

EVOLUTION OF CARBON MARKETS IN AFRICA

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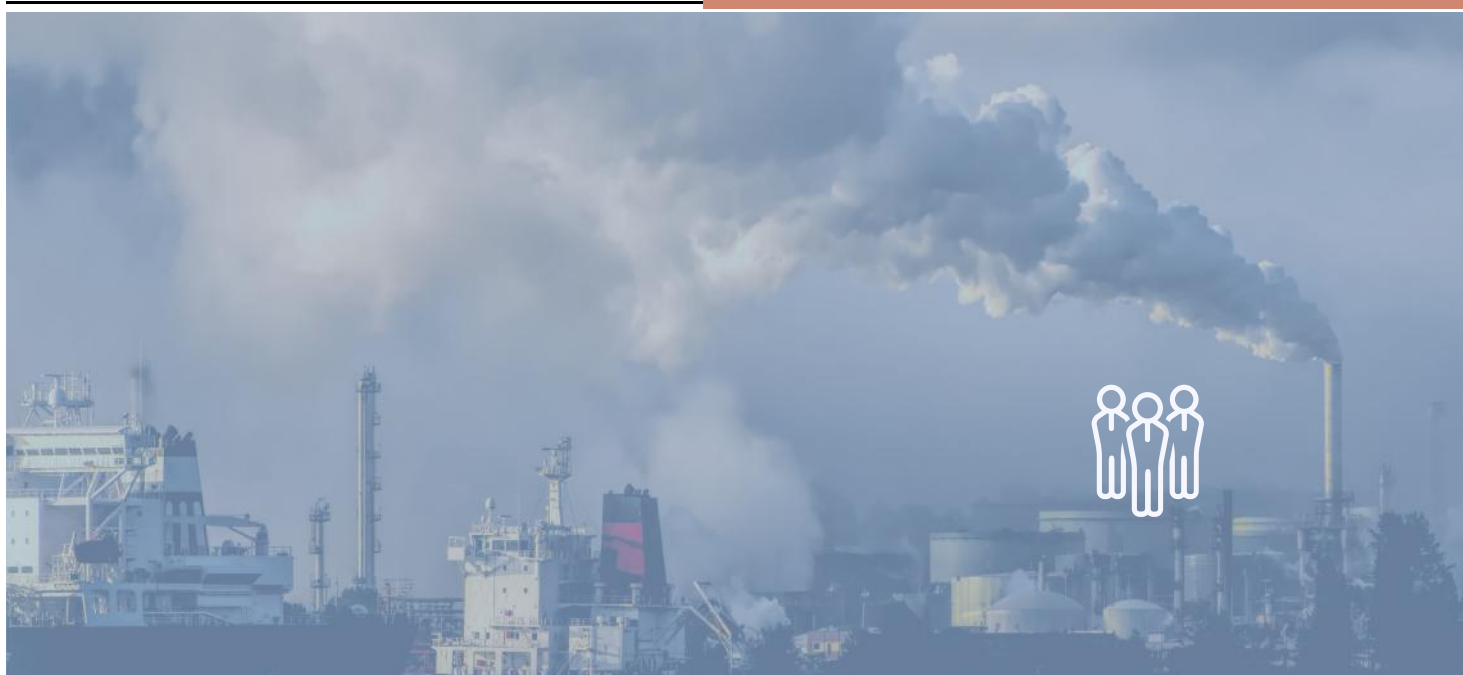
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Carbon Markets and their Functionality.



Executive Summary

Financial markets play a vital role in facilitating the global economy by allocating resources, creating liquidity for businesses, and enabling risk management. They are able to do this because they are liquid and transparent in nature and perceived to be broadly representative of supply and demand in relevant asset classes. This is how financial trading has spread to new asset classes in recent decades – like commodity futures and options – enabling the allocation of investments and management of risk in activities like producing, trading, and buying agricultural commodities.

Carbon markets could work in the same way, but with a focus on allocating resources away from emissions-intensive activities and towards emissions removal and reduction. But in order to fulfill this function, they also need to be liquid, transparent, and representative of a distinctive, investable asset class.

Carbon credits can be generated from a wide range of project types, encompassing forestry and land use, agriculture, blue carbon, renewable energy, household devices, transport, livestock, waste management, industrial gases, and engineered carbon dioxide removal.

Carbon market

Carbon market is a financial system aimed at reducing the emissions of greenhouse gases (GHGs), particularly carbon dioxide (CO₂), which is a major contributor to climate change. This market assigns a monetary value to each metric ton of GHG emissions, allowing companies and countries to buy or sell the rights to emit these gases. The market is divided into two categories: **the compliance carbon market (CCM)** and the **voluntary carbon market (VCM)**. The compliance market is established by national or regional governments through legislation or international agreements and requires companies to offset their GHG emissions by purchasing carbon credits. The voluntary market is comprised of companies that choose to purchase carbon credits voluntarily to reduce their carbon footprint.

The Significance and Criteria for Investing in Voluntary Carbon Markets

Carbon credits are certificates allowing polluters to emit a specific amount of GHGs, typically one metric ton of CO₂. These are traded on carbon exchanges, similar to stock exchanges, with value determined by supply and demand. Demand comes from GHG-emitting companies, while suppliers are those who reduce emissions through clean energy or other means. Prices increase when demand exceeds supply and decrease when supply surpasses demand.

Some **compliance carbon markets** are investable today, but they remain a difficult proposition for institutional investors as they lack depth and their pricing has historically been erratic and highly susceptible to regulation changes, such as in quota allocations. **Voluntary carbon markets**, while relatively small and immature and not yet investable at a scale required for institutional investors, have a significantly more fluid market mechanism. This can be attributed to carbon credit prices that are determined by voluntary supply and demand, and therefore considerably less susceptible to regulatory mandates and policy.

The main goal of carbon markets is to encourage corporations to lower their greenhouse gas (GHG) emissions by providing them with financial incentives. This is done by allowing companies to purchase carbon credits, which can offset their GHG emissions while also obligating them to invest in clean and innovative projects to decrease their carbon footprint. Carbon offsetting, which involves accounting for emissions by buying verified reductions elsewhere, is vital to the proper functioning of carbon markets and the trading of credits.

Both compliance carbon markets (CCMs) and voluntary carbon markets (VCMs) rely heavily on the participation of investors and financial institutions to collect, allocate, and utilize large amounts of capital. Their involvement is critical in linking supply and demand, increasing market liquidity and depth.

For example, in CCMs, investors can trade carbon allowances within the Emissions Trading System (ETS) to enhance liquidity and fill gaps in supply and demand.

To avoid companies relying solely on offsets instead of reducing their carbon footprint internally (including emissions from **scope 1, scope 2, and scope 3**), clear guidelines for offset use are necessary. For example, The World Bank Group has its own guidelines for Emission Reduction Offsets, involving carbon neutrality for scope 1, scope 2, and a portion of scope 3 GHGs by purchasing and retiring offsets. These guidelines ensure alignment with the institution's objectives, support projects addressing climate change, and improve environmental and social outcomes. The guidelines cover project location, type, standards, alignment with Sustainable Development Goals (SDG), impact and co-benefits, sourcing, offset retirement requirements, and time-based requirements, reviewed every two years for business alignment and market trends.

CCMs involve a regulatory cap on emissions and excess emissions must be purchased on the market. VCMs operate differently, with corporate emitters voluntarily purchasing carbon offsets certified by private standards to compensate for their unabated emissions. The driving force behind CCMs is regulations, while VCMs are propelled by net zero commitments of corporations, consumer demand for carbon-neutral products, and investors' pressure on their portfolio companies. CCMs are more established with a market value of around USD 2 Billion.

VCMs can promote global decarbonization efforts by investing in carbon credits that reduce or eliminate emissions, either directly or through third-party funds. Additionally, they can influence portfolio companies to prioritize decarbonization and share best practices and be utilized to procure carbon credits.

Although the establishment of standards and governance for VCMs is a collaborative effort, individual investors bear the responsibility of ensuring that their projects adhere to those standards and scrutinizing potential offset investments according to their own judgement. In this regard, there are five crucial criteria that hold particular significance:

Additionality refers to a project's ability to generate higher emissions reductions than would have occurred without its implementation.

Carbon leakage takes place when a project's activities result in emissions in other areas. For instance, protecting a forest may lead to increased deforestation in other unprotected regions.

