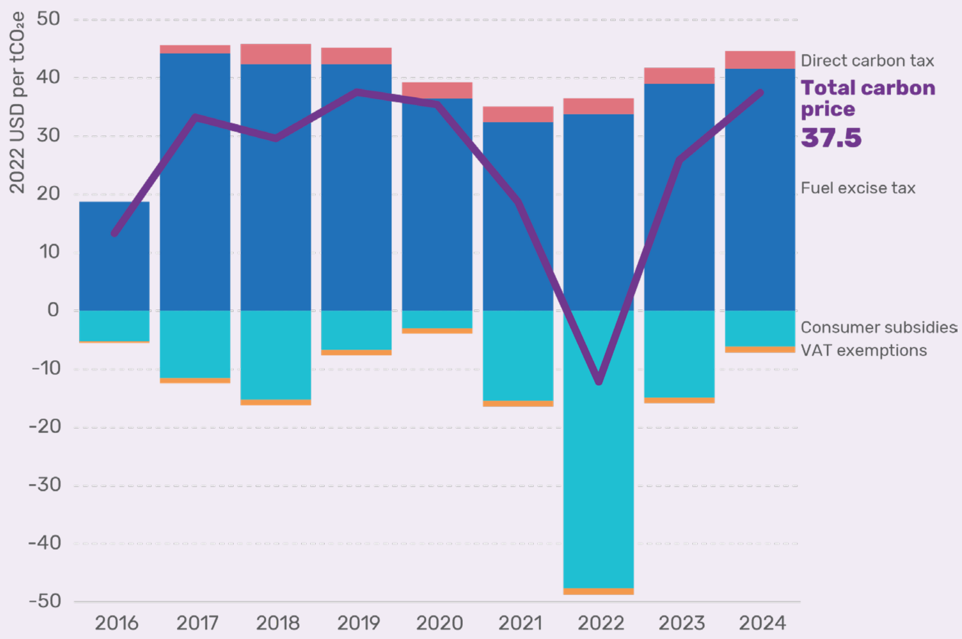
Total carbon pricing in Latin America

Developments in Latin America highlight how broader fiscal reforms that improve the carbon price incentive might complement progress on carbon pricing for fuel combustion-based emissions. Direct carbon pricing through carbon taxation and emissions trading provides a powerful incentive to reduce emissions across an economy. Changes to indirect carbon pricing policies, such as fuel excise taxes and fossil fuel subsidies, can also significantly influence production, consumption, and investment choices. The World Bank's total carbon price[iv] provides a comprehensive picture of the overall carbon price incentive by incorporating both direct and indirect carbon pricing policies.[52] Similarly, the OECD publishes its net effective carbon rates, which combine indirect (which OECD terms "implicit") carbon pricing and direct carbon pricing for 79 countries.[53]

In Latin America net energy tax rates are being adjusted upward following reductions implemented during the global energy crisis. In 2022, amid high inflation and rising energy prices, governments in Latin America, as in many other regions, provided price relief to consumers through reduced fuel taxation and increased fuel subsidies. Over the past two years, many of these measures have been reversed, with excise taxes being restored to their pre-crisis levels and some subsidies being phased out. As a consequence, for most countries in Latin America the total carbon price has recovered from recent downward trends (Figure 6) and is now positive. Fuel subsidies have been reduced in several countries, including Colombia, Ecuador, and Peru. Taxes have also increased in Argentina, Chile, and Mexico, as the excise rates of fuel taxes in the latter two countries are formally linked with oil prices. While the drivers for subsidy reforms are different across countries, some governments are acknowledging that the public budget requirements of fossil fuel subsidies divert resources that could be used to meet broader policy objectives. A key outcome of these reforms is that Latin American governments now have additional fiscal space. For example, in Colombia, the finance minister called for eliminating fuel subsidies to reallocate resources toward social spending while addressing climate change,[54] and Ecuador's central bank acknowledged that fuel subsidies are less beneficial for the economy than targeting the same resources at social spending or public investment in education, energy, health, security, and roads.[55]

[iv] The price gap approach developed by Agnolucci et al. (2023) was complemented by a bottom-up approach developed by Campmas et al. (forthcoming). The World Bank's Total Carbon Pricing approach is a comprehensive methodology designed to calculate the overall carbon pricing signal affecting the emissions from CO_2 emitting fuels based on local data—detailed if possible—on both direct carbon pricing instruments, such as carbon taxes and ETSs, and indirect instruments like energy taxes, subsidies, and VAT differentials. This approach helps standardize, aggregate, and compare the level of carbon pricing efforts across different jurisdictions, sectors, and policy instruments. Total Carbon Price estimates with this bottom-up approach include several instruments (such as sectoral tax exemptions, local taxes on certain fuels, price interventions, or fuel price stabilization mechanisms) that are not considered in other methodologies but have significant effects on final prices.

FIGURE 6
Total carbon price by component in Latin America, 2016–2024

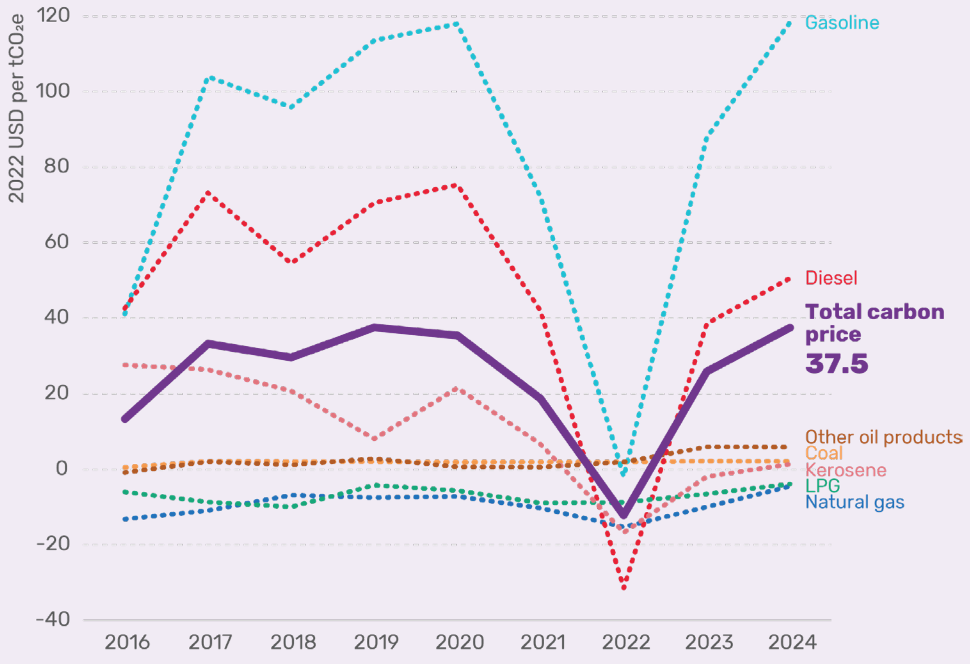


Note: Average total carbon pricing for CO_2 emissions from fuel combustion in Latin America, weighted by the share of each country's CO_2 emissions from fuel combustion over the sample total. Values in 2022 USD. The countries included in the sample are Argentina, Chile, Colombia, Dominica, Jamaica, Mexico, Paraguay, Peru, St. Lucia, and Uruguay, from 2017 to 2023 and up to 2024 when preliminary data was available.

While direct carbon pricing instruments are an important part of the total carbon price, their contribution remains relatively low compared to fossil fuel taxes (and subsidies), particularly in the transport sector. Over the past five years, direct carbon pricing, primarily through carbon taxes, has contributed less than 13% to the total carbon price aggregated across Latin American countries.

Across Latin America, diesel and gasoline typically face a high total carbon price while natural gas and liquefied petroleum gas (LPG) are largely untaxed or even subsidized. Because excise taxes and subsidies are not referenced to emissions, or in some cases are only applied selectively, the total carbon price differs substantially across fuels and sectors. Even though taxes are high for both diesel and gasoline, CO_2 emissions from diesel are priced substantially lower than those from gasoline (Figure 7). In the transport sector, diesel taxation is lower due to concerns about the inflationary impact of increased transportation costs for goods and services. In several countries natural gas has been promoted, and natural gas has remained largely untaxed and has benefited from other measures that support its use. This has resulted in a slightly negative total carbon price. Similarly, LPG also has a negative total carbon price, although subsidies directed toward LPG have typically been aimed at shifting households away from higher-emitting fuels. Coal remains essentially untaxed. Importantly, these estimates do not include emissions from agriculture and land use change—including deforestation—which represent more than 40% of GHG emissions in the region.

FIGURE 7
Carbon prices by fuel in Latin America, 2017–2024

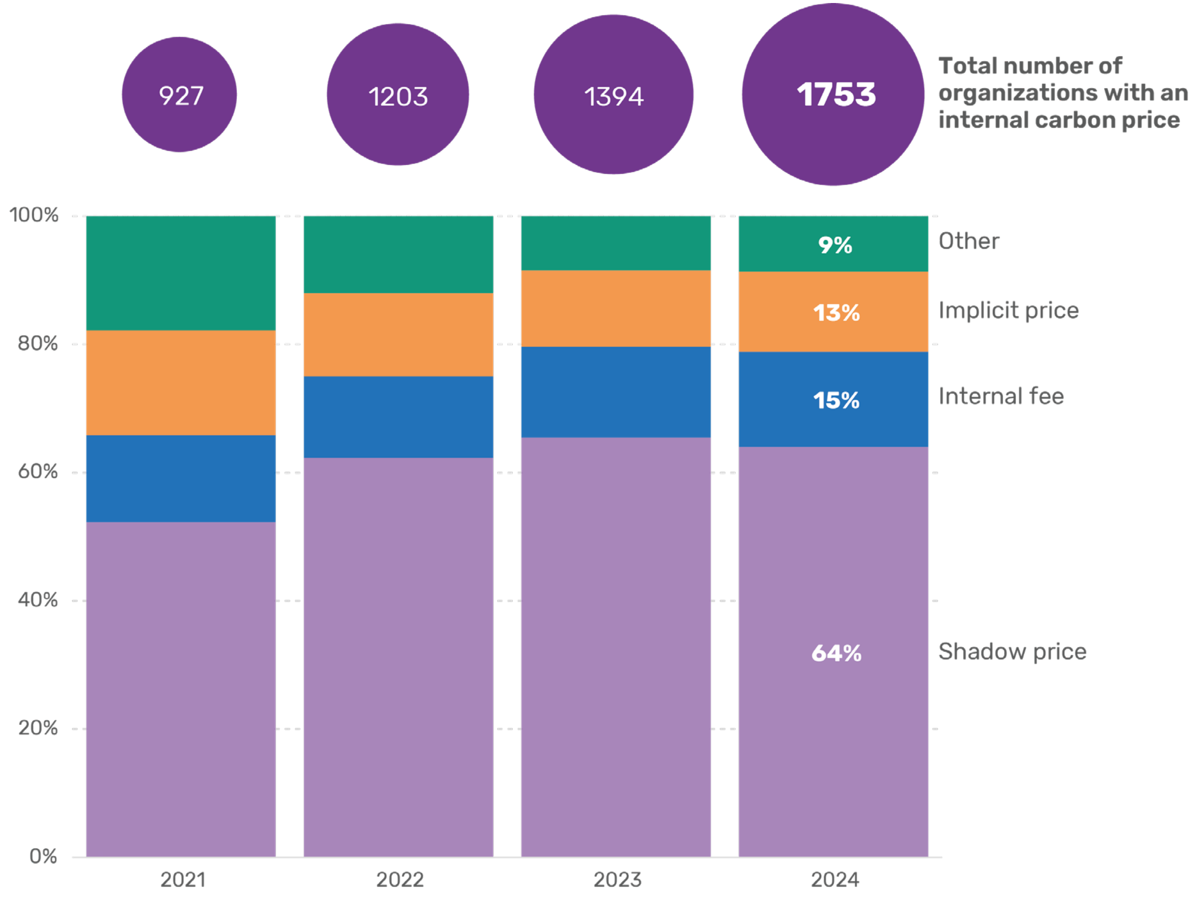


Note: Average total carbon pricing for CO_2 emissions of each fuel in Latin America, weighted by the share of each country on CO_2 emissions from each of the fuels over the sample total. Values in 2022 USD. The countries included in the sample are Argentina, Chile, Colombia, Dominica, Jamaica, Mexico, Paraguay, Peru, St. Lucia, and Uruguay, from 2017 to 2023 and up to 2024 when preliminary data was available.

Stark differences in the total carbon price across fuels and sectors dampen incentives to adopt energy efficiency measures or the switch to lower emission alternatives. The World Bank's report *Taxing and Subsidizing Energy in Latin America and the Caribbean: Insights from a Total Carbon Price Approach* concludes that reform of existing taxes and/or the introduction of direct carbon pricing instruments could allow better alignment of the carbon price incentive across fuels and, combined with complementary actions at the sector level, would provide stronger incentives for technological transformation and mitigation of GHG.[56]

An increasing number of organizations are using internal carbon prices as a tool to help manage climate-related risks, capture opportunities, and inform capital investment decisions. While administratively and operationally different to carbon taxes and ETSs, businesses' use of internal carbon pricing offers insights into how the private sector is incorporating carbon pricing into its business decisions. According to data reported to the global nonprofit CDP, 1,753 companies across 56 countries reported using internal carbon pricing in 2024—an 89% increase on the 927 companies that reported using an internal carbon price in 2021 (Figure 8). The drivers behind the increase center on a continued need to decarbonize investments, promote energy efficiency, set and/or achieve climate-related policies and targets, and incentivize consideration of climate-related issues in decision-making and risk assessments. Shadow carbon pricing, which assigns a theoretical cost to emissions to help evaluate investments and organizational decisions, is increasingly the dominant type of internal carbon price used by companies.

