

CARBON PRICING LEADERSHIP REPORT

2022/23



CARBON PRICING
LEADERSHIP COALITION

This report was prepared by the Secretariat of the Carbon Pricing Leadership Coalition under the leadership of Venkata Ramana Putti. Jichong Wu managed the project with support from Daniella Restrepo Duarte and Andrea Victoria Garcia Salinas. It covers the period ending May 31, 2023.

CONTRIBUTORS

Anna Boneta Herrero (Andorra), Anna Nakleskina (RUSAL), Anupam Badola (Dalmia Cement), Breanna Lujan (Environmental Defense Fund), Britta Johnston (Environmental Defense Fund), Cédric de Meeûs (Holcim), Claire Ong (CPLC Singapore), Darragh Conway (Climate Focus), Dirk Forrister (International Emissions Trading Association), Esther An (City Developments Limited), Fenella Aouane (Global Green Growth Institute), Irene Geleit (bp), Isabel Garro (ACCIONA), Jackson Ewing (Duke University), Jimmy Sah (Infinite Solutions), José Almeida (COPENOR S.A.), Kevin Conrad (Coalition for Rainforest Nations), Lars Bach Jensen (Confederation of Danish Industry), Liubov Yaroshenko (En+ Group), Lukasz Biernacki (Climate Action Data Trust), Madalena Lucas (EDP–Energias de Portugal S.A.), Malek Al-Chalabi (Shell), Marshall Brown (Global Green Growth Institute), Mohammad Shariar Nafees (NaxRo), Philippe Grégoire (Government of Québec, Ministry of the Environment, the Fight against Climate Change, Wildlife and Parks), Rachael Jonassen (The George Washington University), **Silvio Vaz Jr. (Brazilian Agricultural Research Corporation)**, Tamie Kanda (Global Green Growth Institute), Terence Tan (CPLC Singapore), Thomas Blackburn (SustainCERT), Vito Saluto (AMEA Power)

© 2023 International Bank for Reconstruction and Development / The World Bank
1818 H Street NW, Washington, DC 20433
Telephone: +1-202-473-1000
Internet: www.worldbank.org

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 of the data included in this work. The boundaries, colors, denominations, and other information shown on any map 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. All amounts in \$ are United States dollars unless stated otherwise.

RIGHTS AND PERMISSIONS

The material in this work is subject to copyright. Because The World Bank encourages dissemination of its knowledge, this work may be reproduced, in whole or in part, for noncommercial purposes as long as full attribution to this work is given.

Attribution—Please cite the work as follows: World Bank, 2023. Carbon Pricing Leadership Report 2022/23. World Bank, Washington, DC.

All queries on rights and licenses should be addressed to the Publishing and Knowledge Division, The World Bank, 1818 H Street NW, Washington, DC 20433, USA; fax: 202-522-2625; email: pubrights@worldbank.org.

Editing and design by Clarity Global Strategic Communications (www.clarityglobal.net).

About this report

This annual Carbon Pricing Leadership Report complements the Carbon Pricing Leadership Coalition's advocacy and networking activities by elevating thought leadership in the mitigation arena and sharing how partners across all sectors are putting a price on carbon and engaging in carbon markets to reduce their emissions. With less than a decade to go before the Paris Agreement's 2030 deadline, collaboration and knowledge-sharing are more important now than ever before. We hope this report will inspire decision-makers from all sectors to commit to ambitious climate action through carbon pricing in the years to come.

Contents

Foreword	3
Global developments in carbon pricing	5
New mechanisms for carbon finance for developing countries	5
Stakes increase as voluntary carbon markets and climate finance converge	11
User-friendly digital offerings aim to increase transparency and speed	13
Diverse actions to implement carbon pricing in government departments	18
Leadership in action	21
Level playing field for carbon costs is key to meeting net zero commitment	21
Using internal carbon pricing in the transition to net zero	23
Making strides towards net zero	24
Generating carbon credits in emerging economies	27
Cookstoves and nature-based solutions generate carbon credits	28
PMIF programs	29
About the CPLC	33
Our partners	37

Foreword



HANIA DAWOOD, Practice Manager, Climate Finance and Economics, World Bank

The next decade's success in reducing carbon emissions will determine our ability to achieve our climate goals. It is crucial to meet nationally determined contributions (NDCs), develop long-term strategies (LTs), and mobilize capital for the transition. Carbon pricing, as part of a comprehensive policy package, can contribute to broader climate and development objectives. By incorporating climate change costs into economic decision-making, carbon pricing can guide financial flows, including those from international investors, and drive innovation.

The next decade's success in reducing carbon emissions will determine our ability to achieve our climate goals. It is crucial to meet nationally determined contributions (NDCs), develop long-term strategies (LTs), and mobilize capital for the transition. Carbon pricing, as part of a comprehensive policy package, can contribute to broader climate and development objectives. By incorporating climate change costs into economic decision-making, carbon pricing can guide financial flows, including those from international investors, and drive innovation.

This year has witnessed continued progress in carbon pricing. The number of implemented carbon pricing instruments has increased to 73, covering approximately 23 percent of global emissions. New sectors are introducing carbon pricing instruments, and prices have risen in about half of emissions trading systems (ETs) or carbon taxes. However, surging inflation has offset some of these increases. Government revenues from carbon taxes and ETs reached a record high of \$95 billion globally in 2022. Voluntary action in carbon markets has also grown, driven by increased demand for carbon credits from corporations.

Regarding international carbon markets, efforts to operationalize Article 6 are under way. More progress is needed to unlock the potential of carbon markets as a source of international climate finance. Article 6 rules are sufficiently developed to begin preparations in several jurisdictions, including through the Article 6 Implementation Partnership launched at UNFCCC's COP27 under Japan's leadership. The World Bank, through the Partnership for Market Implementation Facility (PMIF), among other initiatives, is supporting the operationalization of Article 6.

To accelerate change, the *Global Carbon Pricing Challenge* urges all countries to adopt carbon pricing as a central component of their climate strategies. We take pride in our collaboration with this Canadian-led initiative, launched at COP27.

Mobilizing the necessary funding for the transition and supporting policy changes will require significant efforts from multilateral development banks, governments, and the private sector. It is crucial to utilize all available tools, including supporting efforts to internalize emission externalities through carbon pricing mechanisms. With this momentum for action comes complexity: divergence in carbon pricing mechanisms at the national and subnational level, and understanding the interaction between different carbon pricing instruments, and the role of carbon markets.

HIGH-LEVEL HIGHLIGHTS: CPLC FROM INCEPTION

Since 2015, the CPLC has worked with over 320 partners to mobilize support for carbon pricing policies in the public and private sectors. It has brought together high-level representatives from governments, the private sector, and civil society, establishing itself as a trusted platform for carbon pricing advocacy. The CPLC has facilitated country dialogues in Brazil, South Africa, India, and others, and established a country chapter in Singapore in 2018.

Significant achievements have been made since 2015. In its inaugural year, the CPLC released the [FASTER principles](#) for effective carbon pricing. In 2016, the CPLC convened the High-Level Commission on Carbon Prices, co-chaired by Nobel Laureate Joseph Stiglitz and Lord Nicholas Stern, which brought together international experts to identify the carbon price range necessary to meet the Paris Agreement goals. The resulting report, released in 2017, was a notable achievement.

During the pandemic, the CPLC continued to engage stakeholders through high-level dialogues and regional workshops worldwide, examining the role of carbon pricing in sustainable and green recovery strategies. In 2021, it convened a net-zero expert taskforce to identify strategies for achieving mid-century net-zero goals and the role of carbon pricing mechanisms, with findings published in the [task force report](#).

The CPLC has made valuable contributions as an advocate for carbon pricing in an ever-evolving context. As we evaluate the next phase of the CPLC, we extend sincere thanks to our partners for joining us on this journey.



This transformation of carbon pricing as a mainstream mitigation tool and the evolving institutional landscape has implications for the CPLC. In the following months, through a process of consultation with partners, the CPLC will review its mandate and work program to respond to the new environment and evolving needs of the carbon pricing movement.

This report showcases some of the ways in which partners have met the climate and development challenges we face. Now, more than ever, we need to continue to work together towards a low-carbon and resilient future. •

Global developments in carbon pricing

FOCUS: NEW MECHANISMS FOR CARBON FINANCE FOR DEVELOPING COUNTRIES



FENELLA AOUANE (LEFT)

Global Green Growth Institute Deputy Director, Head of Carbon Pricing Global Practice

MARSHALL BROWN (RIGHT)

Program Manager, Supporting Preparedness for Article 6 Cooperation (SPAR6C) program

The Global Green Growth Institute (GGGI) is working on a Carbon Transaction Platform to give buyers and sellers an equal seat at the table in Article 6 transactions hosted by developing countries. It is also supporting work to create the mechanisms that will enable the private sector and governments to work together domestically and internationally.

Working towards equity and smooth systems for Article 6 transactions in emerging economies

GGGI is an intergovernmental organization that, among other activities, has been supporting Article 6 readiness in its members country governments across developing countries and emerging economies since 2019. We provide support for the design of relevant regulations, institutional strengthening, and knowledge sharing to catalyze market activity. This is possible through a business model of having permanent country-based staff embedded within the ministries we support.

In late 2022, GGGI published a technical report that presents our experiences of this work. It includes a synthesis of findings from a unique member survey—unique because we had the benefit of sitting with people in more than 30 countries where we work, spending time with them to dig into the deeper issues related to Article 6 implementation. The report explores the need for and barriers to meaningful, equitable participation in carbon markets, and offers a solution through an innovative Carbon Transaction Platform, which we hope to launch in the latter half of 2023.

Because the implementation of Article 6, particularly corresponding adjustments, is going to require governments and the private sector to work together more closely than ever before, we are currently focusing on working with member governments. We need to create smooth systems that the private sector and governments can use to meet NDCs and get carbon finance flowing.

The core of our work is supporting our member and partner governments along a pathway of green growth—and all our partners have said they need finance in order to achieve it. Carbon finance through Article 6 is a critical way for our members to finance their green growth, in addition to climate finance using the traditional avenues of concessional lending, grants, and guarantees. The difference is that it is transactional in nature and therefore better oriented towards the private sector and very scalable.

The platform is still evolving, but the survey has given us insights into what needs to be done to make Article 6 transactions get off the ground. We have realized that many countries are hesitant to participate in Article 6 transactions because they do not feel in control of their decision-making: for example, they lack the information they need to negotiate prices and the local expertise to monitor and validate internationally transferred mitigation outcomes. This discomfort will stop the market from gaining momentum.

Perhaps the most important contribution our platform can make is giving an equal seat at the table for buyers and sellers, by ensuring that everyone has access to the same information. The platform will create a space to bring buyers together, and sellers together, to exchange information prior to trading. Host countries will need to be involved in projects from much earlier because the requirements for authorization are so much stronger: they need to know the projects exceptionally well and be confident that they are aware of the benefits and risks. This is another need that the platform can meet.

We are positive about the advances that have been made in Article 6. There have already been forward trades, but there are still many questions to answer, particularly around issues such as how a country might mix their own obligations under their NDCs with the carbon markets, which might include their own carbon pricing, voluntary carbon market trades, and trades under Article 6. There are also logistical questions around how the private sector can participate in Article 6 trading while not being party to the Paris Agreement.

We have looked at countries like the Republic of Korea for potential solutions—the government is exploring modalities that would allow it to act as a conduit for the private sector to enter the Article 6 market. As a possible model, the government could have a fund or facility that the private sector would use to transact with partners in a host country, supplying the mechanism for the corresponding adjustment to be applied by both the government of Korea and the host country government.

With the operationalization of Article 6 there are exciting opportunities for mechanisms working side by side to get carbon finance flowing while transitioning to net zero. For example, the United States is exploring getting corporate buyers of emissions reductions from other countries to look for transactions that build an energy transition. This forms part of the Just Energy Transition Partnership's work, which aims to fund energy transitions in coal-intensive countries such as Indonesia, South Africa, and Vietnam.

