



ASSESSMENT
OF THE CARBON
CREDIT MARKET IN
LATIN AMERICA AND
THE **CARIBBEAN**



PRESENTATION



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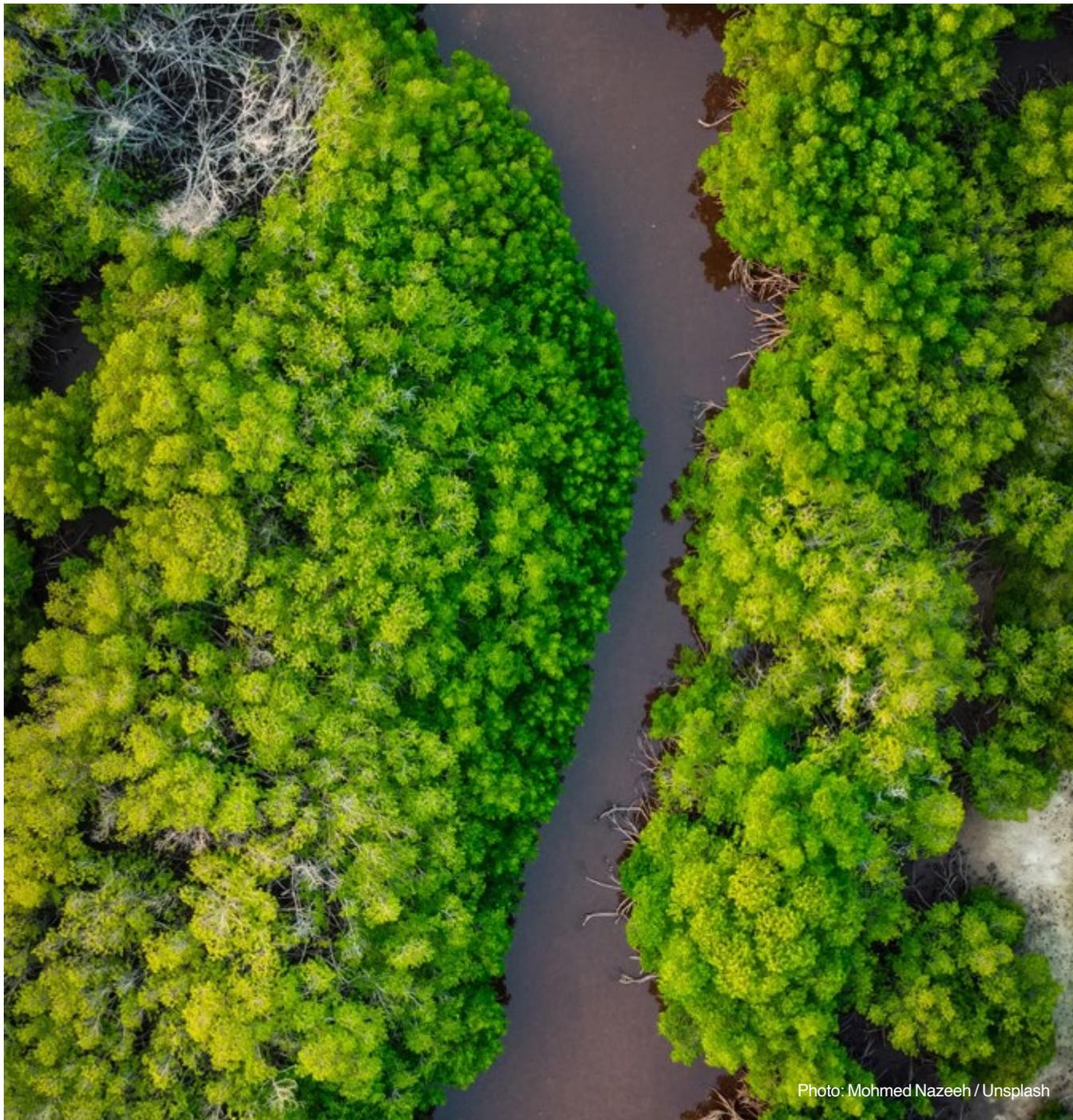


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PREFACE

This assessment of the carbon credit market in Latin America and the Caribbean was prepared by CAF in collaboration with a team from the Climate Center at the Federal University of Rio de Janeiro. The report is designed to inform the work program for the Latin American and the Caribbean Initiative for Carbon Market Development (Iniciativa Latino Americana y del Caribe para el Desarrollo del Mercado de Carbono, ILACC). The report describes the core concepts behind credit markets, traces their development, and assesses current dynamics and ongoing trends. It analyzes the LAC region's position relative to global carbon markets, identifies region-specific risks, and highlights LAC's potential to foster the growth and integration of national, regional, and global carbon markets. It concludes by presenting a workplan designed to facilitate the development of carbon markets in LAC. An appendix includes more detailed analyses of the current situation of six major LAC economies—Argentina, Brazil, Chile, Colombia, Mexico, and Peru—and expands on the relationship between carbon markets and their country-specific climate and socioeconomic development goals.

INTRODUCTION

Over the past several decades, the global political and economic discourse has increasingly focused on the urgent challenges posed by climate change. Many post-pandemic recovery packages have emphasized climate action; a growing number of countries and corporations have committed to achieving climate neutrality; and greenhouse gas (GHG) emissions play an expanding role in trade negotiations and policies. As these trends continue, and as climate-driven disasters and extreme weather events intensify, these issues will become even more relevant and will be integrated more deeply into public and private decision-making. In this context, governments and companies around the world are seeking new ways to reduce their carbon footprint, including public policies that incentivize decarbonization, corporate initiatives to cut GHG emissions, and investments in innovative green technologies. This ongoing search for the most efficient means to enable a carbon-neutral future is generating important challenges as well as strategic opportunities both in the public and private sectors.

Carbon pricing has emerged as a flexible and cost-effective tool for lowering GHG emissions, and it figures prominently in the emerging literature on international best practices for climate change mitigation. [\(1\)](#) Carbon-pricing mechanisms assign a monetary value to GHG emissions, internalizing the cost of climate change and allowing price signals to efficiently influence production and investment decisions. Moreover, the revenue generated by carbon pricing can finance public investment in emission reductions or carbon removal, further mitigating adverse effects on the climate. By assigning a cost to GHG emissions, carbon pricing creates incentives to reduce those emissions as efficiently as possible by generating the greatest gain for firms that mitigate their carbon footprint at the lowest marginal cost. Carbon pricing also shifts investment decisions towards less carbon-intensive alternatives and encourages technological innovation in low-carbon products and systems. [\(2\)](#)



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Given these advantages, carbon-pricing initiatives have become increasingly common across countries, and the number of such initiatives has grown rapidly in recent years.⁽³⁾ Governments typically establish carbon prices either by taxing emissions directly or by setting up emissions-trading systems (ETSs), also called carbon markets. However, a broad range of stakeholders have also developed voluntary carbon-pricing schemes in which the verified reduction of emissions or removal of atmospheric carbon is converted into tradable carbon credits. Firms and institutions that have made emission-reduction commitments, environmentally responsible investors, conservation organizations, and regulators in systems that accept carbon credits as compensation drive demand for credits both in mandatory and voluntary trading schemes. While much of the international discourse around carbon pricing has focused on mandatory systems, voluntary initiatives are gaining prominence both in the theoretical literature and in practice.

The rapid expansion of carbon-credit is expected to continue over the medium term, creating valuable opportunities for public and private entities that develop effective emission-mitigation strategies. Worldwide, carbon markets are expected to grow fifteenfold by 2030 and a hundredfold by 2050.⁽⁵⁾ The Latin American and Caribbean (LAC) region is well positioned to become a major international producer of excess carbon credits on an international level⁽⁶⁾ due largely to its potential to generate credits by slowing, and in some cases reversing, deforestation. A detailed analysis of the opportunities that carbon-credit markets present for organizations, firms and governments in the LAC region, as well as the obstacles they face, will be necessary to inform a robust strategy for attracting low-carbon investment and maximizing the contribution of carbon-credit markets to economic development as social wellbeing across the region.

CONCEPTUAL FRAMEWORK



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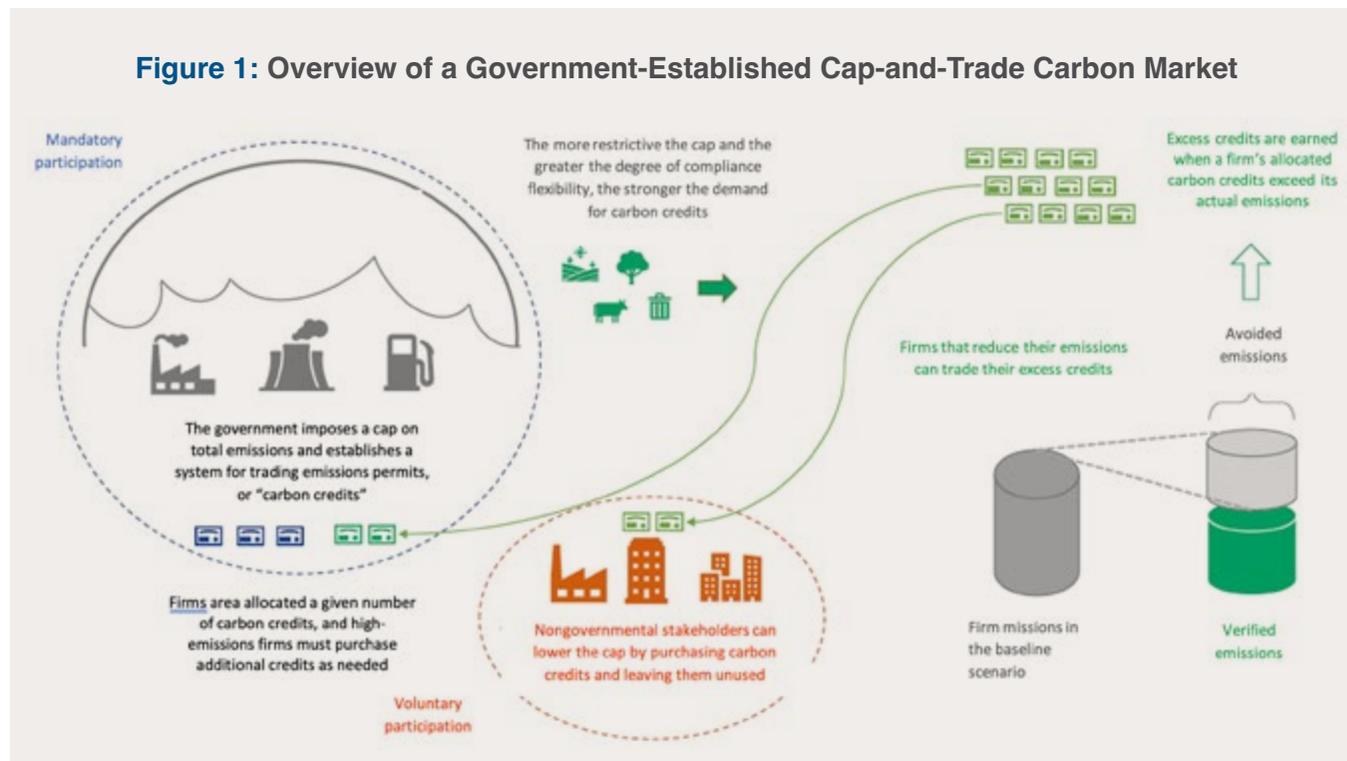


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Because many of the terms involved in the global climate agenda remain broad and may be applied inconsistently, it is necessary to align them with their respective concepts. The following section defines several key features of carbon-credit markets and their relationship to the broader process of decarbonization.

Mandatory and Voluntary Mechanisms for Reducing Carbon Emissions

Government Policies: As noted above, governments can establish carbon prices by levying direct taxes on the GHGs produced by economic activity (i.e., “carbon taxes”) or by setting up an ETS. These policies are known as carbon-pricing instruments (CPIs). The most common type of government-mandated ETS¹ operates under the “cap-and-trade” model, in which policymakers set a maximum (i.e., a “cap”) on the total emissions produced by firms or other regulated agents, establish tradable rights to generate the equivalent amount of emissions, and distribute those rights among firms and other agents. The emissions rights, or “carbon credits,” may be allocated directly by the regulator through a public auction. Agents that possess carbon credits can trade them in the market, and so long as they maintain a stock of credits equal to or greater than their actual emissions, they may sell their excess credits for a profit. In some cases, nongovernmental entities such as conservation organizations or institutions with climate commitments may voluntarily participate in government-mandated carbon markets by purchasing carbon credits and leaving them unused, thereby lowering the cap on total emissions.



Source: Authors’ adaptation based on (Prolo, Penido, Santos, & La Hoz Theuer, 2021).

Carbon taxes and ETS mechanisms offer distinct advantages and drawbacks. While carbon taxes can help maintain price predictability, they leave the total amount of emissions uncertain. By contrast, an ETS can establish a predictable level of emissions, but its impact on prices is uncertain. At present, more than 20% of the world’s GHG emissions are subject to either a carbon tax or an ETS.⁽³⁾

In addition, governments around the world have developed numerous variations and hybrids based on these two systems. One such variation is the baseline performance standard, which requires that regulated agents achieve a certain level of carbon efficiency per unit of production. Agents with levels of carbon efficiency above the standard generate carbon credits that they can sell to less-

¹ In either case, GHG emissions are typically measured in terms of the tons of carbon dioxide equivalent (tCO₂e) produced by the regulated agent.

efficient agents, which have a regulatory obligation to purchase adequate credits to cover their marginal emissions. Under a hybrid approach, policymakers might establish a carbon tax for some sectors and an ETS for others, though it is possible to combine elements of the two schemes within a single sector. For example, establishing an ETS “price corridor” can provide the predictability necessary to make long-term investments. In some cases, firms that are subject to a carbon tax may be allowed to offset their liability by purchasing carbon credits,² granting them greater financial and operational flexibility while continuing to advance decarbonization objectives.⁽⁷⁾

Voluntary Approaches: In addition to government-established carbon markets, a range of actors can create voluntary mechanisms to reduce GHG emissions.³ Rather than relying on government regulators to define emissions targets and allocate carbon credits, firms and other agents can jointly establish systems for measuring emissions reductions or the removal of atmospheric carbon, and create carbon credits to trade in a voluntary market. In such a system, the participants are responsible for defining baseline emissions, developing a verification process for emissions reduction, establishing certification standards, and operating a carbon-credit mechanism.⁽²⁾ Firms and other agents participate in the voluntary market to demonstrate corporate social responsibility, enhance the appeal of their brand to environmentally conscious consumers, or achieve self-defined climate objectives that reflect the mission and values of the organization or institution.