Double counting arises when a host nation counts a carbon credit sold abroad towards its own climate objectives. While the corresponding adjustments are still being finalized, negotiations on Article 6 of the Paris Agreement could result in stricter measures being introduced to prevent double counting in VCMs.

Permanence is a term used to describe the ability of a project to maintain its emissions reductions over time. If emissions removal is reversed due to factors such as deforestation or natural disasters, the project is deemed non-permanent.

Verification is an essential component of high-quality carbon credits. The credit must be registered and verified using internationally recognized standards.

Although some CCMs are currently investable, they are challenging for institutional investors due to their lack of depth and historically erratic pricing, which is highly vulnerable to regulation changes, such as quota allocations. In contrast, VCMs have a more fluid market mechanism, albeit at a smaller and less mature scale that is not yet investable for institutional investors. This is due to carbon credit prices that are determined voluntarily by supply and demand, making them less susceptible to regulatory mandates and policies.

Carbon credit projects can be divided into two types: those that prevent or reduce GHG emissions, such as renewable energy and deforestation prevention, and those that capture or store GHGs, such as reforestation or technological removal.

Climate projects offer multiple benefits such as reduced pollution, job creation, and support for local communities.

Carbon credits can be allocated by governments or generated as carbon offset credits. They represent a verified reduction of one metric ton of CO₂e and can be achieved through various activities. These credits can be categorized into two types:

1. Avoidance/Reduction credits involve implementing lower-carbon technologies and avoiding emission practices, such as reducing deforestation. Projects can be grouped into Avoided nature loss, which limits the loss of nature like forests and peatlands, with high co-benefits for nature and society, and Technology-based reduction, which reduces emissions from sources without financial incentive or regulatory requirement to decarbonize. These projects have co-benefits like improving livelihoods and reducing future removal needs. Industry partnerships are critical to develop newer tech like green hydrogen, sustainable aviation fuels, and green cement.

2. Removal/Sequestration credits involve taking out and using/storing CO₂ from the atmosphere through nature-based or technology-based methods. Nature-based sequestration includes reforestation, soil restoration, and enhancing peatlands and mangroves. These natural climate solutions have positive impacts on biodiversity, water and soil quality, and local communities. Technology-based removal uses Bio-Energy with Carbon Capture and Storage (BECCS) and Direct Air Capture with Carbon Capture and Storage (DACCS) to remove CO₂ from the atmosphere permanently.

Functional carbon markets are crucial for financing GHG reduction projects. A large, efficient market could move billions from carbon-neutral companies to reducing/removing carbon ones. By 2030, the market could be worth \$5-50 billion based on demand for 1-2 Gt CO₂. Some markets prohibit offset credits due to difficulty verifying them, but they can promote tech development. Disclosure of annual emissions and clear strategies are essential. A successful market allows for nature-based and cost-competitive tech solutions. Heavy-emitting industries can partner for low-carbon solutions. Blended financing may be needed for high-risk tech, and early investors could benefit.

Scaling the Voluntary Carbon Market: A Blueprint for Transparency, Verifiability, and Robustness

The market size of the voluntary carbon market could reach over USD50 billion in 2030 , depending on various price scenarios and their driving factors. The demand for this market is assumed to be between 1-2 Gt CO₂. To boost the growth of the market at this scale, the Institute of International Finance established a Taskforce on Scaling Voluntary Carbon Markets in 2020 to significantly expand the voluntary carbon market, making it transparent, verifiable, and robust.

The taskforce took an initial action by developing a plan for a voluntary carbon market that would make it easier, cheaper, and more transparent to buy and sell carbon credits, enhancing trust and authenticity in the process. This market blueprint is intended to meet the expected growth in demand as more businesses strive to adhere to the Paris Agreement's goal of restricting global temperature rise to 1.5 degrees Celsius above pre-industrial levels.

The Taskforce operates based on four primary principles:

Firstly, develop open-source solutions that private organizations can adopt.

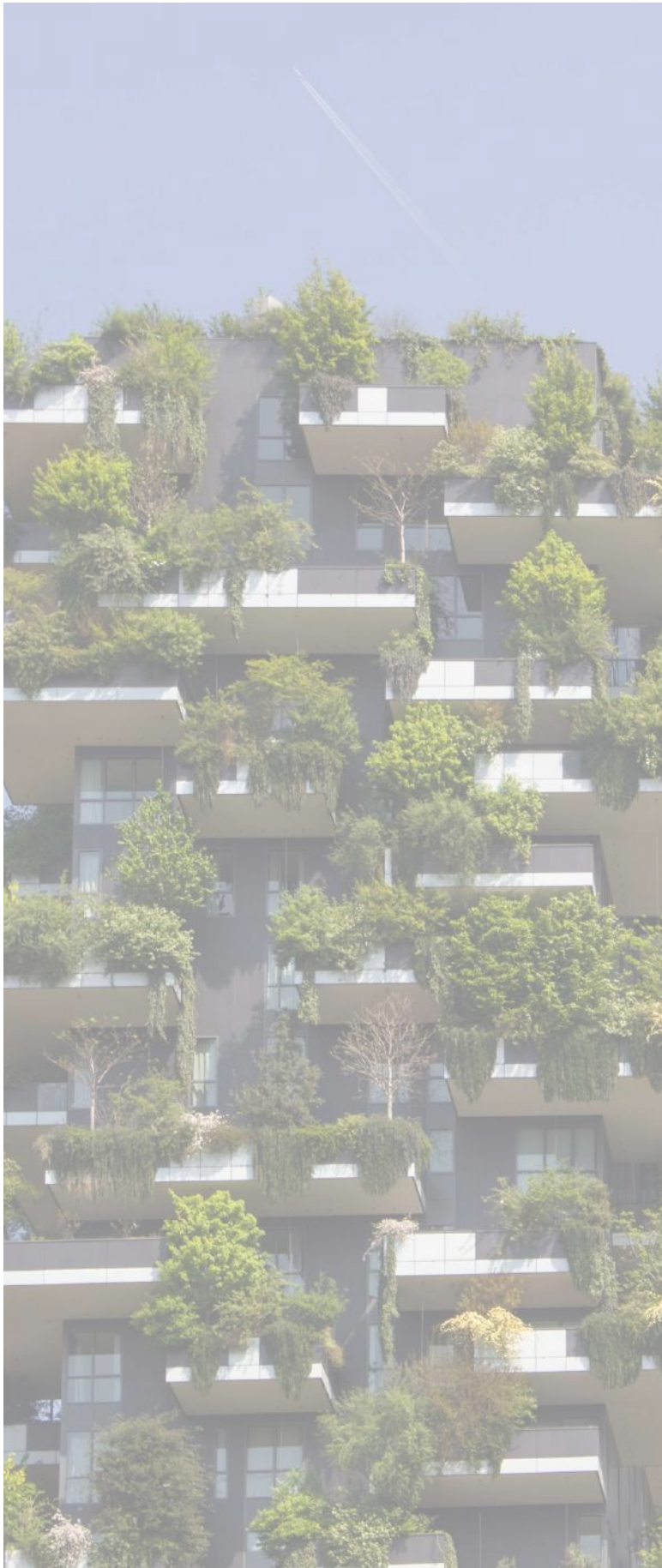
Secondly, the integrity of voluntary carbon markets must be maintained to prevent negative outcomes, and this must be in line with the do-no-harm principles.

Thirdly, the Taskforce will support and amplify the work of parallel initiatives in the field.

Lastly, the Taskforce's main principle is that voluntary carbon markets must not discourage companies from their own efforts to reduce emissions



Carbon Market Participants: A Diverse Mix of Private and Public Sector Entities



The carbon market attracts a wide range of participants from both the private and public sectors. The private sector is represented by various entities, including companies that have binding obligations to reduce emissions, those that have made voluntary commitments to do so, emission-reduction project developers, banks, investment firms, brokerages, law firms, accounting firms, technology developers, and consultants. On the other hand, the public sector is represented by entities such as multi-lateral development banks like the World Bank, government agencies, UN agencies, and non-governmental organizations.

USD 50 Billion

The demand for this market is assumed to be 1-2 Gt CO₂

Evolution of Global Carbon Markets: Increasing Revenue and Trends in Pricing Mechanisms

Global carbon pricing revenue collected in 2021 was around USD 84 billion, representing an increase of over USD 31 billion compared to 2020. Similar to previous occurrences, the surge in carbon revenue is driven by higher carbon prices in various Carbon Trading Systems including the EU ETS, which generates 41% of total carbon pricing revenue, as well as the New Zealand ETS, which began selling allowances, and the California Cap-and-Trade Program.