FIGURE 8
Number of organizations using an internal carbon price and share of type of internal carbon price used, 2021–2024



Note: Companies may report using multiple types of internal carbon prices (e.g., a shadow price and an internal fee). The percentages are also based on companies who disclose their choice of instrument. Therefore, the sum of reported use of internal carbon price type is not equal to the total number of organizations with an internal carbon price. Source: CDP

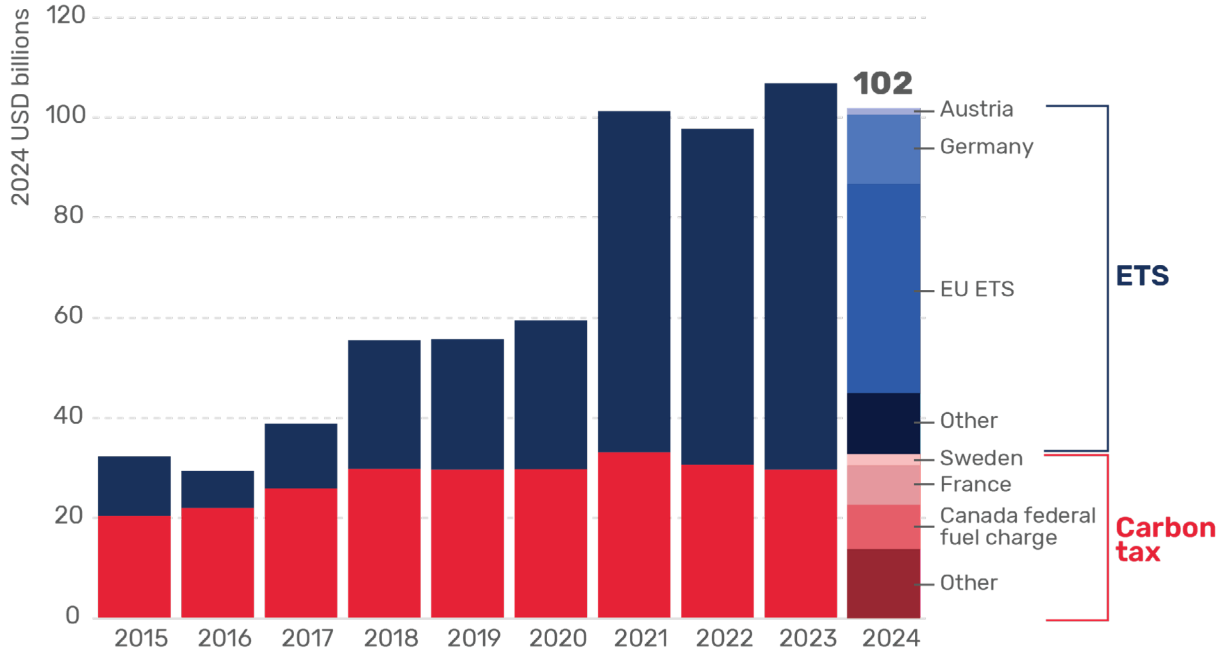
For organizations that disclosed the type of internal carbon price they use, almost two-thirds of organizations adopted a shadow carbon price in 2024. This is a significant increase from 2021, where shadow carbon pricing was used by around half of the reporting organizations (Figure 8). The second most common is *internal carbon fees* (15%), which put a monetary value on emissions to fund sustainability initiatives, followed by *implicit carbon pricing* (13%), where the carbon price is calculated retrospectively based on the costs of implementing emissions reduction projects. The level of internal carbon price applied by companies in 2024 varied significantly—from under USD 10 per tCO_2e to over USD 130 per tCO_2e, with around a quarter of organizations applying a price of less than USD 20 per tCO_2e. Higher internal carbon prices are becoming more common—in 2024 15% of companies applied a price above USD 130 per tCO_2e, an increase from 11% in 2023.

The level of internal carbon price applied by companies in 2024 varied significantly

2.3 Global carbon pricing revenues declined slightly, but continue to deliver over USD 100 billion to government budgets

Carbon pricing continues to provide a small but important revenue stream for public budgets. There are increasing demands for public resources, including to support decarbonization, build resilience, and protect nature and biodiversity, in addition to broader budgetary demands.[57] This places additional pressure on public finance and debt sustainability, meaning many countries are investigating options for fiscal consolidation and domestic revenue mobilization. However, despite these additional pressures, and its broader fiscal advantages, carbon revenues in 2024 declined slightly from 2023 highs—hovering at just over USD 100 billion. The contribution and year-on-year change differs between ETSs and carbon taxes. Revenues from ETSs decreased by around 10%, in real terms, driven by a reduction in revenue from large ETSs, including in the EU, the UK, and in the US states of California and Washington (Figure 9). These reductions were largely due to generally lower allowance prices during 2024 compared to 2023. In the EU (the largest contributor to global revenue), the decline in collected revenues occurred despite the continued reduction of free allocations, which increases auction volumes and the associated revenue base.

FIGURE 9
Total revenues from ETSs and carbon taxes, 2015–2024



The fall in ETS revenue contrasts with carbon taxes, which experienced an increase of approximately 10%, albeit from a smaller base. This increase was driven by increases across several carbon taxes, including in Mexico, Norway, Portugal, Switzerland, and Canada's federal fuel charge before it was removed beginning April 1, 2025. While USD 100 billion in carbon revenue reflects a three-fold increase over the past decade, it remains a fraction of total government tax revenue collected globally and significantly less than the USD 620 billion spent on fossil fuel consumption subsidies in 2023.[58]

Revenue collected from carbon pricing has been used for multiple purposes. This includes promoting environmental and development outcomes, such as investments targeting clean energy projects. For example, California has directed almost USD 28 billion (cumulatively) collected from its ETS toward projects that help deliver specific objectives, such as decarbonization, public health, and economic growth.[59] Carbon revenues are also being used to manage the impact of rising costs through transfers by supporting affected businesses and households, which can help create jobs where revenues are used to reskill workers. Almost 9% of EU ETS revenues were allocated to promote improved social outcomes, including skill development.[60] Carbon pricing revenue has also been used to offset labor taxes, which can promote economic growth through higher labor productivity.[61] For example, in Denmark the carbon tax was introduced in the 1990s in a revenue-neutral way as part of a larger environmental tax package. Additional case studies are summarized in Box 7.

While USD 100 billion in carbon revenue reflects a three-fold increase over the past decade, it remains a fraction of total government tax revenue

BOX 7

Three real-world examples of carbon pricing revenue allocation or planned use

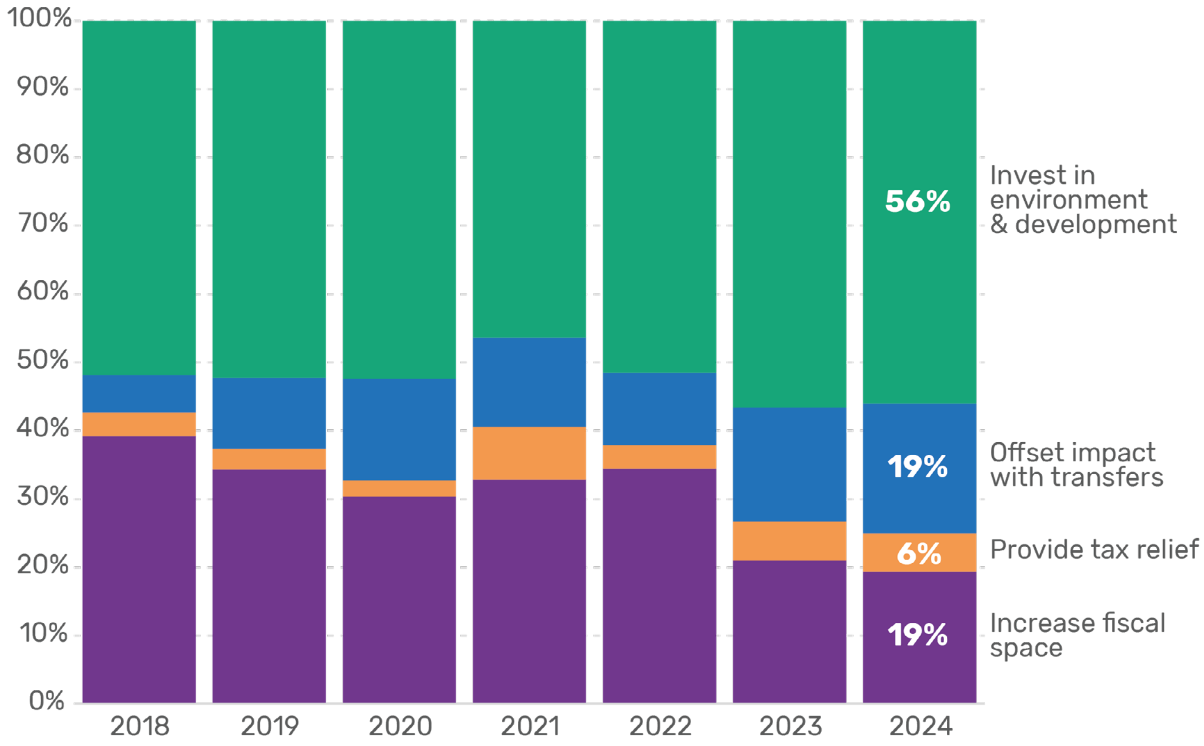
- **Supporting vulnerable groups under EU ETS2:** In the EU, the Social Climate Fund was created to sit alongside the forthcoming EU ETS2, which becomes fully operational in 2027. The Social Climate Fund is intended to provide vulnerable sectors and groups with financial support in the transition to net zero. A key component is the development of National Social Climate Plans, through which financial support is directed to identified affected groups. Measures can include energy efficiency and renovation of buildings; low-carbon transport; and clean heating and cooling.[62]

- **Supporting industrial decarbonization and compensating indigenous communities in Brazil:** Brazil's law establishing its ETS prescribes how future carbon revenues must be allocated in the first five years: 15% to the operationalization and maintenance of the ETS, 75% to finance decarbonization of activities at covered facilities, and at least 5% to compensate Indigenous peoples and communities.[63]

- **Compensating households in Canada:** In Canada, revenues from the federal fuel charge (prior to its repeal in April 2025) were rebated to households, with additional supplements for rural households and large families. Initially, the rebate was designed as a tax cut until the government began directly depositing rebates. However, studies found that only 12% of respondents in 2022 knew that the revenues were redistributed as rebates. In 2023, the Canadian government made updates requiring all banks to include labels to clarify the link between the carbon tax and the rebate.[64]

An increasing proportion of carbon pricing revenue is being directed toward low-carbon development projects. Analysis from the Institute for Climate Economics (I4CE) indicates that in 2024 around 56% of carbon revenues were earmarked toward environment, infrastructure, and development projects, over four percentage points higher than in 2018.[v] This trend partly explains the rising number of green funds, for example in Colombia, Portugal, and Québec. These funds are mostly geared toward climate mitigation, climate adaptation, and low-carbon innovation. Around 25% of global carbon revenue was used to offset the social impact of the transition in 2024, either through direct transfers of these proceeds to households and companies impacted by carbon pricing (19%) or through tax cuts (6%) (Figure 10). This share has increased since 2018, mainly due to a growing portion of transfers in the EU ETS, increased revenues collected through Canada's federal fuel charge (returned to the citizens through the Canada Carbon Rebate), and the implementation of new policies (German and Austrian ETSs), which dedicate all or part of the proceeds toward easing the transition for households and businesses.

FIGURE 10
Share of ETS and carbon tax revenue by category, 2018–2024



[v] Note: I4CE analysis is based on revenue use in 2024, except for EU where revenue use is inferred based on 2023 revenue allocations and mandated allocations, e.g., the latest revision of the EU ETS Directive increased the targeted EU ETS revenue use toward climate and energy objectives from 50% to 100%.

Free allocations, tax exemptions, and use of carbon credits as offsets represent foregone government revenue. To help ease the introduction of ETSs, it is common, at least initially, to allocate allowances freely, rather than selling via auction. While free allocation can help manage carbon leakage and international competitiveness concerns, it reduces the revenues collected by governments. I4CE analysis indicates that forgone annual revenue (as represented by the estimated value of freely allocated allowances) in 2023 for implemented cap-and-trade systems with auctioning was around USD 67 billion, which is close to the total revenue generated by ETSs.[65] Similarly, in the UK it is projected that the future phaseout of free allowances for the sectors covered by the UK CBAM could amount to almost USD 2 billion of additional revenues by 2034.[66] Carbon tax exemptions also represent foregone revenue, although explicit exemptions are less common than free allocation, meaning the amount of forgone revenues from carbon taxes is relatively smaller. South Africa provides tax rebates through free allowances, which for some industries represents an effective rebate of over 90%, significantly reducing the amount of revenue collected. Using carbon credits as offsets provides greater flexibility to businesses and can stimulate investment in uncovered sectors, but it also reduces potential carbon revenue collected. For example, in 2024 around 17.6 million carbon credits were used to offset carbon tax liabilities in Colombia and almost 4 million in South Africa—translating to over USD 100 million and USD 40 million in forgone revenue, respectively.

While free allocation can help manage carbon leakage and international competitiveness concerns, it reduces the revenues collected by governments

CHAPTER 3

Carbon crediting markets and mechanisms

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In 2024, carbon credit markets saw retirements increase, issuances stabilize, and average prices slightly decline. However, there has been increasing divergence in demand, supply, and prices across different types of credits. The growth in carbon credit retirements was mainly due to a spike in demand from domestic compliance markets, while demand from voluntary buyers dipped slightly. Supply continued to outstrip demand, moving the global pool of unretired credits from independent crediting mechanisms close to 1 billion tons. Pricing also shows differentiation across credit types. Credits from carbon removal projects (such as afforestation and reforestation) continue to exhibit price premiums, and credits eligible under international compliance markets and those with higher-quality ratings also attracted higher prices.

3.1 Domestic compliance demand for carbon credits increased, while voluntary buyers shifted toward carbon removals

The carbon credit market landscape is complex, with increasing levels of overlap and interaction with carbon taxes and ETSs. Global carbon credit markets consist of a diverse range of sources of supply, sources of demand, and trading frameworks (Box 8). Historically, there were more discrete markets for carbon credits, where specific sources of supply were matched to distinct sources of demand. For example, independent crediting mechanisms largely supplied the voluntary buyers, while international crediting mechanisms were primarily used by countries to meet international commitments (e.g., under the Kyoto Protocol). In recent years, the linkages and overlaps across compliance and voluntary markets, as well as international and domestic markets, have increased. As a result, few sources of supply can be matched to a single source of demand (Figure 11). For example, certain carbon credits from independent crediting mechanisms (which have historically been used by voluntary buyers) are increasingly permitted in domestic compliance markets—such as in California, Chile, Colombia, and South Africa—in addition to being used by businesses to meet voluntary commitments.

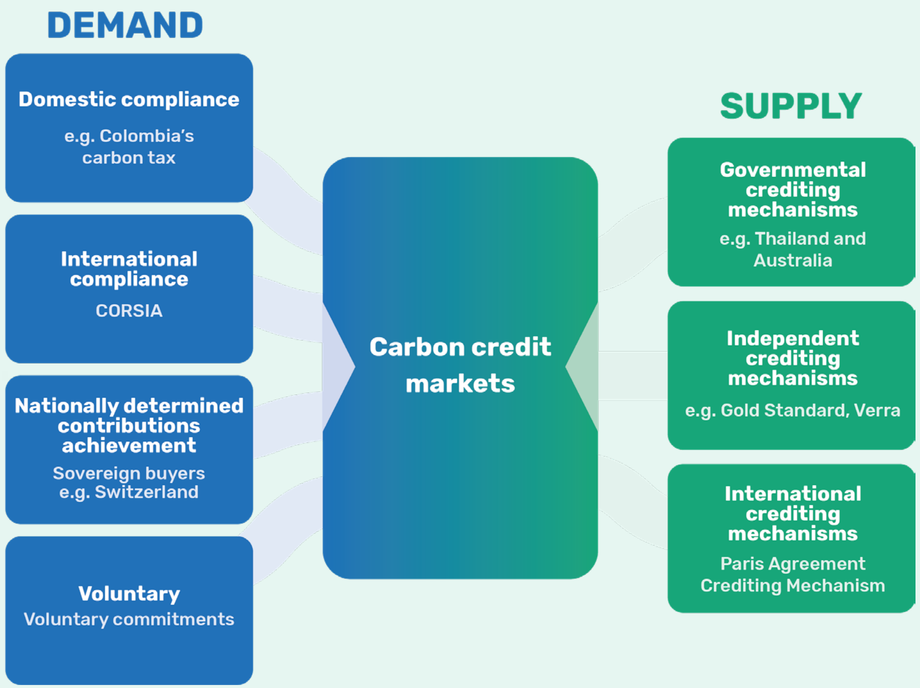
In recent years, the linkages and overlaps across compliance and voluntary markets, as well as international and domestic markets, have increased

BOX 8

The carbon credit market landscape

Carbon credit markets trade "carbon credits," which are units that represent an emission reduction, avoidance or removal equivalent to 1 tCO_2e, generated through voluntarily implemented mitigation activities. Emissions reductions can be generated, for instance, by destroying methane generated at landfills or meeting energy demand with solar or wind instead of fossil fuels. Avoided deforestation, including Reducing Emissions from Deforestation and Forest Degradation, is another example of an emission reduction project. Carbon credits can also represent carbon dioxide removals from the atmosphere, such as sequestering carbon through afforestation or directly capturing carbon from the air and storing it.

