



2024

STATE AND TRENDS OF

carbon pricing

© 2024 International Bank for Reconstruction and Development / The World Bank

1818 H Street NW, Washington, DC 20433

Telephone: 202-473-1000

Internet: www.worldbank.org

Some rights reserved.

1 2 3 4 27 26 25 24

This work is a product of the staff of The World Bank with external contributions. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of The World Bank, its Board of Executive Directors, or the governments they represent.

The World Bank does not guarantee the accuracy, completeness, or currency of the data included in this work and does not assume responsibility for any errors, omissions, or discrepancies in the information, or liability with respect to the use of or failure to use the information, methods, processes, or conclusions set forth. The boundaries, colors, denominations, links/footnotes and other information shown in this work do not imply any judgment on the part of The World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries. The citation of works authored by others does not mean the World Bank endorses the views expressed by those authors or the content of their works.

Nothing herein shall constitute or be construed or considered to be a limitation upon or waiver of the privileges and immunities of The World Bank, all of which are specifically reserved.

Rights and Permissions



This work is available under the Creative Commons Attribution 3.0 IGO license (CC BY 3.0 IGO) <http://creativecommons.org/licenses/by/3.0/igo>. Under the Creative Commons Attribution license, you are free to copy, distribute, transmit, and adapt this work, including for commercial purposes, under the following conditions:

Attribution

Please cite the work as follows: World Bank. 2024. *State and Trends of Carbon Pricing 2024*. Washington, DC: World Bank. DOI: 10.1596/978-1-4648-2127-1. License: Creative Commons Attribution CC BY 3.0 IGO.

Translations

If you create a translation of this work, please add the following disclaimer along with the attribution: *This translation was not created by The World Bank and should not be considered an official World Bank translation. The World Bank shall not be liable for any content or error in this translation.*

Adaptations

If you create an adaptation of this work, please add the following disclaimer along with the attribution: *This is an adaptation of an original work by The World Bank. Views and opinions expressed in the adaptation are the sole responsibility of the author or authors of the adaptation and are not endorsed by The World Bank.*

Third-party content

The World Bank does not necessarily own each component of the content contained within the work. The World Bank therefore does not warrant that the use of any third-party-owned individual component or part contained in the work will not infringe on the rights of those third parties. The risk of claims resulting from such infringement rests solely with you. If you wish to reuse a component of the work, it is your responsibility to determine whether permission is needed for that re-use and to obtain permission from the copyright owner. Examples of components can include, but are not limited to, tables, figures, or images.

All queries on rights and licenses should be addressed to World Bank Publications, The World Bank, 1818 H Street NW, Washington, DC 20433, USA; email: pubrights@worldbank.org.

ISBN (electronic): 978-1-4648-2127-1

DOI: 10.1596/978-1-4648-2127-1

Design: Simpelplus (www.simpelplus.de)

Cover design: Brad Amburn (bradamburn.com)

Copyediting: EpsteinWords

The development of this report was led by the World Bank and prepared by experts from the World Bank and adelphi. Contributions, including on data and information on emissions trading systems, were provided by the International Carbon Action Partnership. Additional data and contributions were also provided by Ecosystem Marketplace.

Platts, S&P Global Commodity Insights, and the Institute for Climate Economics also supported development of this report.

The World Bank task team responsible for this report was composed of Joseph Pryor, Ashia Bio Sawe, Alejandra Mazariegos, Adrian Constantin Gagu, Jichong Wu, Martin Laplane, Harikumar Gadde, Seoyi Kim, Shreya Rangarajan, Jacob Junghun Lee, Kathleen Patroni, Conrad Buffer, and Helen Guys.

The adelphi team included Constanze Haug, David Hynes, Stephanie La Hoz Theuer, Victor Ortiz Rivera, Santiago Ramírez Niembro, Lewis Stevens, and Theresa Wildgrube. Editorial support was provided by Leon Heckmann, Trevor Laroche-Theune, Anastasia Steinlein, and Hermia Tim Lan Chan.