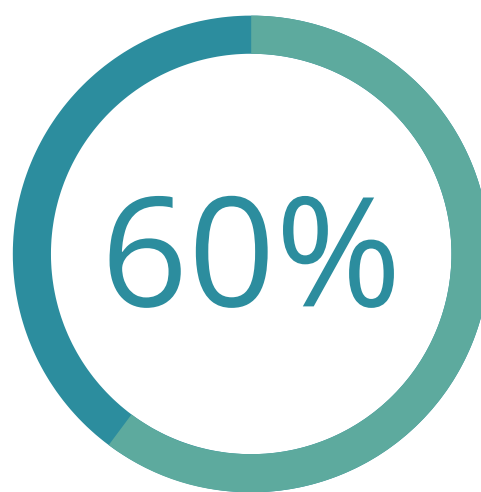
Another factor contributing to the evolution of carbon markets is the growing proportion of auctioned allowances instead of free allocation. This trend is exemplified by New Zealand, which has recently increased its auctioning activities as part of a wider overhaul of its ETS.

Furthermore, most of the revenue collected from carbon pricing schemes in 2020 has been allocated to specific projects, such as environmental or development initiatives, according to The Institute for Climate Economics. Carbon tax revenue is also generally earmarked, but a larger portion is directed to consolidated revenue, and to a lesser extent, distributed through tax exemptions or direct transfers.

However, this categorization is complex and may not capture nuances in fiscal policies, such as revenue being assigned to multiple categories or set aside for specific purposes without legal earmarking. Carbon pricing revenue can be utilized to support sustainable recovery and finance broader fiscal reforms. For instance, Israel's proposed carbon tax includes the reform of existing fuel excise frameworks, while Uruguay's newly implemented carbon tax replaces existing fuel excise charges, and the revenue generated is used to finance policies that promote GHG mitigation and adaptation.

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Two new Emission Trading Systems (ETSs) launched in 2021 - the UK ETS (which includes revenue previously collected under the EU ETS) and the Germany ETS - contributed over 16% of total carbon pricing revenue in 2021. It is important to note that the Chinese national ETS provided free allowances throughout 2021, which resulted in no revenue being generated from this ETS despite it covering the highest amount of emissions. For the first time ever, revenues generated by ETSs exceeded those generated by carbon taxes, with ETSs contributing more than two-thirds of total revenue in 2021. This is primarily due to the fact that ETS prices are increasing at a faster rate than fixed-price instruments.



Carbon pricing revenue increase from 2020 to 2021

Key Trends Shaping Voluntary Carbon Markets Globally

Globally, voluntary carbon markets are being shaped by 4 key trends.

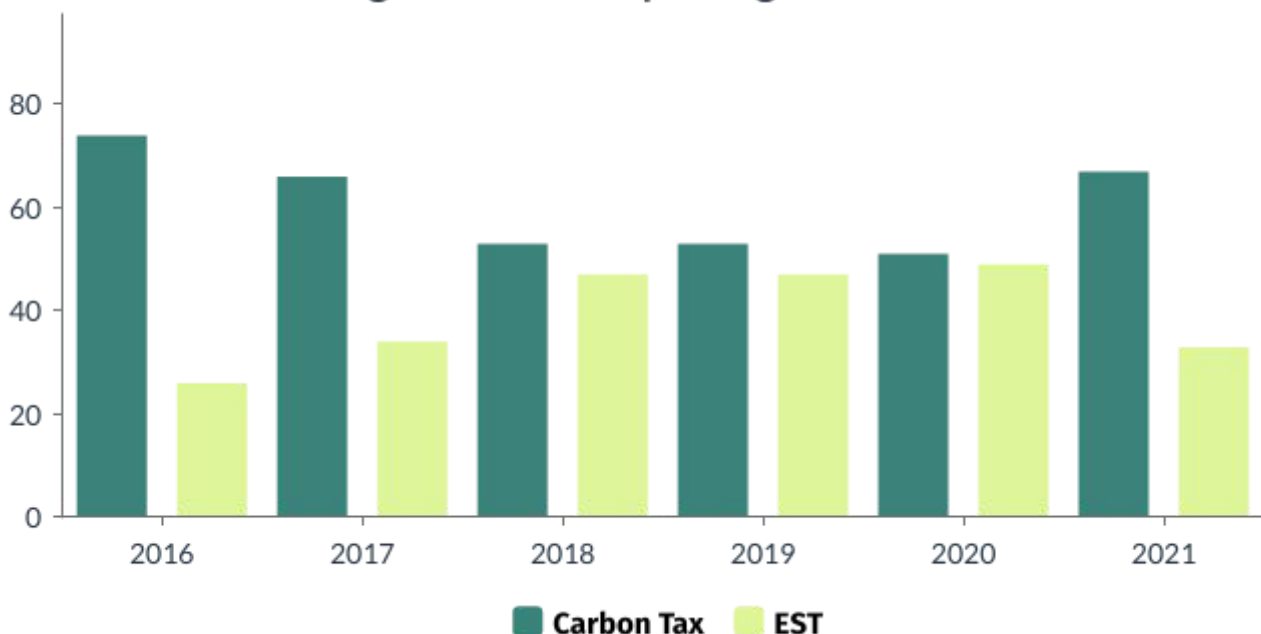
Volume growth: The demand for voluntary carbon markets is steadily increasing and predicted to rise by 15x by 2030 and 100X by 2050 . This growth is being driven by a rising number of corporate net zero commitments and an increase in point-of-sale offsetting, where carbon credits are bundled with physical products to offset the product's carbon footprint, particularly residual emissions. In the long run, demand will be propelled by the need for carbon removals to tackle residual emissions in challenging-to-decarbonize sectors. VCMs are expanding beyond their conventional markets in Europe and North America, with new markets emerging in Asia, the Middle East, and Latin America.

Shift of project types: The voluntary carbon markets are experiencing changes in project types and buyer preferences. New technology-based removal projects, like Direct Air Carbon Capture and Storage (DACCS), are becoming more popular alongside traditional nature-based methods. In addition to these changes, there is a trend among carbon credit buyers that favor removal credits, such as reforestation and Direct Air Capture, over reduction or avoidance credits, like renewables and REDD+. This may be due to confusion about the role of avoidance credits in a company's decarbonization efforts and a need for guidance from target-setting organizations to clarify this issue.

Price growth: The cost of carbon credits differs depending on the type of project, and currently, nature-based projects are being sold for higher prices than other types. In 2021, the average global price for credit was USD 4.08, but it is anticipated that prices will increase in the future. Futures prices in the Chicago Mercantile Exchange reveal that nature-based credits will be worth 3X more in 2025 than they are currently. Additionally, certain credit types are predicted to see a significant price rise, as purchasers prioritize credits that demonstrate high-integrity removal. Engineered CO2 removal credits, such as those generated through Bio-Energy with Carbon Capture and Storage or Direct Air Capture and Storage, are presently being sold for an average of USD350-USD400 per tonne.

Increased government activity: An increasing number of nations are considering the possibility of participating in voluntary carbon markets, which was a previously unexplored area for many of them. This can be accomplished either by producing jurisdictional credits or by engaging in bilateral country-to-country credit transactions.