Mandatory and voluntary ETS mechanisms both require well-defined rules, standards, and verification systems. Criteria for defining baseline emissions and measuring emissions relative to that baseline must be established either by a government regulator or by the participants in a voluntary ETS. Similarly,

emissions reductions must be verified by the regulator or, in the case of voluntary systems, by a trusted third party. Robust and transparent certification methods produce more trustworthy carbon credits with greater liquidity and value.

Table 1: Key Features of Carbon-Credit Markets

	Mandatory	Voluntary
Market Structure	In national and subnational markets, government regulators establish the market, determine emissions targets, and define the obligations of the firms or other agents participating in it. Regulators are also responsible for measuring emissions and enforcing other relevant standards. In supranational markets, an association of member states or a multilateral agreement establishes emissions targets and market mechanisms.	A group of stakeholders collaboratively establishes an ETS and designs the necessary market mechanisms and certification standards.
Supply of Carbon Credits	Carbon credits are issued by a government regulator, often in line with a “cap” on aggregate emissions. Credits may be allocated to firms directly or through an auction. Firms that possess more credits than necessary to cover their emissions may sell their excess credits.	Market participants generate carbon credits by reducing their GHG emissions (or removing atmospheric carbon) according to a collaboratively defined methodology and verification system.
Demand for Carbon Credits	Firms are required to procure as many credits as necessary to cover their emissions. Firms that face the highest marginal cost for emissions reduction purchase credits from those that face lower costs, efficiently reducing the total emissions of all market participants. In addition, organizations that are not compelled to participate in the market may purchase carbon credits and leave them unused, effectively reducing aggregate emissions below the government-established cap.	Firms and other market participants purchase carbon credits to demonstrate corporate social responsibility, enhance their brand image as environmentally responsible actors, or achieve self-defined climate objectives. In some cases, firms that are subject to a carbon tax may purchase credits from a voluntary market to offset their liability.

Source: Authors' elaboration

² Examples of systems that accept offsets for reconciling part of the regulatory obligations are the California ETS and the South African CTax.

³ The projects under consideration range from specific and autonomous projects to projects with a broader scope of participation and geography.

While the growing number of both mandatory and voluntary ETS mechanisms allows for innovation in designing measurement and verification methodologies, reconciling disparate standards can be a challenge when attempting to scale up or integrate existing systems. Some ETSs operate within an administrative jurisdiction, which may be national (e.g., China's ETS) or subnational (e.g., Tokyo's ETS). Others encompass multiple jurisdictions linked by a common framework (e.g., the European Union ETS). In the coming years, further integrating subnational, national, and supranational carbon-credit markets will be vital to enhance their efficiency and achieve the targets of the Paris Agreement.

Synergies between Mandatory and Voluntary Carbon-Credit Markets

Mandatory and voluntary approaches to carbon pricing are not mutually exclusive, and in many cases they may prove complementary. Voluntary markets can utilize the standards and practices developed by government regulators, saving the time and effort of devising their own methodologies while also creating a voluntary market that is compatible with its mandatory counterpart. A mandatory market can benefit from the supply of carbon credits generated

by a compatible voluntary market, which reduces the cost of regulatory compliance. Integrating mandatory and voluntary markets also broadens the scope of decarbonization incentives and increases the overall cost-effectiveness of mitigation efforts.

Demand for voluntarily generated carbon credits by mandatory market participants and/or firms subject to a carbon tax increases the value of those credits, rewarding voluntary emissions reduction. Indeed, regulatory compliance is a major driver of demand for credits from voluntary markets, as mandatory ETSs are often far larger than their voluntary counterparts. In 2020, for example, the total value of the world's government-created carbon markets was over US\$800 billion,⁽⁸⁾ while the combined size of voluntary markets exceeded US\$ 1 billion for the first time in 2021.⁽⁹⁾ Historically, compliance-based demand has played a major role in the development of voluntary carbon-credit markets. Under the Kyoto Protocol, for example, market participants in Latin American countries voluntarily reduced emissions as part of the so-called Clean Development Mechanism (CDM) and sold a significant share of the resulting credits to firms and other agents with regulatory obligations, including entities regulated by the European Union ETS, which accepted such credits in its first years of operation.⁽¹⁰⁾ After 2012, the European Union ETS only accepted carbon credits from least-developed countries, and this change, combined with an economic downturn, led to the collapse of prices for



Photo: Adobe Stock

Latin American carbon credits. However, the recent establishment of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSA) is expected to revitalize demand for voluntary credits.⁴ In addition, the consensus around Article 6 of the Paris Agreement should help ensure that the development of international markets further boosts demand for carbon credits for regulatory compliance.

⁴ Carbon Offsetting and Reduction Scheme for International Aviation is an international aviation regulation, starting in 2021, that seeks to reduce and offset GHG emissions from international aviation in order to generate carbon neutral growth from 2019.

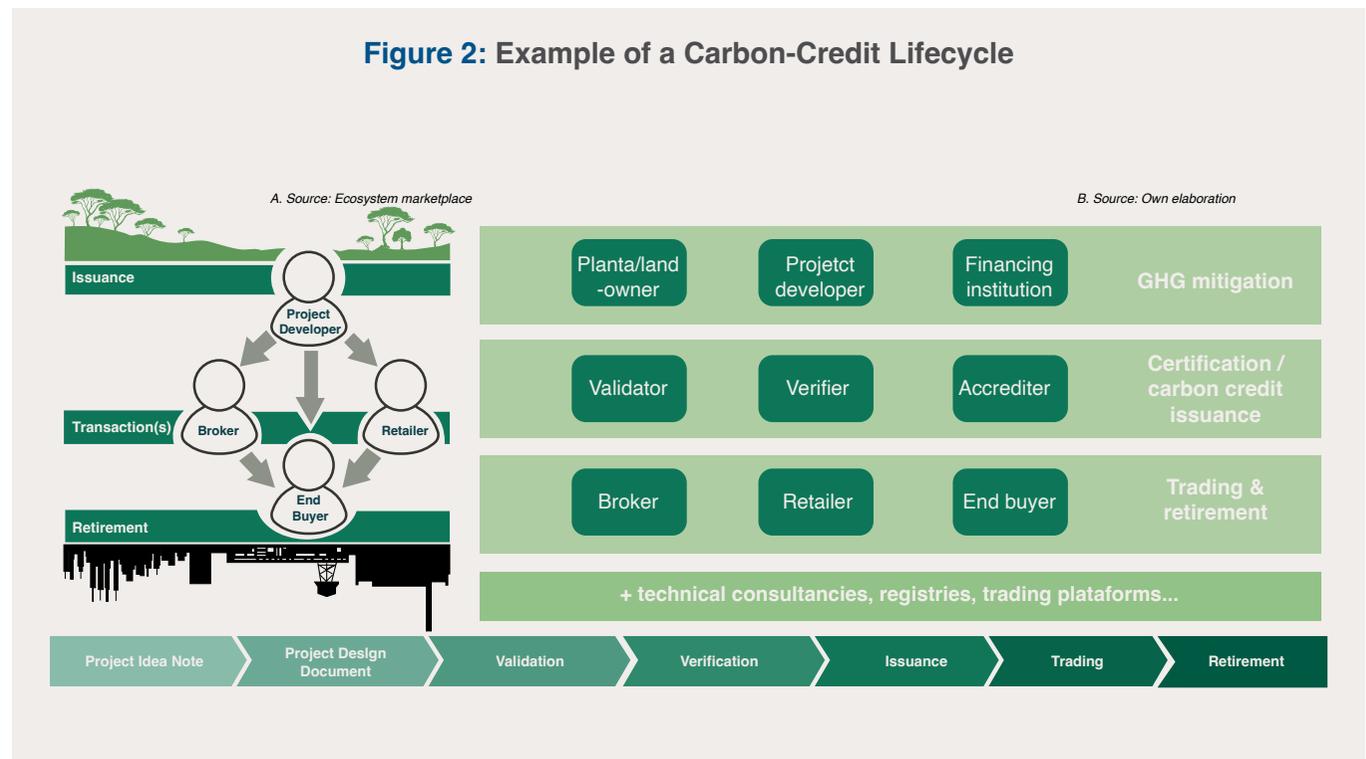


Photo: Adobe Stock

Mechanisms for Generating Carbon Credits

The process of measuring and verifying emissions mitigation and issuing carbon credits requires certification standards, eligibility requirements, and assessment methodologies. In general, carbon credits can be established by: (i) international mechanisms defined by treaties and managed by multilateral institutions, such as the Kyoto Protocol, Article 6 of the Paris Agreement, and the United Nations Framework Convention on Climate Change (UNFCCC); (ii) domestic or regional mechanisms with rules and standards defined by national governments, such as those adopted by Australia, China, and Tokyo; or (iii) certification standards developed by independent organizations, such as the Verified Carbon Standard (VCS) or the Gold Standard.⁽³⁾ In all cases, the liquidity and value of carbon credits hinge on the strength, transparency, and credibility of the mechanisms for issuing them.

Figure 2: Example of a Carbon-Credit Lifecycle



Article 6 of the Paris Agreement

The Paris Agreement is the latest iteration of the global framework for climate negotiation and cooperation. Seeking to limit global warming to well below 2°C compared to pre-industrial levels, parties to the agreement set national goals for reducing GHG emissions, which are known as Nationally Determined Contributions (NDCs). In 2021, following years of negotiations, the 26th United Nations Conference of the Parties on Climate Change (COP26) marked the long-awaited finalization of the Paris Agreement rulebook. The main achievement of COP 26 was the consensus established on Article 6, which provides the general framework for international carbon-credit markets and addresses voluntary cooperation among the parties. Articles 6.2 and 6.4 specifically define mechanisms for the international transfer of carbon credits, laying the groundwork for an international ETS.

Article 6.2: foresees the commercial trading of carbon credits, which it refers to as “internationally transferred mitigation outcomes.” The relevant provisions provide the framework for an ETS spanning multiple participating countries.

Article 6.4: defines rules and methodologies for generating carbon credits through emissions reduction or the removal of atmospheric carbon relative to a projected baseline. Carbon credits are to be verified and issued by a nationally designated authority under the supervision of a dedicated international agency created by the Paris Agreement. These credits can be traded among countries to achieve compliance with their NDCs.
(7)

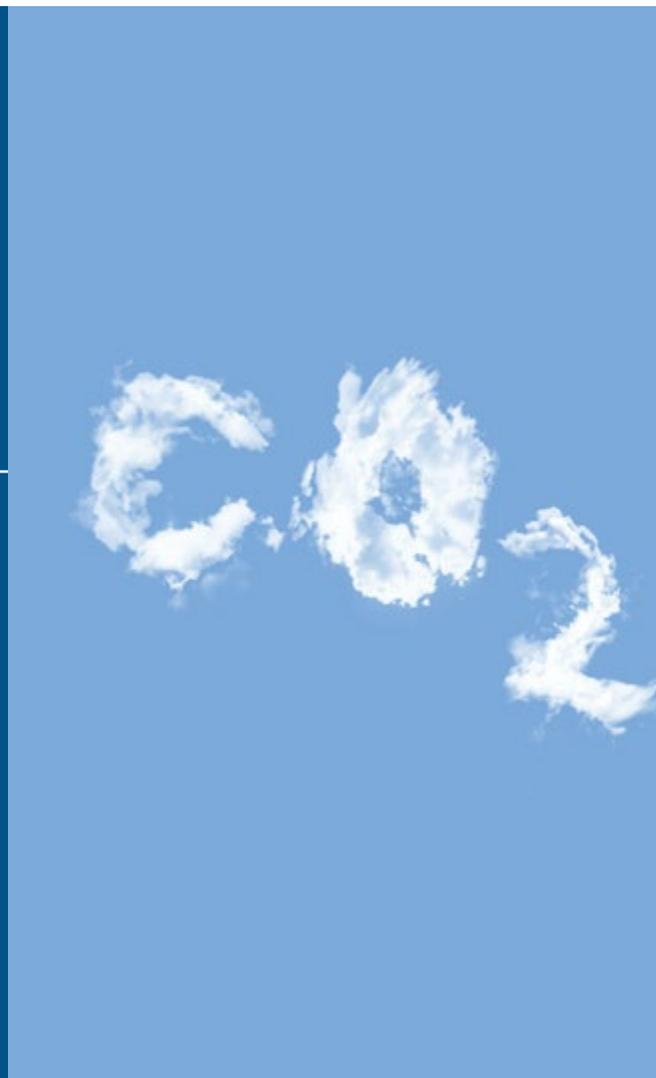


Photo: Matthias Heyde | Unsplash



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Article 6 of the Paris Agreement is expected to play a crucial role in boosting financial flows to ETSS.

