

2023

State and Trends of Carbon Pricing

International Carbon Markets



WORLD BANK GROUP

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Abbreviations and acronyms

ACMI	Africa Carbon Markets Initiative
CAD Trust	Climate Action Data Trust
CCP	Core Carbon Principles
CDM	Clean Development Mechanism
COP	Conference of the Parties
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
EMDE	Emerging Markets and Developing Economies
ETA	Energy Transition Accelerator
GtCO ₂	Gigatonnes of carbon dioxide
ICVCM	Integrity Council for the Voluntary Carbon Market
IEA	International Energy Agency
ITMOs	Internationally Transferred Mitigation Outcomes
NDC	Nationally Determined Contribution
PMIF	Partnership for Market Implementation Facility
SCALE	Scaling Climate Action by Lowering Emissions
UNFCCC	United Nations Framework Convention on Climate Change
VCMI	Voluntary Carbon Markets Integrity Initiative

Foreword

As developing nations grapple with the large financing needs required to achieve our climate goals, the urgency to mobilize substantial capital towards communities, nature, and broader developmental efforts is resoundingly clear. In this context, carbon markets, both under the Paris Agreement and the voluntary carbon market (VCM), can channel much-needed finance towards climate action. In all, 120 nations have considered the role of international carbon markets to support mitigation action and achievement of their nationally determined contribution (NDC) targets, and many corporations are seeking high-quality carbon credits to meet their voluntary climate commitments. Done right, carbon markets can help us get the resources we need now, at scale, and accelerate action by providing much needed source of finance. They can also encourage accelerated action to meet NDCs, providing financing needed to implement them.

In its annual State and Trends of Carbon Pricing Report, the World Bank has been tracking domestic carbon pricing policies, such as carbon taxes and emissions trading systems, that are critical to incentivize action to reduce emissions. With the growing potential for carbon markets as a means to increase climate finance under both the Paris Agreement and VCM, there is a renewed interest in understanding carbon market developments. This report aims to supplement the annual State

and Trends report and contribute to the global effort to promote market transparency and trust by providing digestible insights into the state of play of international carbon markets.

Carbon markets are primed for growth. Countries are increasingly beginning to leverage cooperative approaches under Article 6 of the Paris Agreement to mobilize climate investments for their NDCs. Institutional frameworks and necessary market infrastructure are being put in place to support this ambition. Similarly, voluntary carbon markets, driven largely by demand from corporations for their voluntary commitments, are concurrently serving as a bridge toward deeper decarbonization strategies and can increasingly be used as a vehicle to channel significant private investment to fund mitigation and development efforts.

Carbon markets are, however, at an inflection point with several challenges looming large. Environmental integrity concerns, changing and uncertain government policies, and lack of clarity about how voluntary and Paris Agreement markets will converge all cast shadows on the potential of these markets to fulfill their transformative role.

That said, several initiatives are underway to build integrity and certainty in the market. The World Bank, as laid out in its Engagement Roadmap for Carbon Markets, will be using its convening

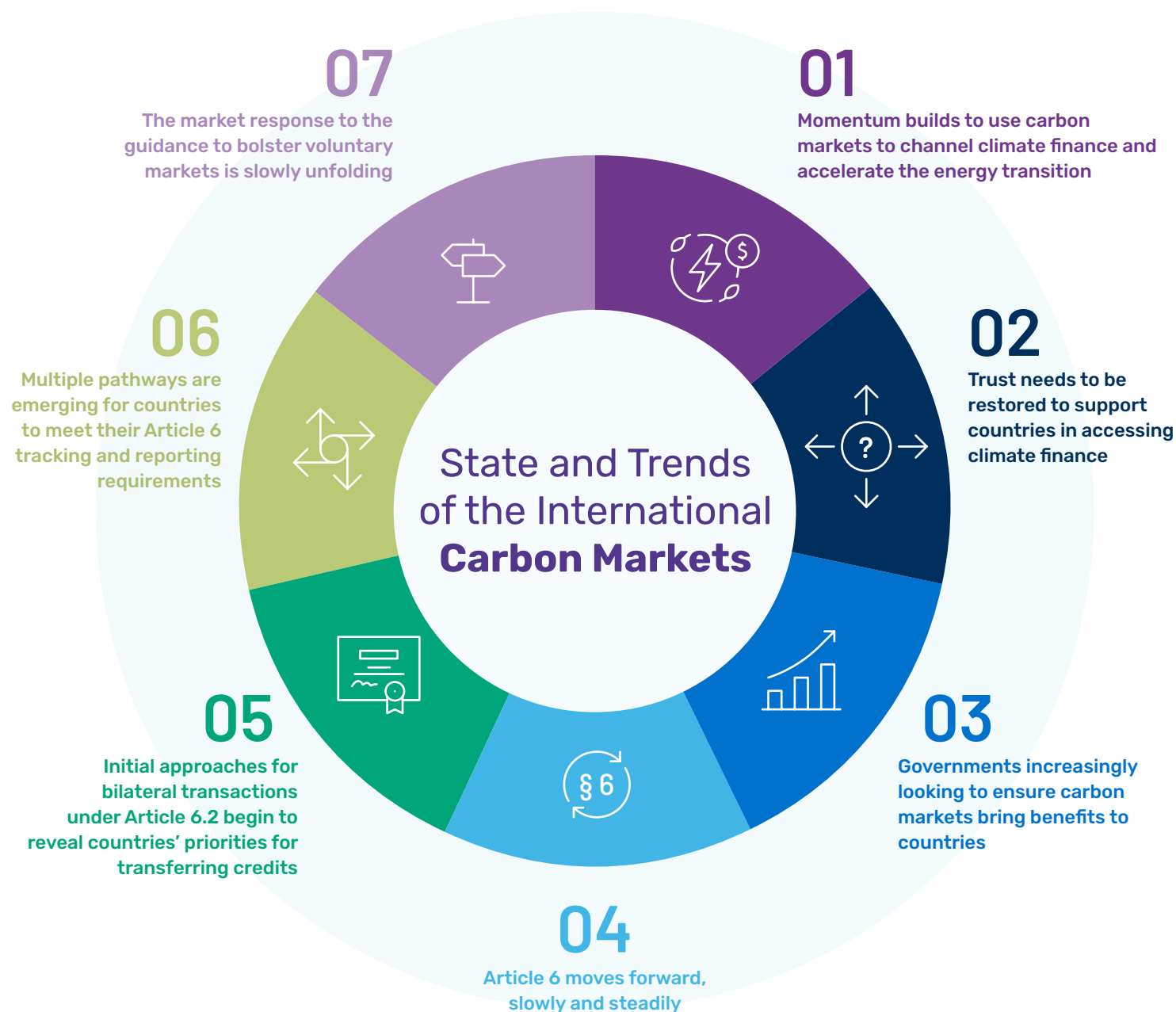
power to work with partners in the ecosystem to implement harmonized high-integrity principles and support countries in generating and marketing high-integrity credits. The World Bank will continue to support efforts in countries to participate and benefit from carbon markets through initiatives like the Partnership for Market Implementation Facility (PMIF), Scaling Climate Action by Lowering Emission (SCALE).

As we stand at the crossroads of possibility, unlocking the potential of transparent, trustworthy, and robust carbon markets today holds the key to accelerating climate action and catalyzing essential capital flows from the private sector. This report on the state and trends of international carbon markets highlights the important progress that has been made, illuminates some of the challenges facing the market, and reiterates the World Bank's commitment to developing high-integrity carbon markets that will benefit developing countries, alongside its commitment to promoting climate policies, such as domestic carbon pricing instruments, that are critical to reduce emissions.