Evolution of global carbon pricing revenues over time



Key Trends Shaping Voluntary Carbon Markets Globally

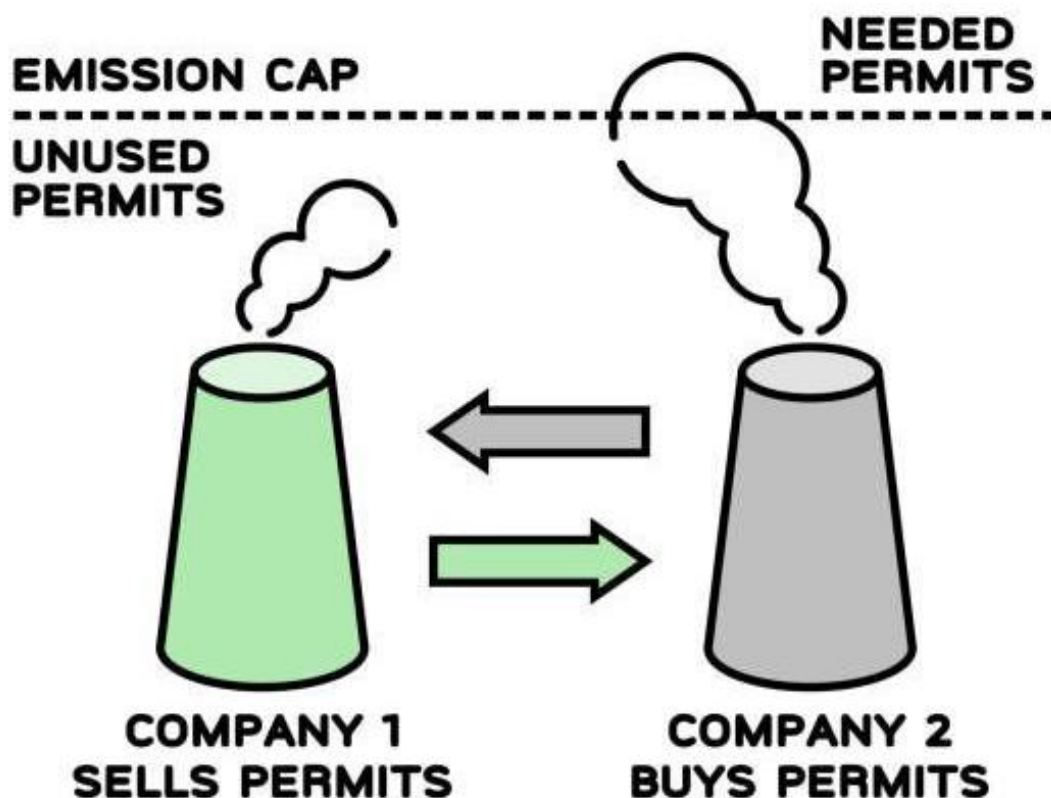
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Historical Overview and Current Status of Carbon Markets' Development Globally.

The Kyoto Protocol, which was agreed upon at a UNFCCC conference in Japan in 1997, marked the beginning of the international carbon pricing system through its flexibility mechanisms. The protocol mandated industrialized countries to decrease their GHG emissions by 5.2% below pre industrial levels between 2008 and 2012, with the option to achieve this target via domestic measures or three mechanisms: International Emissions Trading, Joint Implementation, and Clean Development Mechanism.

1. CLEAN DEVELOPMENT MECHANISM (CDM)

Article 12 of the Kyoto Protocol

The CDM is a program that permits emission reduction or removal projects to earn certified emission reduction (CER) credits in developing nations. Each credit is equivalent to one tonne of CO₂ and can be traded, sold, and utilized by industrialized countries to meet their emission reduction targets under the Kyoto Protocol.

CDM encourages sustainable development and emission reductions while offering flexibility to industrialized nations in how they meet their targets. To qualify for the program, projects must pass a rigorous and transparent registration and issuance process that ensures measurable, verifiable, and additional emission reductions beyond what would have occurred without the project.

The CDM Executive Board oversees the mechanism and is accountable to the countries that have ratified the Kyoto Protocol. The program is considered a pioneer as it is the first global investment and credit system of its kind that provides a standardized emissions offset tool.

2. INTERNATIONAL EMISSIONS TRADING (IET)

Article 17 of the Kyoto Protocol

Nations that have made pledges under the Kyoto Protocol can obtain emission credits from other participating nations and apply them towards fulfilling a portion of their obligations.

To ensure the secure transfer of emission reduction units between countries, an electronic accounting system called **The International Transaction Log** is used. The creation of the European Union Emissions Trading Scheme was driven by the Kyoto Protocol, and many individuals predict the expansion and interconnection of emissions markets across the world.

3. JOINT IMPLEMENTATION (JI)

Article 6 of the Kyoto Protocol

The JI mechanism enables countries with emission-reduction commitments under the Kyoto Protocol to participate in emission-reduction or emission removal projects in other countries with commitments under the Protocol.

The resulting emission units can be counted towards meeting the country's Kyoto target. Emission reduction units (ERUs) are earned by JI projects, with each unit equivalent to one tonne of CO₂. The projects must ensure that all emission reductions are real, measurable, verifiable, and additional to what would have occurred without the project. The JI mechanism offers two approval tracks for projects: party-verification and international independent body verification.

The JI Supervisory Committee oversees the mechanism and is accountable to the countries that have ratified the Protocol. The mechanism was extended until 2020 through a 2012 amendment and played a significant role in the growth of cross-border carbon markets.

In subsequent years, various countries and regions created their carbon markets, such as the European Union, Australia, New Zealand, and California. The Paris Agreement was signed in 2015, in which countries committed to limiting global warming to below 2°C and striving to limit it to 1.5°C. This agreement gave a further boost to carbon markets as nations around the world pledged to reduce their emissions and join carbon markets.

A review of the successful carbon market case studies.

Carbon markets have become an essential instrument in curbing greenhouse gas emissions and minimizing the consequences of climate change. However, even with their increasing popularity, the establishment and functioning of these markets face challenges.

Carbon markets' effectiveness in emission reduction is a concern, especially without a global market. Carbon offsets allow firms to invest in emission-reducing projects rather than reducing their own emissions, raising environmental and social impact concerns for affected communities.

1. European Union Emissions Trading System (EU ETS):

The EU ETS started in 2005 is the largest carbon market in the world, covering over 11,000 power plants and industrial facilities in 31 countries. It works by setting a cap on the total amount of GHG emissions that companies in the system are allowed to emit each year, and then allowing companies to buy and sell carbon credits to meet their emissions targets.

2. Regional Greenhouse Gas Initiative (RGGI):

The Regional Greenhouse Gas Initiative (RGGI) is the first mandatory carbon trading program in the United States, which limits carbon dioxide emissions from the power sector. Currently, 11 states are participants of the RGGI program, including Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Vermont, and Virginia. New Jersey temporarily withdrew from the program in 2012 but rejoined in 2020, while Pennsylvania is expected to join the program in 2022.

RGGI was created in 2005 and held its first auction of carbon dioxide emission allowances in 2008.

The average CO₂ emissions from power sources under the RGGI program have decreased by 48% from 2006-2008 to 2016-2018. The participating states aim to further reduce emissions by 30% below 2020 levels by 2030.

The RGGI program requires power plants with a capacity greater than 25 megawatts to acquire an allowance for each ton of carbon dioxide they emit each year.

Compliance can be achieved by purchasing allowances through quarterly auctions, other power generators within the region, or through offset projects. From 2009 to 2017, the RGGI states experienced a net economic benefit of USD 4.7 billion from the cap-and-trade program.

3. California Cap-and-Trade Program:

The California Cap-and-Trade Program is a market-based mechanism launched in 2013 to reduce greenhouse gas emissions. It sets limits on company emissions and requires them to purchase carbon credits. The state aims to decrease emissions to 1990 levels by 2020, 40% below 1990 levels by 2030, and 80% below 1990 levels by 2050. Additionally, California aims for 100% carbon-free electricity and full carbon neutrality by 2045.

The program covers power plants, industrial facilities, and fuel distributors, with 450 businesses responsible for 85% of California's greenhouse gas emissions needing to comply. California has linked with Quebec's cap-and-trade program, allowing businesses to use emissions allowances from either jurisdiction, expanding the program and reducing compliance costs.

From 2013 to 2017, California's statewide greenhouse gas emissions decreased by 5.3%. California's cap-and-trade program, which invests billions in emission-reducing projects and covers 85% of the state's emissions, may have contributed to the reduction, although it is difficult to pinpoint specific factors.

4. China Emissions Trading System (ETS):

In 2021, China's national Emissions Trading System (ETS) began trading on the platform run by the Shanghai Environment and Energy Exchange (SEEE).

The national ETS regulates 2,162 companies from the power generation sector, which collectively emit around 4.5 billion tons of carbon dioxide per year. This makes China's national carbon emissions exchange the largest carbon market in the world, covering one-seventh of global carbon dioxide emissions from fossil fuel combustion.

China started experimenting with emissions trading in eight regions in 2013 and officially launched its national ETS in 2021. During the initial phase, the ETS regulates over 2,200 companies from the power sector, including combined heat and power and captive power plants of other sectors, that emit more than 26,000 tCO₂ per year during the period of 2013 to 2019. In total, the ETS covers over 4 billion tCO₂, accounting for approximately 40% of the country's carbon emissions, making it the largest carbon market by volume.