There is a significant opportunity for our member countries to generate finance while contributing to the global effort to dramatically reduce emissions. Our work this past year has focused on making sure that our member countries are supported to start taking advantage of the opportunities offered under international carbon markets.

About GGGI

Headquartered in Seoul, Korea, GGGI is a treaty-based international intergovernmental organization with 45 members and over 22 countries and regional integration organizations in the process of accession. The institute is dedicated to supporting and promoting strong, inclusive, and sustainable economic growth in developing countries and emerging economies. With operations in 40 countries, GGGI serves the role of an enabler and facilitator of member states' transition into a low-carbon, green economy, providing policy advice and technical support in the development of green growth plans, policies, and regulations; mobilization of green investments; implementation of green growth projects; and development of local capacities and knowledge sharing. ●

UPDATE: ARTICLE 6

The Article 6 agreements reached at the 2021 COP26 negotiations on the Paris Agreement allow for the transfer of emissions between countries through voluntary cooperation. Article 6.2, which governs bilateral and multilateral country agreements, introduced a framework for reporting and accounting for these internationally transferred mitigation outcomes. Article 6.4 sets up a global carbon market with credits issued under the supervision of the Conference of the Parties.

The decisions adopted at COP27 saw further progress, but work remains to be done on Article 6 before it can be fully functional. Outstanding issues under discussion at COP28 will include:

- Issues around authorizations at country level for credits—including how to ensure corresponding adjustments are applied.
- Questions around what would happen if Article 6.2 credits declared by host countries are revoked or amended at a future date, following review.
- Methodologies for Article 6.4.
- Technical issues such as reporting formats.

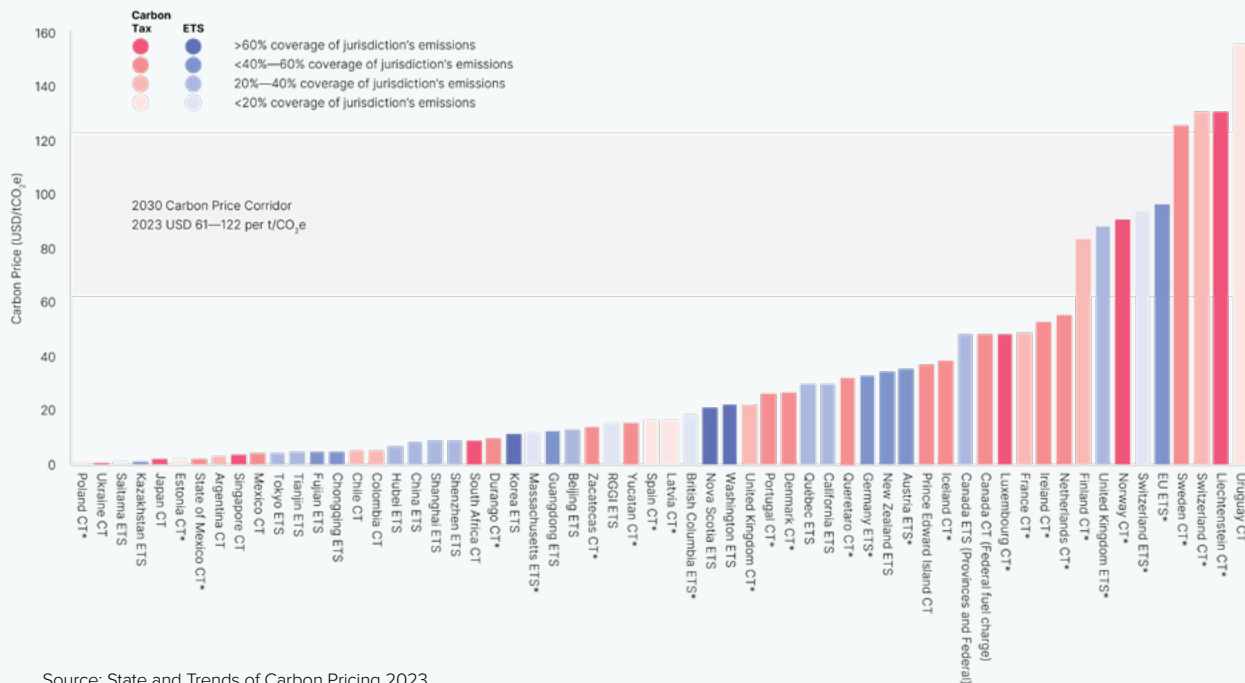
UPDATE: STATE AND TRENDS OF CARBON PRICING 2023

Despite showing remarkable resilience, carbon prices remain well below the levels required to meet Paris Agreement Goals

ETSs and carbon taxes have weathered the 2022 global energy crisis relatively well, with the majority of ETSs and taxes experiencing nominal price increases in the past 12 months. Importantly, there were only a few instances where governments wound back ETSs or carbon taxes in response to the energy crisis. And several new instruments were launched within the past 12 months, taking the number of implemented instruments to 73, covering around 23 percent of global GHG emissions. However, despite showing resilience, it is clear that carbon prices will need to rise to drive decarbonization at the scale and pace required to meet the Paris Agreement goals. As of April 1, 2023, less than 5 percent of global emissions were covered by a direct carbon price at or above the price range recommended High-Level Commission on Carbon Prices (see Figure 1).¹

¹ In 2017, Joseph Stiglitz and Nicholas Stern led a report of the High-Level Commission on Carbon Prices. This report recommended that direct carbon price levels must reach at least \$40 to \$80/metric ton of carbon dioxide equivalent (tCO₂e) in 2020 and \$50 to \$100/tCO₂e in real terms (in 2017 USD) by 2030 (or \$61-122 by 2030 in 2023 terms) to limit global warming to below 2°C, provided a supportive policy environment is in place.

FIGURE 1: PRICES AND COVERAGE ACROSS ETSS AND CARBON TAXES

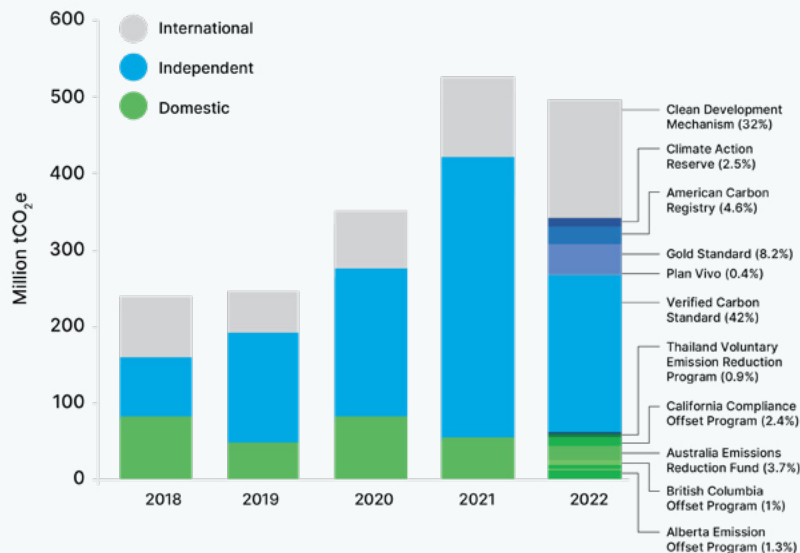


Source: State and Trends of Carbon Pricing 2023.

Carbon credit markets experienced a slowdown after years of rapid growth

Carbon credit issuances and retirements credits fell slightly compared to 2021, although they remain significantly above levels in preceding years (See Figure 2). While issuances from international crediting mechanisms (via the Clean Development Mechanism) grew in 2022 (accounting for around a third of all credits issued in 2022), independent crediting mechanisms continued to represent the largest share of issued carbon credits. Carbon credit price trends varied, with prices for exchange-traded credits declining significantly over the past 12 months across all categories, especially those from nature-based projects. However, some participants have seen prices increase in over-the-counter transactions. The price of futures contracts suggests market participants expect prices to rise and there is potential for the price premium for exchange-traded, nature-based credits to reemerge.

FIGURE 2: GLOBAL VOLUME OF ISSUANCES BY CREDITING MECHANISM TYPE (2018–2022)

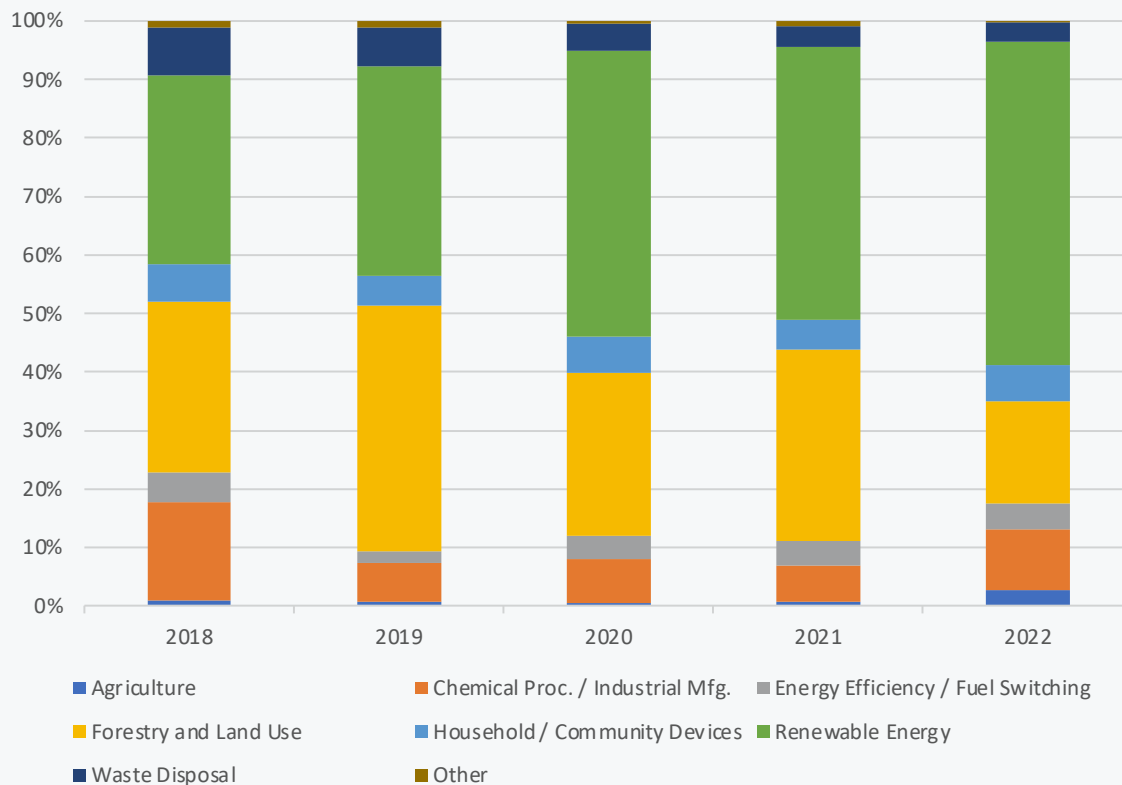


Source: State and Trends of Carbon Pricing 2023.

NATURE-BASED CREDITS ON THE RISE

The number of credits from nature-based sources is growing more quickly than renewable energy-based credits. The latter represented 55 percent of all credits issued in 2022 according to analysis by Ecosystem Marketplace. One reason for the change is that the increased affordability of developing renewable projects has reduced the need for project financing through carbon credits. At the same time, nature-based activities, including emissions reductions from agriculture and forestry and land use activities, have increasingly been sought by buyers.

FIGURE 3: PERCENTAGE OF TOTAL ISSUANCE BY PROJECT CATEGORY



Source: Adapted from State and Trends of Carbon Pricing 2023.

NEW GUIDE TO TROPICAL FOREST CARBON CREDITS SUPPORTS INTEGRITY

The Tropical Forest Credit Integrity (TFCI) Guide, released in 2022 and updated in March 2023, provides companies with guidance on high-quality tropical forest carbon credits to ensure that finance is directed towards growing tropical forest conservation at the scale and pace needed to avert the worst impacts of climate change.