Article 6 differs from the previous international climate framework, the Kyoto Protocol, in that all international transactions conducted for the purpose of meeting climate goals should apply the so-called “matching adjustment.” Under the matching adjustment, the traded asset will count towards the buying country’s compliance with its climate goals and be discounted from the selling country’s compliance, preventing the double-counting of emissions reductions.⁵ The Kyoto Protocol did not require matching adjustments, as the agreement did not include national emissions targets comparable to the NDCs of the Paris Agreement.⁶

The CDM established under the Kyoto Protocol generated considerable opportunities for LAC countries to participate in carbon-credit markets. At its peak, the region hosted over one thousand CDM

projects, or about 13% of all projects worldwide. The region’s main project developers were Brazil (35%), Mexico (18%), Chile (10%), Colombia (7%), Peru (6%) and Argentina (5%).⁽¹³⁾

Over the coming decades, Article 6 of the Paris Agreement is expected to play a crucial role in boosting financial flows to ETSS. Recent studies estimate that the market created by Article 6 mechanisms could grow to US\$300 billion in 2030 and reach US\$1 trillion in 2050.⁽⁶⁾ These estimates are in line with previous forecasts, which predicted that international carbon-credit markets could rise to between US\$ 100 billion and US\$ 400 billion in 2030, with sellers from the global south capturing a significant share of their total value.⁽¹⁴⁾ Countries with greater natural-resource endowments and those capable of generating high

levels of carbon mitigation by implementing nature-based solutions to address emissions generated by agriculture and other land-use sources can play a leading role in the market as sellers of carbon credits. The LAC region’s extensive forests offer a clear opportunity to attract foreign and domestic investment in carbon credits created by forest preservation and reforestation. Moreover, public participation in these efforts could help fund the region’s socioeconomic development while fostering the transition toward a low-emissions future. However, the specific rules for implementing Article 6 mechanisms, including the sources and methodologies accepted under Article 6.4, have yet to be defined, and this issue will need to be addressed in the coming years.

⁵ There are several challenges to ensuring robust accounting of international transfers under Article 6, including the scope and timing of carbon credits, the establishment of targets, and the tracking of international transfers.⁽¹⁰⁾ Moreover, in an environment of highly heterogeneous NDCs, applying the corresponding adjustments is a challenge,⁽¹¹⁾ as some countries have conditional targets, intensity targets, targets not expressed in GHGs (of energy efficiency, for example), and targets expressed in a range.

⁶ The only assets that will not generate corresponding adjustments will be the carbon credits that were issued under the Kyoto Protocol and accepted in the Paris Agreement framework, since they were not generated by projects executed under the Paris Agreement.

OVERVIEW OF GOVERNMENT- ESTABLISHED CARBON- CREDIT MARKETS



Photo: Walter Wust

The 2021 State and Trends of Carbon Pricing report found that most governments continued to implement or increase the ambition of their CPIs despite the economic and social crisis caused by COVID-19. The pandemic's limited effect on CPIs has demonstrated the resilience of governmental climate commitments. In most ETs, reduced economic activity due to the pandemic resulted in a temporary drop in allowance prices, followed by a rapid recovery. According to the 2022 State and Trends of Carbon Pricing report, at the end of 2021 there were 68 CPIs in operation, up from 58 in 2020, with three more scheduled for implementation. Together, these instruments covered 23% of global GHG emissions. China's national ETS was launched in February 2021 and has since become the world's largest carbon-credit market.

Photo: Walter Wust

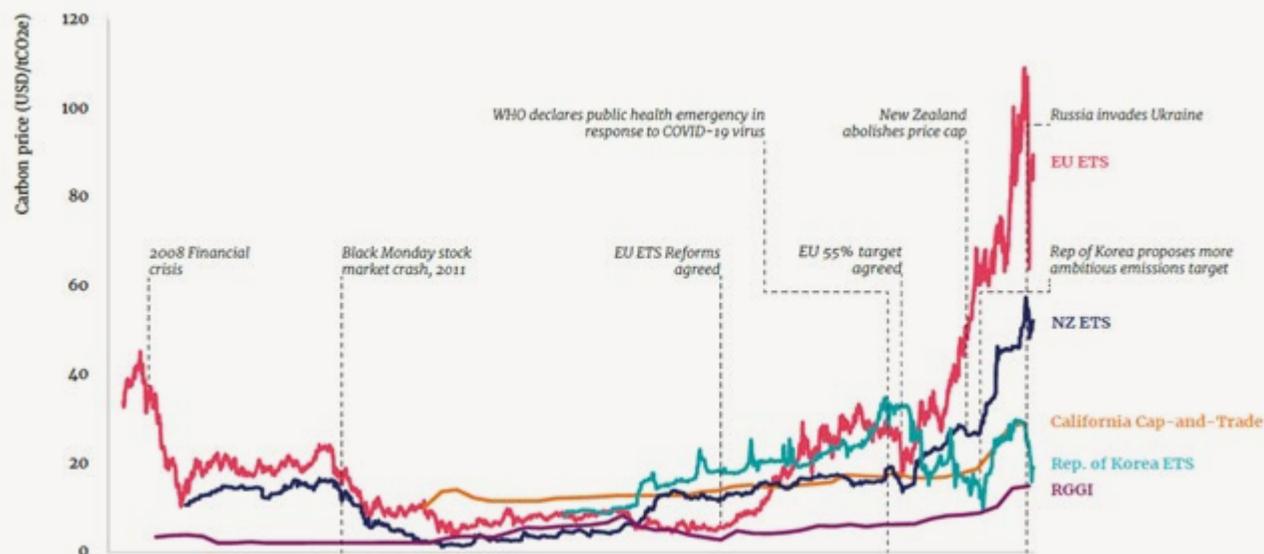
While the continued proliferation of net-zero commitments by governments and the private sector is a positive sign, these commitments must be supported by ambitious short- and medium-term actions. CPIs can generate revenue that can be used to catalyze clean investment, creating a virtuous cycle that contributes toward a sustainable energy transition while reducing regressive distributive impacts and supporting poverty

reduction. In 2021, CPIs generated US\$84 billion in government revenue, an increase of almost 60% over the previous year. This increase in revenues reflected the rising number of initiatives worldwide, the expanding volume of carbon credits auctioned under ETs, and especially the large increase in ETS values, particularly in the European Union, where the allowance price more than doubled in 2021 (Figure 3).



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Figure 3: Price Evolution and Geopolitical Timeline for Selected ETs (2008-2021)



Source: World Bank (2022)

While the private sector's participation in many carbon-credit markets remains limited, several ETs are in the process of being opened up to financial agents, which may improve their liquidity. In 2020, the global financial sector became increasingly interested in emissions trading, with major players such as Goldman Sachs, Morgan Stanley, and Lansdowne Partners becoming active participants in carbon-credit markets. In 2020, the share of carbon credits auctioned in the EU ETS that were purchased by financial firms increased from 37.3% in 2018 to 43.7%, and about 250 investment funds reported being actively involved in the market.

Argentina, Chile, Colombia, and Mexico have pioneered the use of CPIs in the LAC region, implementing four federal taxes, three subnational taxes, and one national ETS. These four countries have embraced CPIs as part of a broader set of structural fiscal reforms. Uruguay recently imposed a national carbon tax on gasoline, replacing its previous per unit excise tax. Moreover, LAC countries are seeking to develop market cooperation. For example, Mexico, Colombia, Peru, and Chile have formed the Pacific Alliance to establish a regional CPI, and Peru has signed a bilateral agreement with Switzerland under Article 6 of the Paris Agreement. Meanwhile, regional stakeholders continue to work toward establishing a legal and regulatory framework that promotes greater environmental integrity and security in the regulated carbon market, enhances the integration of voluntary and government-created carbon markets, and creates new opportunities for investment. According to a report by the Konrad Adenauer Foundation and the Fundação Getulio Vargas, international collaboration on CPIs is desirable, and LAC countries should continue transitioning to the ETS approach, as planned by Mexico and under consideration in Argentina, Chile, and Colombia.

Carbon pricing is still a relatively new concept in the LAC region, and local approaches are continuously evolving. The regional dissemination of CPI experiences offers opportunities for collaboration, for example, via the Carbon Pricing in the Americas (CPA) platform, a cooperative framework launched in December 2017 by government leaders in Canada, Chile, Colombia, Costa Rica, and Mexico, as well as the state governors of California and Washington in the United States, and the Premiers of Alberta, British Columbia, Nova Scotia, Ontario, and Quebec in Canada. The CPA platform aims to strengthen measurement, reporting, and verification (MRV) capabilities, develop common standards, share best practices, build institutional capacity, and engage a diverse array of stakeholders in productive dialogue. The implementation of CPIs in LAC has also generated important learning opportunities. Several voluntary initiatives, including a simulated ETS in Brazil and Mexico that preceded the pilot stage of the Mexican ETS, has provided a basis for further discussions around national and regional CPI policies. The regional experience also highlights the importance of affording sufficient scope for policy adjustments and innovations within a CPI's legal framework.



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OVERVIEW OF VOLUNTARY CARBON-CREDIT MARKETS

Voluntary carbon-credit markets have been evolving for more than two decades, as the Kyoto Protocol, the Paris Agreement, and other global commitments to climate change have boosted demand for carbon credits both by the public and private sectors. The global voluntary ETS market began growing rapidly and reached over US\$500 million in value in 2011. After 2012, however, a global economic downturn coupled with restrictions imposed by some of the main sources of demand and slowing progress on the climate agenda caused the voluntary market to shrink for several consecutive years until it reached a nadir of US\$146 million in 2017.⁽¹⁵⁾ Since then, the market's growth has rebounded, with year-on-year spikes of 50% in 2020 and 100% in 2021 driving its total value beyond US\$1 billion.⁽⁹⁾ The volume of credits traded has increased sharply since 2019, nearly tripling by 2021 (Table 3). Prices, on the other hand, followed a more complicated path, with a drop in the average value in 2020 reflecting the rising supply of carbon credits from Asia.

Table 3: Key Features of the Global Voluntary Carbon-Credit Market

	Volume (MtCO ₂ e)	Price per ton (US\$)	Value (US\$)
2019	104,3	3,07	320 millions
2020	188,2	2,51	473 millions
2021 (until November 9th)	298,4	3,37	1,006 billions
2021 (January-August)	239,3	3,13	748 millions
2021 (September-November)	59,1	4,37	258 millions

Source: Adapted from (Forest Trends' Ecosystem Marketplace, 2021)

2021 was a watershed year for global efforts to address climate change. Reinforcing a trend that started in 2020, when governments around the world announced major COVID-19 recovery packages focused on low carbon investment, a series of events in 2021 helped consolidate stakeholder consensus on climate priorities. The return of the United States to the Paris Agreement and the announcement of a government plan focusing on strong climate-related investments, the strengthening of countries' emissions-reduction commitments via the revised NDCs, the announcement of climate-neutrality targets by governments and corporations that account for about 90% of global GHG emissions, and the consensus around Article 6 of the Paris Agreement were among the highlights of this pivotal year in the fight against climate change.

During 2021, demand for carbon credits increased rapidly. The market, which had historically experienced a chronic oversupply, suddenly saw a massive surge in demand that periodically dried up the spot market.⁷ This pattern was reflected in the volume of credits transacted and market prices, both of which increased significantly over the year. Between January and November 2021, the average price charged on the voluntary market rose by about 35% year-on-year. Moreover, the average price that prevailed between September and November of 2021 was almost 75% higher than the average prices for 2020 and about 40% higher than the average for January – August 2021.

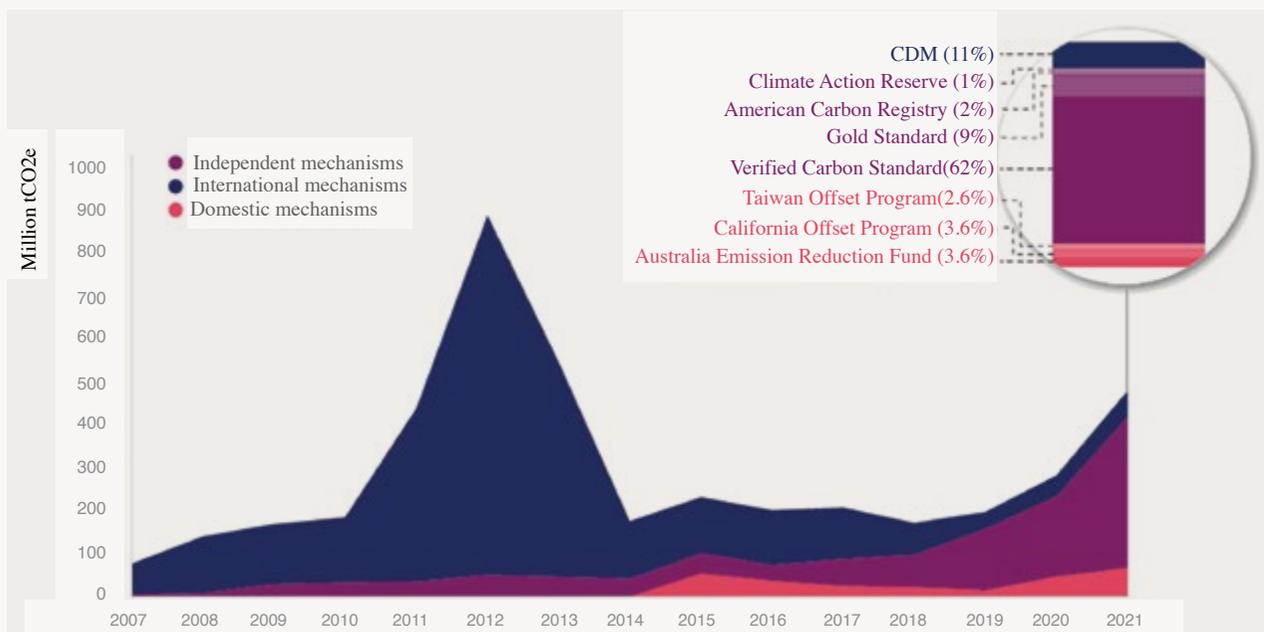
⁷ According to Elizabeth Willmott, Director at Microsoft, this was the first year for some time in which carbon credits experienced a seller's market, with excess demand putting upward pressure on prices.(15)



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Figure 4: Global Volume of Carbon Credits by Certification Category



Source: World Bank (2022)



Photo: Proyecto BAM

Preliminary analyses indicate that these growth trends are likely to continue over the coming decades. The volume of demand in the voluntary carbon credit markets could increase to between 1.5 and 2 gigatons of CO₂e by 2030 and between 7 and 13 gigatons by 2050 if these markets provide the basis for meeting the goals of the Paris Agreement, giving rise to a market valued at US\$50 billion as early as 2030.⁽¹⁷⁾ However, government-created mandatory markets will almost certainly play a greater role in the future,

and less ambitious analyses suggest that demand in the voluntary market could reach 1 gigaton of CO₂e in 2030 and between 3 and 4 gigatons in 2050.⁽⁵⁾ However, even these more modest estimates indicate considerable demand growth. If voluntary markets can supply carbon credits to mandatory markets, particularly those established under Article 6 of the Paris Agreement, prices and volumes of voluntarily generated carbon credits could rise dramatically in the coming decades.