FIGURE 11
Sources of demand and supply in global carbon credit markets



Note: While there is crossover between categories, not all sources of carbon credits are fully fungible across demand segments. For example, international compliance and nationally determined contribution achievement require authorized credits that include a corresponding adjustment.

The four main sources of demand for carbon credits are as follows:

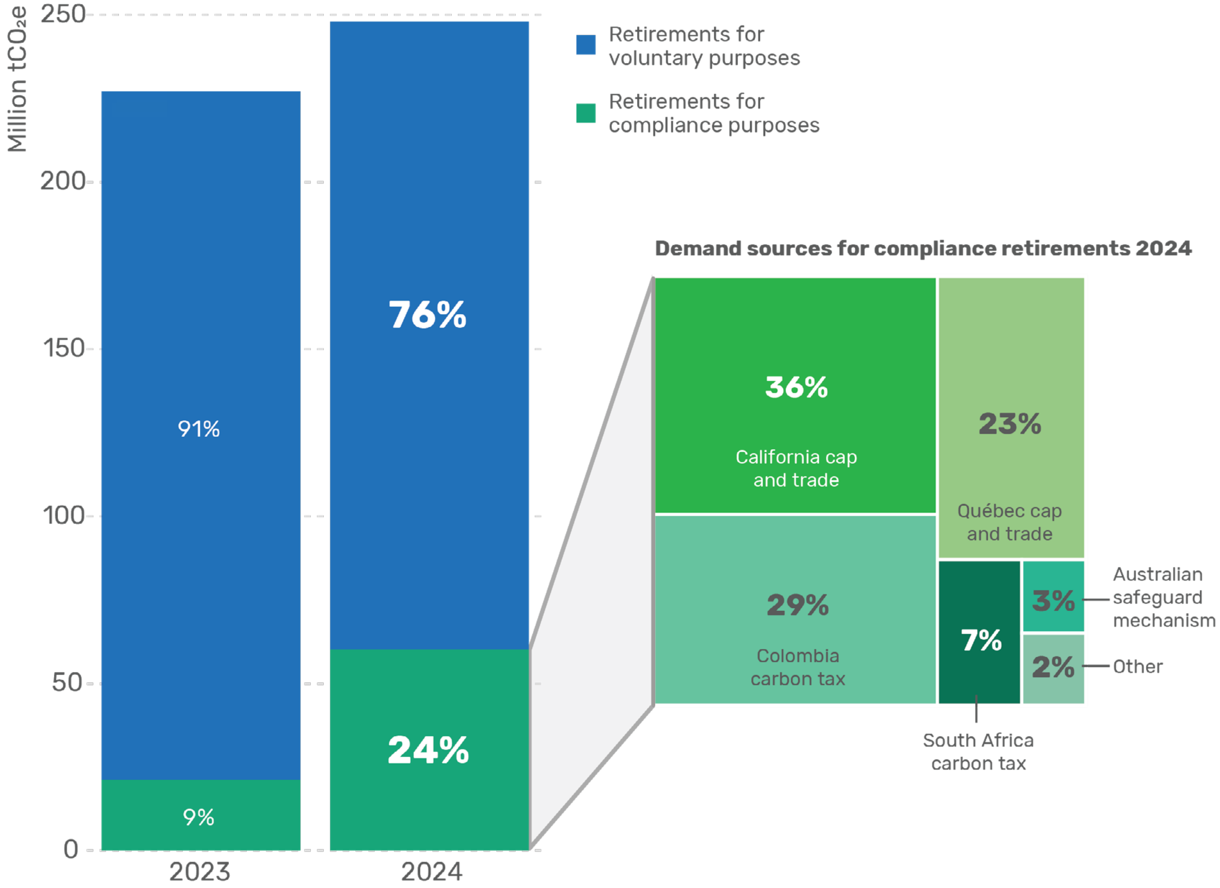
- **Domestic compliance:** This consists of liable entities under mandatory compliance schemes, such as ETSs and carbon taxes, being allowed to purchase carbon credits to meet a portion of their compliance obligations. Examples include liable entities purchasing credits for compliance with Colombia's carbon tax, the Republic of Korea's ETS, and California's Cap-and-Trade Program.
- **International compliance:** CORSIA, introduced by the International Civil Aviation Organization, is currently the only international sectoral compliance system. CORSIA requires covered airlines to offset the growth in their CO_2 emissions beyond 2019 levels by purchasing carbon credits issued by approved crediting mechanisms.
- **Nationally determined contribution (NDC) achievement:** This refers to sovereign demand for international carbon credits (internationally transferred mitigation outcomes) authorized under Article 6 of the Paris Agreement to meet (or outperform) national climate targets (articulated through NDCs submitted to the United Nations Framework Convention for Climate Change). Examples of sovereign buyers include Singapore and Switzerland.
- **Voluntary:** This involves private entities purchasing carbon credits to meet voluntary mitigation commitments. These commitments include corporate net zero targets and other voluntary climate or environmental claims.

The supply of carbon credits (discussed in Section 3.2) is generated through three main categories of crediting mechanisms:

- **Governmental crediting mechanisms:** These are administered by one or more national or sub-national governments. Examples of such mechanisms include the Thai-VER scheme, the Californian Compliance Offset Program, and the Australian Carbon Credit Unit Scheme.
- **Independent crediting mechanisms:** This category includes mechanisms administered by nongovernmental organizations. Examples include Verra's Verified Carbon Standard (VCS) and Gold Standard.
- **International crediting mechanisms:** These are administered or managed by an international organization established with the authority of national governments, such as UN agencies. The principal international crediting mechanism is the centralized Paris Agreement Crediting Mechanism (PACM), established under Article 6.4 of the Paris Agreement.

Overall, carbon credit retirements rose, supported by increased demand from compliance buyers. Retirements reflect the annual use of carbon credits toward, for example, making specific claims or complying with a carbon pricing obligation. Retirements serve as a useful proxy for demand, as they do not include cross-temporal demand, such as buyers purchasing credits for future use. Total retirements in 2024 were around 15% higher than in 2023 (Figure 12). The rise is primarily attributable to a short-term spike in demand for compliance purposes (almost three times higher than in 2023), whereas total retirements for voluntary purposes declined slightly, year on year.[vi] As a result, in 2024, retirements for compliance purposes accounted for almost a quarter of all observed retirements (compared to 9% in 2023). Over half of compliance retirements in 2024 were from entities liable under the California and Québec ETSs,[67] where businesses were required to finalize obligations for the three-year compliance period (2021–2023) by November 2024.[vii] While the increase in retirements was partly driven by these multi-year compliance cycles, compliance markets are nevertheless an important ongoing source of demand for carbon credits. This role may increase as new sources of compliance demand emerge (Box 9). This includes Singapore's carbon tax and Korea's ETS, which both permit the use of international credits.

FIGURE 12
Total carbon credit retirements for compliance and voluntary purposes and demand sources for compliance retirements, 2023–2024

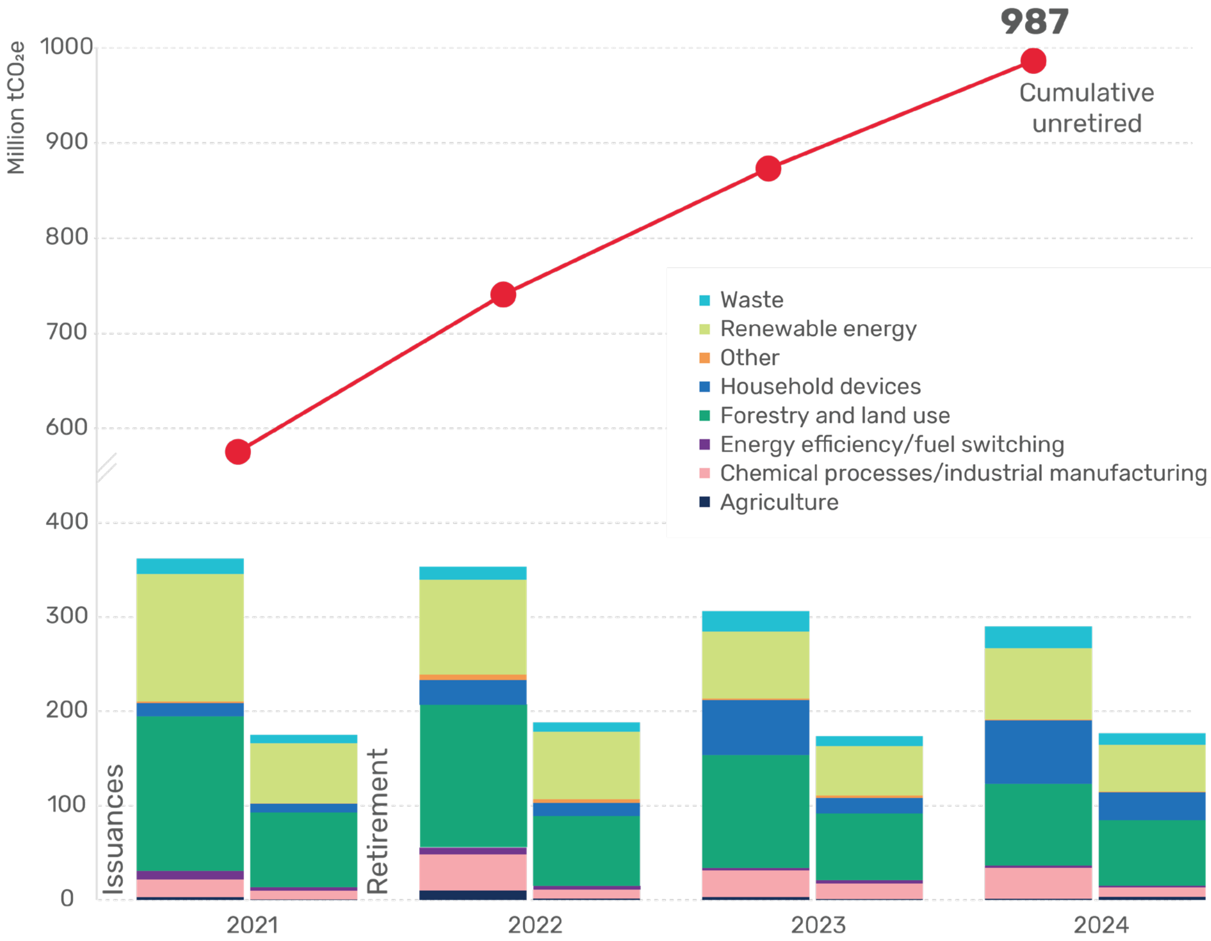


Note: Based on a joint analysis by the World Bank and AlliedOffsets.

[vi] Based on analysis jointly delivered by the World Bank and AlliedOffsets.
[vii] For example, in California's cap-and-trade program, compliance periods are triennial, i.e., three years in length, with smaller annual events in between. For the program's fourth compliance period, covering 2021-2023, covered entities had to submit compliance instruments for 30% of their 2021 emissions in 2022; for 30% of their 2022 emissions in 2023; and then in 2024 for 70% of their 2021 emissions, 70% of their 2022 emissions, and 100% of their 2023 emissions.

Demand from voluntary buyers shifted toward nature-based removals and clean cooking projects. Retirements of nature-based carbon removal credits (within the forestry and land use category) issued by independent crediting mechanisms rose by nearly 25%, through a combination of increased supply and buyer interest in credits from carbon removal projects. This marked a new high. New buyer interest was also reflected in the robust volume of capital flowing to nature-based carbon removal activities through long-term offtake commitments announced by investors and buyer groups such as the Symbiosis Coalition, a 20-million-ton advanced market commitment to purchase nature-based removals.[68] The recognition of carbon removal credits in voluntary corporate net-zero targets, along with jurisdictions such as the UK considering the potential for incorporating removals into domestic carbon pricing instruments, could be contributing to this trend. Beyond removals, carbon credits generated by household technologies—namely clean cooking solutions—also experienced a significant increase in demand, with retirements rising 50% compared to 2023. While retirements of credits from renewable energy projects declined slightly, the category still made up nearly one-third of all retirements recorded by independent crediting mechanisms in 2024 (Figure 13).[69] New purchasing commitments for engineered carbon removals emerged during 2024, with an estimated 8 million tons purchased but only 318,000 tons delivered to buyers (a ratio of approximately 4%).[70] The majority of purchasing commitments are therefore intended to support projects delivering credits in future years.

FIGURE 13
Carbon credit issuances and retirements from independent crediting mechanisms and volume of unretired credits, 2021–2024



Note: Based on data from Climate Focus's Voluntary Carbon Market Dashboard, using project categorizations based on those published by Ecosystem Marketplace. The volume of issuances and retirements by project category covers the following crediting mechanisms: American Carbon Registry, Architecture for Reducing Emissions from Deforestation and Forest Degradation Transactions, BioCarbon, Cercarbono, Climate Action Reserve, Climate Forward, Gold Standard, Plan Vivo, and Verra's VCS. All issuance and retirement data here refers to original issuances, which only include the first time a credit was issued for a specific emission reduction/removal activity to avoid double counting. Original issuances do not rely on previous issuances from other crediting mechanisms.

BOX 9

Interactions between carbon pricing and crediting mechanisms

Carbon crediting and pricing can complement one another, particularly where there are formalized links between them. Around 40% of implemented ETSs and carbon taxes worldwide allow covered installations or companies to use carbon credits to meet part of their obligations, providing flexibility while channeling funds to lower-cost mitigation opportunities outside the regulated sectors.[viii] Most carbon pricing instruments cap this flexibility to a predetermined share to preserve emissions reductions from covered sectors while providing businesses with flexibility. For example, the Colombian carbon tax allows for a maximum of 50% of tax liabilities to be offset through carbon credits generated by independent crediting mechanisms. Similarly, Chile permitted companies to use carbon credits to offset their liabilities under their carbon tax from 2024. South Africa announced in March 2025 a proposed increase in the allowable use of carbon credit by 5%—increasing the quantitative limit to either 10% or 15% (depending on the sector) from January 2026.[71] Some countries have also allowed companies to use international credits generated under Article 6 of the Paris Agreement for compliance purposes. For instance, Singapore allows companies to cover up to 5% of their carbon tax obligations with international credits, provided they are not double counted.[72] Similarly, liable entities in the Republic of Korea can cover up to 5% of their ETS compliance obligations using carbon credits, including from international sources.[73]

Carbon crediting can also build capacity to help implement carbon pricing and extend price incentives to uncovered sectors. The implementation of crediting mechanisms can help build institutions, monitoring systems, and regulatory frameworks. While these are not a prerequisite for all forms of carbon pricing (e.g., an upstream carbon tax would not require them), establishing frameworks, systems, and institutions can provide valuable learnings for countries considering a domestic compliance policy. Carbon crediting mechanisms have been frequently used to help incentivize decarbonization efforts in sectors not covered by an ETS or carbon tax, such as waste and the land sector. For example, the EU and UK are exploring the potential to integrate carbon removal into their respective ETSs.[74]

viii Based on data directly provided by the jurisdictions, reflecting the share of jurisdictions that allow the use of offsets as a flexibility mechanism for compliance under an ETS or carbon tax.