Eight organizations—Conservation International, Coordinator of the Indigenous Organizations of the Amazon Basin, Environmental Defense Fund (a CPLC partner), Amazon Environmental Research Institute (IPAM Amazônia), The Nature Conservancy, Wildlife Conservation Society, World Resources Institute, and World Wide Fund for Nature (WWF)—collaborated to produce the guide, funded by the Bezos Earth Fund.

Developed in response to growing demand for carbon credits in the voluntary market, the TFCI Guide offers comprehensive, step-by-step recommendations for companies to follow when purchasing high-quality tropical forest carbon credits. The guidance is designed to assist decision-makers and teams responsible for developing and implementing corporate climate mitigation and net zero strategies to differentiate tropical forest carbon credits by impact, quality, and scale so that they can navigate the voluntary carbon marketplace with confidence and integrity.

Companies are walked through a four-step process that covers planning and building a portfolio of carbon credits, conducting due diligence, and staying attune to market developments. With the TFCI Guide, companies will be able to direct and leverage their demand for tropical forest carbon credits effectively, which will be critical to determining the appropriate carbon price to incentivize and develop a pipeline of high-quality tropical forest carbon credit supply, and to helping stop and reverse tropical forest loss.



There is a critical need to get things right as the United States seeks to leverage the voluntary carbon market to drive outbound climate finance investments through the Energy Transition Accelerator (ETA), launched at COP27 in late 2022. The ETA must strike the delicate balance of creating robust measurements and safeguards for issuing credits without creating systems that are impenetrably complicated for the stakeholders involved; especially those in low- and middle-income countries (LMICs).

OPINION: STAKES INCREASE AS VOLUNTARY CARBON MARKETS AND CLIMATE FINANCE CONVERGE

JACKSON EWING, Duke University

The global voluntary carbon market is being increasingly depended on to provide climate and development finance to LMICs. As a result, the market and related market efforts need to become more robust, and a reckoning is due on what they should and should not be counted on to deliver across the broader climate finance landscape.

While primarily a tool for climate mitigation, the voluntary carbon market provides pathways for substantial private capital flows to LMICs that help protect natural endowments, sustain agriculture, and build cleaner energy, industrial, and transportation systems. These pathways are straightforward in principle. Private companies invest in projects that have climate mitigation value, measure the resulting avoided or reduced emissions, and gain corresponding credits with which to offset their emissions footprints. Where truly effective, these investments also benefit the places and communities where they occur by supporting infrastructure and systems that can help drive local low-carbon development.

Despite these connections, climate finance and carbon markets—voluntary and otherwise—have largely occupied separate tracks in international climate discourse, diplomacy, and action. Climate finance hinges on developed country commitments to provide resources to developing country counterparts that help them skip or roll back high-emitting development, and to adapt to climate change. Climate finance debates center on developed countries following through on past promises, the need to reform finance delivery institutions and practices, and how best to use scant public money to galvanize larger private investments.

The voluntary carbon market hinges on providing ways for typically well-resourced companies to offset their emissions through actions outside their own supply chains and operations. Voluntary carbon market debates revolve around how to ensure that carbon credits are trustworthy and represent actual mitigation outcomes, and how to scale the supply and effective exchange of credits to meet mounting demand.

These two tracks are converging. There is growing demand for high-quality credits with both clear mitigation value and strong development benefits. Those impacted by voluntary carbon market projects want locally beneficial results. As overall

market transactions increase and the voluntary carbon market becomes more important within company-level decarbonization strategies, the reputational and operational risks from poor credit veracity and negative community impacts increase apace, increasing the stakes for the voluntary carbon market to prove itself an effective climate and development finance vehicle.

Meanwhile, the largest global economy, the United States, is explicitly leveraging the voluntary carbon market to drive outbound climate finance investments through the ETA. The accelerator seeks to drive private investment to support comprehensive energy transitions in LMICs by, for example, increasing renewable energy deployment and retiring fossil fuel assets. The ETA will yield emissions reductions, which recipient LMICs can issue as carbon credits to the investors. The ETA's major innovations are that it takes a jurisdictional, system-wide approach to producing and issuing carbon credits rather than a project-level approach, and that it is more explicitly couched as a climate and energy transition finance vehicle compared to the traditional voluntary carbon market.

Challenges abound. While the ETA will consult groups tasked with ensuring carbon credit reliability—the Science Based Targets initiative, the Voluntary Carbon Markets Initiative, and the Integrity Council for the Voluntary Carbon Market—it faces a steep climb in quantifying and verifying emissions reductions across a portfolio of systems and activities. Assessing risks, reputational and otherwise, may also prove more difficult for investors at jurisdictional levels than for

discrete projects—particularly for fossil fuel retirements that could reward fossil asset holders. These and other problems that already hinder the voluntary carbon market at the project level will become more troublesome in the ETA. The ETA's private sector bent also means it will do little to quell LMIC calls for further public finance from the United States and beyond that is cheap to acquire, fit for purpose, and accessible without overwrought conditions.

Despite these challenges, voluntary carbon market investments and connected innovations such as the ETA are set to grow as tools of climate finance, which means getting them right is critical. The ETA must strike the delicate balance of creating robust measurements and safeguards for issuing credits without creating systems that are impenetrably complicated for the stakeholders involved; especially those in LMICs. The voluntary carbon market must similarly balance the need for greater scale with the reality that, as transactions grow and exchanges move from over-the-counter to registries, the particulars of a given carbon credit—both for mitigation and development—will be more difficult to determine. Both the voluntary carbon market and the ETA must also demonstrate value that goes far beyond climate mitigation if LMICs are to remain committed partners.

Prospects on all these fronts are far from clear. It is clear, however, that major public, private, and civil society actors are seeking to leverage market mechanisms for climate finance on scales never before seen. As such, a new phase of international climate finance has likely begun. ●

“Voluntary carbon market investments and connected innovations such as the ETA are set to grow as tools of climate finance, which means getting them right is critical.”

FOCUS: USER-FRIENDLY DIGITAL OFFERINGS AIM TO INCREASE TRANSPARENCY AND SPEED



The Climate Action Data Trust (CAD Trust) was launched on December 7, 2022, at the Asia Climate Summit with a mandate to work on enhancing transparency in carbon markets through open data. The Singapore-based initiative was founded by the World Bank, the International Emissions Trading Association (IETA), and the government of Singapore. The CAD Trust is an integral part of the World Bank's Climate Warehouse end-to-end digital ecosystem.

The CAD Trust is a decentralized metadata platform that links, aggregates, and harmonizes all major carbon registry data.

As global ambitions to use carbon markets to reach net zero increase, organizations and partnerships are working on digital solutions to enable trustworthy, unified, and faster transactions for both compliance and voluntary markets.

Climate Action Data Trust's new metadata platform aims to promote transparency and boost confidence in carbon markets.

DIRK FORRISTER, CEO of the International Emissions Trading Association, one of the CAD Trust's founding partners

A one-stop shop for all carbon credit registry data

[The CAD Trust](#) aims to promote climate action in line with the Paris Agreement's goals by enhancing the transparency and environmental integrity of carbon credit transactions and international carbon markets. To achieve this, we have created a decentralized information technology platform based on blockchain, which offers a new digital infrastructure for the global carbon market.

The CAD Trust addresses the issue of fragmentation across standards and the lack of centralized registries between voluntary and compliance markets. More than 30 carbon market stakeholders, including 11 national governments and 75 testers across 58 testing sessions, have tested the global infrastructure. The UNFCCC, UNDP, Verra, Gold Standard, American Carbon Registry, Global Carbon Council, Climate Action Reserve, GenZero, and the national governments of Chile, Japan, Peru, Rwanda, Senegal, Singapore, Spain, Sweden, Switzerland, the United Kingdom, and Uganda were among the participants. Once fully operational, the CAD Trust will simplify the integration of distinct registry systems. It will accomplish this by providing a unified and user-friendly metadata layer that can instantly extract information about particular units and projects, forming the basis for compliance reporting and auditing information. Registries connected with the CAD Trust are accountable for the projects and the quality of data they share with the platform. By openly providing details on the life-cycle of projects, issued units, and the movement of units, these registries offer assurance through the CAD Trust that units are not being double-counted.

The potential arising from unifying this data and making it more user-friendly is transformative. Once the CAD Trust system is operational it will be possible for a buyer or an investor to sort project types by country, by vintage, by the standards used for measurements, or by who verified it. For example, in late March 2023, the Integrity Council for the Voluntary Carbon Market issued its initial Core Carbon Principles and Program-level Assessment Framework for a new kind of label of quality, a Core Carbon Principle label. The data layer will be able to reflect this and other labels. This means a much more detailed and up-to-date analysis is possible, and therefore, higher-quality decision-making for businesses and countries involved in carbon markets.

It will also ease the burden in terms of the time and cost of gathering verified information. In the voluntary carbon market, information is usually released quarterly or annually, with time needed to gather data from a number of different sources. The platform will allow for regular updates of trustworthy information and greater speed in decision-making. A big benefit for companies will be the due diligence aspect: being able to go to one place to make sure, before investing, that the project under consideration is not involved in multiple programs.

We hope that it will build confidence and spur more companies and countries to scale up their activities and enter the carbon market.

Enabling Article 6 cooperative approaches

By supporting nationally compatible registry systems, the CAD Trust could become a significant facilitator of Article 6 cooperative approaches. Countries that are interested will also need tracking systems that meet Article 6 requirements to guard against double-counting and to provide trust and confidence that market participants will demand before making investments or purchases. The CAD Trust provides the data specifications for what is needed in the registry: the World Bank has an offering for countries in the form of a registry that is built with CAD Trust data specifications, that is easy to populate, and that can be automated with an application planning interface connection.

This will revolutionize the data, allowing for connectivity and conflict resolution between national and independent standard registries. The CAD Trust has the potential to promote international reporting under the Paris Agreement, enabling better coordination and harmonization of efforts towards achieving the agreement's objectives.

“We hope that the CAD Trust system will build confidence and spur more companies and countries to scale up their activities and enter the carbon market.”

To play this innovative, unifying role, the CAD Trust has brought together both public and private institutions to work together in a way that we have never done before: leadership includes both country representatives and leaders from the non-profit organizations that run voluntary carbon market registries. It also involves technical experts from a wide range of corporates, academic institutions, non-profits, and national governments. A call for an expression of interest has been sent out for those interested in participating in the CAD User Forum, which will comprise market practitioners and users of the data to advise on additional functionality and use. The forum will act as a market sounding board for the CAD Trust Council and the technical committees for technical, policy, and business matters. The CAD Trust announced the members of the User Forum in June 2023.

NEW INTEGRITY COUNCIL LAUNCHES GLOBAL BENCHMARK FOR HIGH-INTEGRITY CARBON CREDITS

The Integrity Council for the Voluntary Carbon Market has launched its Core Carbon Principles and Program-level Assessment Framework. The principles, developed with input from hundreds of organizations throughout the voluntary carbon market, set out a framework for high-quality credits that create real, verifiable climate impact, based on the latest science and best practice.

The Core Carbon Principles are designed to build trust, unlock investment, and channel it to effective climate solutions by providing a readily identifiable benchmark for high-integrity carbon credits, no matter which carbon-crediting program issued them, what kind of credits they are, or where they are generated. This will reduce confusion, overcome market fragmentation, and give buyers confidence they are funding projects that are making a genuine impact on emissions.

DIGITIZING VERIFICATION FOR CARBON MARKETS TO ENABLE FASTER ACTION THROUGH CARBON PRICING

SustainCERT, a climate impact verifier and an official certification body for Gold Standard for the Global Goals, will launch the world's first software platform for digital verification for carbon markets and value chains in 2023.

Digital measuring, reporting, and verification will bring impact verification for carbon markets into the digital age, transforming the verification process from one that is manual to one that is digital. This increases the speed, accuracy, and frequency at which carbon credits can be verified and issued.

Digital technologies can provide the opportunity to scale carbon markets with integrity. If leveraged correctly, they can drastically improve data quality and comparability, increase efficiencies and accuracy of verification activities, and increase overall trust that impact is being achieved as claimed.

