AFRICA'S CARBON MARKET RESILIENCE AMID GEOPOLITICAL SHIFTS



Gaps, Opportunities and Resilience Strategies

2026

ABRIDGED REPORT

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Glossary

Acronym / abbreviation	Full form / description
ACMI	Africa Carbon Markets Initiative
AfDB	African Development Bank
AFOLU	Agriculture, forestry, and other land use
ARR	Afforestation, reforestation and revegetation
AU	African Union
AUDA-NEPAD	African Union Development Agency–New Partnership for Africa's Development
CARP	Centralized accounting and reporting platform
CCP	Core carbon principles
CDM	Clean development mechanism
COP	Conference of the Parties (UNFCCC)
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
DRC	Democratic Republic of the Congo
GDP	Gross domestic product
GHG	Greenhouse gas
ICVCM	Integrity Council for the Voluntary Carbon Market
ITMO	Internationally transferred mitigation outcome
JNR	Jurisdictional and nested REDD+
LoA	Letter of authorization
MACC	Marginal abatement cost curve
MRV	Measurement, reporting and verification
$MtCO_2e$	Million metric tons of carbon dioxide equivalent
NCO	National carbon office
NDC	Nationally determined contribution
N_2O	Nitrous oxide
ODA	Official development assistance
PACM	Paris Agreement crediting mechanism
REDD+	Reducing emissions from deforestation and forest degradation (plus conservation, sustainable forest management, and enhancement of forest carbon stocks)
SBTi	Science Based Targets initiative
tCO_2e	Tons of carbon dioxide equivalent
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
VCM	Voluntary carbon market
VCS	Verified Carbon Standard (now Verra VCS)
VVB	Validation and verification body

Executive summary

Global carbon markets are undergoing structural transformation driven by the operationalization of Article 6 of the Paris Agreement, tightening integrity standards in the voluntary carbon market (VCM) and increasing scrutiny of credit quality. However, Africa's ability to capture growing demand has been constrained by the integrity transition, which responds to heightened scrutiny of whether carbon credits represent real, measurable, durable and additional carbon abatement. The response to demand and resulting changes in market rules have significantly affected methodologies across several project categories, particularly REDD+ and clean cookstoves, which have historically accounted for nearly 80 percent of Africa's credit retirements.

Currently, Africa is a significant participant in global voluntary carbon markets, with a modest presence in higher-value compliance markets. The continent supplies a quarter of retired credits, amounting to approximately 220 $MtCO_2e$ in 2024 with market share steadily increasing. Further, Article 6.2 transactions remain at an early stage. At the time of writing, Ghana's delivery of approximately 12,000 internationally transferred mitigation outcomes (ITMO) to Switzerland remains Africa's only completed ITMO transfer. However, this is changing: Africa's bilateral ITMO supply in the current pipeline is estimated at 6.7 $MtCO_2e$ by 2030.

Africa is well positioned to capture growing demand as a net exporter of carbon credits, suggesting carbon export revenue could become a larger share of its international climate finance receipts, of which it currently accounts for less than one percent.

Some common gaps emerge, highlighting the need for strategic action. First, gaps in governance, policy and institutions are likely the largest barriers to improved transaction outcomes, frequently restricting offtake possibilities to the VCM only, with lower requirements and prices. Second, gaps in African carbon technical capacity and financial architecture result in reliance on international players and donors, curbing the growth of bankable pipelines, reducing the share of onshore benefits and limiting private capital participation. Third, historically Africa's carbon project pipeline has not optimized value capture due to subscale project size, focusing on lower-cost avoidance credits rather than higher-value removals, and occasionally weak project governance. Fourth, effectively navigating the landscape for demand has proven challenging, as a result of fragmented international market rules, weak domestic demand to anchor the industry and a lack of regional coordination.

Analysis highlights that Africa's strategic opportunity lies not in expanding volume alone, but also in capturing resilient, high-value demand through a three-pronged strategy: scaling high-integrity, CCP-aligned methodologies and diversifying towards technology-driven emissions reductions and both nature-based and engineered removal credits; targeting premium buyers; and expanding access to, and the volume of, domestic offset demand through carbon pricing mechanisms.