Hania Dawood

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World Bank*

2023



Introductory message

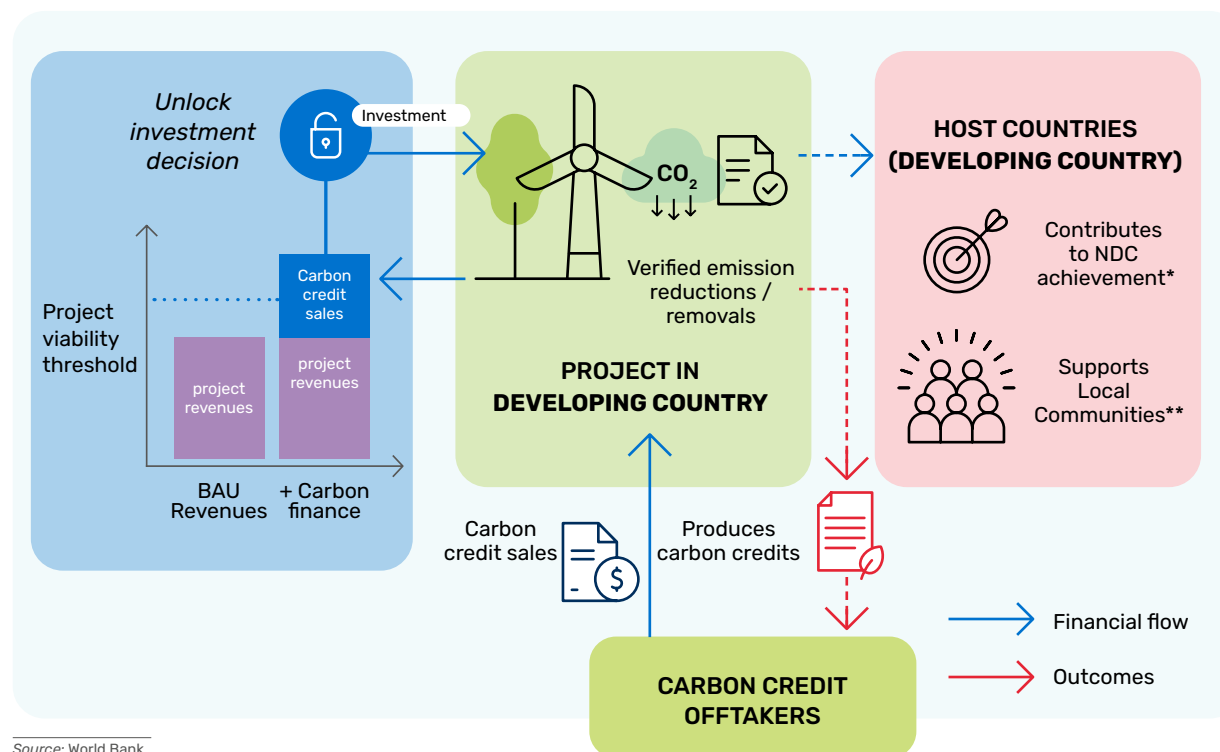
Carbon markets can effectively channel private capital to projects in emerging markets and developing economies.

The world requires a steep change in investment to meet the goals of the Paris Agreement.

The range of total investment needed in emerging markets and developing economies (EMDEs) is estimated at between US\$3 to US\$6 trillion each year by 2050.¹ Recent progress is encouraging. The International Energy Agency (IEA) estimates that US\$1.8 trillion has been invested globally in clean energy in 2023, up 40 percent from 2020.² While investment must continue to grow in all regions, the increase will be greatest in EMDEs, where average annual flows through 2030 need to be between four and seven times greater than volumes seen between 2017 and 2020.³ EMDEs can pursue various measures to mobilize capital, which is both scarcer and more expensive than in advanced economies. One of the available options is carbon finance, where buyers pay for verified emission reductions. Given that buyers tend to be located in advanced economies, these payments often reflect a financial flow into EMDEs.

Figure 1

Unlocking Climate Investments Through Carbon Credits



Source: World Bank.

Carbon markets are a proven tool to channel private sector investment into mitigation activities.

The scale of investment required to reach the Paris Agreement goals far exceeds what is available from public sources. Mobilizing private capital is therefore essential. The United Nations Framework Convention on Climate Change (UNFCCC) estimates that, on average, every US\$1 of public funds invested through the Clean Development Mechanism (CDM) leveraged a further US\$10 of private investment.⁴ The type of finance offered by carbon markets is also different. Today, most climate finance that flows to projects upfront, which includes domestic, international, public, and private finance, is raised via debt or equity, which represented 61 percent and 33 percent, respectively, of climate finance over 2021 and 2022.⁵ Unlike these instruments, which involve costs for borrowers, revenues from carbon credits represent an outcome-based form of climate finance that rewards projects for the climate benefits they generate. These revenues become a valuable source of financing for either improving the overall economics of the relevant mitigation investment (that is, reducing the cost of mitigation) or investing in additional mitigation action.

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EMDEs can benefit from carbon markets in multiple ways.

When the carbon credits are bought for voluntary purposes⁶, or as part of result-based payment programs⁷, they help the host country meet its NDC target. Even when corresponding adjustments are applied and the emission reductions cannot be counted towards the host country's NDC, they still provide a mechanism to mobilize finance. For EMDEs operating a carbon pricing instrument (for example, carbon taxes or emission trading systems), carbon credits can lower compliance costs for regulated entities and incentivize action in noncovered sectors. Finally, carbon credits can be integrated into innovative financial instruments, such as a recent US\$50 million emission reduction-linked bond, which provides upfront capital to distribute water purifiers in Vietnam, with investors receiving payments linked to the number of carbon credits generated instead of ordinary coupon payments.⁸

- 1 Private climate financing article available at <https://www.imf.org/en/Blogs/Articles/2022/10/07/how-to-scale-up-private-climate-finance-in-emerging-economies>.
- 2 World Energy Outlook 2023 available at <https://iea.blob.core.windows.net/assets/614bb748-dc5e-440b-966a-ad9e9ea-022fe/WorldEnergyOutlook2023.pdf>.
- 3 Climate Change 2022 Technical Summary available at https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_TechnicalSummary.pdf.
- 4 Clean Development Mechanism fact sheet available at <https://unfccc.int/sites/default/files/cdm-leveraging-private-finance-and-delivering-results.pdf>.
- 5 Out of the \$1.3 trillion climate finance flows on average across 2021-22 from all international and domestic public and private sources, only \$69 billion was delivered as a grant. Find full Climate Policy Initiative report at <https://www.climatepolicyinitiative.org/wp-content/uploads/2023/11/Global-Landscape-of-Climate-Finance-2023.pdf>.
- 6 Voluntary purposes here refer to corporates' voluntary contribution commitments.
- 7 Under a results-based payments approach, finance is disbursed only when agreed milestones or outcomes have been achieved and verified by a third party. For mitigation programs, outcomes or results are typically specified as verified tonnes of emission reduced or removed. Result-based payments provide an incentive for governments to implement interventions effectively and can be an important tool for building technical capacities, for instance in developing a robust monitoring, reporting, and verification and enabling the system for monetizing emissions reductions and associated milestones to be developed and tested without jeopardizing host countries' ability to meet their NDCs, among others.
- 8 World Bank press release available at <https://www.worldbank.org/en/news/press-release/2023/02/14/emission-reduction-linked-bond-helps-provide-clean-drinking-water-to-two-million-children-in-vietnam>.

01

Momentum builds to use carbon markets to channel climate finance and accelerate the energy transition.

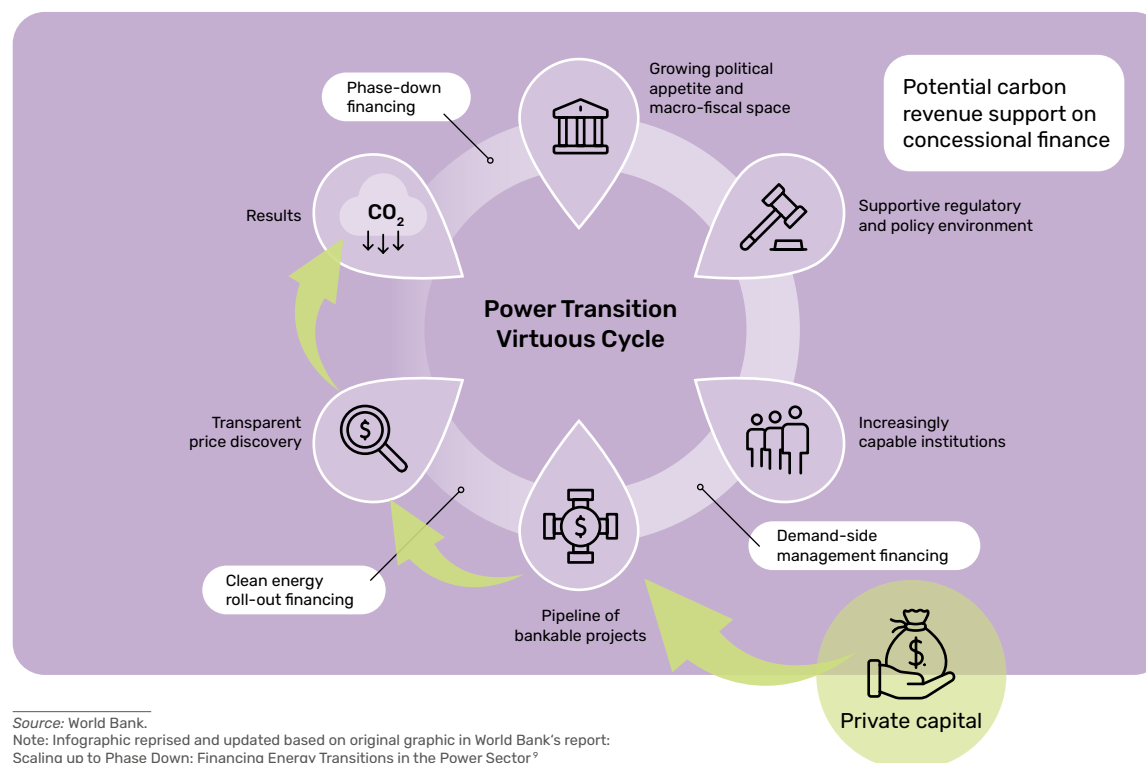
Transitioning to a low-carbon energy system lies at the heart of achieving net-zero emissions.