China's national ETS is expected to be a crucial policy tool in fulfilling the country's climate goals in both the short and long term. China's key targets include reaching its peak in carbon emissions by 2030 and becoming carbon neutral by 2060. The prices of the first transactions in the national ETS are higher than the average price of the regional pilot programs over the past year.

14.3%

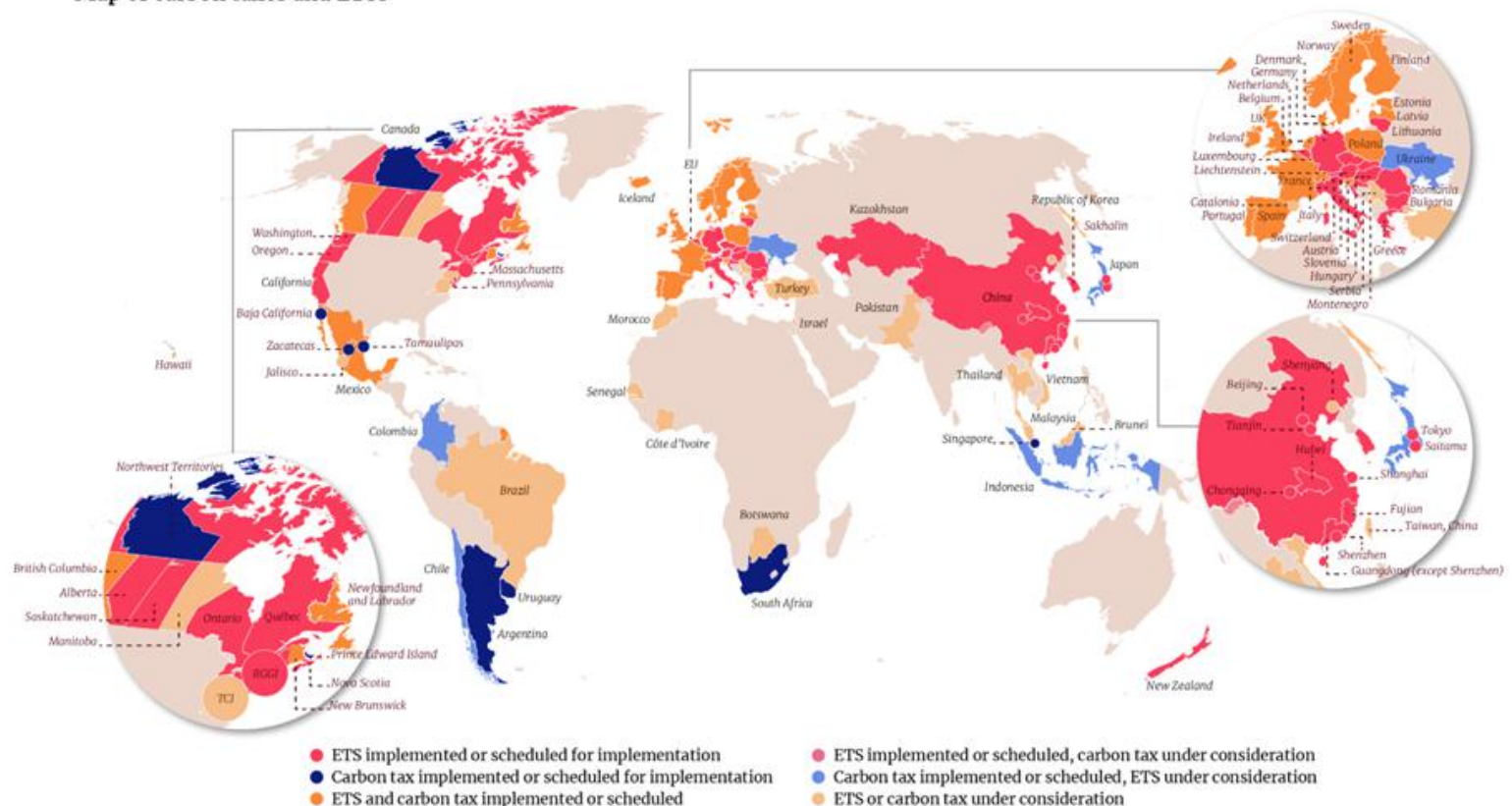
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5. The Tokyo Cap-and-Trade Program:

The Cap-and-Trade Program of the Tokyo Metropolitan Government (TMG), Japan's first mandatory emissions trading scheme (ETS), was initiated in April 2010 and connected to the Saitama ETS. The program mandates large buildings, factories, heat providers, and other entities that consume significant amounts of fossil fuels to reduce emissions below a specific baseline for each facility.

The targets for each covered facility vary based on factors such as energy efficiency, type of facility, and reliance on energy from other facilities. Facilities that exceed their emissions reduction targets can trade the credits earned from their additional reductions.

Map of carbon taxes and ETSs



State of voluntary carbon markets in Africa

African voluntary carbon markets are growing, and at a slightly faster pace than global markets 36% CAGR from 2016 to 2021 vs. 31% for global markets. However, the potential to provide climate finance via carbon markets has not been fully utilized. In the last five years, approximately 65% of credits issued were generated by only five countries, namely Kenya, Zimbabwe, DRC, Ethiopia, and Uganda. Moreover, there is a disparity between project activity and carbon credit potential in different countries. Some countries with high potential for carbon credits have had low levels of activity.

Among the countries with the highest potential such as Madagascar, Angola, Nigeria, Sudan, and Tanzania, only the Democratic Republic of Congo has declared a notable carbon credit agreement.

The voluntary carbon market in Africa has many global players operating at various stages of the supply chain, resulting in fragmentation.

Project developers are mostly small-scale and lack diversification, with only around 100 active on the continent in the past decade. The market is highly fragmented, with an average issuance of around 140 ktCO₂e for project developers not in the top 15.

Additionally, project developers tend to focus on similar project types, with approximately 97% of African carbon credits issued in forestry and land use, renewable energy, and household devices, using around 65 different methodologies over the period from 2016 to 2022.

Local validation/verification bodies (VVBs) are scarce in Africa, and the vast majority of credits are certified by international bodies such as Verra (~80%) and Gold Standard (~20%), with a small fraction (<1%) certified by other entities. Furthermore, there is a noticeable absence of active African-based exchanges or marketplaces, although various initiatives are underway to establish such platforms. These initiatives include a partnership between AirCarbon and the Nairobi International Financial Center, an undertaking launched by the Johannesburg Stock Exchange, and a recently announced project by the Egyptian Government and the Egyptian Stock Exchange.

With regards to demand, most demand for African credits is driven by major international companies. Momentum is building around Africa's voluntary carbon markets, and African governments are increasingly recognizing their potential. The space is occupied by national, regional, continental and global initiatives with some efforts focused on specific sectors, others focused on broader carbon markets and a few focused on overall climate solutions of which carbon markets is just one.

Potential value of Africa-sourced carbon credits: up to \$50 billion or more by 2030



Ambition of the Africa Carbon Markets Initiative (ACMI)

The Africa Carbon Markets Initiative (ACMI) has been established to promote the growth of African carbon markets and overcome challenges hindering their development. The initiative, supported by a coalition of organizations focused on climate impact, clean energy, and sustainable development, aims to create a thriving voluntary carbon market ecosystem in Africa by 2030.

ACMI aims to support the growth of carbon credit production and promote economic development by focusing on decarbonization, energy access, clean energy, forest protection, agriculture, and new income sources. Through ACMI, Africa could leverage carbon markets to attract international investment to address environmental challenges, improve health, and create jobs.

However, while African carbon market activity is growing, it falls short of its potential, with a limited number of countries accounting for the bulk of carbon credits issued to date.

ACMI aims to scale the supply of and demand for African carbon credits, as the 2030 technical potential of Africa-sourced carbon credits is estimated to be up to 2,400 MtCO₂e³ per annum across sectors such as forestry, agriculture, blue carbon, renewable energy, household devices, livestock, and waste management. To achieve this potential, ACMI will need to overcome challenges such as fragmented projects and carbon generating assets, a lack of large-scale developers with sufficient capital and expertise, and a complex and uncertain regulatory landscape.

ACMI's long-term objective is to expand Africa's carbon market to 1.5-2.5 GtCO₂e and mobilize over USD 100 billion per annum by 2050 while ensuring transparent distribution of carbon credit revenue with a significant portion going to African communities. This would benefit Africans by driving renewable energy resources expansion for city-dwellers, promoting healthier cooking for households, improving farming and forestry practices, and creating job opportunities for the growing population.