ICAO estimates that total demand during the first phase of CORSIA will be between 102 and 148 million tons

Demand from CORSIA—the international compliance market for airlines—started to materialize, with large but uncertain estimates for future demand. The International Civil Aviation Organization (ICAO), which oversees the scheme, introduced key updates in 2024 for the scheme's first phase, which covers international aviation emissions from 2024 to 2026 and follows the voluntary pilot phase that concluded in 2023.[75] These updates included approving additional crediting mechanisms and clarifying phase 1 airline participation rules. In line with the commencement of phase 1, the International Air Transport Association (IATA) organized a procurement event (see Section 3.3). While this represents the first initial demand from phase 1, ICAO estimates that total demand during the first phase of CORSIA will be between 102 million and 148 million tons.[76] This estimated cumulative demand would equate to between nearly half and three-quarters of the volume of carbon credits retired in 2024. However, given that enforcement of CORSIA obligations on airlines falls on national governments, the extent to which this demand materializes is dependent on when and how participating jurisdictions transfer CORSIA's rules into national law. As of April 1, 2025, only Brazil, Canada, the EU, and the UK had commenced incorporating CORSIA into their domestic legal frameworks.[77]

Guidance on claims around the use of carbon credits in voluntary corporate climate action remains fragmented and inconsistent. The Science Based Targets Initiative—a climate action organization that defines a science-based framework for achieving net zero goals—released its revised corporate net zero standard for public consultation in March 2025. The draft standard would allow companies to use carbon removal credits to achieve both near- and long-term targets, but it continues to limit the use of other types of carbon credits to beyond value chain mitigation only.[78] Other frameworks for corporate use of carbon credits are also undergoing revisions. In September 2024, the Voluntary Carbon Markets Integrity Initiative—a nonprofit providing guidance on corporate climate action through the voluntary use of carbon credits—launched a public consultation on its updated guidelines for corporate claims. It has also developed a Scope 3 Action Code of Practice for companies interested in addressing value chain emissions.[79] These guidelines propose the use of carbon credits until 2038 for scope 3 claims in order to allow companies flexibility in their science-aligned decarbonization. In addition, the International Organization for Standardization—a global, nonprofit organization that develops and publishes quality and safety standards across industries—started the development of its own international standard for net zero corporate accounting. The draft standard and its guidance on the role of carbon credits is yet to be made public.[80] In parallel, jurisdictions such as the EU and UK have been adopting policies to guide offset-related claims.[81] While these regulations differ in scope and stringency, they generally adopt a cautious approach toward using carbon credits in climate claims, pushing for high environmental integrity and improved transparency (where carbon credits are permitted).

Carbon credit insurance products continue to evolve to help manage uncertainty and scale investment in carbon markets. As in other industries, insurance can play a critical role in de-risking and scaling up investments in carbon credit projects, in turn boosting demand and trust in the market. A range of specialized insurance products are currently offered, from carbon delivery insurance solutions (e.g., covering physical or reversal risks[82]), to political risk insurance (e.g., protecting against confiscation, nationalization, license cancellation, or revocation of authorization under Article 6[83]), to warranty and indemnity policies (e.g., policy protecting buyers or investors against environmental integrity issues[84]). Beyond primary insurance products, the market is actively exploring reinsurance solutions to help insurers manage exposure and expand capacity—key to fostering more resilient and scalable insurance markets.[85] In parallel to these commercial insurance solutions, the Multilateral Investment Guarantee Agency (MIGA) issued its first political risk guarantee for a project supporting the host country's commitment under the Paris Agreement: a USD 180 million policy for a clean cookstove project in Kenya.[86] In addition to covering the risks of expropriation, transfer restriction, and war and civil disturbance, the policy also offers breach of contract coverage against the risk of the host country failing to uphold corresponding adjustments in international compliance markets and NDC achievement.[ix] For example, to safeguard CORSIA buyers, independent crediting mechanisms including the Gold Standard have released guidelines on the eligibility of issued carbon credits under CORSIA, making explicit reference to MIGA's political risk insurance as the pre-approved insurance provider (while exploring the possibility of expanding the list of eligible insurers to commercial entities as well). These advancements in insurance product innovation in response to buyers' increasing concerns signal the growing sophistication of international carbon markets.

Insurance can play a critical role in de-risking and scaling up investments in carbon credit projects

[ix] Corresponding adjustments under the Paris Agreement refer to a key accounting mechanism designed to avoid double counting of emissions reductions or carbon removals when countries transfer credits generated under Article 6 across borders. Where credits are authorized toward the achievement of NDCs, the transferring country is to apply a corresponding adjustment to their GHG emissions inventory. Credits may also be authorized for other international mitigation purposes, such as international compliance under CORSIA.

3.2 Carbon credit supply levels declined slightly, while groundwork was laid for new supply from international mechanisms

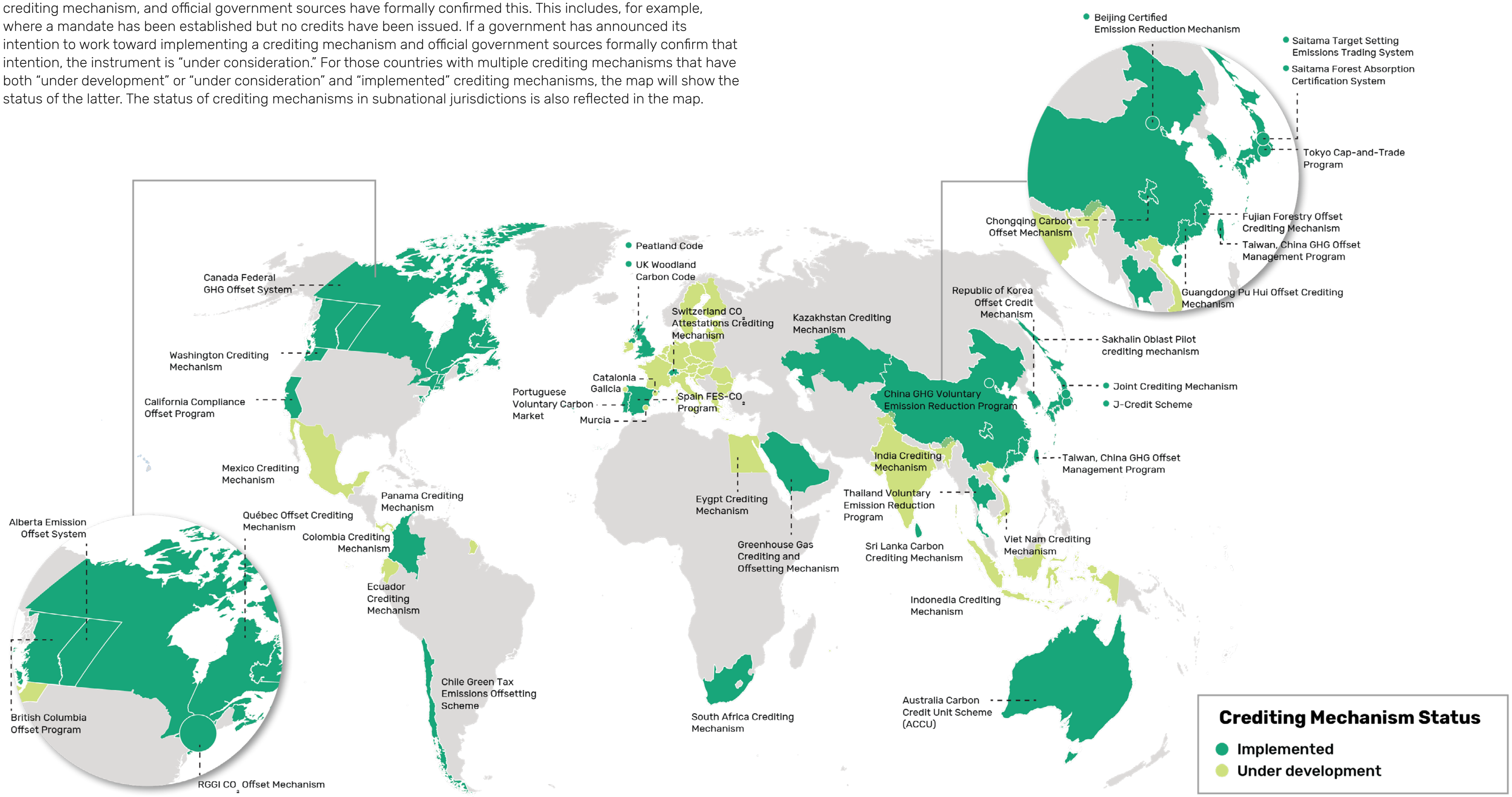
Governmental crediting mechanisms have remained a stable source of supply of carbon credits, offering flexibility to meet domestic compliance demand. As of April 1, 2025, there were 33 governmental crediting mechanisms in place, with an additional 11 under consideration or in development (Figure 14). This represents two fewer implemented than in 2024, due to the Indo-Pacific Carbon Offsets Scheme ceasing operations, and the consolidation of Beijing's two crediting mechanisms into a single program. In 2024, issuances from governmental crediting mechanisms were just over 10% of total issuances from all mechanisms, matching the share observed in 2023.[x] The largest sources of supply were issued by more mature mechanisms, including the Australian Carbon Credit Unit Scheme and California's Compliance Offset Program. At the same time, progress achieved on operationalizing domestic supply initiatives in developing and emerging countries indicates that further growth from governmental crediting mechanisms is on the horizon.

Issuances from governmental crediting mechanisms were just over 10% of total issuances from all mechanisms

[x] Based on data collected by the World Bank on governmental crediting mechanisms and the Climate Focus carbon market dashboard intelligence, April 1, 2025.

FIGURE 14
Map of governmental crediting mechanisms as of April 1, 2025

Note: An instrument “under development” means that a government is actively working toward implementing a crediting mechanism, and official government sources have formally confirmed this. This includes, for example, where a mandate has been established but no credits have been issued. If a government has announced its intention to work toward implementing a crediting mechanism and official government sources formally confirm that intention, the instrument is “under consideration.” For those countries with multiple crediting mechanisms that have both “under development” or “under consideration” and “implemented” crediting mechanisms, the map will show the status of the latter. The status of crediting mechanisms in subnational jurisdictions is also reflected in the map.



Several countries are developing infrastructure to support engagement in international carbon markets

Several countries clarified rules to create, trade, and use carbon credits both domestically and internationally. China recommenced issuances under the China Certified Emissions Reductions Scheme, issuing 9.5 million tCO_2e on March 6 from offshore wind and solar thermal projects.[87] This follows clarification by the government of trading rules and the approval of several new methodologies targeting afforestation, mangrove cultivation, and renewable energy. The Indian government also made progress toward implementing its governmental crediting mechanism. Following the establishment of its institutional framework in 2023, the government approved eight methodologies in March 2025 under its proposed crediting mechanism covering a range of activities, including renewable energy, industrial energy efficiency, landfill methane, and mangrove afforestation and reforestation.[88] In December 2024 Chile expanded the list of independent crediting mechanisms admissible under its domestic carbon tax—adding BioCarbon and Cercarbono to the list of eligible international and independent crediting mechanisms.[89] In August 2024, Egypt adopted before regulation to allow trade of carbon credits through its national stock exchange.[90] Collectively, these institutional frameworks promote access to carbon credits from in-country projects. Beyond rules for governmental crediting mechanisms, several countries (such as Paraguay, Tanzania, Viet Nam, and Zambia) also adopted frameworks to provide the legal and institutional basis necessary for participation in international markets.[91] This includes, for example, defining rules, requirements, and responsibilities for obtaining host country authorization for different uses; identifying activities eligible to generate credits under Article 6 of the Paris Agreement; and determining revenue sharing arrangements associated with implementation and trade. Several countries are developing infrastructure to support engagement in international carbon markets including the development of new carbon credit registries and the adoption of commercial registry systems managed by third-party service providers. The former are underway in Bhutan and Ghana, and Chile and Indonesia are considering the latter.[92]

Annual issuances from independent crediting mechanisms dipped in 2024, driven by declines in supply from historically dominant avoided deforestation projects. A total of 290 million credits were issued by the major independent crediting mechanisms,[xi] representing a year-on-year decline of approximately 5% (Figure 13), though there is significant variation across independent crediting mechanisms.[93] Supply from avoided deforestation programs was about half of 2023 issuances, against a backdrop of concerns about the perceived environmental integrity of projects, and the transition to a new methodology for Reducing Emissions from Deforestation and Forest Degradation (REDD+) by Verra, the largest issuer of avoided deforestation projects.

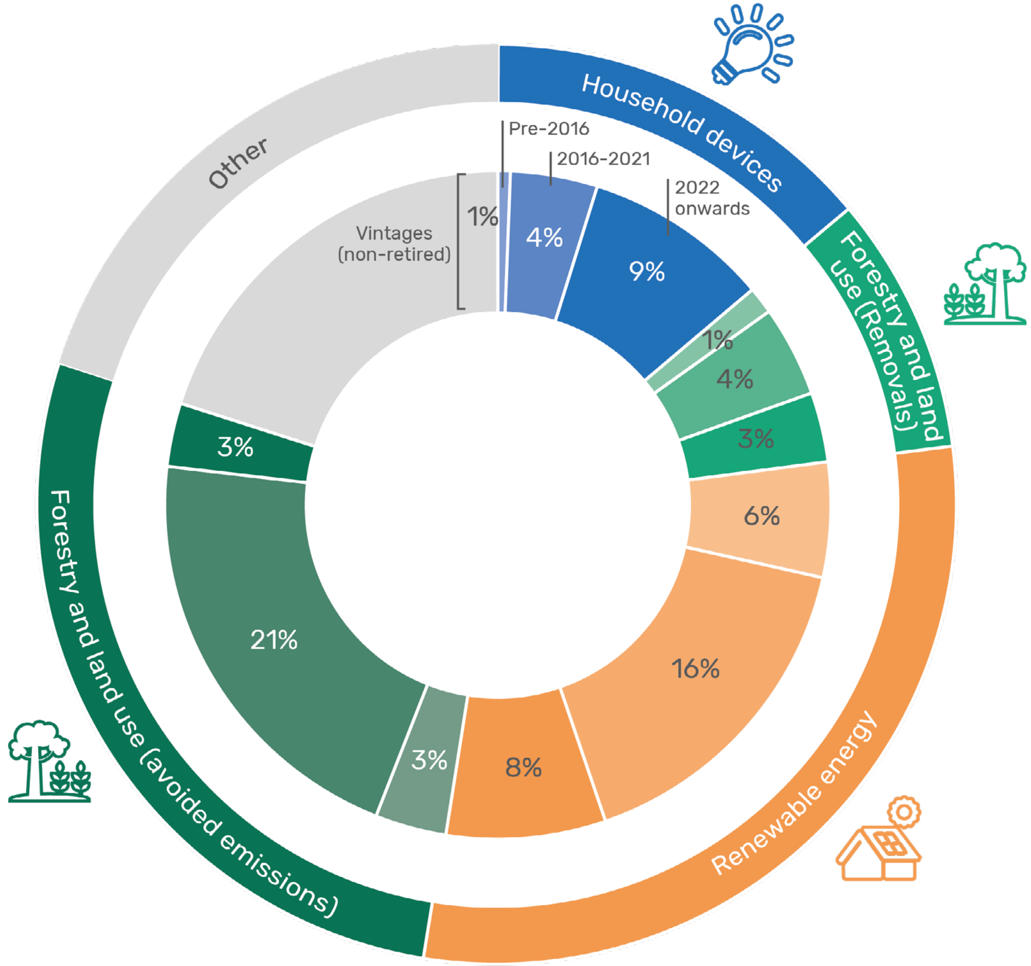
Conversely, some project types experienced increased credit issuances in 2024. For example, issuances of credits from nature-based carbon removal projects—particularly from improved forest management and afforestation/reforestation activities—increased by nearly 20% compared to 2023 levels. Issuances from renewable energy projects stabilized, with no visible sign that last year's decision by the Integrity Council for the Voluntary Carbon Market (ICVCM)[xii] to reject key methodologies is affecting the incentives for project developers to issue credits. Issuances from activities distributing household devices, particularly improved and clean cookstove projects, experienced strong growth, nearly matching issuances from renewable energy activities for the first time. This indicates the continued interest in clean cookstove projects, despite environmental integrity concerns relating to older projects remaining eligible to issue credits for the duration of their crediting periods. Leading concerns include the use of outdated values representing the proportion of biomass harvested unsustainably, and assumptions about the share of devices operating and frequency of their use.[94]

A total of 290 million credits were issued by the major independent crediting mechanisms, representing a year-on-year decline of approximately 5%

[xi] The retirement and supply data from independent crediting mechanisms presented in this report covers the following mechanisms: American Carbon Registry, Architecture for REDD+ Transactions, BioCarbon, Cercarbono, Climate Action Reserve, Climate Forward, Gold Standard, Plan Vivo, and Verra's VCS.
[xii] The ICVCM is a nongovernmental initiative that aims to provide a minimum benchmark of supply-side quality.