This report benefited greatly from the insights and contributions from Jesús Abraham Bartolome Lasa; Alberta Environment and Protected Areas; Andrés Camilo Álvarez-Espinosa; Alexandra Andrea Maite Campmas; Aivi Aolaid-Aas; Veli Auvinen; Christopher Axelson; Charlotte Barber; Kristinn Bjarnason; Simon Black; Velda Buldas; Ciro Calderon; Diana Cardenas Monar; Daniel Clarke; the Clean Energy Regulator (Australia); Alana Clement; Climate Policy Department (Ukraine); Angela Colquitt; Claude Côté; Julie Côté; Katherine Cox; Dan Dale; Danish Ministry of Taxation; Stefano De Clara; Department of Climate Change, Energy, the Environment and Water (Australia); Department of Finance Canada; Department of Finance, Government of the Northwest Territories; Dirección Nacional de Investigaciones y Análisis Fiscal de la Subsecretaría de Ingresos Públicos de la Secretaría de Hacienda del Ministerio de Economía (Argentina); Joaquín Egaña Tamargo; Assia Elgouacem; Amanda Engel; Dominik Englert; Federal Office for the Environment - Climate Division (Switzerland); Cristina Figueroa Vargas; Carolyn Fischer; Mathieu

Fouquet; Nicolas Garceau; Alexandre Godzinski; Marlen Goerner; Rachel Gold; Jorge Gómez Lechaptois; Denitza Gonzalez; the Government of New Brunswick; Stephane Hallegatte; Lotta Hambrecht; Haley Hamza; Insa Handschuch; Andrew Hayes; Sharlin Hemraj; Kolsaker Hjalmar Richter; Livia Hollins; Rurik Holmberg; David Hynes; Heeweon Hyun; Karin Jehle; Katie Keegan; Jussi Kiviluoto; Jessica Knowler; Nicolas Krakovitch; Younghyun Lee; William L'Heudé; Shelby Livingston; Luca Lo Re; Macroeconomic and Finance Advisory, Ministry of Economy and Finance (Uruguay); Bosi Martina; Mark Mateo; MÉXICO2; Ministry of Economy, Trade and Industry (Japan); Ministry of Energy (Hungary); Ministry of the Environment and the J-credit system secretariat (Japan); Ministry of Finance (Hungary); Mariza Montes de Oca Leon; Yuliia Morozova; Marco Murcia; Kuhle Mxakaza; Nives Nared; National Center on Climate Change Strategy and International Cooperation (China); National Climate Change Secretariat and National Environment Agency (Singapore); Derek Nixon; Klaus Oppermann; Yongchul Park; Eduardo Piquero; Alex Procton; Anasuya Raj; Laura Rummelgas; Kim Ricard; Angela Liliana Rodríguez; Clément Roman; Rajinder Sahota; Gabriel Saive; Rico Salgmann; Hugh Salway; Monique Schafer; Juan Pedro Searle; Stephen Shelby; Kay Shirey; Mark Sippola; Jacob Smith; Teresa Solozábal Gallego; William Space; Sandhya Srinivasan; Lewis Stallard; Camille Sultana; Erin Szelagowski; Emma Tauti; Tax Advisory, Ministry of Economy and Finance (Uruguay); Thailand Greenhouse Gas Management Organization; Konstantinos Theodoropoulos; Maria Tome; Dharini Umapathy; Isabella Villanueva; Carlos Villasenor; Laura Weatherer; Klas Wetterberg; Jordan Wildish; Karlygash Zhunussova; and Mourad Ziani.

Report design was done by Simpelplus and editing was done by EpsteinWords.

This report has been developed as part of the Technical Work Program under the Partnership for Market Implementation.



Table of Contents

	<p>FOREWORD</p> <p>7</p>	<p>EXECUTIVE SUMMARY</p> <p>9</p>
<p>CHAPTER 1</p> <p>Introduction 12</p>	<p>CHAPTER 2</p> <p>Carbon taxes and emissions trading systems 18</p>	<p>CHAPTER 3</p> <p>Carbon crediting—markets and mechanisms 35</p>
<p>CHAPTER 4</p> <p>Conclusion 57</p>	<p>ANNEXES</p> <p>Annex A—Definitions 60</p> <p>Annex B—Methodologies and Sources 65</p>	<p>ENDNOTES</p> <p>68</p>



List of Figures

FIGURE 1	Pricing policy ecosystem and report scope	14
FIGURE 2	Global total carbon price for the period 2015-2021 (USD 2023)	16
FIGURE 3	ETS and carbon tax uptake by countries' income group over time (2005-2024)	19
FIGURE 4	Map of carbon taxes and ETSs	21
FIGURE 5	Global GHG emissions covered by ETSs and carbon taxes	22
FIGURE 6	Indicative estimates of the potential GHG emissions covered by different carbon pricing instruments and international initiatives	24
FIGURE 7	Prices and coverage across ETSs and carbon taxes, as of April 1, 2024	25
FIGURE 8	Nominal prices in the largest ETSs and carbon taxes in operation	27
FIGURE 9	Evolution of global revenues over time	29
FIGURE 10	Revenue usage from carbon taxes and ETSs in 2022	30
FIGURE 11	Covered sectors in implemented ETSs and carbon taxes	32
FIGURE 12	Carbon credit use in ETSs and carbon taxes	33
FIGURE 13	Map of governmental crediting mechanisms	37
FIGURE 14	Types of carbon crediting mechanisms and market segments	39
FIGURE 15	Issuances and retirements by project category in independent crediting mechanisms, 2018-2023	41
FIGURE 16	Annual registrations by crediting mechanism type from 2018 to 2023	42
FIGURE 17	Share of annual registrations by project category in independent mechanisms from 2018 to 2023	43