ACMI has set four main objectives to achieve its goal:



Increase African credit retirements to about 300 MtCO₂e by 2030, which is a 19-fold increase from the 16 MtCO₂e retired in 2020, taking advantage of the global market's estimated 15x growth from 2020 to 2030.



Create or support approximately 30 million jobs by 2030 in all aspects of the value chain, including carbon project development, execution, certification, and monitoring.



Raise the quality and integrity of African credits and increase prices from about USD 5 per tonne in 2021 to about USD 20 per tonne, mobilizing up to USD 6 billion in capital from carbon credits by 2030 and over USD 100 billion per annum by 2050.

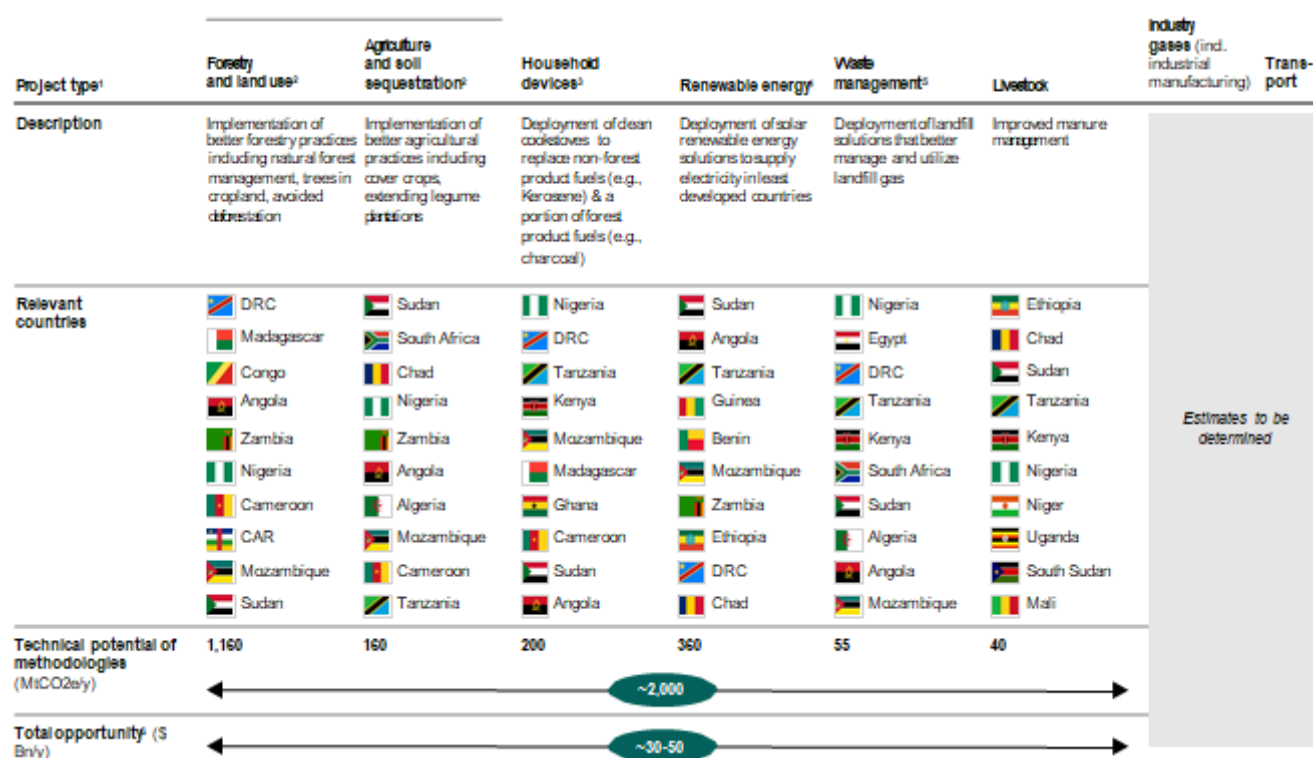


Ensure that the distribution of carbon credit revenue is transparent and equitable, with a significant portion going to local communities. ACMI plans to work with leading organizations to establish transparency and benefit-sharing standards for buyers and sellers, ensuring that the market scales with the correct balance of speed and effectiveness.

Opportunities to generate carbon credits in Africa

Africa has a significant technical potential for carbon credits, with estimations of up to approximately 2,400 MtCO₂e by 2030 through various methods. This could be worth over USD 50 billion if all credits were sold, and even a small portion of this potential could result in billions of climate financing being directed towards Africa, leading to job creation, livelihood improvement, and better energy access, biodiversity, and health.

Several existing methodologies are already active in Africa, such as for forestry, land use, agriculture, soil sequestration, cookstoves, renewable energy, waste management, and livestock projects. Although only nature-based solutions and household devices projects have been implemented meaningfully, these existing methodologies could generate up to 2,000 MtCO₂e, or 85% of the total maximum technical potential in 2030.



Source: ACMI

Africa has the opportunity to explore the development of carbon projects using innovative and emerging techniques and products. These methodologies may involve projects that lack a clear process for validation and verification, such as decommissioning diesel or managing savannah grasslands fires to promote nature.

Additionally, Africa could unlock project types that are globally recognized but have not yet been utilized in Africa, including engineered carbon dioxide removals, blue carbon, and opportunities related to livestock. By adopting these new and nascent methodologies, Africa could potentially produce around 400 MtCO₂e annually by 2030.

Obstacles for growth of African carbon markets

Several challenges still need to be overcome for Africa to fulfil its carbon market potential. These challenges spread across each stage of the value chain.

Supply:

Project Development

1. Limited number of project developers operating in Africa and low capacity of existing developers including gaps in carbon market expertise, implementation capabilities, local expertise and core business capabilities - due in part to the complexity of topic and data, tools and time required. Many projects also have significant physical requirements e.g., seedlings for a reforestation project that can require upfront investment.

Carbon credit project developers operating in Africa are few, relatively small scale and show limited diversification. About 100 project developers have been active on the continent over the past 10 years, of which 15 have issued ~70% of total credits; over 60% of project developers have operated just a single project and over 70% have been active in only one country.

2. High capital intensity for project development

Starting a carbon credit initiative typically necessitates a substantial initial investment. Developers of such projects point out that there are considerable costs associated with establishing a project and bringing it to the stage of validation and verification. This is partly due to the intricate nature of the subject matter and data involved, as well as the tools and time required.

3. Low economic viability for many projects due to insufficient carbon credit revenues or high opportunity costs. Besides capital intensity, new projects may struggle to develop a strong business case. For example, local communities may be faced with high opportunity costs when leveraging land resources (e.g., a community owning forest land may face an opportunity cost between maintaining the forest and replacing it with farmland).

4. Complex /unfavourable regulatory landscape. Developers of carbon credit projects in Africa face obstacles related to regulations. The regulatory framework for carbon credit projects can be complicated and uncertain. The regulations governing issues such as land rights and credit ownership can vary from one country to another. In certain countries, the state has complete ownership of all carbon rights, and private developers must obtain authorization to sell credits and report transactions. Additionally, many landowners in Africa lack official land titles or rely on informal land tenure practices, making it challenging to demonstrate that a project can protect carbon sinks for the standard 25+ year period and to prove the right to sell carbon credits that result from the project.

5. Fragmented ownership of or access to credit generating assets. In Africa, assets that have the potential to generate carbon credits are often fragmented. For example, approximately 80% of the agricultural land is comprised of smallholder farms of ~2 hectares in size. This makes it incredibly difficult to deploy large, at-scale carbon projects. This is not only the case for land but also for other credit generating assets such as livestock.

6. High degree of local relationships and/or community buy-in required to ensure project success. On top of this, many projects require community buy-in or a grassroots approach. For example, deploying a cookstoves project requires working closely with local communities to educate community members about the stove product, distribute and sell stoves. Similarly, project developers have noted the need to ensure that on-the-ground teams speak the local language which can vary within a single country.

7. Distrust of project-based REDD+opportunities vs. jurisdictional projects. Globally, there are signs of increasing distrust towards project-based REDD+ efforts vs. jurisdictional REDD+ efforts for example the Lowering Emissions by Accelerating Forest finance

(LEAF Coalition) that uses the independent The REDD+ Environmental Excellence (TREES) standard from ART, or programs under Verra's Jurisdictional and Nested REDD+ or JNR). Global critics indicate that jurisdictional projects may be less at risk of leakage (e.g., given government controls land use) and easier to do at scale. This distrust of project-based approaches could potentially impact Africa's opportunity to protect its full set of natural assets.