The energy sector is the largest source of global greenhouse gas emissions, reaching an all-time high of 37 gigatonnes of carbon dioxide (GtCO₂) in 2022.¹⁰ According to the IEA, these emissions need to decrease by 35 percent by 2030 to stay on track for a net-zero energy sector by 2050.¹¹ Expanding renewable energy generation is a priority, especially in Africa, where 43 percent of the population lacks access to electricity.¹² The investment required to deliver electricity access and clean cooking for all Africans is estimated at US\$25 billion annually.¹³ The transition will also require early retirement of some fossil-based infrastructure. Without intervention, the IEA estimates that existing fossil fuel assets will emit 600 GtCO₂ by 2050, which is far above the remaining emissions budget to limit temperature increases to 1.5°C.¹⁴ This is particularly relevant for

Integrating carbon markets into sector-level transition plans helps to bridge the financing gap

Figure 2

Illustration of role of carbon credits to help overcome barriers to power sector transition



coal-fired electricity generation, emissions from which were almost 15.5 GtCO₂ in 2022.¹⁵

Carbon markets could help speed up the shift away from coal.

More than 90 percent of coal power capacity is estimated to be shielded from market pressures—for example, through long-term offtake agreements or subsidies. This means that operators lack any incentive to retire plants ahead of schedule, even if cheaper forms of electricity generation are available.¹⁶ The challenge is exacerbated by the relatively young average age of coal plants in Asia, where 73 percent of the global fleet is located.¹⁷ Revenues from carbon credits can complement upfront concessional funding and help cover some of the costs that operators would face if retiring plants early, such as foregone revenue from electricity sales, decommissioning, and just transition measures (for example, worker retraining). Ensuring the environmental integrity of coal transition credits will be essential if this model is to succeed, including ensuring that emissions are not simply displaced to other fossil fuel power plants and that coal-fired electricity is instead replaced by renewable sources.

Scaling up renewable energy and energy efficiency globally are necessary preconditions for phasing down coal power significantly. The World Bank's recent report, [Scaling up to Phase Down: Financing Energy Transitions in the Power Sector](#), highlights the difficulties EMDEs face with access and affordability of capital for adding renewable energy projects to their pipelines. Various forms of financing are needed to support power

sector transition, and carbon credit revenues can complement concessional finance to bridge the financing gap.

Sector-wide transition plans can mobilize finance at greater scale.

Decarbonizing a country's energy sector requires a system-wide approach which extends beyond individual projects. Integrating carbon markets into sector-level transition plans is the objective of the Energy Transition Accelerator (ETA), a collaboration between the US Department of State, The Bezos Earth Fund, The Rockefeller Foundation, and the World Bank. Under the ETA, participating EMDEs will be able to generate carbon credits from emission reductions achieved across the energy sector, such as the decommissioning of coal-fired power and the deployment of clean energy.¹⁸ This will enable credits to be generated in greater volumes, with buyers lined up from both public and private sectors.¹⁹

Momentum to integrate carbon credit revenues is accelerating to support energy access in Africa.

The Africa Carbon Markets Initiative (ACMI) aims to support the development of voluntary carbon markets to finance Africa's universal energy access, scaling clean energy transition, among others. In the last 12 months, the ACMI stimulated demand by securing US\$1 billion in intentions to buy and aggregate high-integrity African carbon credits by 2030 and secured a further US\$250 million in signed intentions to invest in projects to improve access to capital for project developers.²⁰

- 9 World Bank Report available at <https://openknowledge.worldbank.org/server/api/core/bitstreams/d0c0c6a2-f331-4bb9-b9d1-638d1f039e7d/content>.
- 10 IEA 2023: Net Zero Roadmap available at <https://www.iea.org/reports/net-zero-road-map-a-global-pathway-to-keep-the-15-0c-goal-in-reach>.
- 11 IEA 2023: Net Zero Roadmap available at <https://www.iea.org/reports/net-zero-road-map-a-global-pathway-to-keep-the-15-0c-goal-in-reach>.
- 12 Africa Energy Outlook 2022 available at <https://www.iea.org/reports/africa-energy-outlook-2022/key-findings>.
- 13 World Energy Outlook 2023 available at <https://iea.blob.core.windows.net/assets/614bb748-dc5e-440b-966a-ad9ea022fe/WorldEnergyOutlook2023.pdf>.
- 14 IEA 2023: Net Zero Roadmap available at <https://www.iea.org/reports/net-zero-road-map-a-global-pathway-to-keep-the-15-0c-goal-in-reach>.
- 15 CO₂ emissions 2022 report available at <https://www.iea.org/reports/co2-emissions-in-2022>.
- 16 Financing the Coal Transition report available at https://rmi.org/wp-content/uploads/dlm_uploads/2021/11/RMI_Financing_the_Coal_Transition_November_2021.pdf.
- 17 Financing the Coal Transition report available at https://rmi.org/wp-content/uploads/dlm_uploads/2021/11/RMI_Financing_the_Coal_Transition_November_2021.pdf.
- 18 Energy Transition Accelerator article available at <https://www.rockefellerfoundation.org/news/energy-transition-accelerator-and-world-bank-announce-strategic-collaboration-to-scale-up-clean-energy-finance/>.
- 19 Energy Transition Accelerator article available at <https://www.rockefellerfoundation.org/news/energy-transition-accelerator-and-world-bank-announce-strategic-collaboration-to-scale-up-clean-energy-finance/>.
- 20 Africa Carbon Markets Initiative article available at <https://africacarbonmarkets.org/acmis-narrative-on-african-carbon-markets/>.

02

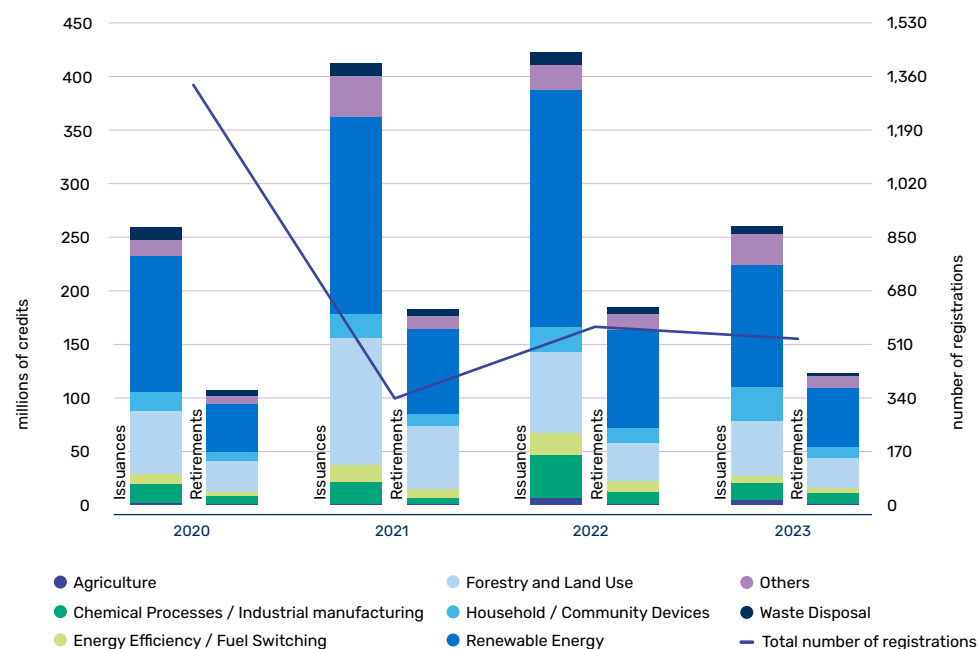
Trust in the voluntary markets needs to be restored to support countries accessing climate finance.