Another significant benefit expected from digitization is the ability to issue credits in near-real time. This would enable earlier cash flows and reduce the financial risks for project proponents. Issuing credits in near-real time can only come about when measuring, reporting, and verification of sustainable development co-benefits, as certified by certain standards, is fully automated.

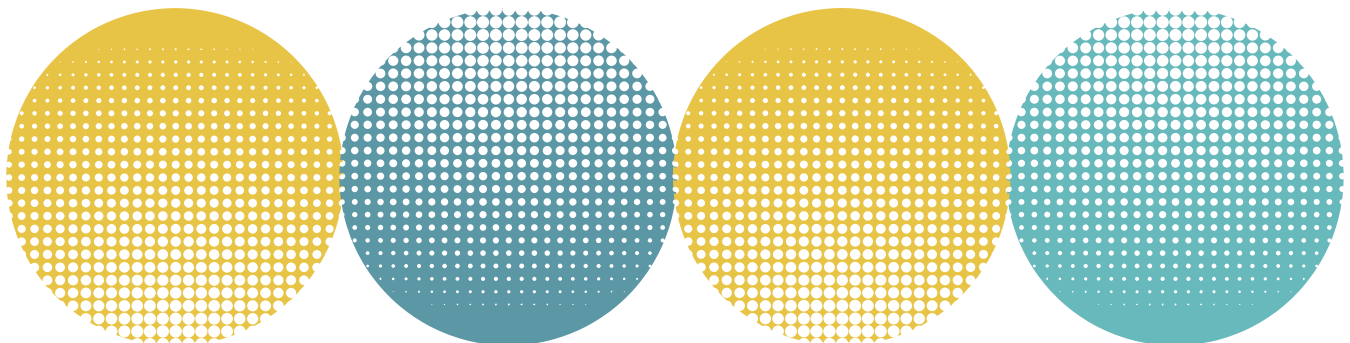
SustainCERT, in preparing to launch the platform, published an open white paper in September 2022. The paper identified blueprints and general principles for incorporating digital verification processes for GHG emission reductions and removals. Two promising blueprints for using digital approaches to verify carbon projects explored the changing roles of project participants and verifiers, and identified general principles related to assessing data, compliance, and quantification. This included specific examples dependent on project type, such as grid-connected renewable electricity projects versus afforestation/ reforestation projects, where requirements can vary greatly.

VOLUNTARY CARBON MARKET DASHBOARD PROVIDES CONSOLIDATED DATA ON RELEVANT CARBON MARKET METRICS

Climate Focus has released a voluntary carbon market dashboard, which aims to provide companies, investors, and project developers with consolidated data on relevant carbon market metrics. This open-source dashboard keeps track of market development indicators for leading voluntary carbon standards, including Verra's Verified Carbon Standard, the Gold Standard's SustainCERT, the American Carbon Registry, the Climate Action Reserve, Plan Vivo, the Global Carbon Council, and Climate Forward. This tool offers access to timely market intelligence using customizable visuals that allow users to segment market data by year, carbon standard, geographic location, or project type.

As interest in the voluntary carbon market grows, transparency around key market indicators—such as carbon credit issuance and retirement data, trends in new project type registrations, and regional developments—is imperative. With leading carbon standards maintaining a siloed approach to publicizing project data, several initiatives have recently been launched to consolidate data flow across these fragmented markets.

Similar initiatives include the Ecosystem Marketplace's Global Carbon Markets Data Intelligence and Analytics Dashboard (also open source) and IHS Markit's Carbon Meta-Registry.



FOCUS: DIVERSE ACTIONS TO IMPLEMENT CARBON PRICING IN GOVERNMENT DEPARTMENTS

While the range of actions taken by partners in government departments reflects their unique circumstances, each contributes to collective decarbonization. As the need for countries to meet Paris Agreement commitments becomes increasingly urgent, partners have also been involved in developing toolkits and courses to enable faster and deeper change.

Québec's one-of-a-kind forestry offset protocol

In December 2022, the Québec government introduced an innovative forestry offset protocol that stands out from most cap-and-trade or REDD offset protocols. The Québec regulation regarding afforestation or reforestation on privately owned land focuses on the achieved real and measurable climate benefits associated with the removal of atmospheric carbon dioxide, to ensure the environmental integrity of credits being issued.

Unlike the climate outcomes or benefits associated with GHG emissions reduction projects, Québec's forestry protocol recognizes that carbon storage in forest ecosystems is only temporary. Instead of issuing credits upfront under the assumption that the designated forest or biomass area will remain intact for years to come, the protocol maintains that the climate benefits of forestry projects designed to remove quantities of atmospheric carbon dioxide must be equivalent to those obtained by GHG emissions reduction projects. In other words, the protocol calls for credits to be issued only in relation to the fulfilled climate benefits of the sequestered carbon, thus avoiding the need for a special reserve of credits to compensate for canceled or invalidated credits should a project not fulfill its promises for whatever reason.

This innovative approach to quantifying and issuing offset credits also reduces the financial burden and operational constraints associated with measurement, reporting, and verification requirements as project promoters do not have the burden to manage permanency for 100 years. This approach also provides greater flexibility in terms of land and resource use and gives project promoters the choice of when to submit a credit issuance request.

Project promoters must go through a rigorous six-step process to have their credits delivered. The generation of an offset credit is based on the radiative effect associated with all annual carbon stocks retired in the atmosphere and the length of time these stocks have been sequestered. To help project promoters make that determination, Québec's International Reference Center for Life Cycle Assessment and Sustainable Transition (CIRAIG) developed a trailblazing metric at the request of the government: the Radiative Budget Balance Calculator.

Only afforestation and reforestation projects completed inside Québec are eligible for offset credit issuance under the regulation, but the government is eager to share its expertise on the subject with its CPLC partners.

Visit <https://menv.gouv.qc.ca/changements/carbone/credits-compensatoires/sequestration-carbone-boisement-reboisement-terres-prive-en.htm> for more information.

Carbon capture technology provides basis for future carbon valuation in Brazilian partnership

A new technology that measures—and can therefore value—carbon dioxide emissions in a carbon capture and use process is put to work in a partnership aimed at decarbonizing the energy sector.



The *Agricarbono* Project is a partnership between the Brazilian Agricultural Research Corporation (Embrapa) and Eletrobras (a major electrical energy utility), which is working towards the decarbonization of the energy and ethanol sectors through the development and application of carbon capture and use processes.

In 2022 it completed a life-cycle assessment using SimaPro software for a technology used in the chemical conversion of carbon dioxide into a nanocomposite for the controlled release of biologically active molecules, such as agrochemicals, as pheromones for smart pest control. The research began in 2021. A critical component of the life-cycle assessment is a valuation of the gaseous effluent for carbon pricing in South America, with the new product also potentially promoting more sustainable agriculture.

The results reflect a high environmental load from the power generation processes analyzed, which included burning of mineral coal and other fossil sources, natural gas, and the use of water in industrial processes for power generation. Future complementary research will analyze the energy mix with a view not only to measuring carbon emissions for carbon pricing, but also to mitigating the environmental impacts of energy generation by reducing emissions. Understanding the environmental load is also critical for ensuring that the agricultural product is sustainably manufactured.



Carbon pricing: a direct positive impact on Andorran citizens

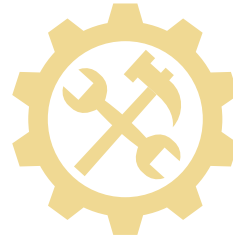
The Andorran Green Fund has been running since early 2022. The revenues from carbon tax—based on a carbon price of 30 euros (about \$28) per ton in July 2021—are promoting actions to reduce GHG emissions and enhance national climate action in Andorra, a mountainous country that is especially vulnerable to climate change.

Under the Green Fund, carbon pricing is intended to mitigate and internalize the social and environmental costs from the use of fossil fuels, as well as to promote changes in behavior and consumption habits to achieve the transition to a low-carbon economy.

Revenues from the Green Fund have boosted the shift towards more sustainable means of transport through two free-of-charge public services: public bus transport and public electric bicycles, which has led to an increase in user numbers of more than 100 percent for both services. This is especially relevant because road transportation GHG emissions in Andorra account for more than 50 percent of the country's total emissions.

Another important challenge for the energy transition in Andorra is the strong reliance on fossil fuels for heating buildings. The Green Fund has contributed to increasing the energy efficiency aid program budget by 23 percent, turning the aid program into one of the fundamental pillars of national climate action.

Tools for implementation: George Washington University partners on publications on carbon pricing



The Environmental and Energy Management Institute at George Washington University has continued to actively support carbon pricing over the past year. The director of the institute's Climate Change and Greenhouse Gas Management program, Rachael Jonassen, has contributed a chapter on emission trading systems to a new toolkit and roadmap on carbon pricing from the Asian Development Bank. In addition, the Environmental and Energy Management Institute, coordinated by Mukes Kapilashrami, has supported the UNFCCC as implementing partner in developing a capacity-building program to enhance the parties' involvement in the UNFCCC process and the national implementation of international climate commitments, including carbon pricing.

The Asian Development Bank toolkit covers emission trading systems, carbon taxes, and fossil fuel subsidy reform, providing relevant country experiences and challenges, and outlining the key steps for getting carbon prices right. It aims to help countries respond to their obligations under the Paris Agreement by introducing these pricing vehicles and generating revenue that can be used to help meet development goals. Sandeep Bhattacharya of the Asian Development Bank leads this effort. Workshops on the content have been offered to Central Asia, and East Asia and the Pacific Islands, which focused specifically on issues related to those areas.

Three courses for the UNFCCC capacity-building program were researched and written by the Environmental and Energy Management Institute. One of them was created by Liz Rose and Rachael Jonassen to support the parties in drafting the legislation needed to meet national climate obligations. It gives practical support for developing framework legislation as well as laws for implementing different forms of carbon tax, emission trading systems, and fossil fuel subsidy reforms. The course provides examples from around the world of legislation that has succeeded, along with the processes that go into making it work. Taking cognizance of the demands created by the constantly changing science, along with the urgency of climate change itself, it includes suggestions for creating regulations and laws that are flexible and enable feedback processes. ●

“The course provides examples from around the world of legislation that has succeeded, along with the processes that go into making it work.”

Leadership in action



OPINION: LEVEL PLAYING FIELD FOR CARBON COSTS IS KEY TO MEETING NET ZERO COMMITMENT

CÉDRIC DE MEEÛS, Vice-President, Group Public Affairs & Government Relations at Holcim

Carbon pricing is an essential piece of the legislative toolbox to incentivize economic transitions towards net zero models. And it requires a level playing field on carbon costs between jurisdictions that apply a carbon price and others that do not. This is why the adoption in 2022 of the European Union's Carbon Border Adjustment Mechanism (CBAM) formed a legislative milestone that will help companies build the necessary business case for investing in next-generation technologies, such as carbon capture, use, and/or storage (CCUS).

The CBAM ensures that manufacturers, including in the cement and concrete sector, who are subject to the European carbon price within the EU, will, as of 2026, gradually build a level playing field with imports from outside the European jurisdiction that are not subject to a carbon price. In other words, importers will be subject to paying an equivalent carbon cost for the carbon embedded in the imported products that are being placed on the European single market. This provides the necessary foundation for accelerating investments in next-generation technologies, such as CCUS, which are an integral component of Holcim's decarbonization journey. As there is no "one-type-fits-all" decarbonization solution, Holcim is developing and tailoring pathways and associated value chains based on local conditions. Having a CBAM in place in Europe is a necessary component for assuring competitiveness on carbon dioxide costs across the region and accelerating the deployment of next-generation low-carbon technologies.

Holcim's global decarbonization program involves hundreds of projects, technological innovations, and innovative material formulations that will enable a 25 percent carbon dioxide reduction by 2030 and a 95 percent reduction by 2050 (per ton of cementitious materials on a 2018 basis). Today, Holcim has the broadest range of low-carbon materials, cement, and concrete solutions, such as its ECOPact concrete range and ECOPlanet cement range, delivering at least 30 percent lower carbon emissions compared to the standard (CEM I) concrete in its respective country.