8. **Lower ease of doing business** in some areas due to factors such as lack of infrastructure. African projects also face general challenges due to a lower ease of doing business.

9. The available **methodologies** provided by standards organizations for carbon credit projects may not be applicable in Africa, particularly in relation to pastureland or diesel replacement, as well as technology usage which is not tailored for the African context. The current methodologies are more suitable for established project types and may not be adaptable to the monitoring and measuring needs of Africa, where infrastructure can pose a challenge and assets can be fragmented. Moreover, Africa presents untapped opportunities for decarbonization and carbon sinks that are not well captured by current methodologies. For instance, many regions in Africa are characterized by high forest low deforestation (HFLD) which may not comply with existing methodologies. Additionally, Africa has the potential to shift from fossil fuels to renewable energy, which is not effectively accounted for in the current methodologies.

10. **High cost and long lead times** for certification, validation and verification.

Validation and verification of carbon credit projects can have a high cost and require long lead times. Projects in Africa had an average of 2-7 years (varied by project type) from start date to first credit issuance, resulting in a significant period of initial investment prior to receiving returns.

Once up and running, projects must continually monitor and validate CO₂e emissions reductions or removals. This can be costly as it may rely on expensive technology that are hard to deploy in an African context.

11. **Insufficient local validation/verification capacity** including lack of African-based validation/verification bodies (VVBs) and local expertise. Verifying a carbon credit project requires collaborating with a third-party validation/verification body (VVB) to adhere to a methodology set out by a standards organization. Africa lacks capacity and capabilities when it comes to VVBs. Very few of the existing players certified by standards such as Gold Standard or Verra have offices in Africa. Additionally, project developers indicate a lack of technical expertise required to verify projects in Africa.

12. **High reliance on relationships, brokers and traders** to bring supply to market. There is a high reliance on intermediaries who own the relationships to bring African credits to the market, and therefore often extract a significant portion of the value. Without the capabilities, time, and contacts it can be difficult for individual project developers to identify buyers without the support of an intermediary.

13. Intermediaries play a crucial role in facilitating transactions of carbon credits, but their **high costs** can have a significant impact on the revenue share for the suppliers. Fees charged by intermediaries can range from less than 5% to as high as 70%, which can be a burden for suppliers, particularly in Africa where most intermediaries are international players. Lack of transparency and difficulty in understanding the fees charged can further exacerbate the problem, leading to reduced financing and revenues for local communities.

14. No standardized processes for rating/assessing important carbon credit co-benefits. A standardized system for evaluating carbon credits that takes into consideration significant co-benefits is not currently in place. Therefore, purchasers must conduct extensive research on projects to grasp their social influence. This may impede the market for African carbon credits, which rely on co-benefits like better access to energy and enhanced livelihoods as a crucial incentive.

15. Small project developers in Africa heavily depend on consistent cash flow and cannot afford to wait for better prices or postpone credit sales. Financing options are scarce in the continent, and there are few effective methods to reduce investment risks for project development and supply, such as futures contracts and insurance.

16. The absence of adequate strategies to reduce risk and encourage investment in project development and supply, such as project supply-chain financing, futures contracts, and insurance, is a challenge. Additionally, many African project developers lack the capacity to withhold or defer the sale of credits for better prices, as they depend on steady cash flow. In contrast, bigger intermediaries are more adaptable to market fluctuations, but this often comes at the cost of reduced community earnings due to higher mark-ups.

17. High cost of capital for financing.

Project developers often face a high cost of capital for the financing they do receive, given the multitude of risks (real and perceived by financiers).

18. Concerns on the integrity of certain credit.

There are significant global concerns over the integrity of carbon credits (e.g., greenwashing) – whether from Africa or from other regions. Certain credit types are criticised for being low integrity, either because the underlying emissions reductions are difficult to confirm, likely to be temporary, or would have happened regardless. There are broader concerns that the existence of voluntary carbon markets acts as a license for companies to continue emitting carbon. These concerns must be accounted for and addressed to ensure that African carbon markets develop with high integrity.

19. Shifting and confusing demand trends that could impact common African carbon credit types.

Global buyers may have some confusion and misinterpretation about the value of avoidance credits, which are especially relevant to African initiatives. This could be due to their perception that removal credits are the only legitimate and reliable means of offsetting, given their focus on demand-driven initiatives and guidance.

However, it is important to note that around 70% of Africa's potential for nature-based initiatives is avoidance-based, including all household devices and energy projects. It is estimated that roughly 80% of Africa's technical potential for reducing 2,400 MtCO₂e by 2030 will be achieved through avoidance-based initiatives. Such trends have the potential to impede Africa's access to funding for these projects or reduce the funding they receive.

20. Pricing may not accurately reflect the value of Africa carbon credits and their co-benefits e.g., energy access, biodiversity. African credits' pricing may not always reflect credits' value and thus lack transparency for buyers, driven in part by inability to effectively price the co-benefits. While African credits were on average priced above global average in 2021 (USD5.52 vs. USD4.08), this value may not fully reflect the immense co-benefits African credits can offer. Carbon credit projects can drive impact in energy access, improving livelihoods, supporting health and wellness, and creating jobs.

21. Limited local demand across the credit ecosystem.

Africa relies almost entirely on international demand. There are no local demand markets on the continent, except in South Africa. While a few Africa-based companies purchase carbon credits (e.g., Nedbank), most of the largest buyers are international organisations.

"As the value of carbon credits rises, so too does the value of land where these carbon credits are generated, and investors should ensure the credits they buy reward those doing the lion's share of the work to reduce emissions: local communities"

~White & Case~

Proposed Action by ACMI

The ACMI proposes several actions to support the development of carbon projects in Africa. These actions include:

1. The establishment of an accelerator/incubator to support high-potential new or emerging project types, particularly technology-based projects. This would involve providing technical assistance and facilitating access to potential investors and international developers of similar projects. Large international buyers could be potential partners.
2. The reinforcement of targeted on-the-ground technical assistance to support project developers throughout the project life cycle. This could be embedded in country planning or offered through regional initiatives for carbon markets or large pan-African technical assistance providers.
3. The establishment of a technical facilitation program aimed at reducing barriers to entry for carbon credit certification for project developers in Africa. The main objectives of this program would be to work with standards organizations to provide more standardized methods for Africa, establish an Africa data baseline, facilitate knowledge sharing, create a public-access repository of template project design documents and online training materials, and create a curriculum in partnership with universities for the development of carbon credits.
4. Actively mobilizing new project developers by reaching out to potential candidates and conducting awareness-raising activities such as conferences and workshops. Potential partners could include nature analytics/geospatial data providers, organizations that can provide data, standards organizations, universities, and technical schools.



Carbon credit generation programs for small-scale farmers

Although smallholder farmers contribute up to 70% of Africa's food supply, it is difficult for them to access and benefit from carbon markets, as high upfront certification costs to create carbon credits and project monitoring costs require scale and access to financing/buyers.

Micro-carbon credit supply models offer smallholders the opportunity to earn income from carbon credit projects through various means, such as:

- The aggregation of farmers into larger carbon credit programs to distribute the expenses of certification and project development;
- The use of technology, including satellite imagery and remote-sensing tools, to monitor biomass growth by smallholder farmers and issue carbon credits accordingly, which helps to further reduce monitoring costs;
- The involvement of a local field force to train and onboard farmers and monitor their impact. For example, Acorn42 partners with field force organizations to enroll farmers, collect real data on sample plots, train AI models, and conduct sample checks.
- The utilization of digital platforms or marketplaces to connect credits produced by smallholder farmers with international buyers.

These models have been particularly developed for agroforestry, conservation, and sustainable agriculture projects worldwide. Some standards, such as Verra, the Gold Standard, and Plan Vivo, have developed methodologies to certify agroforestry projects. Plan Vivo's "PM001 Agriculture and Forestry Carbon Benefit Assessment" methodology, in particular, demonstrates the potential for smallholder agriculture and community forestry projects.

Tactical starting point for any country seeking to build a carbon ecosystem is to draw up a plan for developing the market. Colombia and Mexico's recent efforts provide good examples.

The Colombian Voluntary Carbon Market Platform (CVCMP) was launched in 2016 in cooperation with the Ministry of Environment and Sustainable Development, the Colombian Stock Exchange and with technical support from Fundación Natura, aiming to activate the Colombia carbon market through regulatory framework and supply and demand stimulation.