Overall, supply continued to exceed retirement volumes, with the global pool of unretired credits from independent crediting mechanisms approaching 1 billion tons (Figure 13).[xiii] A large share of these unretired credits, however, relate to "legacy" credits issued many years ago that are not finding any buyers in the market.[95] As of early 2025, over two-thirds of unretired credits from independent crediting mechanisms were from pre-2022 vintages (i.e., the reductions or removals occurred before 2022).[96] The most common unretired credits originate from forestry and land use (36%) and renewable energy (30%) projects, which is consistent with their status as the largest sources of issued carbon credits (Figure 15).

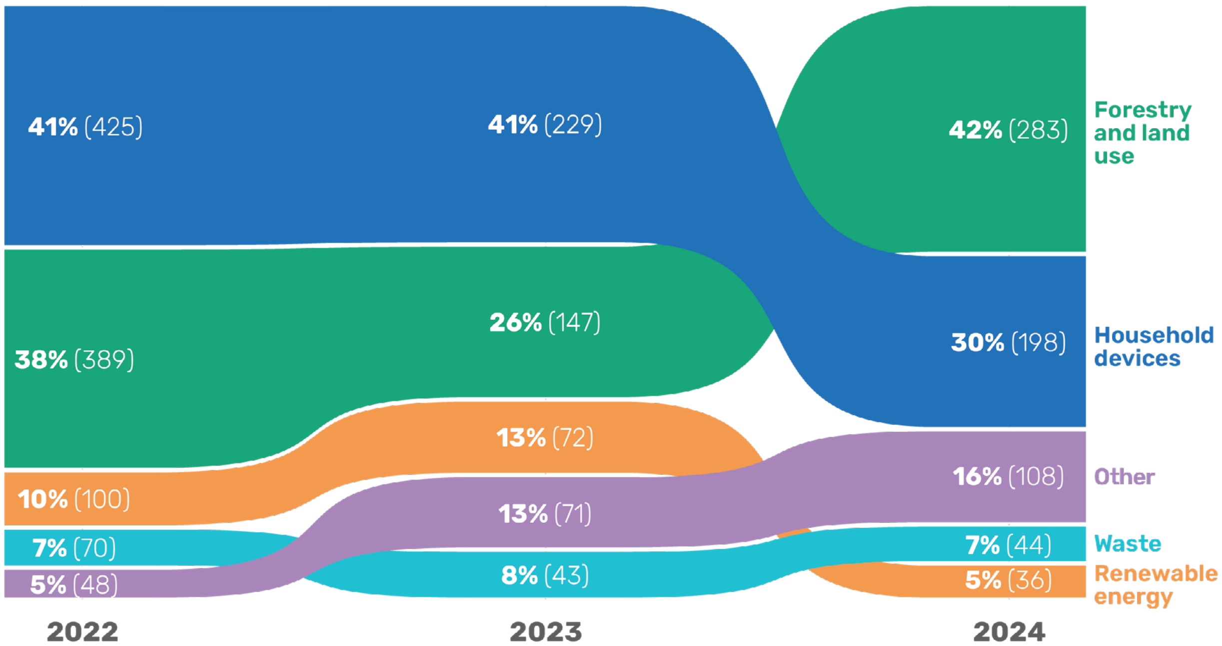
FIGURE 15
Breakdown of unretired credits from independent crediting mechanisms by project type and credit vintage, as of April 2025



[xiii] This excludes unretired certified emission reductions (CERs) from the clean development mechanism.

Project originations are showing early signs of the potential impacts of the ICVCM's recent decisions. Most notably, the number of renewable energy projects listed[xiv]—which also make up a significant share of historical issuances—declined by over 40%, coinciding with ICVCM's announcement that existing renewable energy methodologies will not receive approval under its Core Carbon Principles (CCP) framework (Figure 16).[xv] While the overall number of listed household devices projects declined, nearly half of all the new projects in the pipeline aim to apply one of the three cookstove methodologies recently approved by the ICVCM. There has also been a rise in the number of projects using CCP-approved REDD+ methodologies, including Verra's VCS and ART's The REDD+ Environmental Excellence Standard (TREES).[97] A direct causal link between these trends and ICVCM decisions is challenging to establish. However, listing data suggests that the project developers and other supply-side market participants are responding to the ICVCM's endorsements of specific methodologies, and that the CCPs may be seen as a minimum benchmark of supply-side quality for project developers.

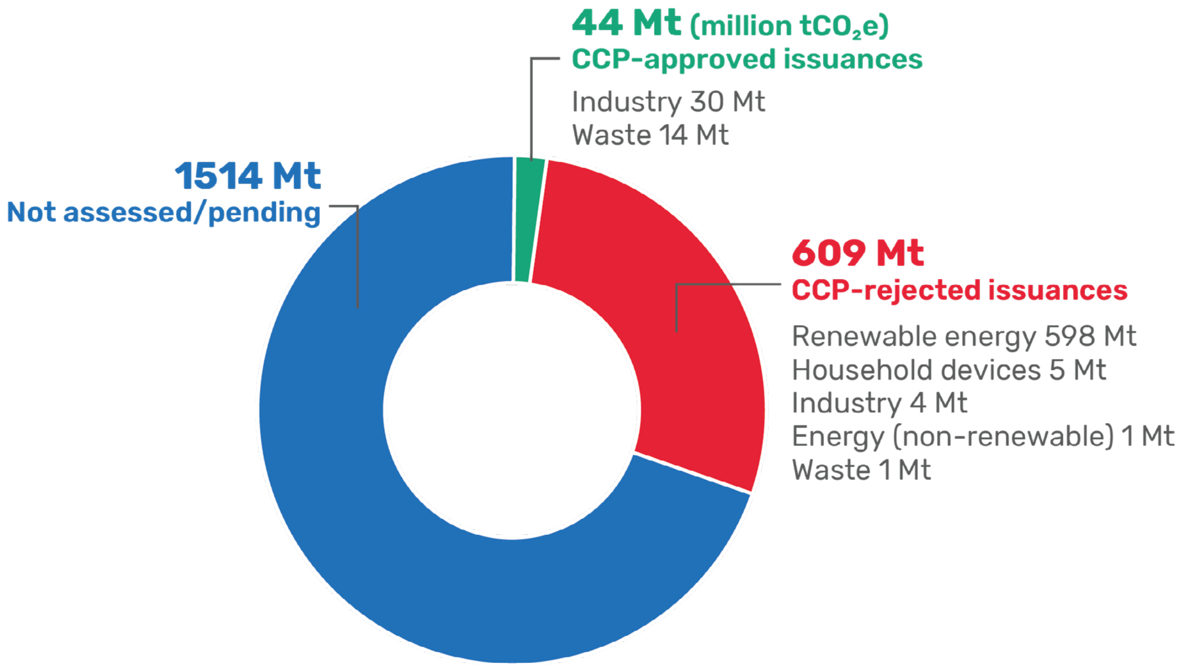
FIGURE 16
The evolution of new project listings in independent crediting mechanisms by category[xvi]



[xiv] A listing occurs before a project is approved and registered by a crediting mechanism. It means the project or program has been submitted for consideration but has not yet completed the validation (audit) process.
[xv] The CCP labelling process is designed to provide a minimum benchmark of supply-side quality by identifying and recognizing high-integrity carbon credits. Approved crediting mechanisms can submit their methodologies to the organization, which evaluates them against a set of principles set out in the ICVCM's Assessment Framework. A CCP label can subsequently be associated with carbon credits that are issued against approved methodologies (including specific versions of methodologies). The ICVCM, however, does not assess individual projects.
[xvi] "Project listings" include new programs of activities, voluntary project activities, and standalone projects as per January 1st of any given year. The project listings data from independent crediting mechanisms presented in the figure covers the following mechanisms: American Carbon Registry, Architecture for REDD+ Transactions, BioCarbon, Cercarbono, Climate Action Reserve, Climate Forward, Gold Standard, Plan Vivo, and Verra's VCS.

Changes in issuances due to project registration preferences, including shifts due to CCP labeling, have yet to materialize. Uncertainty also exists in the relationship between registrations and issuances, noting that the volume of issuances is not necessarily directly related to project listings or registrations.[xvii] As of January 2025, just over 40 million carbon credits were issued with the CCP label, with the majority representing credits from the Verra registry (Figure 17). A much larger share—nearly 40% of historical supply—has been issued against methodologies that have been rejected by the ICVCM. While several governments, such as the UK, have started aligned their principles for high-integrity voluntary carbon markets with the ICVCM's CCPs,[98] CCP labels are currently not formally embedded in decision-making in international compliance or domestic compliance markets.

FIGURE 17
Composition of issuances from independent crediting mechanisms by CCP-label status, million tCO_2e



[xvii] Certain project types (e.g., jurisdictional REDD+ programs) will generally produce higher volumes of credits per project compared to others related to more local, smaller activities, such as those related to household devices.

Countries have agreed to a path forward to generate credits under the UN's new crediting mechanism. Two important standards were endorsed at COP29 to advance the PACM—the centralized UN-administered crediting mechanism (more in Box 10): the standard for developing and assessing methodologies;[99] and the standard on requirements for activities involving carbon removals.[100] The Supervisory Body of the Mechanism—the authority overseeing the PACM—plans to release the first eligible methodologies in the second half of 2025, which is the first step to creating supply from new projects under the mechanism. These will include revised Clean Development Mechanism (CDM) methodologies,[xviii] such as for activities relating to grid-connected renewable electricity generation, thermal energy production, flaring or use of landfill gas, and energy efficiency measures for non-renewable biomass.[101] Agreement was also reached on the required functionalities of the registries to be operated under both the Article 6.2 mechanism (which allows for bilateral/multilateral trading of credits between countries) and the PACM.[102] Clarity on Article 6.2 and guidance on its operation has strengthened the basis for using bilateral transactions. These agreements gathered momentum throughout 2024, with 20 new bilateral agreements being signed or negotiated, bringing the total to about 100 agreements.[103]

Clarity on Article 6.2 and guidance on its operation has strengthened the basis for using bilateral transactions

[xviii] The CDM was a flexibility mechanism under the Kyoto Protocol and the first international crediting mechanism.

BOX 10

COP29 decisions on Article 6

At COP29, the final rules for Article 6.2 (cooperative approaches) and Article 6.4 (the Paris Agreement Crediting Mechanism) were adopted. These rules provide clarity on the operationalization of international carbon markets under Article 6 of the Paris Agreement.

On Article 6.2, agreement was reached on technical details—providing greater certainty on operationalizing country-to-country transfers. In particular, agreement was reached on the procedures and requirements for authorization of internationally transferred mitigation outcomes (ITMOs)—that is where host governments agree to domestic mitigation to be transferred to another party. The COP29 outcome clarified, however, that the initial act of authorization does not necessarily immediately commit the host country to apply a corresponding adjustment. A corresponding adjustment is only required after the point of "first transfer," which the host country can choose to be: (i) when authorization is given, (ii) when the credit is issued, or (iii) when the authorized credit (ITMO) is used or cancelled by the buyer. Importantly, after the point of first transfer, no further changes to the authorization status are allowed unless explicitly permitted in the authorization terms. Authorizations must furthermore specify critical elements to ensure transparency and legal clarity, such as the uses of credits covered by the authorization and terms for changing the authorization (e.g., withdrawal, changes to the authorized volume of credits, etc.)

The COP29 decision also delivered more clarity on the operationalization of the PACM. Two key standards were endorsed (on methodologies and removals), and the COP29 decision clarified outstanding issues including on authorizations and the registry for tracking units. With the main regulatory documents and standards now in place, the PACM Supervisory Body and the Methodological Expert Panel can now focus on developing standards, procedures, and tools. These will provide additional clarity on technical issues, such as accounting for emissions leakage, post-crediting period monitoring requirements, and how to address non-permanence and reversal risks. Further, revisions to six methodologies (referenced above) are ongoing, and the first PACM methodologies are expected in the second half of 2025. In February 2025, the PACM Supervisory Body also approved the procedure for the operation of the mechanism's registry, including developing an interim registry modeled on the registry used under the Clean Development Mechanism. This interim registry will allow PACM credits (known as A6.4ERs) to be issued and tracked until the full PACM registry is available. User access to the interim registry is pending the development of additional user guidance by the UNFCCC secretariat.