FIGURE 18	Potential issuances from 2021-2025 activities that requested transition by host country and project type	44
FIGURE 19	Indicative allocation of retirements by host country to major markets in 2023	46
FIGURE 20	Exchange-traded (ET) prices from April 2021 to 1 April 2024 and comparisons between yearly average of ET and over-the-counter prices (OTC)	49
FIGURE 21	How the Emission Reduction-Linked Bond works	54

List of Boxes

BOX 1	Looking beyond direct carbon pricing	15
BOX 2	Understanding carbon credit markets	38
BOX 3	Tracking purpose of retirement	46
BOX 4	Integrating emission reduction and removals into innovative financial instruments	53

List of Tables

TABLE 1	Key carbon pricing developments at the subnational level in the past year	20
----------------	---	----

Abbreviations and acronyms

ACCU	Australia Carbon Credit Unit	ISDA	International Swaps and Derivatives Association
BP	British Petroleum	ITMO	Internationally Transferred Mitigation Outcomes
CBAM	The EU's Carbon Border Adjustment Mechanism	LoAs	Letters of Authorization
CCPs	Core Carbon Principles	MtCO₂e	Metric tons of carbon dioxide equivalent
CDM	Clean Development Mechanism	NDCs	Nationally determined contributions under the Paris Agreement
CERs	Certified Emission Reductions	nECR	Net effective carbon rates
CFTC	Commodity Futures Trading Commission	OBPS	Output-Based Pricing System
CO₂e	Carbon dioxide equivalent	OECD	Organisation for Economic Co-operation and Development
COP28	28 th annual Conference of the Parties of the United Nations Framework Convention on Climate Change	OTC	Over-the-counter
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation	PoAs	Programmes of Activities
EMDEs	Emerging market and developing economies	REDD+	Reducing Emissions from Deforestation and Forest Degradation
ETS	Emissions trading systems	RGGI	Regional Greenhouse Gas Initiative
FCPF	Forest Carbon Partnership Facility	SBTi	Science Based Targets initiative
GHG	Greenhouse gas emissions	tCO₂e	Tons of carbon dioxide equivalent
I4CE	Institute for Climate Economics	TCP	Total carbon price
ICAO	International Civil Aviation Organization	T-VER	Thailand Voluntary Emission Reduction Scheme
iCRAFT	Innovative Carbon Resource Application for Energy Transition Project for Uzbekistan	UNFCCC	United Nations Framework Convention on Climate Change
ICVCM	Integrity Council for the Voluntary Carbon Market	UNIDROIT	Unification of Private Law
IETA	International Emissions Trading Association	USD	United States dollar
IMF	International Monetary Fund	VAT	Value-added tax
IMO	International Maritime Organization	VCMi	Voluntary Carbon Markets Integrity Initiative
IPCC	The Intergovernmental Panel on Climate Change	VCS	Verified Carbon Standard

Foreword

Carbon pricing can be one of the most powerful tools available to policymakers to incentivize reducing emissions as part of an integrated policy mix. A decade ago, carbon pricing policies covered only 7% of global emissions. Today, nearly a quarter are covered by these instruments.

There is some cause for optimism as carbon pricing and carbon markets continue to evolve and grow, and as new schemes and instruments are introduced that led to revenues reaching a record \$104 billion in 2023. Promisingly, most of the revenues raised went towards climate and nature-related programs.

The total number of implemented instruments also went up: today, there are 75 national carbon pricing instruments in operation – with recent efforts in Australia, Hungary, Slovenia, Taiwan, China, and sub-national schemes in Mexico.

And these policies are also becoming increasingly adaptable to national contexts and new sectors. Large middle-income countries including Brazil, India, Chile, Colombia, and Türkiye are making notable progress towards implementing emissions trading schemes. While the power and industrial sectors still account for the bulk of carbon pricing coverage, there are also advances in other sectors, including international aviation, shipping, and waste. Countries such as China, Vietnam, Thailand and Singapore are also increasingly seeking complementarity between carbon pricing policies and carbon markets by including carbon crediting frameworks in their policy mixes. This approach can support domestic pricing instruments and help the carbon price signal reach uncovered sectors.