Working with other multinationals and startups in Europe and North America, Holcim is working on a portfolio of more than 50 projects in CCUS and mineralization, which are all evaluated in terms of cost, technical feasibility, compatibility with carbon dioxide utilization opportunities, and other aspects of viability and scalability. We anticipate that this will require a cumulative capital expenditure investment of about 2 billion Swiss francs by 2030, in addition to expected public funding, with some projects starting to operate after 2030. These investments will enable Holcim to reach a total carbon dioxide capture capacity of more than 5 million tons per year before 2030.

The maturation of the CBAM policy, together with Holcim's investments in innovative technologies, is catalytic. Having the reassurance, as legislated in the CBAM, that domestic manufacturers and importers will compete equally on carbon costs is an essential building block for investing at scale in advanced low-carbon technologies, such as CCUS.

The European CBAM is not a policy silver bullet. Its implementation will be gradual and will come with substantial legislative changes, such as the gradual elimination of the free allowance for European manufacturers. This requires a thorough and careful implementation of the policy principle to make it a working reality. It includes, for instance, watertight measuring, reporting, and verification protocols; border and customs processes; as well as anti-circumvention

mechanisms. It will also require a great deal of multi- and bilateral engagement with trading partners, especially in the context of other ambitious decarbonization policies such as the US Inflation Reduction Act.

For Holcim, having a carbon pricing mechanism in place is a fundamental element of the decarbonization business case. The net zero transition will require large-scale and sustained investments across entire value chains. Many of the technologies go well beyond a single sector and form societal endeavors that require support and acceptance. Carbon pricing will play a fundamental role in the net zero economy. Its design will have to evolve to embed carbon costs across value chains to ensure that net zero solutions are competitive.

DANISH INDUSTRY SUPPORTS REVISION ON EU'S EMISSION TRADING SYSTEM

The Confederation of Danish Industry, the largest business organization in Denmark representing 20,000 private companies across sectors, supports the recent political agreement to revise the European Union's emission trading system. Denmark has set a high bar for climate ambitions with a target of reducing emissions by 70 percent by 2030 and the goal to become climate neutral in 2045. For a small open economy, having strong climate policies in the European Union is key to a cost-competitive climate effort. Already, the allowance price is about 100 euros and this carbon price signal will support both Europe's climate ambitions and efforts by Danish companies. The agreed revision includes an ambition to reduce carbon dioxide emissions by 62 percent, and inclusion of the marine sector, road transport, and buildings.

In June 2022, the Danish parliament agreed to reform green taxes and introduce a new national carbon tax regime. The reform will ensure a gradual phasing in of a carbon tax from 2025 to 2030. The revision will contribute significantly to the achievement of Denmark's climate target. The reform will include targeted measures to make sure that carbon leakage is minimized. The key elements in the agreement will be fleshed out during 2023.

USING INTERNAL CARBON PRICING IN THE TRANSITION TO NET ZERO

ACCIONA updates its Internal Carbon Price Application Guide

In 2022, ACCIONA updated its Internal Carbon Price Application Guide to incentivize decarbonization and transform its production and consumption model towards a net zero scenario before 2040.

A key requirement is the establishment of an emissions reduction target for businesses and installations that cumulatively account for 90 percent of the company's total emissions. It is now mandatory for all the installations included in this group to prepare a carbon budget. A variable internal carbon price is used for businesses to settle the emissions generated, with the price depending on whether the established targets are met. The income generated by charges for the internal price of carbon is pooled in a fund. The fund has been used since 2016 to acquire carbon credits to offset the emissions generated from its direct action, and, since 2020, to invest in projects to reduce its carbon footprint.

In 2022, 17 initiatives were financed by the decarbonization fund with a potential emissions reduction of about 16,000 tons of carbon dioxide equivalent and a development period of more than one year for some of the projects. Projects cover hydrogen, electrification of machinery equipment, and monitoring of emissions, among others.

City Developments Limited initiates pilot study on carbon pricing

City Developments Limited is committed to both the World Green Building Council's Net Zero Carbon Buildings pledge and its own renewed Science Based Targets initiative (SBTi) targets aligned with a 1.5°C warmer scenario. The real estate business has furthered its decarbonization commitment through the initiation of a pilot study on carbon pricing by an external consultant in January 2023. This study will determine an internal carbon price for the company to enhance its GHG reduction strategy, build more resilient supply chains, and sharpen its competitive edge in the transition to net zero.

As the only Singapore company recognized in the 2022 Carbon Disclosure Project's A List for both climate change and water security initiatives for four consecutive years, City Developments Limited will continue to turn ambition into action and build sustainable communities for future generations.

City Developments Limited believes that, with the rise of more stringent regulatory requirements and heightened investor and consumer activism for low-carbon practices, businesses must step up on decarbonization. As articulation of the Singapore Green Plan becomes clearer, greater adoption of internal carbon pricing is needed to achieve decarbonization by 2050.



MAKING STRIDES TOWARDS NET ZERO

EDP's commitment to becoming net zero by 2040 approved by SBTi

A commitment to becoming net zero by 2040 made by Energias de Portugal S.A. (EDP), a leading global clean energy utility, was approved by the SBTi in March 2023. The net zero commitment is in line with the initiative's Net Zero Standard. EDP aims to be coal-free by 2025, achieve 100 percent green electricity in 2030, and reduce 90 percent of absolute emissions from across all scopes by 2040, from a 2020 baseline. EDP will also commit about \$25 billion in energy-transition capital expenditure towards an annual gross addition of 4.5 GW in the period 2021 to 2030, to reach an ambitious target of over 50 GW renewable additions by 2030.

Dalmia Cement taking action to meet roadmap to become carbon negative by 2040

Dalmia Cement, one of the fastest-growing cement companies in India, is already two years ahead of 2025 interim targets. Compared to competitors of similar current capacity—of over 30 million tons per year—the company is the lowest carbon producer of cement globally, with emissions of 465 kg to 470 kg for a ton of cement. This represents a reduction of more than 40 percent in terms of global averages and about 43 percent on the company's 1990 baseline.

In the absence of a mandatory price on carbon, Dalmia uses an implicit internal shadow price of about \$11. To factor in the high costs of the waste technologies that enable the carbon dioxide reductions, it has made the assumption that in the future these investments will have a carbon credit value of at least \$11.

Actions taken to reduce emissions while maintaining growth include energy and materials efficiency: use of waste on the supply side means using less of the natural minerals that cause carbon dioxide emissions when burnt. Both renewables, such as solar power, and waste recovery from fossil fuels have been leveraged to meet between 40 percent and 45 percent of the company's power requirements. At the same time, the company is on a trajectory to reach production levels of between 127 million tons and 131 million tons of cement by 2030.

In addition to the changes it has already made in technologies and materials, Dalmia has completed a feasibility study on the use of nascent carbon capture and use technology. The projected investment would become feasible if there were a carbon credit price of \$86 per ton of carbon dioxide for such technologies—a price that is not possible in developing countries, where grants and loans are not yet available for such innovations.

The prospect of viability funding has become more likely with the near finalization of Article 6.2—which includes carbon capture in a list of allowed technologies—and Article 6.4. Partnerships with developed countries would allow an income to be generated from carbon credits, along with income from the carbon dioxide itself. A desirable investment scenario would see carbon capture and utilization business units becoming self-sustaining beyond 2030.

Since committing to the pathway to net zero in 2018, Dalmia Cement has shown year-on-year growth, improving profits and reducing costs while enhancing the company's carbon footprint: proof that clean and green is both sustainable and profitable.



En+ Group reports the first results of its transition to carbon neutrality

En+ Group has committed to reducing GHG emissions by 35 percent by 2030 and to becoming net zero by 2050 in both aluminum production and heat and power generation. En+ Group applies an internal carbon price to its aluminum production (initially set at \$20/tCO₂e) and integrates the accounting of GHG emissions into the assessment of the project's efficiency. En+ Group evaluates the potential impact of GHG emissions on its overall financial and economic performance, which it uses to make investment decisions. The group believes that transparency is a significant part of public reporting and for more than three years has been carrying out its own measurement of GHG emissions from the reservoirs of its hydropower stations—hydropower reservoirs emit GHGs mostly from microbial processes that decompose organic matter into methane and carbon dioxide. En+ Group believes that measuring the exact impact of emissions from reservoirs is a more precise and balanced approach than using global averages statistics, since emissions vary widely due to different climatic conditions of reservoirs. Reservoirs located in cold climates emit less GHG emissions (close to zero) than those in tropical climates.

RUSAL is revising climate ambitions and strategy along with carbon pricing regulations

In 2022, RUSAL revised its climate ambitions in line with SBTi recommendations and launched several technological decarbonization projects. In December 2022, the company updated its climate strategy.

Internal carbon price regulations are currently under review. With booming global carbon markets and in the context of

significant carbon prices volatility, it is anticipated that the revised level of the internal carbon price will be optimal for use in investment-related decisions.

RUSAL is also working on next-generation production processes and technologies. The company is the first in the world to produce aluminum using inert anode technology that releases oxygen instead of carbon dioxide, reducing the carbon footprint by 85 percent. RUSAL is currently working on carbon capture technology that will reduce the carbon footprint of the alumina used to produce aluminum.

Washington State carbon pricing program incentivizes decarbonization at bp's Cherry Point

bp believes that a carbon price, whether by means of a carbon tax or a cap-and-trade scheme underpinned by emissions trading, is the most economically efficient way to reduce GHG emissions. Washington State, home to bp's Cherry Point refinery, is the second state in the United States with a comprehensive, economy-wide, market-based carbon pricing program—the Climate Commitment Act. The package of solutions incentivizes and rewards innovation to reduce carbon emissions.

Cherry Point is already making progress in decarbonizing its operations. bp is investing \$269 million to improve the refinery's efficiency, reduce operational carbon dioxide emissions, and increase the renewable diesel production capability. This investment aligns with bp's aim to be net zero across its operations and to reduce the life-cycle carbon intensity of products sold by 15 percent to 20 percent by 2030. The refinery is also the preferred location for two low-carbon projects—a sustainable aviation fuel production facility and a green hydrogen production facility, which, subject to approvals, amount to a total investment of \$1.5 billion.

Shell looking to invest in second carbon capture and storage facility in Canada

Shell supports carbon pricing as a key policy tool that governments and businesses can use to help increase global ambition, and create incentives to invest in lower-carbon technologies and infrastructure such as carbon capture and storage facilities. Shell operates the Quest carbon capture and storage facility in Alberta, Canada. Since it was commissioned in 2015, this facility has captured and permanently stored more than 8 million tons of emissions (as of March 2023). The projected price of carbon in Canada was one of the considerations that prompted Shell to announce in July 2021 a proposal to build a second large-scale carbon capture and storage project at its Scotford Complex in Alberta. The project is expected to start operations around mid-decade subject to a final investment decision by Shell expected in 2023.



Copenor invests in processes to measure and value carbon emissions

Copenor, as a producer of formaldehyde and derivatives, is working with partners to develop a scientific paper about the process of estimating the emissions of a formaldehyde producer, with a focus on the uncertainties and deviations that may be associated with these estimates. This research aims to contribute to the improvement of methods and metrics for the proper accounting of GHG emissions and secure carbon financing.

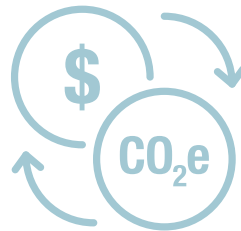
Copenor's partners in this initiative are DEEP ESG, a Brazilian startup that develops technological solutions for identifying and measuring the social and environmental impacts of the activities of companies and organizations, with research support from the Instituto Tecnológico de Aeronáutica, an engineering higher education institution of the Brazilian Air Force.