Future supply from international crediting mechanisms will originate from transitioning and new projects. Transitioning CDM projects will supply the first carbon credits issued under the new PACM. Approximately 1,500 activities registered under the CDM are looking to transition to the PACM, with the first tranche of credits expected to be issued in the second half of 2025.[104] While the potential volume of these carbon credits could be close to 1 billion tCO_2e, actual supply is likely to be considerably lower, given that credit issuance requires host country approval and projects must successfully complete the issuance process to retroactively claim historical emissions reductions delivered in the period 2021 to 2025. The retroactive nature of the credits and concerns around the environmental integrity of some activities may make this supply less attractive to buyers, who may instead consider new (greenfield) PACM projects using methodologies approved by the Supervisory Body of the Mechanism. As of April 1, 2025, over 1,000 new programs and projects had notified[xix] the UN of the intention to submit new projects to the mechanism. This early pipeline of programs and projects shows a broad geographical diversity. While historically large credit-supplying countries, like Brazil and India, continue to be well represented in the list of potential PACM projects, other regions with less success under the CDM (e.g., Sub-Saharan African countries including Kenya, Nigeria, Uganda, and Zambia) are showing an expanding pipeline of new activities.[105]

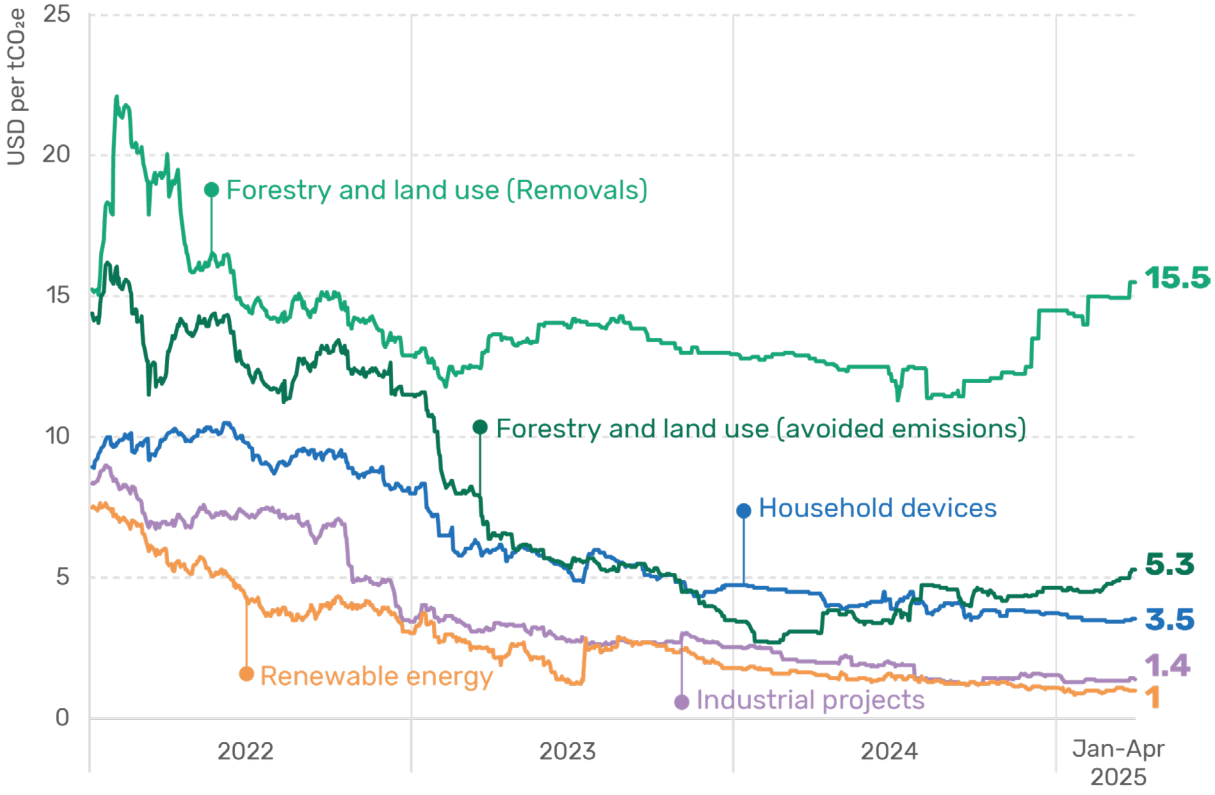
Approximately 1,500 activities registered under the CDM are looking to transition to the PACM

[xix] This relates to "prior consideration" notifications to the United Nations Framework Convention on Climate Change secretariat, which is the first step for project developers to demonstrate that their climate change mitigation activities have considered the financial benefits of the PACM prior to the start of implementation.

3.3 Carbon credit prices generally declined, but credits with specific attributes continued to attract price premiums

Carbon credit prices fell for most project categories in 2024, but nature-based removals displayed resilience. Exchange-traded credit prices declined for most project categories during 2024 (Figure 18). The two largest project categories (measured by annual issuance volumes), avoided deforestation, and renewable energy, experienced sharp declines in exchange-traded prices between April 2023 and April 2024.[106] Prices for avoided deforestation rebounded to USD 5.30 per tCO_2e as of April 1, 2025.[107] Last year's ICVCM methodology decisions may have contributed to the price declines for credits from renewable energy projects—exchange-traded prices fell by nearly one-third following the ICVCM's rejection of renewable energy methodologies in August 2024. Exchange-traded prices for nature-based removals were more resilient, increasing throughout 2024 and closing at around USD 15.50 per tCO_2e on April 1, 2025. Changes in prices for credits traded over the counter (OTC) were more varied, but in general prices were lower—the average OTC price reported by Ecosystem Marketplace for 2024 was USD 6.78 per tCO_2e (about 6% below 2023 average prices).

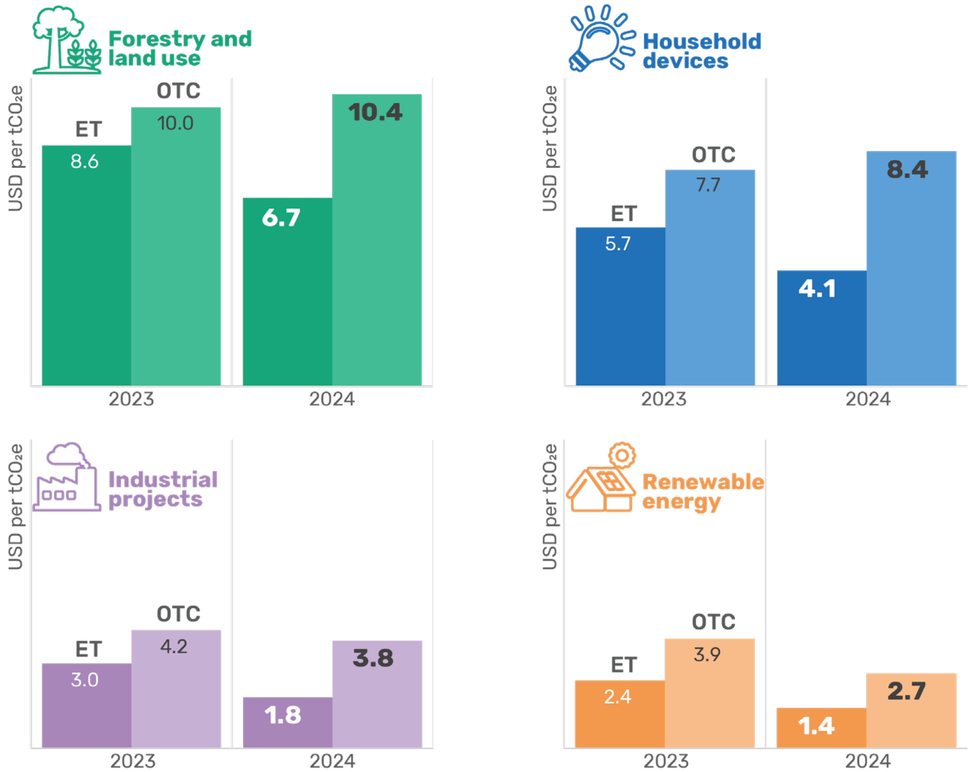
FIGURE 18
Exchange-traded carbon credit prices by project types, January 1, 2022 to April 1, 2025



Note: Prices are based on monthly and yearly averages of the price assessments from Platts, S&P Global Commodity Insights (2025), provided by S&P Global.

OTC credit prices for some project types fell significantly, such as renewable energy credits, which were more than 30% lower than in 2023. At the same time, credits from household devices, energy efficiency, and fuel switching displayed notable increases (Figure 19). OTC prices for all credit types attracted a premium compared to prices traded through standardized, exchange-traded contracts. Nature-based removal credits continued to receive a premium over credits from avoided emissions projects (such as REDD+), suggesting a reluctance from buyers to bid for credits from avoided emissions projects. Additionally, forward prices for nature-based removals commonly exceeded USD 20 per tCO_2e, suggesting a bullish outlook for these activity types.[108]

FIGURE 19
Comparison of average annual carbon credit prices from exchange-traded and over-the-counter transactions by project category, 2023–2024



Note: This figure illustrates the exchange-traded and OTC prices of carbon credits. Prices are based on monthly and yearly averages of the price assessments provided by Platts, S&P Global Commodity Insights, 2025. The Platts assessment reflects bids, offers, and trades for credits as reported in the Platts Market on Close assessment process, in the brokered market, or on trading and exchange platforms. For each of its price assessments Platts has identified a reference base to represent fungible credits across each market segment, considering certification, vintage, volume, and the Sustainable Development Goals. For the nature-based projects, a weighted average of Platts nature-based avoidance price and Platts nature-based removals price is used, rather than a singular price assessment. Adjustments are made for credits that vary from this base, normalizing values based on factors like technology, certification standards, geography, and additional benefits to align them with the market value of the reference base. OTC prices were provided by Ecosystem Marketplace and updated as of February 26, 2025. OTC prices represent volume-weighted yearly averages of carbon credit trades in the voluntary carbon markets. Discrepancies may exist in project categorizations between the exchange-traded and OTC data due to different source methodologies. See Annex C, Definitions, for a detailed note on the carbon credit categorizations used in this figure. Details on Platts's assessments can be found in the Platts' Specification Guide.

Credit prices point to a strengthening correlation between quality and price—credits with a perceived higher quality trade at a premium. Buyers' willingness to pay for perceived high-integrity credits—defined as those receiving favorable ratings from carbon credit rating agencies—is increasingly translating into price premiums. Reporting from carbon credit rating agencies suggests a positive correlation between their proprietary quality ratings and carbon credit prices, albeit using data drawn from small sample sizes. For example, rating agency analysis suggests that buyers of nature-based removal credits paid a premium of up to USD 5 per credit for each increase in the rating band, while other analyses suggest a price premium of 40% for a higher-rated band.[109]

There is an observed price premium for credits eligible to be used for NDC achievement and international compliance markets relative to voluntary markets. The price of credits transacted under Article 6.2 and CORSIA's phase 1 surpassed USD 20 per tCO_2e. For example, Switzerland reported paying an average price of 29 Swiss francs per tCO_2e (over USD 30 per tCO_2e) for Article 6.2 credits to be delivered between 2022 and 2030.[110] Similarly, in February 2025, Singapore conducted a tender process to procure Article 6.2 credits generated between 2021 and 2030 from nature-based projects. The tender attracted almost 20 offers, with prices ranging from USD 18 to over USD 40 per tCO_2e.[111] The premium may partly reflect that, in many jurisdictions, project developers must cover additional costs to obtain host country government approval and the opportunity cost that the jurisdiction incurs by providing a corresponding adjustment. Credits eligible under CORSIA's phase 1 also attracted buyer interest. IATA's procurement event in early 2025 saw 11 airlines purchasing eligible credits at a fixed-price offering of USD 21.70 per tCO_2e.[112] The total volume of these initial purchases was not made public, but all transacted credits are from a jurisdictional REDD+ Architecture for REDD+ Transactions TREES program in Guyana—the only source of phase 1 eligible credits at that time. In March 2025, a second procurement event was organized by IATA, with several new buyers engaging and eligible credits selling at USD 22.25 per tCO_2e. These recent prices exceeded 2024 average prices, with exchange-traded phase 1 eligible credits mostly fluctuating between USD 11 and USD 20 per tCO_2e last year.

Buyers' willingness to pay for perceived high-integrity credits is increasingly translating into price premiums

Annexes

ANNEX A
Reference list of publications

State and Trends of Carbon Pricing is a reference document of the key developments in carbon pricing policies and market trends. The report is part of the World Bank's broader analysis and knowledge base, designed to promote understanding of, and disseminate information on, carbon pricing and carbon markets. Below is a non-exhaustive list of additional resources published during 2024 and 2025 that complement the *State and Trends of Carbon Pricing 2025* report.

- **State and Trends of Carbon Pricing Dashboard** – an interactive data dashboard including factsheets for all carbon pricing instruments. https://carbonpricingdashboard.worldbank.org/
- **Balancing Act: Political Economy and the Pursuit of Ambitious Carbon Pricing in Developing Countries** – practical insights into the political economy challenges and opportunities for advancing carbon pricing, drawing on the experiences of select countries. https://hdl.handle.net/10986/42093
- **Carbon Pricing in the Power Sector: Role and Design for Transitioning toward Net-Zero Carbon Development** – report delving into the power sector value chain dynamics, demonstrating how well-designed carbon pricing instruments can be instrumental in helping countries reach their decarbonization goals. https://hdl.handle.net/10986/42091
- **Measuring, Reporting, and Verifying (MRV) Carbon Credits** – report addressing the challenges with measuring, reporting, and verifying carbon credits. https://hdl.handle.net/10986/42922
- **A Roadmap for Safe, Efficient, and Interoperable Carbon Markets Infrastructure** – outline of critical bottlenecks and priority action areas identified by the Carbon Market Infrastructure Working Group. https://hdl.handle.net/10986/42389
- **High Integrity, High Impact: The World Bank Engagement Roadmap for Carbon Markets** – roadmap for how the World Bank and others can do more to unlock the potential of carbon markets. https://hdl.handle.net/10986/42016
- **State and Trends of Carbon Pricing: International Carbon Markets, 2024** – report evaluating progress made in addressing bottlenecks impeding the growth of carbon markets and proposing recommendations to help markets reach their full potential. https://hdl.handle.net/10986/42094
- **Navigating Decisions on Carbon Markets** – high-level guidance document offering structured questions to guide the development of a host country's carbon market strategy. https://www.pmiclimate.org/publication/navigating-decisions-carbon-markets
- **Carbon Crediting: A Results-based Approach to Mobilizing Additional Climate Financing** – a report providing a deep dive into various crediting approaches—from project-based to the more recent policy and other scaled-up crediting models. https://hdl.handle.net/10986/43049

ANNEX B
Summary of carbon pricing instruments

The table below summarizes key metrics for implemented carbon taxes and ETSs as of April 1, 2025. For up-to-date information, please visit https://carbonpricingdashboard.worldbank.org/.