To capture this opportunity, the report presents a strategic roadmap centred on UNDP's vision for carbon markets, outlining actions African governments can take to advance national development priorities, safeguard NDC achievement and ensure transparent, equitable benefit sharing through participation in Article 6 and voluntary markets. Horizon 1 focuses on establishing the foundations for market participation; Horizon 2 on optimizing carbon revenues through strategic positioning; and Horizon 3 on strengthening market performance.

1. Introduction and analytical framework

Carbon markets are increasingly viewed as a critical source of finance for sustainable development, especially as official development assistance declines amid shifting geopolitical priorities. For Africa, where approximately 90 percent of climate finance has historically come from international public funding[1], developing carbon projects has become central to future climate and economic strategies. Carbon finance can provide African countries with an additional source of funding while respecting national sovereignty and development priorities, without necessarily increasing public debt, and supporting projects that deliver mitigation and, where applicable, adaptation benefits.

The continent stands at a critical juncture in the global carbon market landscape. While Africa contributes less than four percent of global greenhouse gas (GHG) emissions[2,3], it possesses significant opportunities for emissions reductions and removals. African countries accounted for about 20 percent of VCM credit issuances in 2024[4], while participation in compliance carbon markets remains at an early stage. Ghana's transfer of approximately 12,000 internationally transferred mitigation outcomes (ITMOs) to Switzerland[5] in 2025 remains the only completed Article 6 transaction in Africa at the time of writing.

African governments are increasingly exploring carbon markets as a means of advancing national development priorities, including energy access, nature conservation, climate resilience and economic growth. Countries are developing policy frameworks, strengthening measurement, reporting and verification (MRV) systems, and pursuing Article 6 cooperation to mobilize finance and support high-integrity market participation. Progress varies across the continent, highlighting the need for country-led approaches that respond to national circumstances, safeguard NDC achievement and ensure equitable development benefits.

In this context, UNDP plays five roles in supporting the development of African carbon markets. First, it supports African governments to develop robust national carbon-market strategies, legal frameworks and access pathways for participation in international (including Article 6) and domestic carbon markets. Second, it supports the development of high-integrity, investment-ready project pipelines through project identification, preparation and technical assistance, while strengthening national capacity to advance projects towards validation, authorization and transactions. Third, through its High-Integrity Carbon Markets Initiative, UNDP supports principles, guidelines and guardrails that promote real, additional and verifiable emissions reductions alongside broader sustainable development benefits. Fourth, it facilitates partnerships among governments, project developers, financial institutions and investors to mobilize finance and advance pipeline implementation. Finally, UNDP plays an advocacy and convening role to strengthen the African carbon markets agenda.

To assess country readiness, market risks and opportunities, and inform practical recommendations, the study adopted a three-pronged approach:

- **Desktop review:** A comprehensive review of secondary literature and databases was undertaken to establish the evidence base for the analysis. This included mapping country readiness, as well as key gaps and opportunities;
- **Key informant interviews:** Interviews were conducted with diverse stakeholders across government institutions and regulatory authorities; private-sector market participants, including banks, project developers and carbon consultants; and researchers and technical experts with experience in climate policy and carbon markets. Senior experts and decision makers provided their perspectives, mostly on an anonymized basis;
- **Analysis:** The study adopted a comparative case study approach to establish a baseline for assessing country readiness and vulnerability, examining five African countries selected to reflect different geographic regions, levels of market maturity and institutional contexts.

To assess vulnerability to carbon market risks and uncertainties, the study developed a framework examining three dimensions: exposure to market shocks, sensitivity to their effects, and adaptive capacity to respond. Where feasible, scenario analysis explored how different strategies could influence carbon finance flows to the continent.

1.1 Limitations

The analysis may be affected by outdated secondary information, particularly given the rapid evolution of domestic policies and institutions across Africa, international carbon-market trends and the Article 6 architecture. Some policy conclusions may not be applicable to African countries that were not examined in detail in this study. Policymakers should therefore assess the recommendations in the context of their country's domestic policy, institutional and market conditions.

The analysis may not fully reflect the perspectives of all stakeholder groups, owing to limitations in the study's scope and stakeholder availability and access. This is particularly relevant to policymakers, whose availability for consultation was limited during the preparation of the report, and to local communities, as the study did not include fieldwork.