GENERATING CARBON CREDITS IN EMERGING ECONOMIES

New solar power plant creates carbon credits in Togo

Renewable energy developer AMEA Power commissioned a 50 MW solar power plant in Togo in June 2022, and will be issuing the first batch of about 70,000 credits registered through Verra in June 2023. Revenues from the sale of the carbon credits will support the financing of its expansion, which will include an onsite storage system that will provide crucial services to the local grid. These revenues will also strengthen the development of AMEA Power's corporate social responsibility activities in the area: AMEA has already built a new medical clinic and three new school buildings, renovated four schools, and provided school supplies for 1,400 students.



AMEA Power is registering its upcoming projects in other countries such as Burkina Faso, Egypt, and Uganda in different voluntary carbon credits schemes, including the voluntary pricing offset programs Gold Standard and Verra, allowing the company to provide competitive tariffs.

AMEA Power believes that carbon pricing strategies such as carbon credits enable some of the burden of decarbonizing developing countries to be passed onto more developed economies. At the same time, qualifying projects for carbon credits include a strict evaluation of complementary Sustainable Development Goals, which ensures projects provide not only an environmental benefit—but also a social one.

Bangladeshi initiative earns carbon credits by replacing fixed chimney brick kilns with energy-efficient brick kilns

The Industrial and Infrastructure Development Finance Company (IIDFC) is monitoring and maintaining a Clean Development Mechanism project to improve kiln efficiency in the brick-making industry in Bangladesh. The IIDFC is the first financial institute to work in the carbon pricing sector in Bangladesh. There was an estimated reduction of 67,000 tons of emissions during the most recently completed reporting period, from January 2018 to March 2020. The IIDFC will be able to trade the carbon credits either in the voluntary market or in funding agencies after the verification ends in November 2023. To date, 326,627 tons of certified emissions from this project have been traded since 2009.

The fixed chimney brick kilns traditionally used in Bangladesh are high carbon emitters. The project used a Hybrid Hoffman Kiln to construct 16 new energy-efficient brick kilns to reduce emissions of carbon dioxide and other pollutants. In October 2022, this project came first in the category for Environmental Development, under Outstanding Development Project, at the 45th Annual General Meeting of the Association of Development Financing Institutions in Asia and the Pacific. 🟡

Released at COP27, the 2022 Global Status Report for Buildings and Construction finds that the R sector accounted for more than 34 percent of energy demand and about 37 percent of energy and process-related carbon dioxide emissions in 2021.

FEATURE: COOKSTOVES AND NATURE-BASED SOLUTIONS GENERATE CARBON CREDITS

After experiencing a slow-down in demand for voluntary carbon credits due to Russia's invasion of Ukraine, Infinite Solutions embarked on three pilot nature-based projects that will generate carbon credits, currently in the development phase in the Indian states of Maharashtra, Madhya Pradesh, and Assam.



The three projects—a 1,000-acre agroforestry plantation and two cookstoves projects (each for 10,000 cookstoves)—are funded by the company and will showcase its capacity to manage such nature-based projects. Ideally, they will attract investment for future ventures.

The cookstoves projects were registered in the Verified Carbon Standard (VCS) and Gold Standard in late 2022, and the 1,000-acre plantation is due to be registered under VCS in October 2023.

In addition to undergoing external verification, the company will follow up on a household level with all participants to make sure that the cookstoves are being used. And, rather than the company donating the cookstoves, the participants paid for them—as a way of ensuring that they are valued. Infinite Solutions charges the scrap value of the stove (about \$2).

The agroforestry project is linked to rural development in India, where small-scale farmers have access to one acre of land, which is typically insufficient to generate a livelihood and far from irrigation or water sources. A single crop is

harvested during the rainy season. Infinite Solutions has partnered with an NGO, bringing together 1,000 farmers and providing irrigation facilities and mango saplings, in this nature-based solutions project. The aim is for the farmers to build sustainable livelihoods in the long term, while allowing Infinite Solutions to benefit from the carbon credits generated—which is anticipated to start taking place in about five years. During the three- or four-year maturation period before the trees bear fruit and generate profit, the farmers will likely be away seeking employment opportunities in cities. The company will take care of the orchards in the absence of the farmers; it will also supply fruit-processing units such as juicers so that farmers get better prices when the trees become productive.

Infinite Solutions has a number of voluntary offset projects under validation by the Global Carbon Council (GCC), VCS, and Gold Standard, and in 2022 it also registered a new large-scale solar project in Uzbekistan—the first in GCC. The company will be investing funds in developing a project in Ghana because of the Article 6.2 agreement that it has established with Switzerland: the company sees an opportunity in investing in nature-based community projects there. ●

PMIF programs

UPDATE ON OTHER PROGRAMS UNDER THE PARTNERSHIP FOR MARKET IMPLEMENTATION FACILITY

The Carbon Pricing Leadership Coalition is an initiative under the Partnership for Market Implementation Facility (PMIF), which is a global, multi-donor program launched in 2021 to help accelerate global decarbonization efforts. It aims to catalyze the development of the next generation of international carbon markets, and be the one-stop shop for client countries looking to design and deploy carbon pricing policies/programs in line with their domestic contexts and sustainable development priorities. The PMIF also runs several other programs, which are highlighted below.

Partnership for Market Implementation

The [PMI](#) was launched in 2021 as a capacity-building and technical assistance program that supports emerging economies and developing countries in fulfilling their climate ambition and mitigation potential. The program also provides a platform for technical discussions and knowledge exchange on carbon pricing and other policy instruments at various levels.

Of the 17 countries initially selected for the implementation phase, 14 countries have had their proposal formally approved for PMI implementation, and four of these have begun to disburse grant funds. With a target of covering over 30 countries by 2025, the PMI is poised to be an important contributor on carbon pricing and markets over the next decade as countries accelerate their climate action.

REGIONAL PROGRAMS

In addition to the country support program, the PMI supports activities at regional, sectoral, or subnational levels based on demand. In FY23, the PMI initiated a regional program in Sub-Saharan Africa and another in Latin America to help build capacity, assess feasibility, and create infrastructure

(such as measuring, reporting, and verification systems and registries). Discussions began on a Pacific Region program.

Sub-Saharan Africa

The program aims to promote the participation of African countries in post-2020 carbon markets by working with regional institutions to build the capacity of national governments on carbon pricing and coordinate government responses to climate change.

West and North Africa: The team held an in-person workshop in Lomé, Togo, in April 2023. The workshop, coordinated with the West Africa Power Pool (WAPP), had 19 participants from electricity utilities in Benin, Burkina Faso, Côte d'Ivoire, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. Speakers included representatives from the West African Alliance on Carbon Markets and Climate Finance, Ghana's Environmental Protection Agency, and UNFCCC's Regional Collaboration Center (RCC) Lomé. The regional engagement adopts a two-pronged approach to support electricity utilities on the implementation side and ministries of environment on the policy side. A follow-up virtual workshop was held in May 2023 with the UNFCCC RCC.

Southern Africa: Capacity-building activities similar to those for WAPP are planned for the Southern Africa region in partnership with the Southern African Power Pool (SAPP). The procurement process is under way for a series of capacity-building and knowledge-sharing workshops for SAPP, in coordination with the UNFCCC RCCs and the climate change focal points.

East Africa: The Eastern Africa Alliance on Carbon Markets and UNFCCC RCC Kampala are engaging on the delivery of capacity-building support to the region. There are also efforts to establish a broader partnership with development partners across Sub-Saharan Africa.

Latin America

The PMI developed the regional program in Latin America to continue supporting the countries that were part of the Partnership for Market Readiness or have applied to the PMI but are yet to commit to implementing a carbon pricing instrument. In FY23, the work program with Brazil was initiated, scope of work with Ecuador has been agreed, and discussions with Peru made progress.

Brazil: The work covers measuring, reporting, and verification development in the energy sector and is led by the Ministry of Energy and Mines and the Brazilian Energy Research Agency. The ministry is also co-financing the work, which will be an important building block towards a potential emission trading system. It includes implementing a measuring, reporting, and verification system for corporate greenhouse gas emissions in the energy sector; building a stakeholder coalition to advance the domestic regulated carbon market; and assessing the possible co-existence and fungibility of carbon credits and other existing emission reduction assets.

Ecuador: The scope of work has been agreed upon with the Ministry of Environment and terms of reference are being prepared to support Ecuador with finalizing regulation for its voluntary domestic offsetting program and capacity building for the expansion of the national carbon footprint and carbon neutrality program.

Peru: Discussions are under way with the Peruvian Ministry of Environment and the Ministry of Finance. The country is working on a carbon pricing and carbon market roadmap by national mandate.

Pacific Region

The PMI's Program Management Unit will support the Pacific Region on international carbon markets. The initial work program would be structured at both individual country level and regional level.

Potential countries have been identified for further consultation and confirmation of the country's interest and alignment of the PMI's activities with government counterparts.

Ad hoc requests

The scope of regional work has been expanded to include ad hoc requests for support from various countries, including support for infrastructure development; policies and procedures; and capacity building. Following a request from the Ministry of Foreign Trade and External Relations in Bosnia and Herzegovina, a one-year emissions trading assessment work program was developed in line with their plans and timeline outlined in their emissions trading system implementation roadmap and National Energy and Climate Plan (both developed with the Energy Community). Work has been approved for the Philippines and India. Requests have been made by Mongolia and Belize, while others have expressed interest, including Azerbaijan, Uzbekistan, Rwanda, Uganda, Namibia, and Serbia.

TECHNICAL WORK

Workshops

Technical workshop on Country Experiences on Using International Carbon Markets to Achieve NDC Targets Rwanda, March 2023: The workshop was jointly organized by the PMI and Compact with Africa Green Business Fund to support learning and information sharing between countries

about their experience in building readiness to participate in international carbon markets and identifying opportunities to access associated financing flows.

Technical workshop on political economy of carbon pricing during Innovate4Climate 2023: This workshop was jointly organized by the PMI, the London School of Economics, and Adelphi – International Carbon Action Partnership to discuss lessons learned and explore strategies to advance carbon pricing in developing countries.

PMIF Global Knowledge Forum, Bilbao, Spain May 2023: With some PMI countries starting their programs—and almost all countries close to finalizing their program proposals—this two-day forum created space for countries to share their progress, and discuss carbon pricing issues and challenges.

The PMI also carried out in-country workshops on carbon pricing, carbon markets, and results-based climate finance jointly with World Bank country teams:

Vietnam—Results-based carbon and climate finance workshop, February 2023: The workshop aimed to contribute to Vietnam’s efforts to scale up and improve the effectiveness of results-based carbon and climate finance to help the country reduce emissions, finance its NDC activities, and attract private sector investment.

Indonesia—National Climate Finance Workshop: March 2023: The workshop aimed to contribute to Indonesia’s ongoing efforts to scale up finance to meet its NDC targets. It focused on opportunities for results-based and carbon finance, discussing challenges, and sharing lessons for Indonesian policy makers.

Montenegro—Emissions trading capacity building course for Europe and Central Asia countries, May 2023: A training workshop was organized for government officials from participating ECA countries. The workshop was delivered together with the International Carbon Action Partnership and the Joint Vienna Institute. A master class on carbon pricing (with Aware) was prepared for dissemination.

Reports

[The State and Trends of Carbon Pricing](#) was launched at the Innovate4Climate Conference in Bilbao, Spain, in May 2023. Key topics covered in the report include how the global energy crisis has impacted carbon pricing, the geographical distribution of carbon pricing, and how carbon credit markets are evolving, including those under Article 6. The report was launched in conjunction with an update of the Carbon Pricing Dashboard to reflect these latest developments.

Supporting countries with implementation of MRV and registry systems

The PMI technical work program includes supporting countries with the establishment of a measuring, reporting, and verification system and a registry system. Activities include:

- Assessing options for registry systems, including the suitability of open-source tools made available by the World Bank or partners under the Digital for Climate Working Group.
- Establishing a measuring, reporting, and verification system and a registry system for participating in international carbon markets, including Article 6 activities.
- Specifying further measuring, reporting, and verification system and registry development to support additional carbon pricing policies.

Climate Warehouse

The [Climate Warehouse](#) program collaborates with global and local partners to build an end-to-end digital ecosystem that underpins the development of post-2020 carbon markets under the Paris Agreement. To enable a transparent global carbon market with integrity, the Climate Warehouse is supporting countries and jurisdictions through capacity-building programs on GHG mitigation and the implementation of NDCs.