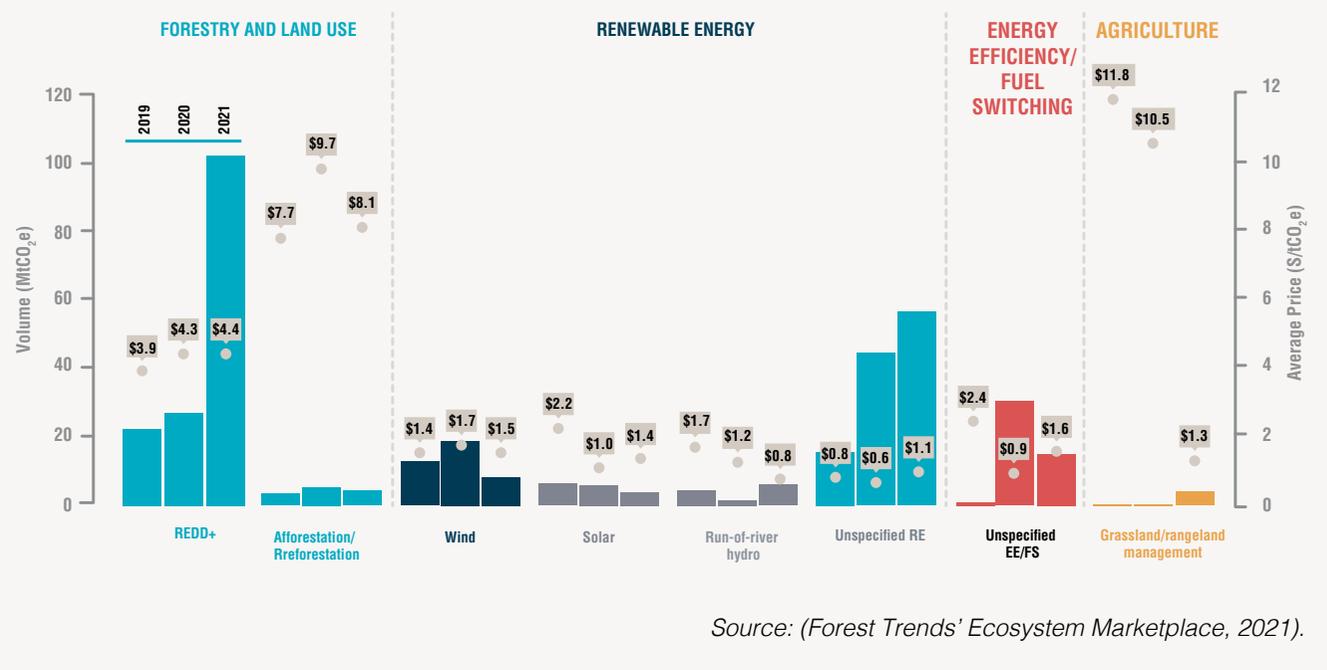
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Photo: Adobe Stock

As noted above, prices for carbon credits in the voluntary market vary significantly depending on their source and credibility. According to Forest Trends' Ecosystem Marketplace (2021), credits based on carbon removal trade at an average of approximately five times the value of credits based on emissions reduction, even though the volume of reduction-based credits is about ten times that of removal-based credits. This preference for carbon removal is likely to continue and even intensify over the long term. Carbon removal currently occurs mainly through afforestation, reforestation, and forest restoration and management projects, including in wetlands and mangrove forests. In 2021, credits associated with the REDD+ sustainable forestry initiative traded at a very high volume and with an average value well above that of energy credits, albeit lower than that of credits from afforestation and reforestation (Figure 5).

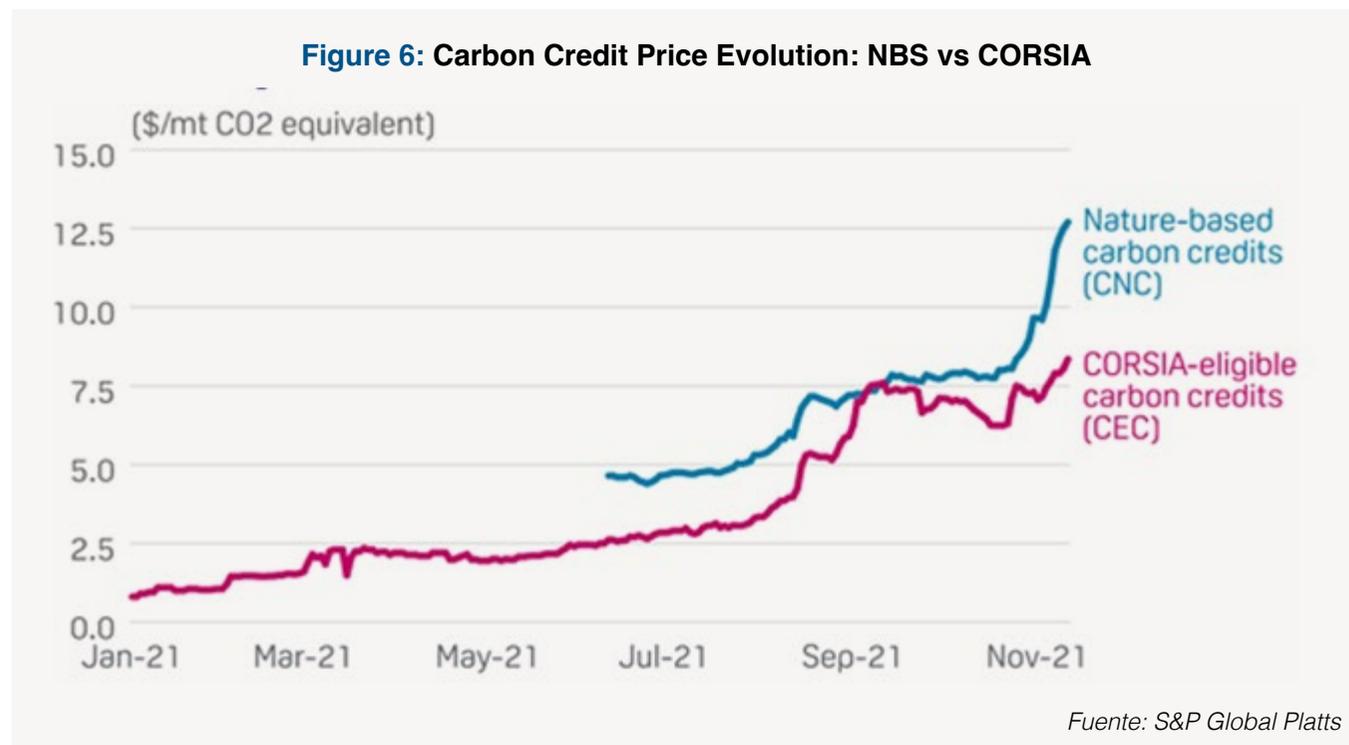
Figure 5: Volumes and Prices of Carbon Credits Traded on Voluntary Markets by Source



Source: (Forest Trends' Ecosystem Marketplace, 2021).

Credits generated by the forestry and land-use sector dominated the voluntary market in 2021, accounting for over 60% of the volume and 70% of the value traded up to August. In terms of volume, which was formerly dominated by energy credits, the surge in REDD+ credits reflected a sharp increase in the average volume of credits issued by each avoided-deforestation project, which significantly exceeded the average for afforestation and reforestation projects. Afforestation and reforestation represented about 50% of all nature-based solution (NBS) projects registered under the main certification standards, while avoided deforestation represented 19%, the former accounted for about 37% of all NBS credits, while the latter accounted for over 50%.⁽¹⁸⁾ Since August, the total value of NBS credits has increased further (Figure 6) and now exceeds the average value of all credits eligible to be used for CORSIA compliance.

An additional factor influencing the perceived quality of carbon credits is the inclusion of attached socio-environmental co-benefits certifications. Projects with certified co-benefits generated credits with an average value of almost US\$6, roughly twice the average for all other credits.⁽⁹⁾ Credits that command the highest prices in voluntary carbon markets tend to: (i) focus on carbon removal rather than emissions reduction, (ii) include socio-environmental co-benefits, (iii) utilize natural solutions involving agriculture, forestry, and land use, and (iv) employ a credible certification standard based on the transparent application of recognized methodologies. Following the widespread adoption of international standards linked to CDM projects, the use of independent standards has rapidly



increased. The most common is the Verified Carbon Standard (VCS), which has been awarded to projects with a total achieved mitigation of over 630 metric tons of CO₂e. Other standards, such as the Gold Standard, the Climate Action Reserve (CAR), and the American Carbon Registry (ACR), are also widely used.

Since 2020, the LAC region has accounted for the second-largest volume of carbon credits traded on voluntary markets after Asia. In addition, LAC also has the second-largest reserve of unused carbon credits

at over 100 million, which could be included in future negotiations.⁽¹⁸⁾ Moreover, the volume of credits offered by the region almost doubled between 2020 and 2021, suggesting that LAC still has untapped potential to boost supply, while the average price of the region's carbon credits is below that of credits from Africa, North America, and Oceania, which indicates scope to increase value. Improving the perceived quality of LAC credits will hinge on the transparent adoption of standardized best practices.

More than 80% of LAC credits were based on forestry and land-use projects. Credits generated by this sector were sold at an average price of over US\$4 in 2020 and 2021, above the average for the region. Brazil and Peru produced the largest volumes of carbon credits. The region's underused potential to provide such credits and their value on the voluntary market indicate that this is a strong investment opportunity.

Despite their recent growth, voluntary carbon markets are still at a relatively early stage of development. Since 2012, when economic turbulence and political uncertainty slowed action on the climate agenda at the international level, voluntary carbon markets have experienced a period of relative inactivity marked by a chronic oversupply of credits and a small group of significant market players. Historically, voluntary

ETSs have been dominated by specific and bilateral contract negotiations, with a lack of standardization and transparency making it difficult to accurately estimate prices and volumes for the aggregate market. Consequently, there is considerable variation between the prices of signed contracts, reflecting both the decentralized nature of the transactions and the variability of asset quality.

The failure of voluntary markets to keep pace with the degree of standardization that prevails in mandatory markets reflects a lack of legal and financial experience among market players, as well as the relatively marginal nature of voluntary markets for much of their existence. However, this situation is changing rapidly as the international environment evolves and asset values rise, and the resulting dynamism should foster a process of professionalization and financialization in voluntary markets. Bilateral over-the-counter contracts and spot-market transactions should give way to negotiations on centralized platforms involving standardized securities and operating mainly in futures markets—trends which are already evident in mature mandatory markets such as the European Union ETS. Several centralized platforms already exist and experienced a large increase in trading volumes and prices throughout 2021, such as the Aircarbon Exchange and Carbon-Based Lifeforms.

Table 4: Volume and Average Price of Carbon Credits on Voluntary Markets by Project Region

	2019		2020		2021 (through August)	
	Volume (MtCO ₂ e)	Price (USD)	Volume (MtCO ₂ e)	Price (USD)	Volume (MtCO ₂ e)	Price (USD)
África	16.1	\$3.94	14.9	\$4.24	23.9	\$5.52
Asia	45.6	\$1.80	63.0	\$1.60	91.8	\$3.34
Europe	1.1	\$2.92	1.7	\$9.47	0.8	\$2.96
Latin America & Carribbean	15.3	\$3.45	18.9	\$4.17	36.6	\$3.74
North America	15.5	\$3.51	11.6	\$6.31	10.0	\$5.13
Oceania	0.5	\$12.53	0.1	\$20.57	0.1	\$32.93

Source: (Forest Trends' Ecosystem Marketplace, 2021)

The Role of the Private Sector in Voluntary Carbon-Credit Markets

The private sector has supported the development of carbon-credit markets by purchasing credits to meet regulatory requirements, make good on commitments to environmental sustainability and/or corporate social responsibility, and enhance their corporate image in the eyes of consumers and investors due to “net zero commitments or ESG (Environmental, Social, and Governance) standards.”⁽¹⁹⁾ Increasingly, compensation-related services are being offered, such as travel, delivery, purchases, among others, which, in addition to contributing to the company’s offsets, provide value and a differentiated market. Currently, the most active buyers in the voluntary carbon markets are firms in the energy, consumer goods, finance, and insurance sectors.⁽¹⁹⁾

The financial sector’s interest in voluntary carbon-credit markets has grown rapidly. Financial firms have committed to collect and disseminate climate-related information on their portfolios in line with the protocols established by the Taskforce on Climate-Related Financial Disclosures (TCFD). An increasing number of financial firms have made net-zero commitments, and some have shown speculative interest in purchasing credits as investors.⁽²⁰⁾ Among the outcomes of COP 26, the Glasgow Financial Alliance for Net Zero Emissions, which is composed of more than 500 banks, insurers, investors, and other firms, has committed to aligning its US\$130 trillion aggregate asset portfolio with the climate goals established in

the Paris Agreement. Of this amount, US\$57 trillion in assets are managed by members of the Net Zero Asset Managers initiative and more than US\$63 trillion are managed by the Net-Zero Banking Alliance,⁽²¹⁾ underscoring the historic nature of this private-sector initiative.