Despite the positive trends that are outlined in this year's report, higher pricing and wider coverage are going to be essential to really unlock the potential of carbon pricing. This will require political commitment, stronger global frameworks, and initiatives to share best practices that can help drive ambition. Time is not on our side as countries will need to move further, faster to decisively bend the emissions curve and safeguard a livable planet.

The Annual State and Trends report provides objective and up-to-date information on key developments in carbon pricing, reflecting our efforts to become a world-class Knowledge Bank. It is part of our overall effort to support countries worldwide to understand and develop a full range of carbon pricing policies, including through our Partnership for Market Implementation program.

I hope this year's report, like its predecessors, will inform, influence and incentivize governments, private sector partners, and civil society stakeholders to support policies that put a price on carbon and help decisively bend the emissions curve.

Jennifer Sara

Global Director, Climate Change Group, World Bank



Executive Summary

Executive Summary



Carbon pricing adoption has been limited over the past year, but there are promising signs of uptake in middle-income countries

- There are 75 carbon taxes and emissions trading schemes in operation worldwide.
- There was a net gain of two carbon pricing instruments over the past 12 months.
- Middle-income countries including Brazil, India, and Türkiye have made progress towards carbon pricing implementation.
- Implementation also progressed at the subnational level, despite some setbacks.
- Progress was observed in sector-specific multilateral initiatives for international aviation and shipping.
- The European Union Carbon Border Adjustment Mechanism commenced, requiring importers of specified products to report embedded emissions.



Carbon prices remain insufficient despite a decade of strong growth

- An implementation gap remains between countries' commitments and implemented policies.
- Carbon pricing instruments cover around 24% of global emissions. Carbon taxes and emissions trading systems (ETSs) currently being considered could lift coverage to almost 30%, but this will require strong political commitment.
- While carbon tax rates showed slight increases, price changes within ETSs were mixed with ten systems experiencing price decreases over the past 12 months, including long-standing ETSs in the European Union, New Zealand, and the Republic of Korea.
- Price levels continue to fall short of the ambition needed to achieve the Paris Agreement goals.



Carbon pricing revenue reached new highs

- Carbon pricing revenues in 2023 exceeded USD 100 billion for the first time, driven by high prices in the EU and a temporary shift in some German ETS revenues from 2022 to 2023.
- ETSs continued to account for the bulk of carbon pricing revenues.
- Over half of the revenue collected was used to fund climate- and nature-related programs.
- Despite carbon pricing revenue reaching record highs, its contribution to countries' national budgets remains low.



Emerging flexible designs and approaches reflect the adaptability of carbon pricing to national circumstances

- Governments are increasingly using multiple carbon pricing instruments in parallel to expand coverage or price levels.
- Carbon pricing is mostly applied in the power and industrial sectors, but is increasingly being considered in other sectors, such as maritime transport and waste.
- Governments continue to allow regulated entities to use carbon credits to offset carbon pricing liabilities, which can increase flexibility, lower compliance costs, and extend the carbon price signal to uncovered sectors.
- Carbon pricing continues to offer benefits beyond mitigation, including as a fiscal tool.



Carbon credit markets saw mixed movements

- Governments, particularly in middle-income countries, are increasingly including crediting frameworks in their policy mix, with a view to supporting both compliance and voluntary markets.
- Credit issuances fell for the second consecutive year. Retirements remained substantially below issuances, generating a growing pool of non-retired credits in the market.
- Compliance demand is building but voluntary demand continues to dominate.
- Prices declined across most project categories, except for carbon removal projects, signaling interest in this project category.
- Prices were more resilient in over-the-counter transactions, which allow buyers to pursue specific purchasing strategies.
- Credits with specific attributes—such as co-benefits, corresponding adjustments, or recent vintages—traded at a premium, demonstrating the value these characteristics provide buyers.



The subdued market and reduced confidence emphasize the importance of initiatives to rebuild integrity and credibility

- The integrity of carbon credits remains a critical area of concern for the market.
- On the supply side, the Integrity Council for the Voluntary Carbon Market has established a benchmark for credit quality, with the first tranche of approved credits expected in 2024.
- On the demand side, efforts have focused on the importance of reducing operational and value chain emissions and the potential role for carbon credits to address residual emissions.
- Development and implementation of Paris Agreement Article 6 continues, despite setbacks and delays.