The program’s recently launched CAD Trust is working towards a free, open-source metadata platform to provide the basis for reporting for markets and the UNFCCC. Using

blockchain technology, the CAD Trust enables a transparent accounting of carbon, supports reporting compliance requirements, and strengthens the implementation of NDCs under the Paris Agreement.

Compact with Africa

The [Compact with Africa](#)—Green Business Fund is an associated trust fund dedicated to supporting financial institutions and small and medium businesses on climate action. The fund is designed to achieve this objective via three pillars: (1) policy dialogue and enabling environment, (2) capacity building and technical assistance, and (3) access to innovative financial instruments. The Green Business Fund delivered its first policy dialogue event in Kigali in March 2023 in collaboration with the African Center for Economic Transformation and the World Bank's Finance, Competitiveness, and Innovation Global Practice. This dialogue, facilitated by private sector representatives, brought together participants from the ministries of Finance, Economy, and Environment. A key takeaway from the policy dialogue was a demand for greater prioritization of climate change and more climate finance learning events for policy makers.

The fund also co-sponsored the PMI technical workshop on country experiences using international carbon markets to achieve NDC targets and led two sessions on private sector participation in carbon markets and climate finance.

The Green Business Fund team organized a joint mission with the World Bank's Agriculture and Food Global Practice to advance a proposal to design a results-based climate finance scheme linked to the adoption of climate-smart agriculture practices, as an incentive tied to a credit line provided to the Development Bank of Rwanda. The engagement is expected to run for two years.

Networked Carbon Markets

Networked Carbon Markets conducts technical work to design concepts, financial products, and technology applications

for climate markets. The new concepts and approaches developed are then tested further as part of the Climate Warehouse's activities.

During the year, Networked Carbon Markets produced a knowledge paper: [Benchmarking a Global-level Carbon Price Framework: Tracking Heterogenous Carbon Pricing Towards Paris Goals](#).

The Climate Market Club is a group of 14 governments that jointly develop modalities for piloting Article 6 of the Paris Agreement. The work of the club is made available to a wider set of stakeholders through the publication of Article 6 Approach Papers, and an information paper, which can be found [here](#).

Regional Climate Weeks

[Regional Climate Weeks](#) bring together a diverse range of stakeholders for regional collaboration on climate change. Participants include representatives of governments, the private sector, development organizations, youth groups, and civil society. This year, Regional Climate Weeks will aim to connect to the outcomes of the Global Stocktake, which is why they are scheduled to take place between July and November 2023. Discussions with the UNFCCC Secretariat and the other core partners (UNDP and UNEP) to co-develop the agenda for the next Regional Climate Weeks are under way.

The plans for the year are as follows:

- Africa: September 4–8 in Nairobi, Kenya. Will take place in parallel with the African Climate Action Summit.
- MENA: October 9-12 in Riyadh, Saudi Arabia.
- Latin America and the Caribbean: October 23-27 in Panama City, Panama. Will take place jointly with the Latin American Ministerial Forum for Environmental Ministers.
- Asia Pacific: November in Johor, Malaysia.

About the CPLC



WHO WE ARE

The Carbon Pricing Leadership Coalition, or CPLC, was launched in 2015 to promote carbon pricing as an effective tool to drive mitigation action as countries started reducing their carbon emissions in terms of the Paris Agreement. It is a voluntary initiative that brings together leaders from government, business, civil society, and academia to enhance global understanding of carbon pricing as a tool for accelerating and financing effective climate action.

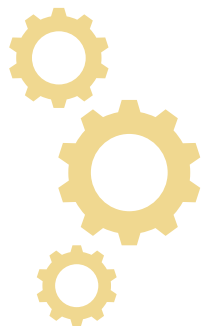
From a partnership base of 21 governments and 90 businesses and civil society organizations, the CPLC has grown to include 36 national and subnational jurisdictions, 181 businesses, and 104 civil society organizations. Membership is voluntary and requires no membership fee.

The CPLC provides a platform for its partners to learn about carbon pricing, stay up to date with new developments and research in the field, and share experiences related to the challenges involved with implementing carbon pricing mechanisms.



OUR MISSION

We convene leaders from government, business, civil society, and academia across all regions of the world to advocate for, and catalyze action towards, the successful implementation of carbon pricing to address climate change and contribute to sustainable development.



OUR APPROACH

The CPLC strives to:

- **Mobilize and highlight examples of demonstrated leadership** on carbon pricing, and build the case for others to take action
- **Identify critical constraints to carbon pricing**, foster common understanding of solutions, and identify opportunities to enhance the use of carbon pricing policies and measures
- **Deepen advocacy efforts** with the private sector and civil society to foster collective action
- **Strengthen the knowledge base** by effectively communicating unbiased, rigorous, and objective information on key issues
- **Broaden advocacy and engagement** in regions that are not well represented in the CPLC.



OUR PRIORITIES

Our priorities are to:

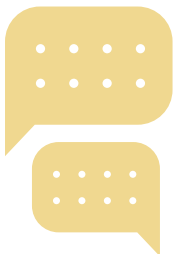
- **Amplify the role of carbon pricing** in achieving 2030 net zero targets
- **Promote carbon markets** and global trade
- **Ensure a just transition** to a low-carbon economy.



OUR LEADERS AND TEAM

The CPLC Secretariat is administered by the World Bank Group.

It is governed by the High-Level Assembly co-chairs and an Advisory Group of 21 representatives from government, business, and strategic partners.



ADVISORY GROUP

The CPLC's Advisory Group provides technical guidance and insights on developments in carbon pricing, while identifying opportunities to expand the CPLC's reach.

Government

Syeda Hadika Jamshaid, Pakistan

Juan Pedro Searle, Chile

Chris Shipley, UK

Private sector

Anirban Ghosh, Mahindra Group

Shilpa Gulrajani, BNP Paribas

Chris Leeds, Standard Chartered Bank

Cédric de Meeûs, Holcim

Jason Mitchell, Man Group

Emmanuel Normant, Saint-Gobain

Susan Shannon, Shell

Strategic partners and civil society

Emily Farnworth, University of Cambridge

Michael Green, Native

Marina Mattar, Perspectivas Comunicação & Relações Institucionais

Joseph Robertson, Citizens' Climate Lobby

Ousmane Fall Sarr, West Africa Carbon Market Alliance

Katie Sullivan, International Emissions Trading Association (IETA)

Felipe De León Denegri, Costa Rica

High-level carbon pricing champions

Feike Sijbesma, Royal Philips and Global Climate Adaptation Center

Mahendra Singhi, Dalmia Cement (Bharat) Ltd

CPLC SINGAPORE

Jointly hosted by the CPLC and the UN Global Compact Network Singapore (GCNS), CPLC Singapore (CPLC SG) is the first international chapter of the CPLC. In addition to its original aim of promoting internal carbon pricing as a mechanism to reduce emissions, as part of the broader GCNS outreach on carbon management, it also promotes carbon measurement, monitoring, and reduction among companies in Singapore. It has a particular focus on small and medium businesses, which typically lack the know-how and resources to get started. CPLC SG was launched in 2018 by Teo Chee Hean, then Singapore's Deputy Prime Minister and Coordinating Minister for National Security.

CPLC SG's recent activities and achievements:

Carbon Emissions and Recording Tool (CERT)

CERT is a cornerstone of the LowCarbonSG program, which is a nationwide capability-building program launched with the support of the National Environment Agency and Enterprise Singapore. CERT enables businesses to measure, monitor, and manage their carbon emissions. It is designed to be easy to use for participants new to the carbon accounting space, and covers Scope 1, Scope 2, and a few categories of Scope 3 emissions. Although the program is just over two years old, there has been an encouraging uptake. As of March 2023, 83 companies have submitted at least one year's worth of emissions data, for which they have been awarded the LowCarbonSG logo for their emissions-monitoring efforts. With the data submitted, CPLC SG is able to analyze and produce benchmarks for the data as a whole and for four initial key sectors.

Network and stakeholders

CPLC SG has a growing membership base—212 companies have signed a pledge and become partners as of March 2023. It provides regular updates through newsletters and organizes webinars and networking events. It also provides workshops to enable CPLC SG partners to showcase their sustainability solutions and share their good practices on decarbonization.

Thought leadership and industry contributions

CPLC SG published its first annual Singapore Business Carbon Report in 2022, and the second report has just been published. CPLC SG has deepened its partnership with Singapore institutions of higher learning, such as the National University of Singapore and Nanyang Technological University, to provide deeper analysis and thought-provoking articles to help members and partners. CPLC SG continues to introduce internal carbon pricing concepts and practical advice on implementation at its upskilling workshops. A member of CPLC SG staff also represents GCNS in the Singapore Standards Working Group on carbon capture, utilization, and storage.

Upskilling

As of March 2023, CPLC SG has trained more than 656 participants representing 410 companies through workshops and bespoke programs in partnership with key stakeholders. In these workshops, CPLC SG teaches why climate change is a matter of crisis; why companies should embark on the decarbonization journey; what key terms mean; recent trends; relevant regulations; and how to measure, monitor, and

reduce carbon emissions. Starting in May 2023, in partnership with Enterprise Singapore, CPLC SG will be launching a subsidized two-day program, called [Carbon Accounting and GHG Management](#), for senior professionals to obtain deeper capabilities in carbon accounting and management.

CPLC SG is well positioned to support and further the urgently needed transition to a net zero carbon emissions future in Singapore and the region. ●



Participants at CPLC SG's carbon management workshop

Our partners

WE ARE PROUD TO HAVE 321 PARTNERS FROM ALL SECTORS.

36 GOVERNMENT PARTNERS (including state-owned entities)

Alberta
 Andorra
 Belgium
 British Columbia
 California
 Canada
 Chile
 Colombia
 Costa Rica
 Côte d'Ivoire
 Delhi Metro Rail Corporation Ltd.
 Denmark
 Ethiopia
 Finland
 France
 Germany
 Indian Railways
 Italy
 Japan
 Kazakhstan
 Mexico
 Morocco
 The Netherlands
 New Zealand
 Northwest Territories
 Norway
 Ontario
 Pakistan
 Panama
 Portugal
 Québec
 Singapore
 Spain
 Sweden
 Switzerland
 United Kingdom

181 PRIVATE SECTOR PARTNERS

Abengoa
 Acciona

ACT Financial Solutions
 AECOM
 AGL Energy
 Aimia
 Air Canada
 Alessandri
 ALLCOT Group
 AlliedCrowds
 AMATA
 AMEA Power
 Anglo American
 AP4
 Arvind
 Atmoterra
 Atos SE
 AXA
 B12
 Baker McKenzie
 Bank Australia
 Barco NV
 Barrick Gold Corporation
 Bearfeldt GmbH
 BG Group
 BHP Billiton
 Bird Construction
 Blackstone Energy Services Inc.
 BMO Financial Group
 BNP Paribas
 BP
 Braskem
 Broad Group
 BT Group
 Cálida
 Canadian Tire Corporation
 Carbon Engineering
 Carrefour
 Catalyst Paper Corporation
 Cement Association of Canada
 Cemex
 Cenovus Energy Inc.
 CIBC
 Climate Focus
 Coca-Cola HBC AG

Colbún
 CommerzBank
 ConocoPhillips
 COPENOR
 Coway
 CPFL Energia
 DAI Global
 Dalmia Cement
 Danfoss
 Daniels Power Corporation
 DAO Integral Platform for
 Climate Initiatives
 Desjardins Group
 DNV GL
 Drax Group
 EcoAct Inc.
 Ecofrotas
 ECOTIERRA
 EDP–Energias de Portugal S.A.
 Ekbd Consult
 EKI Energy Services Ltd.
 Électricité de France
 EllisDon
 EN+ Group
 Enaex
 Enagás
 Enbridge
 Enel
 Engie
 Eni
 EnvironmentFirst Energy Services
 Private Limited (EESPL)
 Equinor (formerly Statoil)
 Eskom
 EY
 Ferrovial
 Fortum
 Garanti Bank
 Get2C
 Global Environmental Markets
 Godrej & Boyce Mfg. Co. Ltd.
 Gol Linhas Aéreas Inteligentes
 Groupe ADP