Instrument name	Type	Start date	Jurisdiction	Region	Economy income group	Main price rate	Share of jurisdiction's GHG emissions covered	Government revenue from direct carbon pricing (2024)
Albania carbon tax	Carbon tax	2010	Albania	Europe & Central Asia	Upper middle income	USD 13.7	73%	
Alberta TIER	ETS	2007	Canada	North America	High income	USD 66.2	59%	USD 412 million
Andorra carbon tax	Carbon tax	2022	Andorra	Europe & Central Asia	High income	USD 32.4	95%	
Argentina carbon tax	Carbon tax	2018	Argentina	Latin America & Caribbean	Upper middle income	USD 5.3	38%	USD 225 million
Australia safeguard mechanism	ETS	2023	Australia	East Asia & Pacific	High income	USD 21.8	26%	
Austria ETS	ETS	2022	Austria	Europe & Central Asia	High income	USD 48.5	36%	USD 1,264 million
British Columbia OBPS	ETS	2016	Canada	North America	High income	USD 66.2	26%	
Beijing pilot ETS	ETS	2013	China	East Asia & Pacific	Upper middle income	USD 12.2	17%	USD 1 million
California cap and trade	ETS	2012	United States	North America	High income	USD 29.3	76%	USD 4,401 million
Canada federal OBPS	ETS	2019	Canada	North America	High income	USD 66.2	3%	
Chile carbon tax	Carbon tax	2017	Chile	Latin America & Caribbean	High income	USD 5.0	55%	USD 140 million
China national ETS	ETS	2021	China	East Asia & Pacific	Upper middle income	USD 11.8	51%	
Chongqing pilot ETS	ETS	2014	China	East Asia & Pacific	Upper middle income	USD 5.5	14%	USD 3 million
Colima carbon tax	Carbon tax	2025	Mexico	Latin America & Caribbean	Upper middle income	USD 27.8	17%	
Colombia carbon tax	Carbon tax	2017	Colombia	Latin America & Caribbean	Upper middle income	USD 6.5	20%	USD 133 million
Colorado GHG crediting trading system	ETS	2023	United States	North America	High income		3%	
Denmark carbon tax	Carbon tax	1992	Denmark	Europe & Central Asia	High income	USD 108.4	64%	USD 503 million
Durango carbon tax	Carbon tax	2023	Mexico	Latin America & Caribbean	Upper middle income	USD 4.9	34%	USD 6 million

Estonia carbon tax	Carbon tax	2000	Estonia	Europe & Central Asia	High income	USD 27.0	10%	USD 2 million
EU ETS	ETS	2005	European Union	Europe & Central Asia	High income	USD 70.4	40%	USD 41,703 million
Finland carbon tax	Carbon tax	1990	Finland	Europe & Central Asia	High income	USD 66.9	45%	USD 1,375 million
France carbon tax	Carbon tax	2014	France	Europe & Central Asia	High income	USD 48.1	41%	USD 7,844 million
Fujian pilot ETS	ETS	2016	China	East Asia & Pacific	Upper middle income	USD 4.7	16%	
Germany ETS	ETS	2021	Germany	Europe & Central Asia	High income	USD 48.5	39%	USD 13,933 million
Guanajuato carbon tax	Carbon Tax	2023	Mexico	Latin America & Caribbean	Upper middle income	USD 4.9	40%	USD 2 million
Guangdong pilot ETS	ETS	2013	China	East Asia & Pacific	Upper middle income	USD 5.4	12%	
Hubei pilot ETS	ETS	2014	China	East Asia & Pacific	Upper middle income	USD 5.3	20%	
Hungary carbon tax	Carbon tax	2023	Hungary	Europe & Central Asia	High income	USD 38.8	32%	USD 182 million
Iceland carbon tax	Carbon tax	2010	Iceland	Europe & Central Asia	High income	USD 60.1	37%	USD 54 million
Indonesia ETS	ETS	2023	Indonesia	East Asia & Pacific	Upper middle income	USD 0.7	24%	
Ireland carbon tax	Carbon tax	2010	Ireland	Europe & Central Asia	High income	USD 68.5	34%	USD 1,111 million
Israel carbon tax	Carbon tax	2024	Israel	Middle East & North Africa	High income	USD 1.5	78%	
Japan carbon tax	Carbon tax	2012	Japan	East Asia & Pacific	High income	USD 1.9	80%	USD 1,452 million
Kazakhstan ETS	ETS	2013	Kazakhstan	Europe & Central Asia	Upper middle income	USD 0.9	43%	
Korea ETS	ETS	2015	Korea, Rep.	East Asia & Pacific	High income	USD 6.5	79%	USD 134 million
Latvia carbon tax	Carbon tax	2004	Latvia	Europe & Central Asia	High income	USD 16.2	2%	USD 8 million
Liechtenstein carbon tax	Carbon tax	2008	Liechtenstein	Europe & Central Asia	High income	USD 136.0	72%	USD 9 million
Luxembourg carbon tax	Carbon tax	2021	Luxembourg	Europe & Central Asia	High income	USD 58.5	72%	USD 303 million
Massachusetts ETS	ETS	2018	United States	North America	High income	USD 9.3	9%	USD 19 million
Mexico carbon tax	Carbon tax	2014	Mexico	Latin America & Caribbean	Upper middle income	USD 3.9	29%	USD 411 million
Mexico City carbon tax	Carbon tax	2025	Mexico	Latin America & Caribbean	Upper middle income	USD 2.8	18%	
Mexico ETS	ETS	2020	Mexico	Latin America & Caribbean	Upper middle income		36%	
Montenegro ETS	ETS	2022	Montenegro	Europe & Central Asia	Upper middle income	USD 25.9	43%	USD 14 million
Morelos carbon tax	Carbon tax	2025	Mexico	Latin America & Caribbean	Upper middle income	USD 12.3	31%	
Netherlands carbon tax	Carbon tax	2021	Netherlands	Europe & Central Asia	High income	USD 94.8	45%	
New Brunswick OBPS	ETS	2021	Canada	North America	High income	USD 66.2	54%	
New Zealand ETS	ETS	2008	New Zealand	East Asia & Pacific	High income	USD 32.0	44%	USD 293 million

Newfoundland and Labrador Performance Standards System	ETS	2019	Canada	North America	High income	USD 66.2	36%	USD 0.4 million
Norway carbon tax	Carbon tax	1991	Norway	Europe & Central Asia	High income	USD 133.9	65%	USD 1,605 million
Nova Scotia OBPS	ETS	2019	Canada	North America	High income	USD 66.2	36%	USD 13 million
Ontario EPS	ETS	2022	Canada	North America	High income	USD 66.2	26%	
Oregon ETS	ETS	2021	United States	North America	High income		48%	
Poland carbon tax	Carbon tax	1990	Poland	Europe & Central Asia	High income	USD 0.1	24%	USD 7 million
Portugal carbon tax	Carbon tax	2015	Portugal	Europe & Central Asia	High income	USD 72.7	40%	USD 1,270 million
Quebec cap and trade	ETS	2013	Canada	North America	High income	USD 41.5	76%	USD 1,055 million
Queretaro carbon tax	Carbon tax	2022	Mexico	Latin America & Caribbean	Upper middle income	USD 32.8	18%	USD 15 million
Regional Greenhouse Gas Initiative	ETS	2009	United States	North America	High income	USD 23.3	14%	USD 1,456 million
Saitama ETS	ETS	2011	Japan	East Asia & Pacific	High income	USD 1.0	16%	
San Luis Potosí carbon tax	Carbon tax	2024	Mexico	Latin America & Caribbean	Upper middle income	USD 16.7	68%	USD 1 million
Shanghai pilot ETS	ETS	2013	China	East Asia & Pacific	Upper middle income	USD 10.8	21%	USD 13 million
Shenzhen pilot ETS	ETS	2013	China	East Asia & Pacific	Upper middle income	USD 6.5	37%	
Singapore carbon tax	Carbon tax	2019	Singapore	East Asia & Pacific	High income	USD 18.6	71%	USD 150 million
Slovenia carbon tax	Carbon tax	2023	Slovenia	Europe & Central Asia	High income	USD 33.3	46%	USD 173 million
South Africa carbon tax	Carbon tax	2019	South Africa	Sub-Saharan Africa	Upper middle income	USD 12.8	82%	USD 92 million
Spain carbon tax	Carbon tax	2014	Spain	Europe & Central Asia	High income	USD 16.2	2%	USD 118 million
State of Mexico carbon tax	Carbon tax	2022	Mexico	Latin America & Caribbean	Upper middle income	USD 2.8	47%	USD 14 million
Sweden carbon tax	Carbon tax	1991	Sweden	Europe & Central Asia	High income	USD 144.6	40%	USD 2,306 million
Switzerland carbon tax	Carbon tax	2008	Switzerland	Europe & Central Asia	High income	USD 136.0	35%	USD 1,426 million
Switzerland ETS	ETS	2008	Switzerland	Europe & Central Asia	High income	USD 64.7	13%	USD 50 million
Tamaulipas carbon tax	Carbon tax	2022	Mexico	Latin America & Caribbean	Upper middle income	USD 16.7	48%	USD 82 million
Tianjin pilot ETS	ETS	2013	China	East Asia & Pacific	Upper middle income	USD 5.3	18%	
Tokyo cap and trade	ETS	2010	Japan	East Asia & Pacific	High income	USD 4.0	19%	
UK Carbon Price Support	Carbon tax	2013	United Kingdom	Europe & Central Asia	High income	USD 23.2	12%	USD 872 million
UK ETS	ETS	2021	United Kingdom	Europe & Central Asia	High income	USD 57.2	27%	USD 3,250 million
Ukraine carbon tax	Carbon tax	2011	Ukraine	Europe & Central Asia	Upper middle income	USD 0.7	32%	USD 80 million

Uruguay CO_2 tax	Carbon tax	2022	Uruguay	Latin America & Caribbean	High income	USD 158.8	5%	USD 302 million
Washington CCA	ETS	2023	United States	North America	High income	USD 50.0	71%	USD 811 million
Yucatan carbon tax	Carbon tax	2022	Mexico	Latin America & Caribbean	Upper middle income	USD 15.0	32%	USD 6 million
Zacatecas carbon tax	Carbon tax	2017	Mexico	Latin America & Caribbean	Upper middle income	USD 12.3	50%	USD 16 million

Note: Price and revenue values are blank where data is not available or where revenue has not been collected.

ANNEX C

Definitions

Carbon pricing

Carbon pricing seeks to align the costs of consuming carbon-intensive fuels or using carbon-intensive processes with the social costs of those activities. If well designed and sufficiently ambitious, carbon pricing creates economic incentives to shift investments, production, and consumption toward low-carbon alternatives, drives clean technological innovation, and reduces the need for additional public spending. Carbon pricing can help raise revenues in a more efficient and less distortive way than alternative options, such as labor taxes, while delivering numerous benefits to society beyond climate mitigation. Carbon pricing is an important policy tool that can be used as part of a comprehensive policy package to decarbonize economies.

Direct carbon pricing

Direct carbon pricing is implemented to reduce GHG emissions by providing a price signal closely linked to actual emissions. Direct carbon pricing instruments are categorized as "compliance" instruments or "carbon crediting" mechanisms. Under compliance instruments (such as emissions trading systems or carbon taxes), covered entities are obligated to pay for the emissions from covered activities. Participation in carbon crediting on the other hand is voluntary, with participants earning credits in recognition of quantified and verified emissions reductions or removals.

Indirect carbon pricing

Indirect carbon pricing refers to instruments that change the price of products associated with carbon emissions in ways that are not directly proportional to the relative emissions associated with those products. These instruments provide a carbon price signal, even though they are often (primarily) adopted for other socioeconomic objectives, such as raising public revenues or addressing air pollution. Examples of indirect carbon pricing include fuel and commodity taxes, as well as fossil fuel subsidies affecting energy consumers. For example, fuel excise taxes apply a tax to the volume of fuels, such as gasoline and diesel (e.g., dollars per liter), which places a price on the carbon emissions from the combustion of those fuels. However, the price is not determined in proportion to the relative emissions resulting from the combustion of those fuels. Conversely, fuel subsidies that reduce the price of fossil fuels create a "negative" indirect carbon price signal, which incentivizes higher consumption and therefore increases carbon emissions.

While carbon pricing policies can be categorized as direct or indirect, in practice, the distinction is not always obvious. The most direct carbon pricing policy would apply an equivalent and proportional incentive to reduce greenhouse gas emissions across all sectors and fuels. Indirect carbon pricing policies still create a price signal that applies to fossil fuels or products, but they are not designed to apply a consistent price across emissions from different sources (e.g., the price is not linked to actual GHG emissions or the carbon content of fuels). ETSs, carbon taxes, and carbon crediting are direct carbon pricing policies, but in reality, all examples of these policies currently in operation differ across sectors, fuels, activities, and/or gases. As a result, the distinction between direct and indirect carbon prices is less stark in practice, and carbon pricing policies sit on a spectrum from direct to indirect.

Term category	Term	Definitions
Carbon pricing instruments	Emissions trading system	In an ETS, the government places a limit on the amount of GHG emissions from covered entities. Entities must surrender emission units (or "allowances") to cover their emissions within a compliance period. Each emission unit represents the right to emit a certain volume of emissions (typically 1 tCO_2e) and can be traded between covered entities or sometimes with other traders. There are several different types of ETSs, including "cap-and-trade" and "rate-based" approaches, and different terms are used for the emission units within different systems. The carbon price in these systems is usually a function of supply and demand for emission units.
	Carbon tax	Through a carbon tax a government levies a fee on covered entities for their GHG emissions, providing a financial incentive to reduce emissions. Under a carbon tax, the government sets the price of emissions (the tax rate). The resulting volume of emissions reductions achieved by the policy is determined by the response of the emitting entities to the set price.
	Carbon crediting mechanism	Under a carbon crediting mechanism, tradable credits (each representing 1 tCO_2e) are generated through voluntary mitigation activities that avoid (preventing GHGs from being released, such as capturing methane from landfills) or remove (extracting GHG from the atmosphere, for instance through afforestation that sequesters carbon) emissions. These credits are issued following established protocols designed to ensure that each credit corresponds to a real and measurable reduction or removal. Once issued, carbon credits can be sold, creating a source of revenue for the project. While carbon crediting mechanisms create a source of supply, they rely on a separate source of demand for credits in order to deliver a financial incentive to reduce emissions. Demand for credits can come from compliance instruments (e.g., businesses regulated under an ETS or a carbon tax that allows the use of offsets, countries meeting nationally determined contribution targets under the United Nations Framework Convention on Climate Change (UNFCCC), or voluntary offsetting.
Types of carbon crediting mechanisms	International crediting mechanism	Mechanisms managed or administered by an international organization, including those established with authority of national governments, such as UN agencies. This category includes the Paris Agreement Crediting Mechanism.
	Independent crediting mechanism	Mechanisms administered by a nongovernmental organization, such as Verra and Gold Standard.
	Governmental crediting mechanism	Mechanisms administered by one or more governments, such as the California Compliance Offset Program and the Australian Carbon Credit Unit Scheme.
Status	Under consideration	A government has announced its intention to work toward the implementation of a carbon pricing instrument and this has been formally confirmed by official sources.
	Under development	A government is actively working toward the implementation of a specific carbon pricing instrument (for example, a mandate may have been established, but regulated entities do not yet face compliance obligations, or no credits have been issued) and this has been formally confirmed by official government sources.
	Implemented	The instrument is in full operation. For a compliance instrument, the carbon pricing instrument has been formally adopted through legislation and compliance obligations are in force and enforced. For crediting, credits have been issued (or have frameworks in place to allow credits to be used domestically) and activities are ongoing.

Term category	Term	Definitions
Greenhouse gases	CO_2	Carbon dioxide
	CH_4	Methane
	N_2O	Nitrous oxide
	PFCs	Perfluorocarbons
	HFCs	Hydrofluorocarbons
	SF6	Sulfur hexafluoride
	Other	Other GHGs or substances that are not regulated under the UNFCCC, for example black carbon or nitrogen oxides.
Sectoral coverage status	Covered	Point-source emissions from this sector are generally subject to compliance obligations (even if the regulation may apply to entities upstream or downstream from the emissions point source) or eligible for crediting. Some emissions from the sector may not be eligible or covered, for example if there are exemptions or exclusions for a particular GHG.
	Covered in principle	Some point-source emissions from this sector are covered, but in practice the share of emissions covered is very low. The low coverage rate is usually due to non-sector-specific exclusions such as certain fuels or gases being exempt, most entities in the sector falling below relevant thresholds for participation, or most entities already being covered by another initiative.
	Not covered	No point-source emissions from the sector are covered.
Sectors covered by a compliance carbon pricing instrument	Electricity and heat	Emissions resulting from fuels burned in facilities primarily producing electricity or heat for shared use.
	Industry	Emissions produced by industrial facilities including manufacturing, metal production, fertilizer production. Includes emissions from fuel used for energy in these facilities as well as emissions from industrial processes.
	Mining and extractives	Emissions from mines, rigs, and fuel processing. Includes emissions from fuel used for energy in these facilities as well as fugitive emissions.
	Transport	Emissions resulting from fuels burned for energy in the service of moving people or goods (e.g., road, rail) except for aviation.
	Aviation	Emissions resulting from fuels burned in the aviation sector.
	Buildings	Emissions resulting from fuels burned for energy in residential, commercial, and public sector buildings.
	Agriculture, forestry, and fishing fuel use	Emissions resulting from fuels burned for energy in the agriculture, forestry, and fishing sectors.
	Agricultural emissions	Emissions resulting from agricultural processes like livestock and fertilizer use. Excludes fuel use and land-use, land-use change, and forestry.
	Waste	Emissions resulting from waste management facilities including incineration of waste, methane or CO_2 produced from landfills, etc. Excludes fuel use.
	Land-use, land-use change, and forestry	Emissions (or removals) resulting from changes to carbon sinks in plants and soils.