Several global institutions have emerged to guide the financial industry toward its climate objectives. The Science-Based Targets initiatives (SBTi) aims to help companies adopt appropriate targets for reducing their GHG emissions,⁽²²⁾ while Oxford University has developed the Oxford Offsetting Principles to provide guidance on the use of carbon credits by the private sector.⁽²³⁾ In addition, the Voluntary Carbon Markets Integrity Initiative (VCMI) is a global multi-stakeholder initiative that aims to ensure that voluntary carbon markets make meaningful, measurable contributions to international climate goals.⁽²⁴⁾ Launched in 2020, the Taskforce on Scaling Voluntary Carbon Markets (TSVCM) is another private-sector-led effort to scale up voluntary carbon markets through coordinated action, reporting, and disclosure. The TSVCM’s mission focuses on enhancing the quality of carbon credits, and it has developed a set of core principles for labeling carbon credits that meet specific criteria. The TSVCM also promotes dialogue between stakeholders, identifies emerging opportunities and challenges, and has proposed a global governance framework for regulating voluntary carbon markets.⁽⁵⁾

In the wake of COP 26, several key questions remain regarding how voluntary markets should function. Areas requiring further clarification include how

transactions exclusively involving the private sector will comply with the new rules, and how private transactions will be aligned with national interests and policies. The TSVCM on the demand side and the VCMI recommendations on the supply side have attempted to address these issues.^(24; 25) In LAC, the private sector has considerable potential to engage with voluntary carbon-credit markets, both as a source of carbon credits from existing activities and as an investor in new projects under Article 6.4. Nevertheless, efforts to shore up the credibility and transparency of voluntary markets remain critical.



Since 2012, when economic turbulence and political uncertainty slowed action on the climate agenda at the international level, voluntary carbon markets have experienced a period of relative inactivity marked by a chronic oversupply of credits and a small group of significant market players.

CARBON-CREDIT MARKETS IN LATIN AMERICA

The LAC region has participated in CPIs since the launch of the Kyoto Protocol, under which countries across the region participated in the development of CDM projects and the sale of the resulting credits. LAC countries hosted more than 10% of all CDM projects worldwide, and Brazil was the third-largest host country. However, the region's participation was hindered by restrictions on the source of carbon credits, which could be generated only from afforestation and reforestation projects and only within a limited timeframe. In recent years, the implementation of CPIs in LAC has been progressively strengthened by international partnerships and marketing alliances, including the Carbon Pricing Leadership Coalition, [\(26\)](#) Carbon Pricing in the Americas, [\(27\)](#) and the Pacific Alliance, [\(28\)](#) the support provided by the World Bank's Partnership for Market Readiness, [\(29\)](#) and various bilateral and multilateral initiatives. [\(30\)](#)

Countries across the region have developed a variety of climate-related policy instruments that are becoming progressively integrated into their respective NDCs. These include command and control instruments, tax incentives, and public credit lines for low-carbon investment. Mexico is piloting the region's first mandatory credit market, while Colombia and Chile are already preparing to establish their own markets, and a proposed market in Brazil is at an advanced stage of legislative discussion. In addition, Argentina, Chile, Colombia, Mexico, and Uruguay have established CPIs that use carbon taxes.⁸

⁸ More information can be found in the attached 'Country Profiles' document.

Table 5: Summary of CPIs in LAC

Elements of the CPI	Argentina	Colombia	Mexico	Chile	Uruguay
NDC	Limit GHG emissions to 359 MtCO ₂ e by 2030, incorporating climate adaptation goals	Limit emissions to 169.44 million tCO ₂ e in 2030, with a decrease in emissions between 2027 and 2030, tending towards carbon neutrality by mid-century	Unconditional 22% reduction in GHG emissions and 51% reduction in black carbon emissions by 2030, and a conditional 36% reduction in GHG emissions and 70% reduction in black carbon emissions by 2030	Limit GHG emissions to 1100 MtCO ₂ e between 2020 and 2030, peaking the emissions by 2025 and reaching an emissions level of 95 MtCO ₂ e by 2030, with a climate-neutrality goal for 2050	Reduce CO ₂ , CH ₄ , and N ₂ O intensity of GDP relative to 1990 levels by 24%, 57%, and 48%, respectively, in 2025 and by 27%, 62%, and 51% in 2030. May be revised to be more ambitious, subject to feasibility
Total Emissions (base 2015)	441MtCO ₂ e	190MtCO ₂ e	822MtCO ₂ e	149MtCO ₂ e	30MtCO ₂ e
Type of CPI	Carbon tax	Carbon tax	Carbon tax / Pilot ETS	Carbon tax	Carbon tax
Regulation	Law 27.430 of 2017 (Argentine Tax Reform)	Law 1931 of 2018 (Art 29 and 30)	General Law on Climate Change Art 94 (Reform 2018)	Framework Law on Climate Change (under discussion)	Presidential Decree 441/021
Year of implementation	2018	2017	2014	2017	2022
National coverage (% GHG emissions)	Approx.40%	Approx.20%	Approx.30%	Approx.42%	11%
Regulated entities	Buy/sell fossil fuels; all sectors except biofuels	Buy/sell fossil fuels; all sectors except coal	Buy/sell fossil fuels; all sectors except gas	Boilers / turbines emissions (>50MW); all sectors and fossil fuels except biomass	Gasoline Distributors
Price – US\$/tCO₂e	1 - 10 (2019-2028)	5	1 - 4	5	137
Use of "offsets"	No	Yes	Yes	Expected	No
Revenue recycling	General budget	Sustainable Colombia Fund and offsets	General budget	General budget	General budget and financing of mitigation and adaptation activities
In Progress	PMR support on the viability of using energy certificates and revising the CPI	Proposal for an Emissions Trading System	Pilot phase of the ETS by the end of 2022.	La Ley Marco del Cambio Climático fija el objetivo de neutralidad en carbono para 2050. El proyecto de ley incluye disposiciones para un Sistema de Comercio de Emisiones	Año inicial del impuesto de carbono sobre la gasolina

Source: Own elaboration

To complement their domestic CPIs, countries such as Chile, Colombia, and Mexico have also developed, or are in the process of developing, mechanisms to certify domestic carbon credits that can be used to offset the liabilities imposed by national carbon taxes. These efforts demonstrate the complementarity between government CPI policies and the carbon credits generated in voluntary markets.

NBS projects are prominent in the LAC region and often generate socio-environmental co-benefits, and the resulting credits are increasingly in demand. International collaborations are active in the region, including the LEAF Coalition (Reducing Emissions by Accelerating Forest Finance), a public-private effort that seeks to mobilize US\$1 billion to fund emission reductions via tropical and subtropical REDD+ programs. The LEAF Coalition's public call in 2021 involved the governments of Norway, the United States, and the United Kingdom, as well as major firms such as Amazon, GSK, Nestlé, McKinsey & Company, and Bayer.⁽³¹⁾ Since 2008 the World Bank has been implementing the Forest Carbon Partnership Facility (FCPF), which includes several agreements for verified GHG reductions and removals in LAC. The FCPF focuses on reducing emissions from deforestation and forest degradation, as well as responsible forest carbon stock management and conservation in developing countries.⁽³³⁾

The LAC region has always been among the top project developers: the region currently generates over 20% of the world's supply of outstanding carbon credits for voluntary markets and is the global leader in NBS credits, producing more than two-thirds of all NBS credits in circulation. Brazil and

Peru are the host countries with the largest number of outstanding NBS credits, followed by Indonesia. Of the more than 1.2 billion carbon credits issued under the four main voluntary market certification standards,⁹ just under 600 million remain in use, while the rest have been retired.

Table 6: Volume of LAC-Produced Carbon Credits in Global Circulation

	Total	% mundo	% LA&C	SBN (evitadas)	SBN (remoção)	RE	Outros
Brasil	47.593.230	9,6%	44,7%	33.240.471	3.987.979	8.113.715	2.251.065
Peru	33.877.599	6,8%	31,8%	32.473.549	130.639	0	1.273.411
Colombia	6.875.890	1,4%	6,5%	5.865.453	716.595	231.701	62.141
Chile	1.508.869	0,3%	1,4%	25.120	441.819	455.556	586.374
Argentina	1.270.047	0,3%	1,2%	0	0	1.259.145	10.902
Mexico	939.680	0,2%	0,9%	0	652.188	41.648	245.844
Uruguay	5.442.741	1,1%	5,1%	0	5.403.612	38.140	989
Guatemala	4.010.105	0,8%	3,8%	3.316.571	55.839	500	637.195
Panama	2.218.808	0,4%	2,1%	0	2.218.808	0	0
Honduras	1.093.821	0,2%	1,0%	0	0	338.319	755.502
Outros (aprox)	1.715.997	0,3%	1,6%	140.243	504.171	718.436	353.147
Total	106.546.787	21,5%	100,0%	70,4%	13,2%	10,5%	5,8%

Source: Own elaboration based on data from Climate Focus VCM Dashboard (Feb 22, 2022)

⁹ These are the Verified Carbon Standard (VCS), the Gold Standard, the American Carbon Registry (ACR), and the Climate Action Reserve (CAR). Together they represent more than 90% of the global voluntary market.

ASSESSMENT: OPPORTUNITIES AND CHALLENGES

Figure 6 presents an analysis of the LAC region's strengths, weaknesses, opportunities, and threats (SWOT) for developing carbon-credit markets.

Figure 6: LAC Carbon-Credit Markets SWOT Matrix

Strengths

- Potential for generating carbon credits, particularly from NBS (REDD+, A/R, among others), but also from other sources, such as renewable energy/bioenergy
- Part of the potential for credit generation would be from GHG removal projects, that should be more valued
- Co-benefits related to socio-environmental impacts
- Experience with Kyoto mechanisms and voluntary markets, as well as national regulations in some countries

Weaknesses

- Need for capacity building, data and information
- Methodologies for issuing BS credits are less developed and widespread, as well as more complex than for other types of credits such as energy credits
- Non-permanence, which affects forest credits and requires additional safeguards
- Continuity of illegal deforestation

Opportunities

- Voluntary carbon markets expected to grow significantly in the context of corporate net-zero targets, generating high demand for carbon credits to offset residual emissions.
- Further growth in demand for carbon credits for compliance purposes in the context of Article 6 of the PA and other international regulations such as CORSIA. There is also the possibility that jurisdictional and regional regulations such as ETS will multiply by accepting offsetting
- Stricter demand sources are likely to narrow the scope of eligible credit sources over time, favoring removal and co-benefit credits
- Regional market could contribute to the development of natural capital comparative advantages by generating jobs, optimizing efforts, developing sustainable business clusters, attracting technologies, and catalyzing national and international private capital

Threats

- Failure to consolidate strong methods for NBS, particularly to address non-permanence, may restrict sources of demand
- Poor transparency, standardization, and lack of human and institutional capacity can undermine credit credibility, restricting sources of demand
- Failure to realize significant declines in deforestation rates may undermine value and liquidity of NBS credits, particularly REDD+

In the future, the region will face strong competition in the supply of carbon credits from renewable energy projects in Asia. Latin America already has a much cleaner energy and electricity matrix than Asia, reflecting past and ongoing investments in low-carbon energy, which narrows the scope for further emissions reductions. Meanwhile, Latin America enjoys a clear advantage in NBSs, as its competition is limited to a small group of countries outside the region with comparably dense forest cover (e.g., Indonesia). While alternative approaches to sequestering atmospheric carbon are emerging, including technologies that allow the geological capture and storage of carbon dioxide, for now their costs remain high, and their ability to compete with NBS is limited. Even in the event of a technological breakthrough that sharply reduces the costs of these technologies, they will continue to depend heavily on the availability of reservoirs near thermal power plants and carbon-intensive industries.

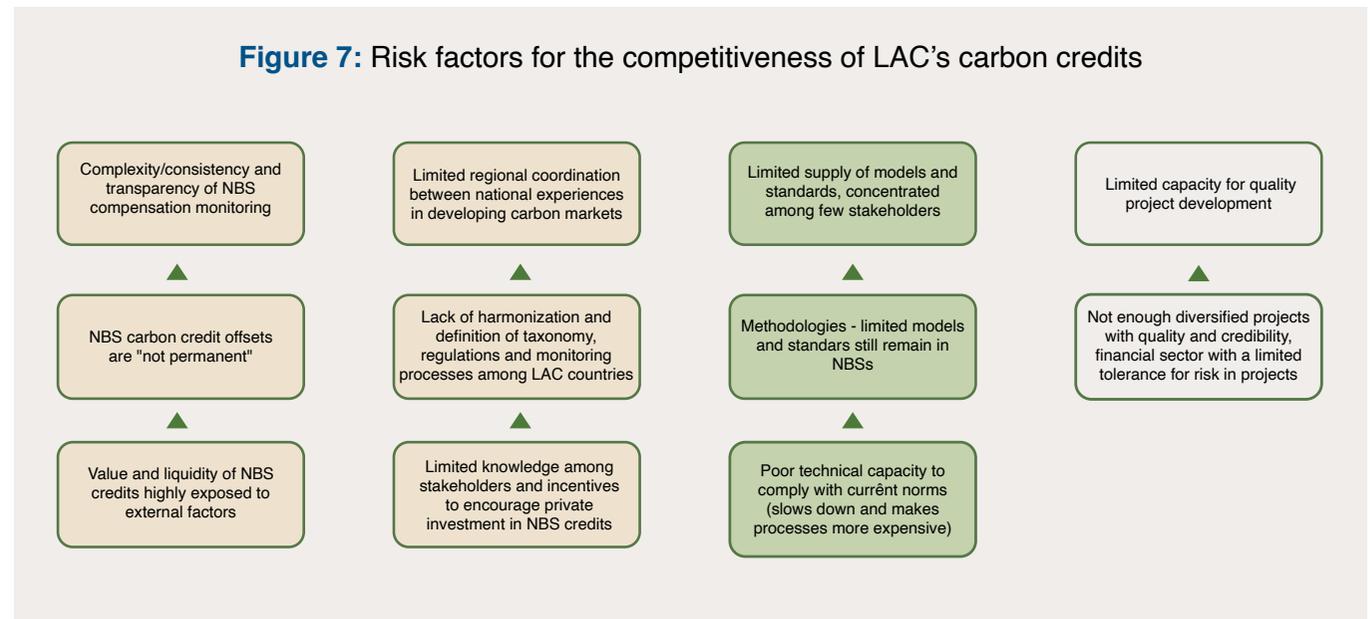
Projected growth trends in global carbon-credit markets present an enormous opportunity for LAC countries. With large expanses of rainforest, including the Amazon, and other natural biomes, the region has the capacity to generate and trade large volumes of carbon credits, effectively monetizing its comparative advantages in NBS. Moreover, while the regional electricity sector is less carbon-intensive than those of other developing regions, notably Asia, LAC still has significant potential to expand the production of renewable energy, which offers a secondary source of carbon credits. Increased engagement in carbon-credit markets could attract large amounts of foreign

capital to help finance sustainable development across the region, with investments in climate mitigation augmented by efforts to expand social and environmental co-benefits. However, the LAC region's ability to become a global leader in the production of carbon credits will require sound policy decisions that effectively address constraints on the expansion and integration of carbon-credit markets (Figure 7).