Grupo Financiero Banorte SAB de CV
 Hindustan Construction Company
 HSBC
 Iberdrola
 ICF International
 IKEA Canada
 Infigen Energy
 Infinite Solutions
 Infosys
 Keyassociados
 Kruger Inc.
 LafargeHolcim
 LATAM Airlines Group
 Libélula
 Lloyd's Register
 Loblaw Companies Limited
 Mahindra
 Man Group
 MexiCO₂
 Michelin
 Milbank
 Mott MacDonald
 National Australia Bank
 Natura
 NatureBank
 Naturgy Energy Group
 (formerly Gas Natural Fenosa)
 Navigant
 NaxRo
 NEAS Energy
 NEI Investments
 Nestlé
 Nouveau Energy Management
 Novartis
 Novozymes
 Obrascón Huarte Lain (OHL Group)
 Ontario Power Generation
 Origin Energy
 Paper Excellence
 Perspectivas
 Perspectives Climate Group GmbH
 PG&E
 Poch (WSP)
 Pollination
 Portafolio Verde
 Powerledger

Predict Ability Limited
 Rabobank
 Redshaw Advisors
 Resolute Forest Products Inc.
 Royal Bank of Canada
 Royal DSM
 Royal Philips
 RUSAL
 Saint-Gobain
 Schneider Electric
 Scotiabank
 Şekerbank
 Shell
 Shell Canada
 Siemens AG
 Sindicatum
 SinoCarbon
 SkyPower
 Sodimac
 Solvay
 South Pole Group
 S&P Global
 SSE
 Standard Chartered Bank
 Star Rapid
 Statkraft
 Suez (formerly Suez Environnement)
 Suncor Energy
 Sweep
 Tata Group
 TC Energy Corporation
 Teck Resources
 TELUS
 The African Stove Company
 The Carbon Trust
 The Climate Solutions Group
 The Co-operators Group Limited
 Toronto-Dominion Bank Group
 Total
 Trucost
 Ukgasbank
 Unilever
 Vale SA
 Vena Energy
 Veolia
 Vestas

Viña Concha y Toro
 Visão Sustentável
 Yes Bank
 Zenith Bank

104 STRATEGIC PARTNERS

ABIQUIM - Brazilian Chemical Industry Association
 African Energy Chamber
 American Sustainable Business Council
 Arbor Day Foundation
 Asia Society Policy Institute
 BCSD Portugal
 Brazilian Agricultural Research Corporation (Embrapa)
 Brazilian Association of Airlines (ABEAR)
 Brazilian Tree Industry (IBA)
 BSR
 Carbon Market Institute
 Carbon Market Watch
 Caring for Climate
 CDP
 CEBDS
 Center for Clean Air Policy
 Center for Climate and Energy Solutions (C2ES)
 Centre for Climate Engagement at University of Cambridge
 Centre for European Policy Studies
 Ceres
 Children's Investment Fund Foundation (CIFF)
 China Low Carbon Network
 CII-ITC Centre of Excellence for Sustainable Development
 Citizens' Climate Lobby
 Clean Prosperity
 Cleantech21
 Climate Leadership Coalition
 Climate Markets and Investment Association
 Climate Neutral
 Climate Outreach
 Climate Solutions Group Ltd
 Climate Strategies
 Climate Transparency Initiative
 ClimateXChange

Coalition for Rainforest Nations
 Columbia University SIPA Center on Global Energy Policy
 Conservation International
 Duke University Nicholas Institute for Environmental Policy Solutions
 East African Alliance on Carbon Markets and Climate Finance
 Entreprises pour l'Environnement
 Environmental Defense Fund
 ERCST
 European Bank for Reconstruction and Development
 Fundación Natura
 George Washington University, Environmental and Energy Management Institute
 Global Green Growth Institute
 Global Maritime Forum
 Gold Standard Foundation
 Groupe de Travail Climat REDD
 Haga Initiative
 I4CE
 IDEAcarbon
 IETA
 IFC
 Institute for Global Environmental Strategies
 Instituto Ethos
 International Carbon Action Partnership (ICAP)
 International Center for Trade and Sustainable Development
 International Monetary Fund (IMF)
 Japan Climate Leaders Partnership (Japan-CLP)
 Klimaatplein.com
 Massachusetts Institute of Technology (MIT)
 National Business Initiative
 Organisation for Economic Co-operation and Development (OECD)
 Pembina Institute
 Put a Price on It, D.C.
 Russian Carbon Fund
 Second Nature

Sekem Group
 Shakti Sustainable Energy Foundation
 Solutions for Our Climate
 Stockholm Environment Institute
 Sustainable Communities India Pvt Ltd
 Svebio, the Swedish Bioenergy Association
 Swarthmore College
 TAPP Coalition
 The B Team
 The Climate Group
 The Climate Trust
 The Confederation of Danish Industry
 The Generation Foundation
 The Institutional Investors Group on Climate Change
 The Nature Conservancy
 The Prince of Wales's Corporate Leaders Group
 The Shift Project
 The Union of Concerned Scientists
 The University of the South Pacific
 The World Bank Group
 The Zero Carbon Campaign
 True Animal Protein Price Coalition
 UNICA
 United Cities and Local Governments of Africa
 United Nations Foundation
 United Nations Global Compact
 United Nations Global Compact Singapore
 University College London
 Verra
 WBCSD
 We Mean Business
 West African Alliance on Carbon Markets and Climate Finance
 World Bioenergy Association
 World Economic Forum
 World Resources Institute
 WWF
 Yale University

CPLC SINGAPORE PARTNERS

In 2021, CPLC Singapore engaged 197 companies and upskilled 333 staff in emissions awareness and knowledge.

17 Lifeworks Pte Ltd
 Accudyne Industries Asia Pte Ltd
 Acktec Technologies Pte Ltd
 Action Impact Pte Ltd
 Acuitas Pte Ltd
 AkzoNobel Paints (Singapore) Pte Ltd
 AMFS Pte Ltd
 Anderco Pte Ltd
 Ants Innovate Pte Ltd
 Asia Pulp and Paper Company Ltd
 Association of Process Industry (ASPRI)
 Avant Proteins Pte Ltd
 Bali Grove Pte Ltd
 Barghest Building Performance Pte Ltd
 Beni Warehousing Pte Ltd
 BH Global Corporation Ltd
 Big Bang Seabreeze Pte Ltd
 Biophilic Pte Ltd
 Blue Waves Food Empire Pte Ltd
 BNP Paribas
 BoilerMaster Pte Ltd
 Bok Seng Logistics Private Limited
 Brightree Pte Ltd
 Browzwear Solutions Pte Ltd
 Capella Hotel, Singapore
 Carbon Care Asia Pte Ltd
 Centre for Business Sustainability, Nanyang Technological University (NTU)
 Changi Airport Group (Singapore) Pte Ltd
 City Developments Limited (CDL)
 Climate Resources Exchange International Pte Ltd (CRX)
 Coastes Pte Ltd
 Contact Sense Asia Pte Ltd
 Containers Printers Pte Ltd

- Cooling Lab Pte Ltd
- Danfoss Industries Pte Ltd
- Desire Lines Pte Ltd
- DiviGas Pte Ltd
- DSM Singapore Industrial Pte Ltd
- Durapower Holdings Pte Ltd
- Dyna-Mac Engineering Services Pte Ltd
- Dynamic Capital Growth Pte Ltd
- EcoSense Enviro Solutions Pte Ltd
- ecoSPIRITS Pte. Ltd
- engeco Pte Ltd
- Eng Hup Shipping Pte Ltd
- ENGIE Asia Pacific
- ETH Enterprise Pte Ltd
- Evercomm Singapore Pte Ltd
- ExxonMobil Asia Pacific Pte Ltd
- FOC Sentosa
- Futurus Construction
- GAC (Singapore) Pte Ltd
- Gogreen Holdings Pte Ltd
- Greenpac (S) Pte Ltd
- Guava Amenities Pte Ltd
- Hashstacs Pte Ltd 'STACS'
- Herculean Climate Solutions
- Hydratech Industries Pte Ltd
- Hydrogen and Fuel Cell Association of Singapore (HFCAS)
- IBC Solar Energy Pte Ltd
- ICF International Pte Ltd
- idstats Research Pte Ltd
- IHI Asia Pacific Pte Ltd
- Innovate 360 Pte Ltd
- Insect Feed Technologies Pte Ltd
- Interface Singapore Pte Ltd
- iWow Technology Pte Ltd
- Jetaime Perfumery Pte Ltd
- Jurong Port Pte Ltd
- Lendlease Singapore Pte Ltd
- LYS Energy Solutions Pte Ltd
- Marquis Energy Global Pte Ltd
- Matex International Limited
- Maximator Far East Pte Ltd
- MEP Systems Pte Ltd
- Merlin Entertainments Singapore Pte Ltd
- Mermaid Ventures Pte Ltd
- MolyWorks Materials Pte Ltd
- Mordec International Pte Ltd
- Mount Faber Leisure Group MTQ
- Mun Siong Engineering Limited
- N&E Innovations Pte Ltd
- Ngo Chew Hong Edible Oil Pte Ltd
- Nitto Denko (Singapore) Pte Ltd
- Northmore Gordon Pte Ltd
- Oasia Resort Sentosa
- OceanMaster Engineering
- Olam Cocoa Pte Ltd
- Onestop Pte Ltd
- Ovol Singapore Pte Ltd
- P99 Pte Ltd
- Penguin International Limited
- Petrochemical Corporation of Singapore Pte Ltd
- Prestige Technology (S) Pte Ltd
- PricewaterhouseCoopers LLP Singapore
- Princeton Digital Group (Singapore) SG1 Pte Ltd
- PSA International
- Quest Ventures
- RHT Green Pte Ltd
- Right People Renewable Energy (RPRE)
- Sasha's Fine Foods
- Save A Crust Pte Ltd (CRUST Group)
- Seatech Solutions International (S) Pte Ltd
- Seatobag Pte Ltd
- Sembcorp Industries Limited
- Sentosa Golf Club
- SEPPURE Pte Ltd
- Shiok Meats Pte Ltd
- Singapore Institute of Technology
- Singapore Telecommunications Limited (Singtel)
- Societe Generale
- Solaris Strategies Singapore Pte Ltd
- Sophie's Bionutrients Pte Ltd
- South Pole Carbon Asset Management
- SpaceAge Labs Pte Ltd
- Spark Systems Pte Ltd
- StarHub
- Stemcell United Pte Ltd
- Strategic Marine (S) Pte Ltd
- SWTS Pte Ltd
- Tanjong Pagar Town Council
- Tembusu Asia Consulting Pte Ltd
- The Barracks Hotel Sentosa
- The Outpost Hotel Sentosa
- T-RECs.ai Pte Ltd
- TRIA Pte Ltd
- TRIREC Holding Pte Ltd
- Trucost (part of S&P Global)
- Tru-Marine Pte Ltd
- TuffChem Environmental Services Pte Ltd
- TurtleTree Labs Pte Ltd
- UglyFood Pte Ltd
- UL Verification Services Private Limited
- Umami Meats Pte Ltd
- UnaBiz Pte Ltd
- Unilever Asia Pte Ltd
- Uniweld Products (USA) Pte Ltd
- Vac-Tech Engineering Pte Ltd
- Victory Pte Ltd (previously Victory Petroleum Trading Pte Ltd)
- Village Hotel Sentosa
- Viswalab Singapore Pte Ltd
- Volve Solutions Pte Ltd
- Wholesome Savour Pte Ltd
- Wilhelmsen Ships Service (S) Pte Ltd
- W Singapore Sentosa Cove Hotel
- Zilingo Pte Ltd



**CARBON PRICING
LEADERSHIP COALITION**

1818 H St NW, Washington, DC 20433

www.carbonpricingleadership.org | cplcsecretariat@worldbank.org