Organic waste is added to a household biogas system.
Photo by: UNDP

2. Market readiness

Africa has become a major supplier in voluntary carbon markets, accounting for about a fifth of global voluntary market issuances and a quarter of retirements. However, this position has not yet translated into commensurate value capture. Supply remains concentrated in project types such as REDD+ and clean cookstoves, which have historically attracted lower prices in some market segments. This can expose African markets to evolving integrity requirements and shifting buyer preferences, increasing vulnerability to price pressures and demand shocks. Carbon revenues have not always translated into equitable local development benefits, underscoring the importance of transparent benefit-sharing frameworks and domestic value retention.

The assessment finds that readiness gaps are particularly evident at the institutional level. While many African countries have signalled their intention to participate in carbon markets through national climate strategies, fewer than a third have established the full set of operational elements assessed in this study as necessary to transact at scale across international carbon markets. These institutional gaps can constrain access to higher-value Article 6 opportunities, which require clear authorization procedures, corresponding adjustment arrangements and registry and tracking systems. Technical capacity constraints also affect readiness.

Currently, Africa is only realizing a small share of its carbon financing potential. Climate mitigation finance flows totalled $22 billion to sub-Saharan Africa in 2023[6]. In comparison, Ecosystem Marketplace reports VCM transactions in Africa amounted to $82.5 million that year[7], accounting for only 0.4 percent of climate mitigation finance received. Although the figures differ in geographic coverage and reporting scope, they illustrate the modest scale of recorded VCM transactions relative to broader climate mitigation finance flows.

2.1 African carbon policy

Africa's focus on carbon market development can be viewed through the lens of economic policy linked to the just energy transition. The African Union (AU), through its African Union Climate Change and Resilient Development Strategy and Action Plan (2022–2032), outlines a continent-wide framework for low-emission, climate-resilient growth. In September 2025, the AU published the Africa Action Plan on Carbon Markets, which provides guidance for African states on governance, readiness, policy alignment, capacity-building and coordinated approaches to carbon-market participation[8]. This continent-wide focus is also reflected in the nationally determined contributions (NDCs) of many African countries, which identify carbon-market finance as a key mechanism to support implementation.

To deliver on policy objectives, the African Union Development Agency–New Partnership for Africa's Development (AUDA-NEPAD) is advancing carbon-market reform to support countries across the continent. It recently announced three major initiatives to strengthen Africa's engagement in global carbon markets: the African Integrity and Equity Principles for Carbon Markets, a draft framework to promote high-integrity and socially inclusive carbon markets in Africa; a continental coordinating mechanism to connect technical experts and focal points from all 55 AU Member States and regional alliances, reduce fragmentation and strengthen Africa's collective voice in carbon markets; and a Digital Tracking Platform for Article 6 Readiness, designed to monitor country-level progress under Article 6.2 of the Paris Agreement and support consistent terminology and data across the continent.

Strengthening regulatory certainty can be supported by aligning carbon-market legislation with relevant public-finance laws[9], ensuring that authorization decisions, revenue-sharing arrangements and carbon-rights allocations are reflected, where appropriate, in national budgeting and accounting systems. Engaging ministries of finance in regulatory coordination, in line with national institutional mandates, can enhance fiscal oversight and reduce the risk of off-budget flows. Integrating MRV outputs into national statistics and climate budget-tagging systems can also support the coordinated tracking of mitigation outcomes and public expenditure, strengthening transparency and investor confidence.

2.2 Article 6 markets

Article 6 of the Paris Agreement was adopted at COP21 in 2015 as a framework for countries to cooperate in achieving their climate targets. It provides for international cooperation, including market-based approaches involving the transfer of mitigation outcomes, to support greater emissions reductions and direct investment towards cost-effective mitigation opportunities.

Alongside Article 6, the global compliance landscape includes sector-specific mechanisms such as the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), which requires airlines to offset eligible emissions using approved emissions units[10]. While CORSIA operates outside the Paris Agreement framework, it incorporates requirements related to host-country

authorization and accounting to address the risk of double counting[11]. This creates an additional source of compliance demand that may interact with Article 6 transactions.

Article 6.2 covers decentralized cooperative approaches, including bilateral or multilateral arrangements involving the transfer of ITMOs for use towards NDCs or other authorized international mitigation purposes. Participating countries must apply corresponding adjustments in accordance with Article 6 guidance to avoid double counting. This decentralized structure contrasts with Article 6.4, which establishes a centralized UN-supervised crediting mechanism with standardized requirements and issuance processes.