The market has slowed over the past year.

As of the end of September 2023, issuances and retirements of carbon credits were both down around 13 percent on levels seen over the same period (January to September) in 2022. Over the period, the distribution of issuances and retirements across most carbon credit categories has remained broadly similar. The proportion of renewable energy credits has fallen while that of household device credits has increased.²¹ The slowdown has been attributed to various factors. Critical media coverage over the year continued to cast doubt on the environmental integrity of some carbon credits, particularly those from avoided deforestation activities.²² Clean cookstove projects also came under scrutiny.²³ Challenging macroeconomic conditions linked to the impact of the COVID-19 pandemic and the war in Ukraine, and uncertain and changing government policies (see key message 3) further weighed down on the market activity. In addition, the market was awaiting the outcome of key voluntary standard setting initiatives (see key message 7). Although guidance was published in the summer, market participants are seeking further clarity

Figure 3

Global Volume of Issuances, Retirements, and Registrations by Project Category from January 2020 to September 2023



Source: Ecosystem Marketplace.

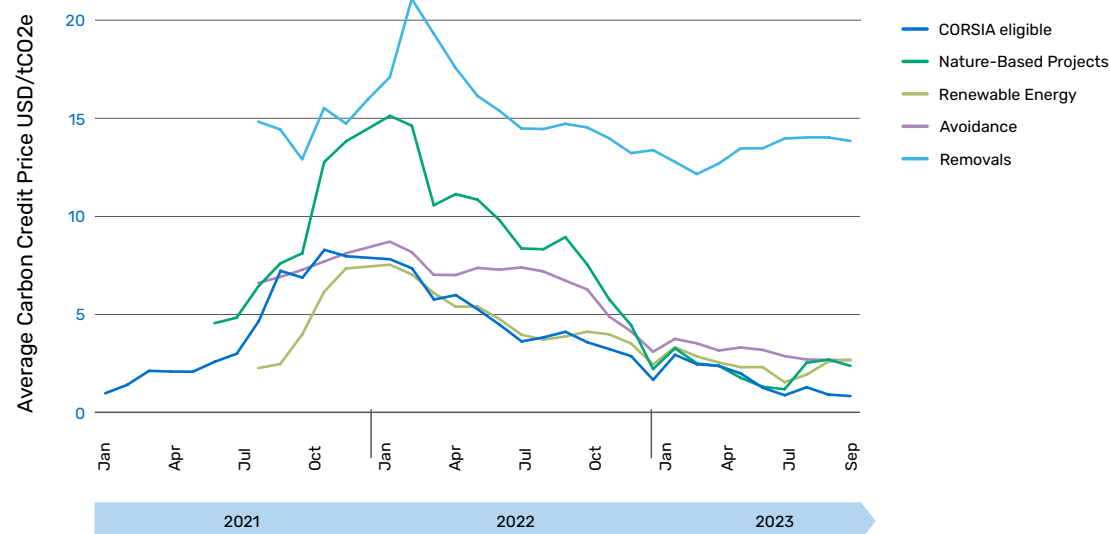
on how to implement and meet these requirements, and progress on this will emerge only in 2024. In the meantime, several large corporations announced moves away from using carbon credits for offsetting.²⁴

Prices for many types of carbon credits held steady or declined.

Apart from removal projects, prices of carbon credits traded through standardized contracts declined over the course of 2023, continuing the trend from the previous year. In some cases, the declines over the whole period have been significant: by September 2023, the value of credits eligible for use in the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) pilot phase (2021 to 2023) was nearly 90 percent lower than in January 2022. The price declines reflect an apparent wider fall of activity in standardized markets, with Xpansiv CBL reporting that around 18 million tons were traded on its global exchange platform in the first six months of 2023.²⁵ Although this only covers the first half of the year, it is still significantly below the 116 million tons that were traded over the whole of 2022.²⁶ Prices appear to have held up better in over-the-counter transactions. According to Ecosystem Marketplace, the average price so far in 2023 for OTC transactions is US\$7.56²⁷, up from US\$7.39 in 2022. Prices for agriculture and forestry credits have increased from 2022, while those from energy efficiency and household devices have fallen.

Figure 4

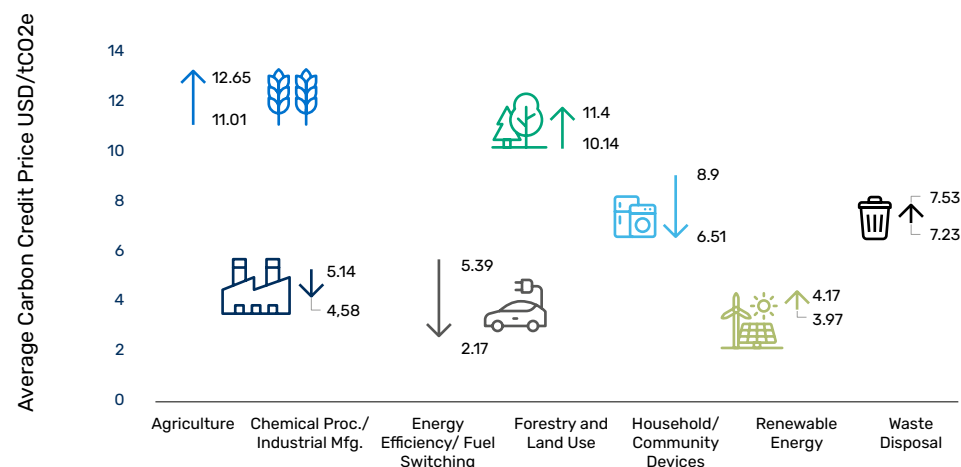
Prices of Standardized Carbon Credit Contracts January 2021–September 2023



Source: S&P Global Platts.

Figure 5

Change in Average price of Over-the-counter transactions by project type, January 2022–September 2023



Source: Ecosystem Marketplace.

Despite the headwinds, there were still encouraging developments.

Analysis from Trove Research, in cooperation with the International Emissions Trading Association, Sylvera, and Verra, found that finance flowing into carbon markets has accelerated markedly in recent years. An estimated US\$17 billion was invested between 2020 and 2022, almost as much as the US\$19 billion invested over the preceding eight years.²⁸ The African Climate Summit in September also saw US\$650 million pledged to buy carbon credits under the ACMI.²⁹ Separately, research published by Ecosystem Marketplace found that companies engaged in voluntary carbon markets are more likely to report reduced gross emissions, have

an approved science-based target, and disclose their emissions. These findings provide some evidence that carbon credits can play a positive complementary role in corporate decarbonization strategies.³⁰ With greater certainty and clarity, voluntary markets can unlock additional financing needed to scale up climate investments.

Findings provide some evidence that carbon credits can play a positive complementary role in corporate decarbonization strategies.

21 Data on issuances and retirements by project category provided by Ecosystem Marketplace and cover the following crediting mechanisms: American Carbon Registry, City Forest Credits, Clean Development Mechanism, Climate Action Reserve, Global Carbon Council, Gold Standard, Plan Vivo, and Verified Carbon Standard.

22 For example, <https://www.newyorker.com/magazine/2023/10/23/the-great-cash-for-carbon-hustle>.

23 For example, <https://www.climatechangenews.com/2023/08/25/cookstove-offsets-carbon-emissions-credits-india-enking/>.

24 For example, <https://www.bloomberg.com/news/features/2023-08-31/shell-silently-abandoned-its-100-million-a-year-plan-to-offset-co2-emissions#xj4y7vzkg> and <https://www.esgtoday.com/nestle-moves-away-from-carbon-offsets-to-focus-on-emissions-reductions-across-brands/>.