Term category	Term	Definitions
Coverage threshold		Some initiatives set a threshold above which entities must, or can, join a compliance carbon pricing instruments. There are many different ways of expressing these thresholds—many use an emissions threshold (e.g., installations with emissions above 25,000 tCO_2e).
Point of regulation	Point source	The point source is where the GHGs are physically released into the atmosphere (e.g., at the installation combusting fuel). Regulation at the point source is where the compliance obligation is imposed on the entities that release the covered emissions into the atmosphere.
	Upstream	The compliance obligation is imposed at a point in the supply chain before the point source of emissions entering the atmosphere. For example, in relation to emissions from fuel combustion, upstream coverage could be at the point at which the fuel is first commercialized by extractors, refiners, or importers, or at point of sale to the final consumer.
	Downstream	Obligations apply at a point in the supply chain after the point source of emissions. This could include entities being liable for the emissions associated with the electricity they use. These entities are downstream from the point source of emissions (which would occur at a power station).
Credit project categories under crediting mechanisms	Agriculture	Reducing emissions from any activities in the agricultural sector.
	Carbon Capture and Storage/Carbon Capture and Utilization	Removals achieved through carbon capture and storage or carbon capture and utilization.
	Energy efficiency/fuel switching	Avoiding emissions from the participant's energy use through either reducing the amount of energy the participant consumes or switching to a less emissions-intensive energy source.
	Forestry and land use	Increasing the volume of emissions removed from the atmosphere or avoiding emissions being released through changes to terrestrial sinks.
	Fugitive emissions	Avoiding the release (intentional or unintentional) of GHGs during the extraction, processing, transformation, and delivery of fossil fuels to the point of final use.
	Chemical process/ industrial manufacturing	Avoiding emissions produced by industrial facilities including manufacturing, metal production, fertilizer production. Includes emissions from fuel used for energy in these facilities as well as emissions from industrial processes.
	Renewable energy	Emissions avoided by integrating renewable energy into the energy supply in the place of fossil fuel power.
	Transport	Reduction of emissions resulting from fuels burned for energy in the service of moving people or goods (e.g., road, rail), including for aviation.

Term category	Term	Definitions
Issuance type	Original issuance	Issuances of credits that reflect the first time a credit has been issued for a specific emission reduction/removal activity. Original issuances do not rely on any previous issuances from other crediting mechanisms.
	Non-original issuance	Issuances of credits that are connected to previous issuances from another crediting mechanism. Non-original issuances can either be issued via "direct" or "adjusted" conversions. Direct conversions are issuances that are converted 1-1 from another crediting mechanism. Adjusted conversions are issuances that are converted from another crediting mechanism but in accordance with own standards (issuances volumes might be changed).
	Overlap	Overlap can occur as a record of eligible credits as a result of the conversion of a credit from one program to another—meaning the original credit representing the specific emission reduction has been cancelled or retired in the original mechanism's registry in order for the subsequent credit to be issued.
Country income group		The World Bank classifies economies for analytical purposes into four income groups: low, lower-middle, upper-middle, and high income. For this purpose it uses gross national income per capita data in USD, converted from local currency using the World Bank Atlas method, which is applied to smooth exchange rate fluctuations. More information on country classification can be found on the Knowledge Base, available on the World Bank website: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519.

ANNEX D
Methodologies and Sources

1. **Sources and timelines:** The *State and Trends of Carbon Pricing 2025* report draws on a range of sources, including official reporting (i.e., government budget documents), related legislation that underpins the carbon pricing initiative, statements from governments and public authorities, and information provided by jurisdictions. Data and updates in the report represent the situation as of April 1, 2025, unless stated otherwise.

2. **Emissions:** For countries, (GHG) emissions data for the most recent year (2023), as well as GHG emissions data from previous years, is sourced from the EDGAR (Emissions Database for Global Atmospheric Research) Community GHG Database (2024),[113] where available, to promote consistency across jurisdictions. The EDGAR dataset aggregates emissions data for certain countries, including France and Monaco; Serbia and Montenegro; Spain and Andorra; and Switzerland and Liechtenstein. In these cases, the GHG emissions estimate for each country was determined based on the relative emissions of each country in the most recent GHG emissions inventory reported to the United Nations Framework Convention on Climate Change or also with respective emissions of the PRIMAP-hist national historical emissions time series (v2.6.1).[114] For subnational jurisdictions, GHG emissions data is based on the following:
   - GHG emissions values for Canadian provinces and territories are taken from Canada's latest national inventory.[115]
   - GHG emissions values for US states are based on official subnational GHG inventory reports of each of the respective states, available from the US Environmental Protection Agency Greenhouse Gas Inventory Data Explorer.[116]
   - GHG emissions values for Mexican states are based on official state GHG inventory data, where available. To ensure a complete time series, known annual emission values from official state-level GHG inventories are extrapolated based on the correlation of each state's GHG emissions with national GHG emissions data (as sourced through EDGAR). In the absence of specific GHG emissions inventory data for Zacatecas, state emissions were estimated based on the relationship between Zacatecas' and the national GDP across all years.
   - GHG emissions values for China subnational jurisdictions are based on the Carbon Emissions Accounts and Datasets (https://www.ceads.net/data/province/). This data was supplemented with additional information provided by ICAP.

   Values are presented in gigatons of carbon dioxide equivalent emissions aggregated using Global Warming Potential values from Intergovernmental Panel on Climate Change (IPCC) AR5 (GWP-100 AR5). Consistent with decision 6/CP.27, parties transitioned to the AR5 GWP values in their national inventory reports by December 31, 2024.

3. **Coverage:** The proportion of global GHG emissions covered by a direct carbon price is calculated based on direct carbon pricing instruments that are "implemented." The estimate of emissions coverage for each carbon pricing instrument is based wherever possible on official government sources and considers the scope (sectors, fuels, and/or gases) of policies but does not necessarily factor in all exemptions and/or free allocations. A bottom-up approach is used to calculate emissions coverage by economic sector based on data provided by governments on the point of coverage (upstream or point source), overlaps with other policies, and coverage thresholds (the

level of emissions/fuel use/power generation above which the carbon price applies). Each jurisdiction's total GHG emissions from national greenhouse gas inventory sectors IPCC (2006 Guidelines[117]) is mapped to a set of 24 detailed economic sectors (Table 2), while also removing GHG emissions that are specifically excluded from or not covered by the carbon pricing policy and adjusting for coverage thresholds. The bottom-up estimates are reconciled with the economy-wide coverage data provided by governments and overlap between instruments (where applicable) is removed to avoid double counting. The results reflect the expansion of the Chinese National ETS to cover cement, steel, and aluminum and the removal of the Canadian Federal Fuel Charge and subsequent removals of carbon prices at the province or territory level.

4. **Price:** Carbon prices from carbon taxes and ETSs are nominal prices and are generally based on the exchange-traded or auction prices on April 1, 2025, or the most recent available. Additional price information is further clarified here:
   - As of the time of writing, no information on the value of allowances in the Mexico ETS is available.
   - Massachusetts ETS price data is equal to the auction clearing price for 2023 units from the auction held on March 19, 2025.
   - California and Québec cap-and-trade price data is based on the clearing price of the most recent auction, held on February 26, 2025.
   - Regional Greenhouse Gas Initiative price data is the weighted average of the allowance transfer transaction prices on April 1, 2025. Prices are converted from USD per short ton carbon dioxide equivalent (CO_2e) to USD per metric ton CO_2e.
   - UK ETS price data is the UK Allowance Daily Futures Price on April 1, 2025.
   - New Zealand ETS price is the spot price on April 2, 2025.
   - Beijing Pilot ETS price is the average transaction price on March 27, 2025.

   Carbon prices are converted from nominal to real (2025 USD) by adjusting the observed value to the base year (2025) by way of a two-step process: (1) local currencies are converted into USD using the market exchange rate as of April 1 in the observed year (using the International Monetary Fund (IMF) exchange rates); (2) the USD historical values are then adjusted to a base year of 2025 using the average consumer price index for the United States from the IMF World Economic Outlook Database.[118]

5. **Average carbon prices:** *Covered* emissions-weighted average carbon prices are determined by multiplying each instrument's carbon price in real terms (based on average market prices or price levels submitted to the World Bank) in each year by the volume of emissions covered in the jurisdiction by that instrument, divided by the total emissions covered by the carbon pricing instrument in a given year. *Global* emissions-weighted average carbon prices are calculated through a similar process as covered emissions weighted average (i.e., the carbon price is multiplied by the volume of covered emissions). However, for the *global* emissions-weighted average, the result is divided by global GHG emissions in that year (rather than covered emissions in that year). Global GHG emissions are based on data from EDGAR's GHG 2024 dataset. For 2025, *global* GHG emissions are based on 2024 levels. For carbon taxes with multiple tax rates applied to different fuels or emissions sources, a weighted average carbon price is estimated based on the proportion of each fuel's contribution to the jurisdiction's GHG emissions. The share of consumption by fuel and use category (e.g., power, industry, transport, residential, or services) was calculated using country-level data from the International Energy Agency (IEA) Fuel Combustion database. Carbon tax rates for each fuel under each carbon tax were determined by converting fuel tax rates provided by each government in fuel quantities (e.g., volume or weight) into prices per tCO_2e. Norway and Poland include multiple rates but apply a single rate to the majority of emissions. For these carbon taxes the most common carbon tax rate is used. Both metrics for emissions-weighted average carbon prices are shown in real terms (2025 USD).

TABLE 2
Mapping of economic sectors and IPCC 2006 Guidelines for National Greenhouse Gas Inventories emissions codes

Detailed list of economic subsectors	IPCC 2006 Inventory code(s)	Aggregated list of economic sectors
1. Electricity and heat combustion	1.A.1.a	Power
2. Manufacturing combustion	1.A.2 apportioned between 2. manufacturing combustion, 3. metal production combustion, 4. mining combustion and 6. construction combustion using IEA Energy End-Uses and Efficiencies database	Industry
3. Metal production combustion		Industry
4. Mining (excluding fuels) combustion		Mining and extractives
5. Fuel extraction and production combustion	1.A.1.b, 1.A.1.c, 5B	Mining and extractives
6. Construction combustion	see entry for 2. manufacturing combustion	Industry
7. Domestic aviation combustion	1.A.3.a	Aviation
8. Road transport combustion	1.A.3.b noRES	Transport
9. Domestic shipping combustion	1.A.3.d	Maritime
10. Pipeline combustion	1.A.3.e	Transport
11. Rail combustion	1.A.3.c	Transport
12. Residential combustion	1.A.4 apportioned using IEA Energy End-Uses and Efficiencies database	Buildings
13. Services combustion		Buildings
14. Agriculture, forestry and fishing combustion		Agriculture, forestry, and fishing fuel use
15. Other combustion	1.A.5	Transport
16. Manufacturing non-combustion	2.A.1, 2.A.2, 2.A.3, 2.A.4, 2.B, 2.D, 2.E, 2.F, 2.G	Industry
17. Metal production non-combustion	2.C	Industry
18. Fuel extraction and production non-combustion	1.B.1, 1.B.2	Mining and extractives
19. Agricultural emissions non-combustion	Section 3 and 5 A	Agricultural emissions
20. Waste and wastewater non-combustion	Section 4	Waste
21. Forestry and land use non-combustion	3B and 3D*	Land Use, Land-Use Change
22. International aviation combustion	1A3ai	Aviation
23. International shipping combustion	1A3di	Maritime
24. Other extra-territorial emissions	N/A**	Not included

Note: *Forestry and land use non-combustion emissions were not included in the EDGAR data or global totals at this stage. The only carbon pricing instrument covering forestry and land use at this time is the New Zealand ETS.

** Other extra-territorial emissions were not included in the EDGAR data or global totals at this stage. These emissions will be tracked in future as jurisdictions start broadening the scope of their carbon pricing instruments to cover these emissions.

6. **Revenue:** Revenue is for the period January 1, 2024, to December 31, 2024. Adjustments are made for jurisdictions with fiscal years that do not align with a calendar year. For countries with fiscal year running from April to March (e.g., the UK), three-quarters of the revenue from the current budget (2024–2025) and one quarter of the previous budget (2023–2024) are summed to estimate the 2024 revenue. For countries with fiscal year running from July to June (e.g., Australia), half of the revenue from the current budget (2024–2025) and half of the previous budget (2023–2024) are summed to estimate the 2024 revenue. Where 2024 revenue was not available before the report was finalized, official revenue forecasts for 2024 in previous years' official budget documents were used, or revenue is estimated based on revenue collected in 2023 (for which there have been no policy changes). Revenue values are converted from nominal to real (2024 USD) by way of a two-step process: (1) observed revenue values in local currencies are converted to USD using the market exchange rates as of April 1 in the observed year (using the IMF exchange rates); (2) the USD historical revenue values are then adjusted to a base year of using the GDP deflator index for the US from the IMF World Economic Outlook Database.[119]

7. **Exchange rate conversions:** Price and revenue data are converted from national currency to USD using the IMF exchange rates.[120] Where exchange rates from national currency to USD are not available from the IMF, rates from the respective countries' central banks are used.

8. **Crediting data:** Carbon credit issuance, project registrations, and retirement data by project category are for the period January 1, 2024, to December 31, 2024. Data from independent and international crediting mechanisms is sourced from the applicable publicly available registries. Data from governmental crediting mechanisms were provided by governments for the following crediting mechanisms: Alberta Emission Offset Program, Australia Carbon Credit Unit Scheme, Beijing Certified Emission Reduction Mechanism, British Columbia Offset Program, California Compliance Offset Program, Colombia Crediting Mechanism, Guangdong Pu Hui Offset Crediting Mechanism, J-Credit Scheme, Joint Crediting Mechanism, Kazakhstan Crediting Mechanism, Quebec Offset Crediting Mechanism, Republic of Korea Offset Crediting Mechanism, Spain FES-CO_2 Program, South Africa Crediting Mechanism, Switzerland CO_2 Attestations Crediting Mechanism, crediting mechanism in Taiwan, China, Tokyo Cap-and-Trade Program and Washington Crediting Mechanism. Price data for exchange-traded transactions is provided by Platts S&P Global Commodity Insights covering the period from June 2021 to April 2025. It reflects the most competitively priced underlying contracts that meet the specifications of the carbon credit price assessments. Over-the-counter price data is provided by Ecosystem Marketplace and is based on confidentially disclosed price and transaction volume information. It represents volume-weighted average prices for carbon credits traded in voluntary carbon markets, current as of February 26, 2025.

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