While the CPIs of individual LAC countries are at different stages of development, the region as a whole has great potential for innovation, cooperation, and investments that enhance the socioeconomic co-benefits of decarbonization. Among the region's

voluntary initiatives, several programs have been launched to measure carbon emissions. These include (i) Sello de la Red Argentina de Municipios frente al Cambio Climático (RAMCC) and Huella de Carbono Corporativa in Argentina; (ii) Huella de Carbono Perú (HC-Perú) in Peru; (iii) Huella Chile in Chile; (iv) Programa Nacional de Carbono Neutral in Colombia; and (v) Floresta+ Carbono in Brazil. Colombia's CERCARBONO initiative has taken an innovative approach to strengthening carbon-credit markets in the region by developing its own voluntary certification protocol and project validation methodologies (see Colombia profile in the Appendix).

Figure 7: Risk factors for the competitiveness of LAC's carbon credits



Source: Authors' elaboration

CONCLUSION

The analysis presented above highlights LAC's enormous potential to generate carbon credits, particularly from NBS but also from renewable energy and other sources. To realize LAC's potential, regional actors will require a detailed assessment of the prospective sources of carbon credits to guide investment and policy decisions. Further support will also be necessary to link regional carbon-credit suppliers with international markets, both mandatory and voluntary, and to leverage the region's comparative advantages in NBS. A well-designed strategy for developing, expanding, and integrating carbon-credit markets in LAC could catalyze job creation, foster the growth of sustainable business clusters, accelerate the adoption of new technologies, and attract inflows of private capital from within and outside the region.

To succeed, efforts to develop carbon-credit markets in LAC and strengthen the region's carbon-pricing infrastructure must address several key challenges. The first challenge is human capital, as workers, administrators, and policymakers with the specialized skills and experience necessary to design and operate an ETS are in short supply across the region. Here, as elsewhere, the solution is greater coordination among regional stakeholders. Collaborative training programs, platforms for sharing experiences and disseminating best practices, and efforts to leverage international expertise can help governments build their institutional capacity cost-effectively while

creating new opportunities for engagement with the private sector. A second, related challenge will be to enhance communications and harmonize the analytical methodologies and certification standards that underpin carbon-credit markets. Here again, coordinated action between stakeholders will be crucial to success, and analyzing the state of the institutional and governance framework for CPs could help resolve issues around transparency and promote standardization, laying the groundwork for integrating national, regional, and international markets. A third challenge will be to develop suitable and attractive financial and non-financial instruments and mobilize resources to finance projects at competitive terms and prices. Cross-country collaboration can help overcome the limited depth and capacity of national financial systems by enabling tools and strategies developed abroad to be rapidly adapted to the domestic context.

In addition, specific challenges must be addressed on a country-by-country basis to enable the formation of a comprehensive regional carbon-credit market. These include: (i) accomplishing the political collaboration necessary to create a regional strategic vision; (ii) harmonizing the systems and processes used by existing sub-regional markets, such as the Pacific Alliance, while ensuring that more advanced markets do not hinder the development of new markets or inhibit market integration; and (iii) managing imbalances between large and small markets to avoid creating power imbalances that could sow distrust.

Addressing these challenges will be critical to ensure the integrity and competitiveness of carbon credits produced in LAC, particularly those generated by NBS, on the international market, and to enable the establishment of a LAC market of sufficient scale to operate internationally. The presence of a large and sophisticated carbon-credit market in LAC would enable the growth of cost-effective regional value chains for legal and financial services, auditing, consulting, certification, monitoring, blockchain solutions, project management, and other business services related to the production, verification, and sale of carbon credits. A regional market would attract international investors, expand the range of financing alternatives for private investments in projects with high social and environmental impact, accelerate the adoption of new technologies, and promote the formation of economies of scale in emissions reduction and carbon removal. Finally, the development of regional markets dealing in a diversified array of carbon credits would create substantial economic and environmental co-benefits, including job creation, poverty reduction, and improvements in quality of life, advancing regional development goals that extend well beyond the climate agenda. Conversely, failing to address these challenges would hinder the production of carbon credits in LAC and relegate the region to an ancillary role supplying North American, European, and Asian markets.

THE ILACC WORK PROGRAM 2022-2026

The Purpose of the ILACC

As the carbon-credit markets across the world rapidly expand, countries and firms are intensifying their efforts to gain a foothold in the production and trading of carbon credits. Mandatory ETSs and carbon taxes already cover more than 20% of global GHG emissions, with their total market value surpassing US\$800 billion in 2021. Meanwhile, voluntary markets have recently experienced double- and even triple-digit growth rates, exceeding US\$1 billion in market value in 2021. Following the end of COP26 and the approval of the Paris Agreement's Article 6 rulebook, the NDCs have created new international carbon-credit market opportunities. Recent estimates indicate that the combined value of mandatory and voluntary carbon-credit markets could reach into the trillions of dollars by 2050.

In this context, an increasing number of national, subnational, and even municipal governments are developing new capabilities to engage with carbon-credit markets. In LAC, Argentina, Chile, Colombia, and Mexico have already implemented CPIs, with four federal taxes, three subnational taxes, and a pilot ETS in Mexico, while Colombia, Chile, and Mexico are developing carbon-credit mechanisms that could

be used to offset liability for national carbon taxes. In addition, the Pacific Alliance and Mercosur are pioneering the establishment of regional carbon-credit markets. To support the development of CPIs in LAC, the ILACC promotes the global competitiveness of the carbon credits generated in the region as part of a broader effort to accelerate job creation, income growth and poverty reduction, value-chain development, technological upgrading, and the diversification of environmentally sustainable products and activities.

Program Objectives

The 2022-2026 Work Program outlined here was informed by extensive consultations with representatives of partner institutions from countries in the region, including active and potential participants in carbon-credit markets. Throughout its implementation, the ILACC's objectives and activities will be collaboratively defined and regularly updated by its member institutions. The process for designing the 2022-2026 Work Program was based on a theory of change that sought to establish long-term goals and then lay out the preconditions and actions necessary to achieve them, with targets defined for the short, medium, and long term. As a result, all activities and outcomes are logically sequenced and prioritized.

Proposal

The ILACC proposal is designed around four overarching areas for strategic intervention:

- 1. Knowledge Management and Capacity Building**, including activities designed to increase the knowledge base of regional development banks and other key players and enable them to participate in carbon-credit markets by offering training sessions with experts and creating support materials ;
- 2. Comparative Analysis and Harmonization of Certification Standards and Registry Systems**, including comparative evaluations of different carbon-credit certification methodologies and standards to assess their relative strengths and weaknesses and define international best practices;
- 3. Identification of Financing Gaps and Development of New Financial Products**, including an analysis of constraints on carbon-credit project financing in the region, as well as efforts to expand the availability of financial resources and support the creation of new financial products by development banks;
- 4. Coordination of the Governance Structure**, including mapping national and regional market institutions and building out the governance structure at the regional level with support from stakeholders in the private sector and civil society.

In addition, the ILACC is developing a **LAC Carbon Market Observatory** as a cross-cutting activity designed to support interventions in all four programmatic areas. This observatory will be responsible for monitoring and analyzing trends in carbon-credit markets. It will produce quarterly publications on market dynamics and materials designed to spread awareness of the ILACC and its activities. Finally, the knowledge base produced by the observatory could lay the groundwork for more ambitious initiatives, including the development of a regional certification standard for carbon credits and the creation of a registration and trading platform for regional carbon credits.



Photo: Proyecto BAM

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APPENDIX: COUNTRY FACT SHEETS

This section presents fact sheets that outline the commitments and historical background of climate action, focusing on the use of carbon pricing instruments, for the six focal countries of this report. The Fact sheets are a starting point for the organization of such data, and should be dynamically updated in an interactive process with the participation of representatives from each of the countries in discussion, and may even be extended to other countries.

Argentina

• NDC

Argentina's total GHG emissions are around 368Mt CO₂e per year, with the energy and AFOLU sectors being the major emitters, accounting for 53% and 39% of national emissions, respectively. In the energy sector, ground transportation, electricity generation and fuel consumption are the largest emitters, while in the AFOLU sector, livestock, land use change and forestry are the largest emitters (33).

In its updated NDC in 2020, the country committed to limit its GHG emissions to 359 MtCO₂e by 2030, applicable to all sectors of the economy. In addition, the new NDC incorporates an adaptation target, in accordance with article 7.1 of the Paris Agreement, focused on reducing territorial, socioeconomic and environmental vulnerabilities and strengthening the resilience of different sectors (34).

• Historical background and climate action instruments

Through the Decree 891 of 2016, the National Climate Change Cabinet (GNCC- for its Spanish acronym) was created, with the main purpose of designing climate change policies through the articulation of different levels of governance. The GNCC brings together the main formulators of climate change public policies and centralizes the actions proposed by the ministries in order to generate coordinated responses. Thus, the Ministry of Environment and Sustainable Development acts as the technical coordinator of the Cabinet (33; 35).

In December 2018, Argentina passed a carbon tax on fossil fuels in the context of a broad tax reform (Law 27,430) that sought, among other things, facilitate the energy transition to a low-carbon economy (33). In addition to tax reform, the RenovAr Program assists in the development of renewable energy in the country, aiming to increase its share through hydroelectric and energy efficiency projects in mass transportation and infrastructure (33;36). In this regard, the PMR program is supporting the evaluation of policy instruments in line with the NDC targets, including the feasibility of negotiating Renewable Energy Certificates (RECs) and Energy Efficiency Certificates (EECs) and assisting in further analysis of the Argentine carbon tax (37).

• Experiences with carbon pricing regulations

In the context of a broad tax reform, Argentina implemented in 2018 a carbon tax on fossil fuels equivalent to US\$ 10/tCO₂e, with a phase-in period of 10 years, where the corresponding rates for each fuel were defined based on their emission factors (33). This tribute applies to importers, companies that refine, produce, manufacture and/or obtain liquid fuels and/or other hydrocarbon by-products in all their forms, directly or through third parties, as well as producers and/or processors of mineral coal (38; 33).

For it to be implemented, Argentina had to review existing fuel taxes and so the tax was then phased in in 2019 at a cost of US\$ 1/tCO₂e until it reaches US\$ 10/tCO₂e in 2028 (33). However, the rate update for the year 2021 has been postponed to 2022 for gasoline and diesel (4).

Finally, the revenues from the CPI go to different areas of the national budget, from social security systems to investments in transport infrastructure, among other funds and investments (20).

• Experiences in the carbon credit market

The Argentine Network of Municipalities against Climate Change is a coalition of more than 250 municipalities in Argentina that coordinates and promotes strategic plans for dealing with climate change (44), in line with the objectives of the Global Covenant of Mayors for Climate and Energy (44). The main purpose is to promote and implement municipal, regional or national projects or programs related to climate mitigation and adaptation. In this sense, it proposes to reduce GHG emissions by 45% by 2030 and achieve climate neutrality by 2050.

In 2019, the Network developed a tool and a Corporate Carbon Footprint Seal, based on international protocols and standards. The goal is to offer a quality service of calculation and analysis, mitigation and/or offsetting and carbon neutrality of the corporate carbon footprint at prices adapted to the economic reality of the national market. This service is applicable to public and private entities that intend to quantify their emissions in order to reduce and/or offset them. In addition, 50% of the funds generated by the services of the seal are destined to projects that generate a threefold environmental, social, and economic impact in the municipalities within the network (39).

Regarding the development of carbon credit projects, Argentina had a moderate participation in the Kyoto mechanisms, hosting about 5% of the number of LAC projects (40). In the voluntary markets, however, the country's participation in independent certification mechanisms is smaller so far. The Argentine carbon credit projects are focused on renewable energies (18).

Brazil



• NDC

Reduction of GHG emissions by 37% in 2025 and 50% in 2030, compared to 2005 levels (UNFCCC, 2021). Brazil has made significant progress towards meeting its targets. Emissions from land use, land use change and forestry (LULUCF) traditionally represent the largest contributor to the country's emissions profile (20).

In its first NDC the country adopted goals of reducing its greenhouse gas emissions (GHG) by 37% by 2025 and 43% by 2030, taking 2005 as reference year, and foreseeing the adoption of broad measures related to land use and the increase of renewable sources (except hydroelectric power) in its energy matrix from 28% in 2012 to 33% in 2030, expanding the participation of sustainable bioenergy to approximately 18% in the same period. The country has also reserved the option of using market mechanisms established under the Paris Agreement (34).