25 Xpansiv Quarterly VCM Review available at <https://xpansiv.com/xpansiv-quarterly-vcm-review-q2-2023/>.

26 Xpansiv Trading 2022 Insights available at <https://xpansiv.com/trading-insights-from-2022/>.

27 This is based on the data through the end of September 2023. The Ecosystem Marketplace launched the most recent report on the 2023 state of the voluntary carbon markets which can be found here.

28 Trove Research report available at <https://trove-research.com/report/global-carbon-credit-investment-report#:~:text=A%20major%20new%20study%20by,in%20future%20investment%20already%20committed>.

29 Africa Climate Summit article available at <https://www.reuters.com/business/environment/africa-climate-summit-opens-with-focus-financing-continental-unity-2023-09-04/>.

30 Ecosystem Marketplace article available at <https://www.ecosystemmarketplace.com/publications/2023-em-all-in-on-climate-report/>.

03

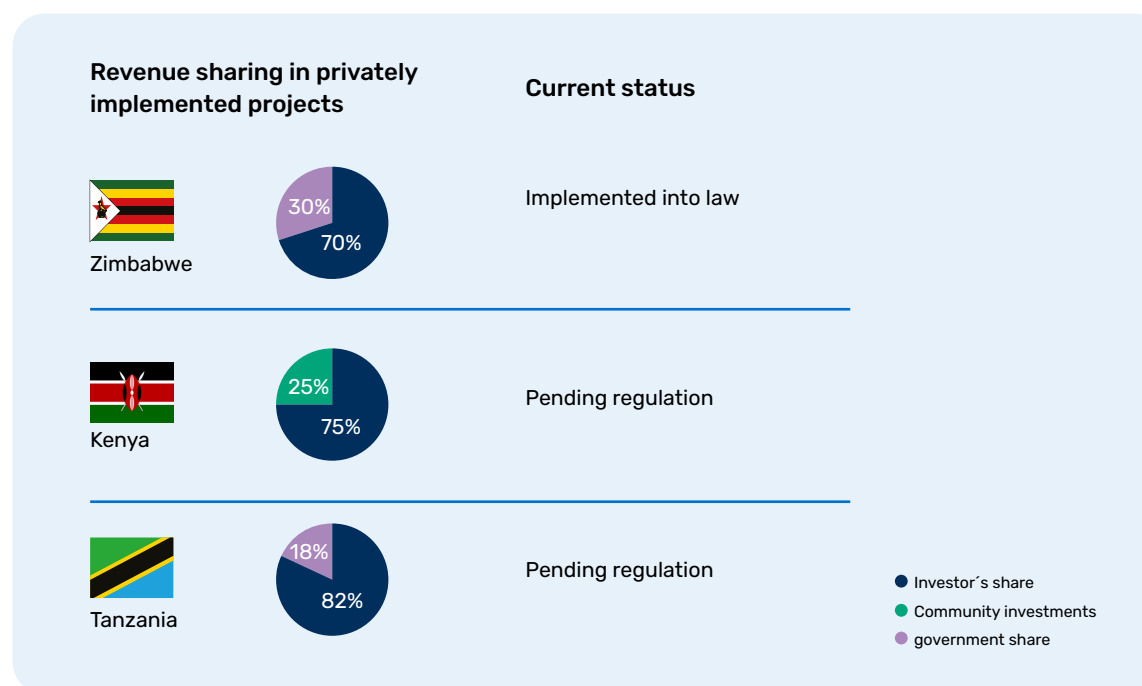
Governments are increasingly looking to ensure carbon markets bring benefits to countries.

The appetite for more direct government intervention in carbon markets, mainly in the voluntary carbon markets is growing.

Government involvement has been limited to date. However, concerns that host countries—both governments and local communities—have not benefited sufficiently from carbon crediting activities are prompting more intervention. This trend of greater government involvement is unfolding within the broader context of host countries implementing measures to meet their enhanced responsibilities under Article 6 of the Paris Agreement.

Figure 6

Revenue Sharing Approaches Considered for Carbon Credit Trading



Source: World Bank.

Various arrangements are being explored to ensure increased benefits to communities and countries.

For example, the past year has seen several African governments propose different revenue sharing arrangements for projects implemented in their countries. The first to do so was Zimbabwe, which announced in May that 50 percent of revenues would be taken by the government, with a further 20 percent reserved for local communities. This was later revised to a share of at least 30 percent for the government, with project developers able to keep the remainder.³¹ In Kenya, draft regulations propose a range of between 25 percent and 40 percent depending on the project type, with resources going to local communities, county governments, and a national consolidated fund for sustainable development.³² The governments of Malawi,³³ Mozambique,³⁴ and Tanzania³⁵ are also considering similar arrangements.

The recent drive to introduce revenue sharing arrangements is motivated by a desire by governments to ensure that more of the monetary value of carbon credits is captured within their countries.

To succeed in the longer term, carbon markets need to balance the interests of different stakeholders.

The recent drive to introduce revenue sharing arrangements is motivated by a desire by governments to ensure that more of the monetary value of carbon credits is captured within their countries. If the incentive structures are not sufficiently established, the climate investments in the countries might slow down or developers may search for opportunities in jurisdictions with more favorable environments. Rather than imposing a uniform arrangement, countries may instead consider taxing only transactions that generate excessive rents, which can be redistributed to local communities.

31 Zimbabwe carbon law article available at <https://www.bloomberg.com/news/articles/2023-09-27/zimbabwe-amends-carbon-law-to-boost-developers-profit-share>.

32 Kenya's draft regulation available at <https://www.environment.go.ke/wp-content/uploads/2023/09/19.09.23-reviewed-Carbon-Markets-Regulations-With-list-of-all-Schedules.pdf>.

33 Malawi carbon credit review article available at <https://www.bloomberg.com/news/articles/2023-07-07/malawi-orders-review-of-all-carbon-credit-projects#xj4y7vzkg>.

34 Mozambique carbon regulatory framework article available at <https://carbon-pulse.com/226062/>.

35 Tanzania carbon credit article available at <https://www.theeastafrican.co.ke/tea/science-health/inside-tanzania-kenya-rules-to-tap-carbon-credits-windfall-4326982>.

04

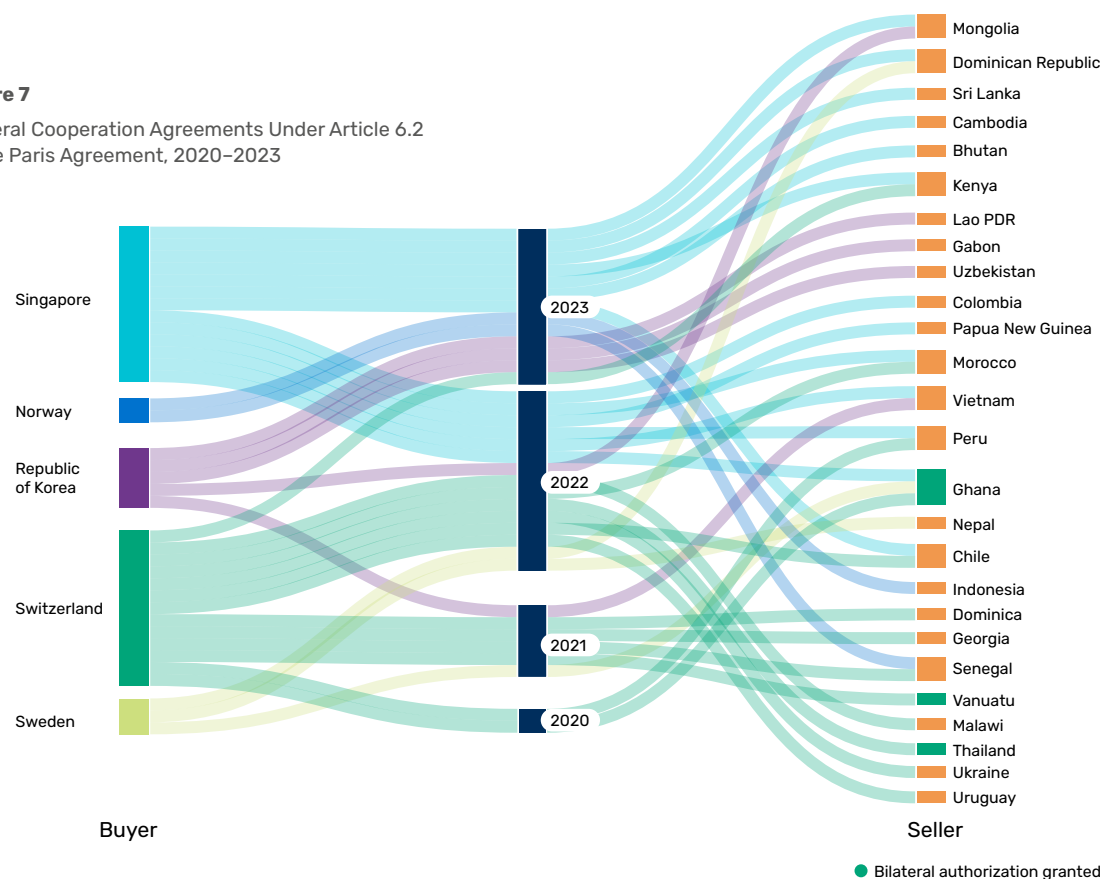
Article 6 moves forward, slowly and steadily.