Africa has significant potential for Article 6.2 transactions, owing to its mitigation opportunities, sustainable development co-benefits and position in low-carbon value chains, including hydrogen, green ammonia, sustainable agriculture and critical minerals. African countries are pursuing Article 6.2 cooperation through bilateral arrangements and pilot activities[12]. Ghana's issuance and transfer of approximately 12,000 ITMOs to Switzerland in July 2025 marked an important milestone in Africa's participation in Article 6.2 cooperation. It demonstrated how national authorization and accounting arrangements can translate cooperative approaches into completed, high-integrity transactions.

COP29 in 2024 marked a significant step towards operationalizing Article 6.4, also known as the Paris Agreement Crediting Mechanism (PACM) [13]. Implementation continues through the development and application of methodologies, registry infrastructure and operational procedures. These developments reinforce the importance of strengthening national readiness to participate effectively in the mechanism[14].

Participation in Article 6.2 requires host countries to demonstrate institutional and technical readiness. Key elements include:

- Letters of authorization (LoAs) and standard operating procedures: Clear processes for authorizing cooperative approaches, mitigation outcomes and their intended uses;
- Centralized Accounting and Reporting Platform (CARP) reporting: Arrangements to meet the applicable initial, annual and regular reporting requirements;
- Registry access and tracking: Access to a registry capable of recording and tracking ITMOs, including through national arrangements or the international registry.

In the near term, Africa's receipts under Article 6 may remain limited. The pipeline assessment cited in this report estimates potential bilateral supply of 6.7 $MtCO_2e$ by 2030, with an indicative value of US$180 million to US$360 million[15]. These estimates represent potential supply and revenue rather than confirmed purchases. The report also identifies approximately 195 $MtCO_2e$ in African CDM credits as potentially eligible for use under applicable transition arrangements, with transition requests reportedly covering around two thirds of the relevant pipeline. The associated revenue estimate of US$2 billion to US$4 billion by 2030[16] would depend on the applicable eligibility and transition requirements, pricing assumptions and sufficient buyer demand.

2.3 The voluntary carbon market

The VCM developed alongside the implementation of the Kyoto Protocol in the early 2000s. Participation is primarily driven by companies, organizations and individuals purchasing carbon credits voluntarily, rather than to meet a legal requirement. These voluntary carbon credit purchases typically support climate commitments, including emissions compensation and, where consistent with applicable guidance, carbon-neutrality claims.

In recent years, the VCM has undergone an integrity transition. The market peaked at US$2.1 billion in 2021[17], before heightened scrutiny of credit integrity emerged in 2022. In 2023, the Integrity Council for the Voluntary Carbon Market (ICVCM) introduced the Core Carbon Principles (CCPs), establishing a consistent, science-based benchmark for identifying high-integrity carbon credits[18]. The first methodologies eligible for CCP labelling were approved in June 2024, covering two project types[19]. At the time of the assessment, the ICVCM had approved methodologies covering 11 project types under its CCP label, including REDD+, improved forest management and efficient cookstoves[20].

In 2024, the VCM contracted for the third consecutive year, with reported transaction value falling to US$535 million[7], amid evolving market requirements and buyer preferences. The market is shifting towards updated methodologies and stronger integrity requirements, although the pace of this transition varies across programmes and project types. Reported transaction volumes decreased by 25 percent[7], while the average price fell by 5.5 percent to US$6.34 per credit. These developments coincided with increased scrutiny of credit quality, market standards and methodologies.

VCM buyers are increasingly prioritizing higher-integrity credits and placing greater emphasis on the distinction between emissions reductions and carbon removals. Agriculture, forestry and other land use (AFOLU) credits with credible carbon sequestration attributes, such as afforestation, reforestation and revegetation (ARR) and agroforestry, outperformed the broader market in 2024, with average credit prices reaching US$20 and US$14, respectively. Renewable energy and REDD+ credits recorded weaker market performance amid concerns about additionality and credit quantification in some projects and methodologies. Buyer preferences are also influenced by guidance on corporate net-zero strategies, including that of the Science Based Targets initiative (SBTi).

Within the category of carbon avoidance credits, household and community device projects attract buyer interest for their potential social benefits. Retirements in this category recorded the greatest growth in 2024, with 27 million credits retired[7]. This presents an opportunity for Africa, whose issuance profile illustrates its supply of credits available for market transactions (see Figure 1). More than 40 percent of household and community device credits traded in 2024 came from the continent[21].