On December 8, 2020 the Brazilian government presented an update to its 2015 NDC, referring to it as a "New First NDC". The new document reaffirmed the 37% greenhouse gas emissions reduction target for 2025 and made official the 43% reduction target for 2030. The emissions baseline on which these percentages are calculated, however, was revised so that, in absolute volumes, the targets represent an additional 0.5GtCO₂ in 2025 and 0.4GtCO₂ in 2030. The New First NDC did not present sectoral targets and stated that the success of long-term strategies, and in particular the year by which climate neutrality will be achieved, depends on the functioning of the market mechanisms (71). Also, in the scope of the 26th United Nations Climate Change Conference of the Parties (COP26), Brazil announced the revision of its NDC targets, which strengthened the country's climate ambition, increasing the commitment to reduce emissions in 2030 to 50%. This commitment, following the baseline in the latest version of the national inventory, translates to about 1.28 GtCO₂e. However, in April 2022, a second revision of the NDC was submitted ratifying the GHG reduction commitment of 37% by 2025 and 50% by 2030 (ref. year 2005, based on the Fourth National Inventory, which had a new methodological update), not internalizing the other commitments made at COP26 and maintaining a higher level of emissions compared to the original NDC (81).

• Historical background and climate action instruments

Brazil's National Policy on Climate Change, enacted in December 2009, aims to promote the development of a Brazilian market for emissions reductions, as well as other objectives. The main instruments included in the PNMC (for its acronym in Portuguese) are of the Command and Control type - such as actions to combat deforestation for the reduction of emissions in compliance with the Forest Code - and fiscal incentives - such as the subsidized funding under the Low Carbon Agriculture Plan (ABC Plan). In this regard, as part of its activities under the PMR, the Brazilian government conducted studies on the possible implementation of market-based instruments to meet Brazil's mitigation targets and reduce overall mitigation costs. This included the development of project options, economic and regulatory impact assessments, as well as an analysis of potential interactions between carbon pricing instruments and existing policies (72; 73). The country also showed interest in participating in the Partnership for Market Implementation (PMI), which offers financial and technical support to put into practice the studies' recommendations in terms of CPIs, but was not included in the first phase of the program. Thus, amid discussions about the regulation of a national carbon market, the Brazilian scenario gained new contours with the institutionalization of the Brazilian Market for Emissions Reduction (MBRE for its acronym in Portuguese), via Federal Decree No. 11.075 of May 19, 2022, already provided for in the PNMC of 2009 (82).

In addition, the Ministry of Economy has been strengthening the understanding of CPIs through engagement, communication and consulting (53). The PMR Brazil team, for example, has been engaged in conversations with private sector representatives who support the carbon pricing agenda in Brazil, as well as representatives of civil society organizations (74). Noteworthy is that work in this area also continues through other international cooperation activities, such as through the Climate Change Policy Program (PoMuC) with the German Agency for International Cooperation (GIZ).

Furthermore, the National Biofuels Policy (RenovaBio) was approved in 2017 - Federal Law 13,576 (75). The policy, inspired by California's Low Carbon Fuel Standard (LCFS), represents a modified Tradable Performance Standards approach for the fuel sector and sets mandatory targets for the purchase of biofuels by fuel distributors. To meet the targets, distributors must purchase specific volumes of certificates (Decarbonization Credit - CBIO), which represent emission reductions related to the replacement of fossil fuels by biofuels (76). CBIO trading began in June 2020, and discussions are underway on the revision of GHG reduction targets under the program, as well as on other project features.

- **Experiences with carbon pricing regulations**

With the support of the World Bank's PMR, the Brazilian government studied the possible implementation of market-based instruments to meet Brazil's mitigation targets and reduce overall costs, such as design options, economic and regulatory impact

assessments, and interactions with other policies. In addition, Brazil implemented several engagement and communication activities on carbon pricing with different stakeholders (53).

In addition, since 2013, a group of leading companies has been participating in a voluntary ETS simulation to gain experience and develop proposals for an ETS in Brazil. The ETS simulation is coordinated by the Center for Sustainability Studies of the Getulio Vargas Foundation (Gvces).

Finally, in 2021 there was a discussion in the National Congress about a bill (PL) for the implementation of an emissions trading system in Brazil, as well as an emissions MRV system and a national carbon credit certification standard, associated with a registry system. The PL 528/2021, later appended to the PL 2148/2015, could enable the creation of a regulated carbon market in the country.

In this context, the Bill is still being processed, while the Brazilian Government institutionalized in May 2022 the MBRE via Decree, establishing procedures for the elaboration of Sectoral Plans for the Mitigation of Climate Change, and instituting the National System for the Reduction of Greenhouse Gas Emissions (SINARE). However, the document still leaves open points, with discussions about legal uncertainty and questions about how the provisions will work. In general, it is understood that the Decree can still be modified, but it already signals an important starting point for a regulated carbon pricing instrument in Brazil.

- **Experiences in the carbon credit market**

The country is currently and historically the most important supplier of carbon credits in LAC, having issued about 16 million carbon credits in the first half of 2021 alone, more than the total emissions in FY 2020 (13 million). REDD+ is the main type of project, followed by renewable energy. According to the Trove report, the country represents 50% of the world's potential for REDD+ and restoration, reinforcing its status as a supplier in LAC in the coming decades. Currently, second (18), Brazil has about 48 million non-retired carbon credits certified by leading independent standards. These credits are based primarily on avoided deforestation, renewable energy and reforestation projects.

The largest REDD+ project in Brazil to date is the RMDLT Portel project in the Pará region, with more than 7 million credits issued. Other large REDD+ projects include the Pacajai and Envira Amazônia projects. The largest issuer of renewable energy credits in Brazil is the 700MW BAESA hydroelectric project, with more than 6.5 million credits issued to date.

In terms of participation in the CDM markets, Brazil played a protagonist role, being the third largest project developer in the world and the largest in the region (77). Brazil also played a leading role in the development and validation of methodologies, being the main responsible for the approval of the first methodology in the Land Use and Forestry sector under the KP, for A/R projects. It was also the host country for the first project of its kind, which had the credits purchased by the World Bank fund (78).

It should be noted that the government has been playing a role in creating a basic voluntary market structure in recent years, formalizing conservation initiatives, giving credibility to projects, providing a fair and safe return on investment, incorporating forest conservation into corporate/ESG policy, and sowing a favorable business environment [\(20\)](#). One example is its national Floresta+ program, which encourages payments for ecosystem services and ensures that project developers and investors receive a return on their investment. The initiative, launched in 2020, recognizes the conservation of native forests in all biomes to provide a bridge to payment/monetization for environmental benefits.

Shortly after the launch of the Floresta+ program, the Brazilian Congress passed a new Act on Payments for Ecosystem Services. This foundational legislation may lead to other governmental approaches related to payment for ecosystem services and carbon markets.

Chile



• NDC

Commitment to limit GHG emissions to 1100 MtCO₂e between 2020-30, to peak emissions by 2025, and to reach an emissions level of 95 MtCO₂e by 2030, with a climate neutrality goal for 2050 [\(34\)](#).

• Historical background and climate action instruments

Since 2012, the Department of Climate Change of Chile's Ministry of Environment designs, implements and maintains Chile's National GHG Inventory System (SNICHILE) to ensure the sustainability of the inventory preparation (INGEI), the consistency of the reported flows and the quality of the results. Noteworthy is that the "Compromisos Nacionales PANCC 2017-2022" is the coordinating instrument of the climate change policy, which integrates the actions that will be carried out by the more than twenty Ministries and Services in charge of climate change, including the newly constituted Agency for Sustainability and Climate Change and subnational governmental agencies. Its main purpose is to face the challenges raised in the short and medium term by the impacts of climate change in the Chilean national territory, and to promote the implementation of the commitments undertaken by Chile in the UNFCCC. Also noteworthy in the climate agenda are the sectoral adaptation plans.

• Experiences with carbon pricing regulations

Chile has been implementing a carbon tax since 2017 with a value of US\$ 5 per ton of CO₂ [\(57\)](#). Unlike other carbon taxes, which are implemented based on the carbon content of fossil fuels, the Chilean tax is levied on the emissions of the regulated entities, for which a MRV system on emissions is used [\(59\)](#). This tax was approved as part of a broader tax reform aimed at raising funds for initiatives in health and education [\(20\)](#).

A reform approved in 2020 will change the threshold for applying Chile's carbon tax to set it in terms of emissions volume (entities emitting 25,000 tCO₂/year or more) rather than based on the technical characteristics of the regulated entities (i.e., based on the thermal output of boilers and turbines) starting in 2023. This change was possible after three years of operation provided better quality emissions data [\(66\)](#).

The carbon tax system in Chile does not currently allow offsets to be used to comply with tax obligations of the regulated entities. However, with the reform approved in 2020, scheduled to come into effect in 2023 [\(67\)](#), regulated entities will be allowed to offset part or all of their taxable emissions. Also, the country has been looking at ways to improve its MRV system for its current carbon tax, as well as developing a mandatory reporting system and advancing an MRV scheme for mitigation actions within its energy sector [\(68\)](#). MRV is perceived as a key infrastructure element that could allow policymakers to expand CPI to other pricing instruments [\(66\)](#).

Finally, Chile's proposed Climate Change Framework Law has been under legislative discussion since September 2021. If approved in its current version, it foresees a system of GHG emission limits applied to specific entities or groups of regulated entities. The exceeding reductions relative to these emission limits could be certified as a tradable unit [\(53\)](#).

Additionally, also with the support of the PMR and the German Agency for International Cooperation (GIZ - Deutsche Gesellschaft für Internationale

Zusammenarbeit), studies, stakeholder engagement processes and capacity building activities were generated, such as studies on policy coherence of CPIs and activities such as stakeholder dialogue to provide input on the development of a regulated carbon market (69). In terms of a regulatory carbon market mandate, the Framework Law on Climate Change, currently under discussion, debates the possibility of developing a GHG emission cap system, whose surplus in reductions could be certified as a tradable unit.

Importantly, Chile is determined to continue its cooperation with the World Bank. In the context of the transition period from PMR to PMI, work is expected to be focused on a guide to implement the changes in the carbon tax, as well as on deepening the understanding of the role of carbon pricing in carbon neutrality, including the development of the system contained in the draft climate change law. Chile has also joined the World Bank's Warehouse Initiative to develop a portfolio of GHG mitigation projects and is engaged in activities as part of the Climate Market Club, an initiative that supports countries in developing their Article 6 pilots to exchange lessons from practice (70).

- **Experiences in the carbon credit market**

Today, voluntary trading of offsets takes place in the Santiago Climate Exchange, a local voluntary carbon offset trading platform established in 2009. It should be noted that the country has large expanses of forests and natural ecosystems, so AFOLU projects have been issuing a high number of credits based on independent certification standards, such as the

Verified Carbon Standard (VCS). Among the main independent certification standards, such as the VCS, Chile currently has about 1.6 million credits still on the market, both in the energy and forestry sectors (18). Leveraging potential funding sources could significantly expand the protection of these areas through carbon offset projects, while supporting local communities and their well-being.

In terms of the KP CDM projects, Chile was the third largest project developer in LAC, hosting about 10% of the projects in the region (13).

In addition, there are several protocols and methodologies for the certification of carbon credits that have been developed and are being used in Chile. They are mostly in the AFOLU category, but are highly criticized as international organizations see problems with local indigenous communities (20).

Furthermore, Chile is implementing pilot activities under Article 6 in cooperation with the government of Sweden, in addition to Joint Credit Mechanism activities, and participating in the Chile-Canada Program to reduce emissions in the waste sector (20).

Colombia



- **NDC**

Colombia's total GHG emissions are around 244Mt CO₂e per year and represent about 0.3% of the global emissions. The energy sector and the AFOLU sector have been responsible for the largest share of emissions, about 34% and 52% of the country's emissions, respectively (33).

In its updated NDC in 2020, the country committed to limit its emissions to 169.44 million tCO₂e in 2030, which corresponds to a 51% reduction from BAU (business as usual) levels, with emissions decreasing between 2027 and 2030, tending towards carbon neutrality by mid-century (34).

In this context, Colombia published its national climate change policy, which covers all major policies and actors and provides guidelines for climate planning and management at the sectoral, local, departmental, regional and national levels (33).

- **Historical background and climate action instruments**

In 2016, the National Government approved Decree 298, which created the National Climate Change System (SISCLIMA for its acronym in Spanish), whose purpose is to articulate measures to combat climate change through agreements, processes, resources, plans, strategies, instruments, and mechanisms between the State, the private sector, and non-profit organizations. In this context, the State published

its National Policy on Climate Change, bringing guidelines for climate planning and management at different levels (33).

In the same year and as part of a broad tax reform, Colombia passed Law 1819 that established a national carbon tax and through Decree 926 of 2017 established a compensation mechanism, in which entities certified as “carbon neutral” can fully or partially fulfill their tax compliance obligation, provided that neutralization of the carbon emissions they caused is verified (33; 50).

In 2018, Colombia passed Law 1931 that establishes provisions for the establishment of an Emissions Trading System (ETS), ratifying economic and financial instruments for climate change management. In particular, articles 29 and 30 of the Law provide the National Greenhouse Gas Emission Trading Quotas Program (PNCTE for its acronym in Spanish), where the government can recognize the payment of carbon tax as part of the compliance obligation of regulated entities under the PNCTE (20;51;52;53).

Finally, the Climate Action Law (Law 2,169, of December 22, 2021) was instituted, which consolidates the commitments made by the country in the NDC and establishes goals for the full implementation of the Colombian ETS by 2030. This law determines measures that must be carried out in the short, medium, and long term to mitigate climate effects, by different entities, and establishes the obligation of legal entities to report direct and indirect GHG emissions, following criteria to be defined by the Ministry of Environment and Sustainable Development (4; 82).