The number of countries preparing to participate in Article 6 continues to grow.

A significant milestone was reached with the submission of the first Article 6 initial reports by Ghana,³⁶ Switzerland,³⁷ and Vanuatu³⁸ as part of their cooperation agreements. Belize, Honduras, and Suriname also announced their intention to trade so-called “sovereign” carbon credits generated from national level forestry programs under Article 6.³⁹ Progress on linking Article 6 to domestic carbon pricing instruments is moving ahead as well, albeit slowly. In October, Singapore published criteria for international carbon credits eligible for use for the country’s domestic carbon tax, with further details on eligible host countries, methodologies, and crediting mechanisms due by the end of the year.⁴⁰ The Republic of Korea signed agreements to implement projects in the Socialist Republic of Viet Nam and Uzbekistan, where some of the emissions reductions may be converted into Korean Offset Credits. These could then be used by entities regulated under the country’s emissions trading system.⁴¹

Figure 7

Bilateral Cooperation Agreements Under Article 6.2 of the Paris Agreement, 2020–2023



Source: World Bank.

Note: Bilateral cooperation agreements signed under Article 6.2 until September 2023. This excludes Japan’s agreements under its Joint Crediting Mechanism (some of which were signed before the Paris Agreement) and Australia’s Indo-Pacific Offset Scheme. While these agreements are Article 6-aligned, they are not explicitly mentioned as Article 6.2 agreements, and therefore are excluded from the figure.

The first outcomes of various initiatives to build readiness for participating in carbon markets are emerging and reinforce the need for robust decision-making frameworks to support the authorization process (more in Key Message 5)

Many of the frontrunner efforts have focused on African countries. In October, Zambia published the first part of its National Carbon Market Framework.⁴² The guidance addresses the process for submitting and evaluating mitigation activities under Article 6 and was developed in partnership with the *Supporting Preparedness for Article 6 Cooperation* program.⁴³ In June, ACMI partnered with Mozambique to develop a national policy framework.⁴⁴ This is the first of several planned “carbon market activation plans” to support governments across the continent.⁴⁵ Through the *World Bank’s Partnership for Market Implementation Facility*, countries are receiving assistance on a range of topics, including conducting gap assessments, developing an Article 6 strategy, building infrastructure, and delivering capacity building activities, all vital for quickening the pace of implementation.

Conducting gap assessments, developing an Article 6 strategy, building infrastructure, and delivering capacity building activities, all vital for quickening the pace of implementation.

The Article 6.4 mechanism is getting closer to becoming fully operational.

The Article 6.4 Supervisory Body met six times throughout 2023 to continue developing operational guidelines for the mechanism. Progress was made across the board, including on methodological approaches and removals, on which the body had been unable to reach consensus ahead of the 27th Conference of the Parties (COP27). The recommendations on both issues will now be considered for adoption by countries at COP28.⁴⁶ Beyond the operational guidelines, another important step is to establish the Article 6.4 registry. A call for stakeholder input was launched in September, although the timeline for launching the registry is not yet clear.⁴⁷ Elsewhere under Article 6.2, the UNFCCC has implemented an interim solution while the digital platform for country reporting is being developed.

- 36 Ghana’s Article 6.2 Initial Report available at <https://cmo.epa.gov.gh/index.php/2023/09/14/ghana-publishes-its-first-article-6-2-initial-report/>.
- 37 Switzerland’s Article 6.2 Initial Report available at https://unfccc.int/sites/default/files/resource/230517_InitialReport_Switzerland.pdf.
- 38 Vanuatu’s Article 6.2 Initial Report available at https://unfccc.int/sites/default/files/resource/1-%20Initial%20Report%20Template%20Vanuatu_FINAL.pdf.
- 39 Belize, Honduras, and Suriname article available at <https://carbon-pulse.com/223889/>.
- 40 Singapore article available at <https://www.nea.gov.sg/media/news/news/index/singapore-sets-out-eligibility-criteria-for-international-carbon-credits-under-the-carbon-tax-regime#:~:text=The%20Eligibility%20Criteria%20requires%20ICCs,to%20demonstrate%20high%20environmental%20integrity>.
- 41 Republic of Korea article available at <https://carbon-pulse.com/224774/>.
- 42 Zambia’s National Carbon Market Framework available at <https://www.mgee.gov.zm/wp-content/uploads/2023/10/Part-1-of-the-carbon-market-framework-for-zambia.pdf>.
- 43 Zambia article available at <https://unepccc.org/spar6c-supports-zambias-pursuit-of-a-greener-future/>.
- 44 Mozambique article available at <https://further-africa.com/2023/06/14/carbon-market-game-changer-mozambique-partners-with-geapp/>.
- 45 Africa Carbon Markets Initiative Roadmap Report available at https://www.seforall.org/system/files/2022-11/ACMI_Roadmap_Report_Nov_16.pdf.
- 46 Meeting report available at <https://unfccc.int/sites/default/files/resource/a64-sb008.pdf>.
- 47 Call for input article available at <https://unfccc.int/process-and-meetings/the-paris-agreement/article-64-mechanism/calls-for-input/call-for-input-2023-structured-public-consultation-modalities-for-operation-of-the-article-64>.

05

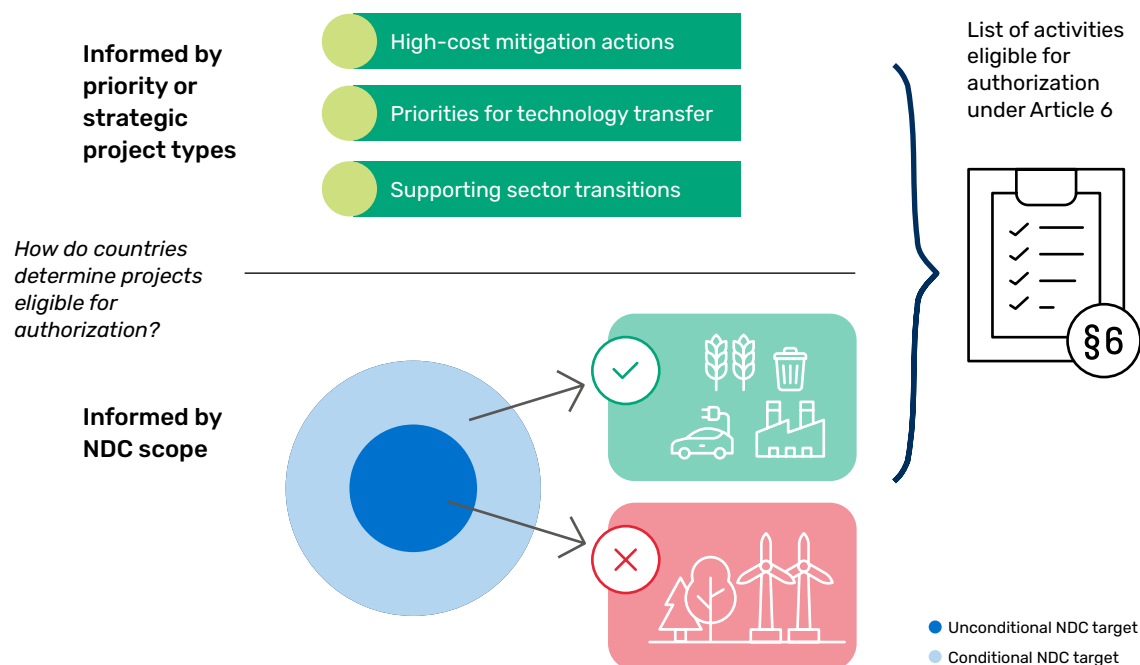
Initial approaches for bilateral transactions under Article 6.2 begin to reveal countries' priorities for transferring credits.