2.4 Africa's carbon-market supply

Africa's share of retirements in the VCM has grown significantly over recent years. Based on 2024 volumes, the continent accounts for a quarter of total market retirements, highlighting Africa's rising prominence in the VCM. The AFOLU sector, particularly REDD+, has dominated retirements of African credits, accounting for 47 percent of the African volume over the past five years. Clean cookstoves, which reduce emissions from household fuel use and can lessen pressure on forests, follow with a 30 percent share. Together, these categories account for nearly 80 percent (77%) of retirements, primarily from emissions avoidance and reduction projects.

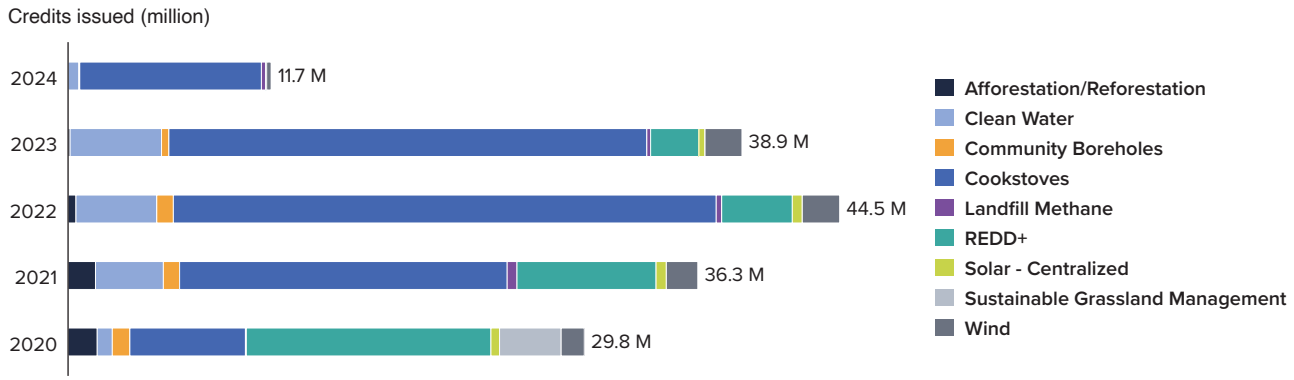
In Africa, project types remain relatively concentrated, with cookstove projects accounting for an increasing share of carbon credit generation and contributing to limited portfolio diversification. While the global carbon market is more diverse, it has also become increasingly concentrated in recent years. For 2024 issuances, the effective number of project types–a measure of portfolio diversity rather than a count of categories–was approximately eight globally, compared with 1.4 in Africa. This concentration increases sensitivity to changes in market rules and buyer preferences, particularly for cookstove and REDD+ credits.

Geographically, eastern and southern Africa have historically accounted for the largest shares of African credit retirements. East Africa represents more than 40 percent of retirement volumes, led by Kenya, which has the largest country share on the continent at 18 percent. Southern Africa accounts for 35 percent, with Zimbabwe and South Africa contributing the largest volumes in the region. Western and central Africa each account for approximately 10 percent, with the Democratic Republic of the Congo (DRC) contributing the largest volume across these two regions.

African participation in carbon markets continues to face a range of structural barriers. Access to project development finance is a particularly important constraint. Local developers often have limited upfront capital to cover feasibility studies, validation costs and verification expenses, which can be substantial in low-income contexts. As a result, projects frequently rely on external financiers, underscoring the importance of equitable partnerships and transparent benefit sharing. Alongside these structural constraints, integrity concerns can affect market growth and buyer confidence. Concerns about over-crediting in some clean cookstove projects and methodologies highlight the need for robust quantification and verification to safeguard environmental integrity and manage reputational risks for host countries, developers and buyers[22].

An 'African premium' is evident for several key project types in the VCM, suggesting stronger buyer interest in these African credits. Pricing data for five key project types was analysed for the year ending July 2024. Four of the five project types commanded a premium relative to global averages, averaging 80 percent[23]. By contrast, African REDD+ credits (Africa's largest categories of credit supply) traded at a discount to the global average, potentially reflecting concerns about methodological integrity and perceived political risk.

Figure 1. African VCM credit issuances by project type, 2020–2024 (project types covering over 90 percent of issuance)



Source: Berkeley Carbon Trading Project, Voluntary Registry Offsets Database

3. Representative country case studies

To facilitate a deeper investigation of countries' readiness to engage in international carbon credit transactions, this report adopted a case study approach. This enabled a more detailed analysis of policy, institutional and market ecosystem factors, considered alongside countries' track records of carbon trading activity.