The launch of the CVCMP was a component of the Colombian government's attempt to fulfill its Nationally Determined Contribution goals by promoting the use of domestically-produced carbon credits that are validated according to recognized carbon standards. The government established a working group with State representatives, created a national carbon credit registry, and defined a minimum carbon price through a carbon tax as part of these efforts.

The government of Mexico created a voluntary carbon credit exchange with assistance of the UN Environment Programme (UNEP) and the UK PACT (MEXICO2). It also implemented capacity building activities including training sessions, market simulations and study tours for project developers. Mexico's VCM retirement volume grew to 620 ktCO₂e (~USD2.5 million) in 2021 from ~30 ktCO₂e in 2011.

Experiences of Colombia and Mexico demonstrate that focused country-level approaches to VCMs can significantly expand climate projects and highlight the opportunity for African countries to develop such purposeful approaches to activating carbon market ecosystems. ACMI is urging African nations to create plans to activate voluntary carbon markets that would include defining the country's level of ambition, integrating the VCMs into the broader climate plans, aligning relevant governance structures, clarifying regulations, developing demand incentives, and supporting the local market ecosystem.

ACMI has identified seven areas that require attention in the activation plan for a voluntary carbon market:

1

Ambition: Governments must set specific targets to increase carbon credit volumes at national and sectoral levels. These targets will guide actions required to unlock potential in sectors and project types most relevant for the country.

2

Integration into climate plans: Carbon markets can help achieve climate and energy transition goals, and a VCM activation plan should specify their role. They should be combined with national financing to advance effective climate action.

3

Governance structure: Roles and accountability concerning the VCM activation plan must be clarified at all levels of government. Central coordination will ensure that existing sectoral strategies are integrated into the national carbon market plan.

4

Regulations are vital for voluntary carbon market growth. They should enable VCM development with guidelines for carbon credit commercialization, registration, emissions reporting, land regulation, fiscal policy, and Article 6 accounting clarification.

5

Facilitating the supply ecosystem: Countries should offer training and financial support to project developers and verification bodies. For instance, Mexico's National Institute of Nuclear Research provides workshops to improve technical skills for carbon capture projects

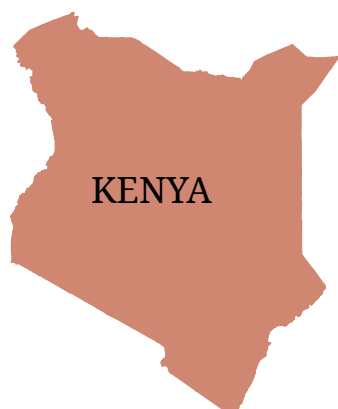
6

Jurisdictional REDD+ programs: Where applicable, countries can pursue harmonization with current REDD+ standards to enable jurisdictional REDD+ programs

7

Demand Incentive: Clear market rules can boost local and global demand for country carbon credits. This requires a carbon tax to drive local demand, quantification of emissions, and the use of a carbon registry, which can be developed nationally or through existing registries.

Potential targets of VCM by African Countries



NDC established a target to reduce emissions by 32% below business-as-usual by 2030. Kenya could develop a comprehensive voluntary carbon market activation plan, expanding into sectors such as agriculture, forestry, and renewable energy. This could mobilize up to \$1.3 billion per year by 2030 and support over 3 million jobs.



Nigeria has passed the Climate Change Act and the Energy Transition plan, which set targets to reduce greenhouse gas emissions by 47% in 2030, achieve carbon neutrality by 2060, and generate 30 GW of energy by 2030, with 30% renewable energy. To achieve these goals, Nigeria could create a comprehensive voluntary carbon market activation plan, aiming to retire 30-40 MtCO₂e by 2030 and expanding to project types such as forestry, agriculture, DRE, and livestock. This could mobilize up to \$0.6-0.8 billion per year by 2030 and support over 3 million jobs.



Gabon is committed to remaining carbon-neutral beyond 2050, with a goal of maintaining its net carbon absorption of at least 100 million tCO₂e per year. Gabon could expand its existing regulations to create a comprehensive voluntary carbon market activation plan, aiming to retire 9-12 MtCO₂e by 2030 and capturing 20-30% of its maximum annual technical potential. This could mobilize up to \$250 million per year by 2030 and support over 3 million jobs.



TOGO

Togo's NDC set an unconditional target to reduce emissions up to 6 MtCO₂e, 21% below BAU by 2030. Togo could develop a comprehensive voluntary carbon market activation plan, expanding from waste management projects to sectors such as forestry, household devices, renewable energy, and livestock. By retiring 2-3 MtCO₂e by 2030, Togo could cover up to 50% of its NDC target, mobilizing up to \$60 million per year by 2030 and supporting over 100,000 jobs.



MALAWI

Malawi's NDC set a target to reduce emissions by 12.8-18.1 MtCO₂e below BAU by 2030. Malawi could develop a comprehensive voluntary carbon market activation plan, retiring 3-5 MtCO₂e by 2030 and expanding to include forestry and waste management projects. This could cover up to 30% of the NDC target, mobilizing up to \$100 million per year by 2030 and supporting over 300,000 jobs.



MOZAMBIQUE

Mozambique aims to reduce emissions by 40 MtCO₂e until 2025. By capturing up to 30% of its maximum annual technical potential, Mozambique could produce up to 25 MtCO₂e annually by 2030, expanding into forestry, renewable energy, and household devices projects. This could mobilize up to \$500 million per year by 2030 and support over 500,000 jobs.

Potential targets of VCM by African Countries

Verified Carbon Credits (VCMs) have seen significant growth worldwide in the past five years, with a compound annual growth rate of over 30 percent between 2016 and 2021 due to carbon credit retirements. The popularity of VCMs as a means of reducing carbon emissions has increased, resulting in a 50 percent rise in demand last year. The current value of carbon credit retirements is estimated to be over USD700 million, indicating the significant potential of VCMs in tackling climate change.

Although demand for African-origin carbon credits has also grown at a compound annual rate of 36 percent from 2016 to 2021, it has come from a low starting point. Last year, African carbon credits were only worth USD123 million, far below their potential value. Only about 11 percent of the total credits issued globally from 2016 to 2021 came from African nations, with the majority originating from a few large projects. Africa is thought to be generating just 2 percent of its maximum annual potential of carbon credits currently.





Alternative Ways to Fund African Conservation Areas: Moving Beyond Carbon Credits.

To secure long-term financing for important conservation areas in Africa, it may be necessary to explore a variety of financing solutions beyond carbon credits. Although carbon credits are an effective way to monetize carbon emissions reduction, they do not always apply to conservation areas that lack significant carbon absorption or stocks or fail to meet additionality requirements. Therefore, alternative financing mechanisms must be developed to complement carbon credits, such as bundled products that can be used alongside carbon credits or standalone financing instruments for conservation areas.

There are four main types of financing instruments available for nature protection beyond carbon credits: grant-based, investment-based, ecosystem value-based, and compensation-based. Grant-based instruments are currently the dominant financing method for conservation areas, with philanthropy and government budgets providing the majority of funding. However, there is a growing trend towards results-based financing and public-private partnerships to leverage private finance. Investment-based instruments, such as blended finance and public-private partnerships, aim to generate financial returns while also creating positive social or environmental impacts. Ecosystem value-based instruments monetize sustainable ecosystem value to achieve self-sustaining returns. Finally, compensation-based instruments offer voluntary or compulsory compensation for actual or potential negative environmental impacts.

These financing instruments can be combined or used alone to protect critical geographic areas in the long term. For instance, the Seychelles successfully mobilized capital for marine conservation through the world's first Blue Economy debt for nature swap, which converted national debt into funds for sustainable development of its marine and coastal assets.



Carbon Pricing: Carbon Markets and Carbon Taxes. "Department of Forestry Forest Carbon and Climate Program"

World Bank Group (WBG) Guidelines/Criteria for Selection of Emission Reduction Offsets

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The Lowering Emissions by Accelerating Forest finance (LEAF)

BeZero Carbon "Global carbon ratings and risk analytics"

IFAD: Small farmers with a big message for the world

UNFCCC : NDC Registry



This report was based off of the information found at

<https://openknowledge.worldbank.org/entities/publication/a1abead2-de91-5992-bb7a-73d8aaaf767f>

https://www.seforall.org/system/files/2022-11/acmi_roadmap_report_2022.pdf



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