Host country authorization is an essential part of meeting international compliance demand for carbon credits.

The Article 6.2 guidance requires that, in order to be used to meet NDC targets, countries must first authorize Internationally Transferred Mitigation Outcomes (ITMOs). Authorization means that the countries agree to apply corresponding adjustments for emission reductions to avoid double counting. Authorized and adjusted credits cannot be used by the host country to meet its own NDC. While straightforward in theory, deciding which carbon credits to authorize is more complicated in practice. Selling countries must ensure that they do not authorize emission reductions that they need to meet their own NDC targets. Setting up national processes to assess and grant authorizations is not only important for Article 6 but also for the successful implementation of CORSIA.

Figure 8

Illustration of A Few Countries' Approaches in Determining Eligible Projects for Authorization under Article 6



Source: World Bank.

Note: Infographic based on findings from: Global Green Growth Institute Insight Brief 07, 2023 Implementing Article 6 of the Paris Agreement: Options for governance frameworks for host countries⁴⁸

The first approaches towards authorization are showing how countries can manage the process.

So far, countries have considered which activities to authorize based on two key factors. The first is based on strategic or priority activities, for instance, to support projects in particular sectors or in areas where countries are targeting the transfer of technology. The second is based on the scope of activities covered by the NDC. In general, activities that fall outside of a country's "unconditional" contribution—that is, the actions that it has committed to deliver with domestic resources—are being considered for authorization.⁴⁹ These two factors are often considered in parallel—for example, identifying priority projects within the conditional NDC component. The first policy frameworks—for instance from Ghana or Thailand—also provide models for how countries can manage the process of assessing and approving requests for authorization from a practical perspective.

Every transfer of authorized credits creates obligation and an associated liability for the host country, which is linked to the marginal cost and the associated opportunity cost of meeting the NDC. Countries, therefore, need to take the opportunity cost into account in developing their strategies for authorization of credits. In doing so, understanding the domestically available mitigation options and their costs and conducting in-depth analysis on what it takes to achieve the country's

Comprehensively analyzing what it takes to achieve the country's NDC aids informed decision making

NDC are helpful first steps to making informed decisions.

Managing overselling and pricing ITMOs are two further challenges facing host countries.

A few countries have decided to retain some of the emission reductions to further guard against the risk of overselling. In Ghana, 99 percent of the mitigation will be authorized, with the rest held in a national buffer account.⁵⁰ Paraguay plans to reserve between 3 percent and 10 percent,⁵¹ while Indonesia will withhold at least 10 percent, although the credits may be partially or fully returned once relevant sectoral or subsectoral targets have been met for two consecutive years.⁵² Pricing strategies for ITMOs are at an earlier stage. When countries authorize carbon credits, they may have to undertake additional emission reductions to meet their NDC targets. If these additional emission reductions are more expensive than those it has authorized, the authorization will involve an opportunity cost.⁵³ In addition, even when countries are in a comfortable position to meet their NDC targets, if the marginal NDC achievement cost exceeds the price of ITMOs, authorization in such cases will also involve an opportunity cost. Whether and how to capture the opportunity cost is an issue that remains largely unaddressed. So far, only Ghana has introduced a corresponding adjustment fee, ranging from US\$3 to US\$5 per tonnes of carbon dioxide equivalent (tCO₂e), with the explicit rationale of addressing the opportunity cost of authorizing carbon credits. Ninety percent of the revenue raised will go to a fund to finance mitigation in the conditional component of the country's NDC, as well as action outside of the NDC's scope.⁵⁴

48 Global Green Growth Institute Insight Brief available at https://gggi.org/wp-content/uploads/2023/08/GGCI_InsightBrief_07_Final.pdf.

49 Global Green Growth Institute Insight Brief available at https://gggi.org/wp-content/uploads/2023/08/GGCI_InsightBrief_07_Final.pdf.

50 Ghana's Carbon Market Framework available at https://cmo.epa.gov.gh/wp-content/uploads/2022/12/Ghana-Carbon-Market-Framework-For-Public-Release_15122022.pdf.

51 Paraguay article available at <https://www.bacn.gov.py/leyes-paraguayas/11986/ley-n-7190-de-los-creditos-de-carbono>.

52 Indonesia article available at https://jdih.menlhk.go.id/new/uploads/files/english/english_version_jdih-KLHK_1131-21-2022.pdf.

53 Corresponding Adjustment and Pricing of Mitigation Outcomes paper available at https://ik.imagekit.io/mtozw1gojjs/world-bank/CW_Corresponding_Adjustment_Pricing_Approach_paper_002_40be438f93_PhThJ6kbz.pdf.

54 Ghana's Carbon Market Framework available at https://cmo.epa.gov.gh/wp-content/uploads/2022/12/Ghana-Carbon-Market-Framework-For-Public-Release_15122022.pdf.

06

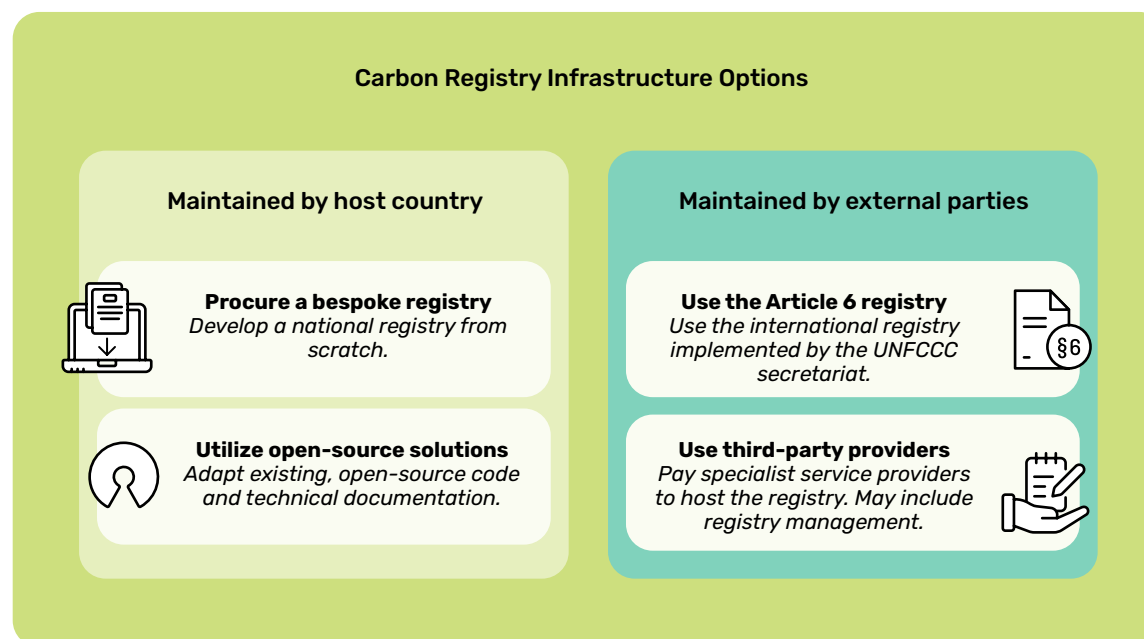
Multiple pathways are emerging for countries to meet their Article 6 tracking and reporting requirements.

Countries can choose from several different market infrastructure options for meeting tracking and reporting requirements.

Firstly, they can procure a bespoke national registry and operate it in-house. Secondly, they can build a national registry using existing open-source systems. For example, the *Digital for Climate* (D4C) Working Group, provides a joint registry offering, including the UNDP National Carbon Registry and the World Bank Core Registry. Both systems are modular, have opensource software, and technical documentation can be reused and tailored by countries. Countries can explore and test these opensource systems and repurpose them according to their technical and policy requirements – examples of countries that deployed the UNDP and World Bank opensource registry systems include Namibia and the Royal Kingdom of Bhutan, respectively. Thirdly, countries can contract specialist third-party providers to host and operate a national registry using existing infrastructure such as APX, IHS Markit (merged with S&P Global in 2022), and Ecoregistry. Finally, countries can use the system provided by the UNFCCC secretariat

Figure 9

Options on the Registry Models that Countries Can Consider



Source: World Bank.

under Article 6. The most appropriate solution varies among countries, depending on factors such as level of carbon market activities, available resources, or whether the country plans on operating a domestic carbon pricing instrument.