- **Experiences with carbon pricing regulations**

Through the Law 1819 of 2016, Colombia established a carbon tax on fossil fuels whose coverage is approximately 20% of Colombia’s total emissions, with a value of US\$ 5 per ton of CO₂, where the regulated entities are producers and importers of fossil fuels (except coal). In addition, the instrument has a mechanism for offset credits and the country is developing the technical design of its emissions trading system as a pilot, expected to start in 2023 or 2024. (33).

The Colombian tax includes a compensation mechanism. Once the taxes are collected from fuel distributors, they can request exemption on a certain taxable event, as long as they prove the cancellation of the emissions reduction or removal certificates, acquired from a national mitigation project for the volume of emissions equivalent to what would result from burning the related fuel. These projects must be validated and their removal results verified by organizations (regardless of the standards and projects) duly accredited under the requirements of ISO 14065, either by the National Accreditation Agency of Colombia (ONAC) or following the modification made by Decree 446 of 2020, by accrediting entities that are members of the International Accreditation Forum (IAF) until there is a Mutual Recognition Agreement (33; 50; 54).

Thus, the carbon tax is seen as an initial step towards the development of a regulated market in the country, and for that, Law 1931 of 2018 was created establishing the framework for the creation of the Colombian ETS. At the moment, Colombia is developing several studies with support from the PMR and its successor program, PMI, in order to understand the impacts of an ETS on economic sectors and the other activities necessary for the design of the ETS through communication, engagement, and a planned pilot. In this context, the Colombian Climate Action Law signals the need to strengthen carbon markets to boost the national economy, and with this, establishes that, starting in 2023, half of the revenues from the carbon tax will be used, among others, for coastal erosion management, conservation of water sources, and ecosystem protection. The other half of the revenue will be destined to finance the Illicit Use Crop Substitution Program (Programa Nacional Integral de Sustitución de Cultivos de Uso Ilícito – in Spanish) (4).

It is worth mentioning the importance of developing an ETS complementing the carbon tax, since the country is an important exporter of iron and steel, fertilizers and cement products that are covered by the recently established European Union Border Adjustment Mechanism (CBAM), where a carbon price is fixed on imported goods, aiming to gradually equalize the carbon price for domestic and imported products (55).

- **Experiences in the carbon credit market**

Regarding the Law 1931 of 2018, provisions are included for the issuance of carbon credits as follows: voluntary actions by non-regulated entities that generate GHG emissions reductions or removals may receive allowances under the PNCTE if they are verified, certified, and registered in the National GHG Emissions Reduction Registry. The PNCTE is in the regulatory review phase, and its operationalization will complement other mitigation instruments, such as the carbon tax and its offset program (51;52;53).

Within the context of the Clean Development Mechanism, Colombia was the fourth largest project developer in the region and issued approximately two million certified emission reductions (CERs) with an average price of US\$ 5/tCO₂e in the transportation, renewable energy, chemical industry and landfill sectors, generating a revenue of more than US\$ 10 million for the projects in 2019. Of the 2 million CERs, approximately 1.6 million were cancelled for compliance with Colombia's carbon tax (56).

In 2021, the Colombian Ministry of Environment and Sustainable Development introduced the National Carbon Neutrality Program, where projects participating in the program that achieve certified project status will receive an identification label called "NDC - Carbon Neutral". This initiative recognizes the efforts of public and private sector organizations towards neutrality, and in exchange, the country offers tax reduction incentives based on "effort levels" to reduce greenhouse gas emissions while generating public revenue (20).

Such interesting developments are complemented by Colombia's participation in voluntary carbon markets under independent certification standards. An example of a national certification initiative, leveraged by Decree 926 of 2017, was the creation of CERCARBONO - an international certification standard for carbon projects, where own voluntary certification protocols and methodologies for validation, monitoring, reporting, verification and certification of projects have been developed. This initiative becomes an important benchmark when thinking about regional strengthening, since it is present, besides Colombia, in countries like Bolivia, Brazil, Ghana, and Panama. It is also worth mentioning that, together with the EcoRegistry registration platform, a platform that uses blockchain technology, the certification currently has 94 registered projects on its platform, and about 33 million credits issued, mostly in the AFOLU sector. (83).

In this way, the country has been developing projects mostly in the forestry and land use sector (REDD+ and reforestation), where in 2021, about 7 million credits from Colombian projects were still available for transactions in the voluntary market (18).

Mexico



- **NDC**

Commitment to a (unconditional) 22% reduction in GHG emissions and 51% reduction in black carbon emissions by 2030 compared to BAU levels, and a (conditional) 36% reduction in GHG emissions and 70% reduction in black carbon emissions by 2030 (34).

- **Historical background and climate action instruments**

The General Law on Climate Change (LGCC for its acronym in Spanish) is the main legal instrument that Mexico has to address climate change. Since its approval in 2012, this law aims to regulate, promote, and enable the implementation of adaptation and mitigation actions to combat climate change, in parallel to the promotion of sustainable development in the country. With the LGCC, Mexico has committed to reduce its emissions by 50% by 2050 with international support involving the transfer of funds or technology. Furthermore, the National Strategy on Climate Change (ENCC for its acronym in Spanish) is configured as the main instrument that governs the national policy to face the effects of climate change and move towards a competitive, sustainable and low carbon economy in the medium and long term. The Strategy is composed of three pillars: pillars of the national climate change policy; adaptation to the effects of climate change; and low emission development. Finally, the Special Climate Change Program 2014-2018 (PECC 2014-2018) stands out, which is a legal planning instrument that represents the public administration's contribution in the 2014-2018

period to meet the 30% GHG reduction target by 2020. It has three main goals: to reduce the vulnerability of the population and productive sectors to climate change; to protect and conserve ecosystems and the environmental services they provide; and to increase the resilience of strategic infrastructure to the adverse impacts of climate change.

- **Experiences with carbon pricing regulations**

Mexico was the first LAC country to implement both a carbon tax and an emissions trading system. The national carbon tax, with a value of US\$ 0.40-3.20 (57), has been in operation since 2014 and applies to fossil fuels, excluding natural gas. Mexico's national carbon tax does not accept offsets for compliance with its carbon taxes (20). In addition to the national carbon tax, there are subnational actions, starting with the implementation of carbon taxes in the state governments of Baja California, Tamaulipas, and Zacatecas. Currently, there is a discussion about the implementation of these taxes in the state of Jalisco as well. It is noted that the creation of carbon taxes as a result of a reform was part of a strategy to increase revenues in a context of declining oil revenues and in order to be compatible with reforms to liberalize the energy sector (20).

Since 2017, Certified Emission Reductions (CERs) for projects developed in Mexico under the Clean Development Mechanism (CDM) can be used for carbon tax compliance, for a value equivalent to the market value of the credits (58). According to SEMARNAT's estimates (59), the carbon tax has been responsible for a reduction of approximately 1.8 million of tCO₂ per year (60).

Additionally, with the support of GIZ and PMR, Mexico has developed several studies on the implementation of an ETS in the country, including design elements, options and interactions, as well as communication and stakeholders' engagement (61). The country also implemented several capacity building activities, such as carbon market simulations, in-country and virtual trainings, and study visits (62; 63). Note that the General Law of Climate Change mandated the introduction of mandatory MRV for entities that emit more than 25,000 tCO₂e per year, generating fundamental data for the design of the ETS (64).

The process of developing an ETS in Mexico began in 2015, when SEMARNAT started an evaluation of a mandatory ETS. In 2016, an informal dialogue process began with representatives of sectors likely to be covered, such as steel, cement, and the chemical industry. Initial feedback from the private sector was very critical (20). However, the existence of an international mitigation commitment by Mexico, in the form of its NDC, precluded the possibility of inaction.

Already in 2017-2018, SEMARNAT announced a simulation exercise with the support of PMR, which facilitated deeper understanding and capacity building among private sector stakeholders. These activities further facilitated more technically focused dialogues and the eventual creation of a Working Group with these stakeholders, given that a legislative reform of the Mexican General Law on Climate Change mandating an ETS was passed. The dialogue within the Working Group increased adherence to the policy by potential regulated entities and allowed the regulator to hear and incorporate concerns into the draft regulations. Throughout this process, technical studies commissioned by SEMARNAT with support from GIZ informed the discussions and the design of the system (20).

The Mexican ETS pilot started operating in 2020 and covers direct CO₂ emissions from facilities in the energy and industrial sectors that generate at least 100,000 tCO₂ per year, which in sum represents about 40% of the country's emissions (20). It was designed to have the least economic impact on the regulated entities and will help test the system design, improve the quality of emissions data, and build capacity for the regulated entities before the official start of the ETS, planned for 2023. It should be noted that interactions between ongoing policies and actions should be analyzed, such as between the ETS and clean energy certificates in Mexico (65).

- **Experiences in the carbon credit market**

In November 2013, a carbon credit trading platform was launched in Mexico with the support of the United Nations Environment Program (UNEP) and the Government of the United Kingdom. The Mexican Carbon Platform (MEXICO2) was established to trade carbon credits, which have been certified by internationally recognized methodologies and protocols, to meet the demand of the voluntary market and for compliance with Mexico's national carbon tax.

Mexico is also on schedule to finalize its offset mechanism and is reviewing the Climate Action Reserve (CAR) forest protocols and considering using them under the proposed ETS in the country. The forest protocols will facilitate domestic offset projects in reforestation and improved forest management. Other protocols for livestock, agriculture, and road transportation are in early stages of evaluation.

It is also noteworthy that the PMR has supported the development of three other offset protocols covering sectors not regulated by Mexico's ETS. In addition, there are Joint Credit Mechanism activities involving the country, together with Costa Rica and Chile (20).

In terms of participation in the Kyoto mechanisms, Mexico was the second largest developer of projects in LAC, with about 18% of the region's projects. On the voluntary markets, Mexican credits issued by the main independent certification standards are still scarce, with less than one million credits currently on the market (18).

Peru



- **NDC**

According to data from the National Inventory of Greenhouse Gases (INGEI for its Spanish acronym), 53.1% of emissions in Peru correspond to the AFOLU sector (42). In its updated NDC in 2020, the country made an (unconditional) commitment to limit its GHG emissions to 208.8 MtCO₂e in 2030, and a (conditional) commitment to limit GHG emissions to 179 MtCO₂e in 2030, depending on both international funding and favorable conditions. This meant an increase in its ambition from 20% to 30% reduction in the unconditional target, and from 30% to 40% in the conditional target (34; 42).

In this sense, the State has been engaged in the improvement and methodological robustness of the INGEI under the management of the Infocarbono platform, which is one of the main tools for Monitoring, Reporting and Verification systems (42;43). Besides Infocarbono, another platform that is being developed is the National Registry of Mitigation Results (Renami), in which public and private institutions will be able to register their GHG reduction initiatives. In addition, the organizations will be able to transfer GHG reductions, as a result of their mitigation activities, to participate in the national and international carbon markets (44).

- **Historical background and climate action instruments**

Due to structural socio-environmental factors strongly influenced by the country's poverty and inequality rates, Peru is one of the most vulnerable countries to the effects generated by climate change, and with this, recognizes that the fulfillment of its NDC contributes considerably to reduce these risks (42).

Regarding the achievement of its goals, the Peruvian State has been establishing increasingly participatory mitigation measures for all the sectors contemplated in the NDC. To make this possible, the state has its Law No. 30754 - Framework Law on Climate Change (LMCC for its acronym in Spanish). Furthermore, through the Peruvian Ministry of the Environment (MINAM), the country started the year 2021 with a participatory process of updating its National Strategy for Climate Change with a 2050 horizon, seeking carbon neutrality and resilience of the population, ecosystems, livelihoods, and productive and infrastructure systems. Among the activities related to the scope of the Strategy, is the preparation of the Technical Study for carbon neutrality in Peru by 2050 and the development of the National Adaptation Plan, with time horizons of 2030 and 2050 (42; 45).

- **Experiences with carbon pricing regulations**

In general, despite not having implemented any carbon pricing policy, Peru has made continuous efforts to ensure its participation in international carbon markets, such as through the establishment of a social carbon cost of US\$ 7.17 per tCO₂e for public investment project analyses (46).

Furthermore, the following are the main initiatives of the Peruvian State supported by the PMR in the direction of a CPI: (i) Conduct of studies to evaluate the impact of the introduction of a carbon price in different sectors of the economy; and (ii) Development of the National Carbon Footprint Program (47), as well as the National Registry of Mitigation Results (44) and other technical components of its national GHG and MRV data management system, assisting both the regulated and voluntary markets.

- **Experiences in the carbon credit market**

Peru is currently the second largest supplier of carbon credits to LAC, after Brazil (20). The country has progressively participated in the international regulated and voluntary carbon markets, with about 60 projects in the CDM - it was the fifth largest CDM project developer in the region - and more than 20 projects in the voluntary standards, mainly in Verified Carbon Standard and Gold Standard (48). The main platform is the National Carbon Footprint Program (in Spanish, Huella de Carbon Peru), which seeks to promote and recognize the efforts of public and private organizations towards the national goal (47).

A great example of the country's success in carbon credit trading is the signing of the first bilateral agreement under the Paris Agreement between Peru and Switzerland at the end of 2020. Signed even before Article 6 was agreed upon, in the context of the San Jose Principles for High Ambition and Integrity in International Carbon Markets, the agreement provides for the Peruvian state to receive funding for sustainable development projects while providing carbon credits to Switzerland, which can count these credits towards its emissions reduction targets and transfer the retirement rights to the local government or private companies in Switzerland. In this regard, the agreement proposes a number of principles to safeguard the integrity of carbon market transactions (20; 49; 30).

Peru also currently has significant participation in the voluntary carbon markets from independent certification standards, with more than 30 million credits not yet retired, (18) the vast majority from deforestation reduction projects. By 2021, Peru generated a volume of credits equivalent to 23.5 MtCO₂e from independent standards (15).

Finally, Peruvian carbon credits are mostly generated by REDD+ projects, and among the largest projects by emission volume are the Cordillera Azul National Project, the Madre de Dios Amazon REDD Project and the Alto Mayo Project (20).



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