Systems can be built standalone or designed for end-to-end digital integration.

Standalone systems are designed to fulfil particular functions—for instance a national carbon registry or a separate platform for Article 6 and NDC reporting. Most countries that are developing infrastructure today are exploring standalone carbon registries. Standalone systems have the advantage of being simpler in design and operation although they come with limited interoperability. On the other hand, end-to-end integrated systems incorporate some or all of the different processes within the carbon credit lifecycle. Under this model, the carbon registry could be integrated with platforms for digital project-level monitoring, reporting, and verification, as well as for trading carbon credits. Integrating different services can offer streamlined operations and enhanced transparency, although the system could be more complex and expensive to establish and manage. The *D4C*⁵⁵ initiative is working with countries to prototype and test end-to-end digital systems.

Guidelines and solutions at the international level can help increase transparency and interoperability

As many countries look to develop their own infrastructure, there is a risk that a lack of interoperability and data sharing between systems inhibits market functioning. International guidance can help promote greater consistency. The standards established under the UNFCCC provide a minimum set of common requirements for Article 6 infrastructure. Initiatives such as opensource national carbon registries, by providing a modular and interoperable solution that can be widely adopted, facilitate the development of interoperable systems. Meta systems such as the Climate Action Data (CAD) Trust also have an important role to play, aggregating and harmonizing carbon markets data collected from a wide variety of independent and national registries. The CAD Trust's Data Dashboard—the public interface where users can access information about carbon credits—is due to be launched by the end of 2023.⁵⁶

The most appropriate solution varies among countries, depending on factors such as level of carbon market activities, available resources, or whether the country plans on operating a domestic carbon pricing instrument.

⁵⁵ Digital for Climate framework available at <https://www.theclimatewarehouse.org/work/digital-4-climate>.

⁵⁶ Climate Action Data Trust dashboard available at <https://climateactiondata.org/data-dashboard/>.

07

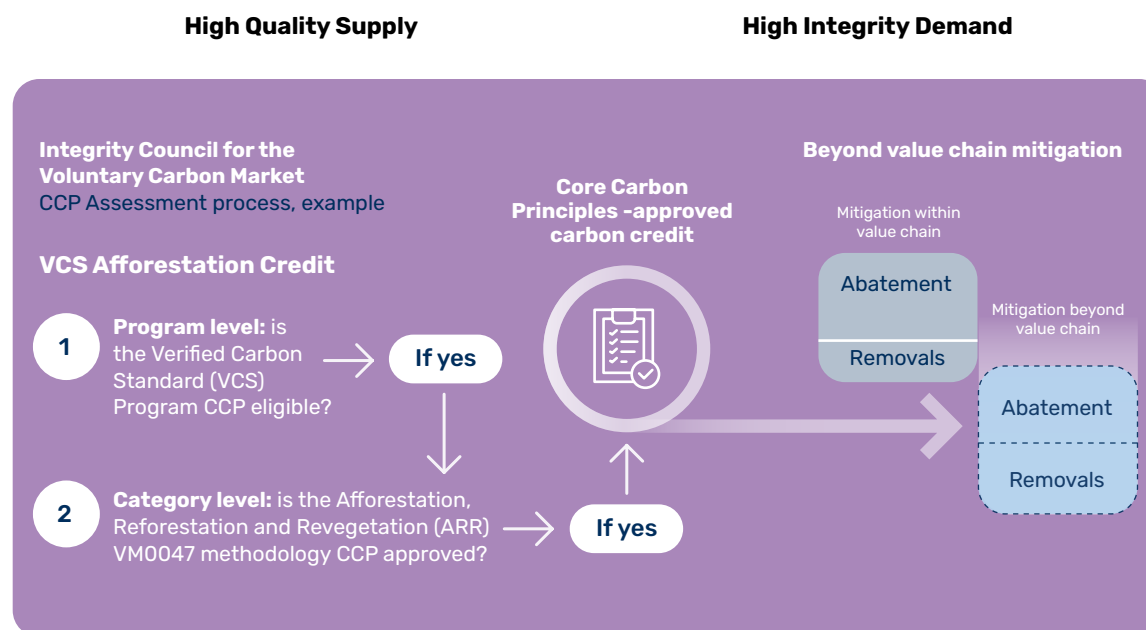
The market response to the guidance to bolster voluntary markets is slowly unfolding.

Guidance published over the summer sought to offer more clarity for voluntary market participants.

In July, the Integrity Council for the Voluntary Carbon Market (ICVCM) finalized the first iteration of its framework for assessing carbon credits against its “Core Carbon Principles” (CCP). Carbon credits issued from eligible project types and by eligible crediting programs will be able to use the CCP label.⁵⁷ The first CCP-eligible programs and carbon credit categories are expected to be announced in early 2024.⁵⁸ Meanwhile, in June, the Voluntary Carbon Markets Integrity Initiative (VCMI) published its final Claims Code for buyers.⁵⁹ It recommends that companies adopt science-based targets and choose one of three “claims,” depending on how many of their residual emissions are compensated. The compensation should be done using CCP carbon credits.⁶⁰

Figure 10

Core Carbon Principles and An Example of the Assessment Process and Application of Claims Guidance



Source: World Bank.

The impact of the guidance on the market remains to be seen.

The operationalization, uptake, and effects of the new guidelines are still unclear. For the ICVCM, an assessment from Trove Research estimates that fewer than 20 percent of currently registered projects have a high or very high likelihood of meeting the CCP requirements, while 45 percent have a low likelihood.⁶¹ Aligning the market around the CCP requirements might therefore imply a potentially significant reduction of available eligible credits, at least in the short term. For the VCMi, the impact will ultimately depend on uptake of requirements by companies. If widely adopted, it could boost demand for CCP-labelled credits. One barrier may be fulfilling all the criteria, which include third-party assurance that the company meets the requirements of the Claims Code. The VCMi has already recognized the challenge and is considering whether special provisions should apply for certain types of companies (for example, small and medium sized enterprises), and is expected to release further guidance ahead of COP28, potentially outlining some flexibility in the use of carbon credits.⁶²

The market is evolving to support different types of corporate claims.

Carbon credits have often been used to support various types of carbon neutrality claims. The outcome at COP27 signaled a first move away from this approach, with the adoption of “mitigation contribution” credits from the Article 6.4 mechanism. In June, South Pole, one of the world’s largest project developers, launched “Funding Climate Action,” as an alternative way for companies to describe their support for climate action.⁶³ These developments are taking place against a backdrop of increasing scrutiny of companies’ environmental claims. Carbon crediting standards are also responding to the trend, with Verra proposing to publish claims guidance for buyers, which will make recommendations on the credible use of Verra’s credits and any associated claims.⁶⁴ As these markets evolve and efforts focused on strengthening the transparency and robustness of these markets operationalize, the global community will be able to accelerate climate action and mobilize private capital flow more effectively.

As markets evolve and efforts to strengthen their transparency operationalize, global community will be able to mobilize private capital more effectively

57 Integrity Council article available at <https://icvcm.org/global-benchmark-for-high-integrity-carbon-credits-aims-to-mobilize-climate-finance-at-speed-and-scale/>.

58 Article available at <https://carbon-pulse.com/228932/>.

59 VCMi Claims Code of Practice available at <https://vcmin integrity.org/vcmi-claims-code-of-practice/>.

60 VCMi Claims Code of Practice available at <https://vcmin integrity.org/vcmi-claims-code-of-practice/>.

61 Trove Research article available at <https://trove-research.com/report/potential-impact-of-the-core-carbon-principles-on-the-global-carbon-credit-market-20-sep-2023>.

62 Voluntary Carbon Markets Integrity Initiative article available at <https://vcmin integrity.org/vcmi-announces-publication-date-for-additional-guidance-within-claims-code-of-practice/>.

63 Funding Climate Action press release available at <https://www.southpole.com/news/south-pole-calls-for-businesses-to-align-around-new-future-proof-green-claim-funding-climate-action>.

64 Verra article available at <https://verra.org/verra-to-issue-claims-guidance-for-consultation/>.