Five case study countries were selected from the top 20 African carbon producers to reflect different geographic regions, levels of market maturity and institutional contexts. The countries selected were South Africa, Egypt, Kenya, Ghana and the DRC.

To systematically evaluate country readiness to participate in international carbon markets, a structured assessment framework was applied. An overall readiness rating for each country was derived from indicators covering legal and regulatory, institutional, technical, and market and finance capacity. Figure 2 presents these ratings, providing a comparative overview of strengths and gaps in readiness to engage in both the VCM and Article 6 carbon-market activities. The results reflect a best-effort, desk-based assessment using information available during the assessment period. Gaps in publicly available information should not necessarily be interpreted as an absence of capacity. The ratings represent the study's analytical findings rather than comprehensive assessments of national performance.

3.1 South Africa

South Africa (GDP 2024: US$400 billion)[24] is Africa's largest economy and among the top 15 global emitters, producing approximately 499 $MtCO_2e$ in 2022[25,26], reflecting its reliance on coal across the energy system. The 2024 Climate Change Act provides a comprehensive legal framework for a low-carbon economy[27], complementing the 2019 Carbon Tax Act. Carbon-market development has been supported by the country's carbon tax system, which allows companies to use approved carbon credits to offset a portion of their taxable emissions, with allowances of 5–10 percent, creating demand for local offset projects since 2019.

The study's assessment places South Africa at a **medium level of readiness** to participate in international carbon markets. It benefits from a clear legal mandate, established institutions, strong MRV systems and active private-sector engagement. Areas for further strengthening include advancing Article 6 implementation arrangements, developing benefit-sharing guidelines and diversifying the project pipeline beyond renewable energy.

3.2 Democratic Republic of the Congo

The DRC (GDP 2024: US$70 billion)[28] has a significant emissions profile, largely associated with land-use change. In 2022, its GHG emissions were estimated at 708 $MtCO_2e$, with more than 90 percent attributed to deforestation and land-use change, including forest loss associated with small-scale agriculture[29]. Engagement in international carbon markets has developed at varying rates, with greater activity in the VCM. In 2020 and 2021, issuances were predominantly from REDD+ projects, reaching nearly 10 million credits.

The study assesses the DRC's readiness to participate in international carbon markets as **low**. Its forests represent one of the world's largest natural carbon sinks, and the country has demonstrated its capacity to generate substantial credit volumes. Building on its forest resources and existing carbon-market experience, the DRC could strengthen its readiness through further development of

Figure 2. Country analysis readiness ratings.

Capacity dimension	South Africa	DRC	Kenya	Ghana	Egypt
Legal and regulatory					
Institutional					
Technical					
Market and finance					
Overall	Medium	Low	Medium-high	High	Low-medium

Low · Low-medium · Medium · Medium-high · High

Article 6 arrangements, registry functionality, institutional capacity and community benefit-sharing mechanisms.

3.3 Kenya

Kenya (GDP 2024: US$124 billion)[30] is Africa's leading carbon credit producer by issuance volume over the past five years. Under the CDM, Kenya developed diverse project types, including geothermal, which accounted for almost half of the 13.5 million credits issued, alongside wind, reforestation, cookstove projects and water purification. In the voluntary market, Kenya has since become Africa's largest source of credits. Its electricity grid has a low emissions intensity[31], relying substantially on hydropower and geothermal generation[32].

The study assesses Kenya's overall readiness as **medium-high**. It combines long-standing carbon-market experience with an established legal and institutional framework. Its regulatory arrangements, diverse project pipeline and pursuit of Article 6 cooperation position it favourably to scale up high-integrity credit supply. Areas for further strengthening include establishing MRV protocols and expanding locally available validation and verification capacity.

3.4 Ghana

Ghana (GDP 2024: US$82 billion)[33] has a history of low emissions intensity[34] and is among Africa's early movers in operationalizing Article 6.2 cooperation. It was the first African country, and among the first globally, to authorize ITMO transfers. Its 2020 bilateral agreement with Switzerland, ratified in 2022, has delivered approximately 12,000 ITMOs from a cookstove project, which have been issued and transferred.

Ghana has strengthened its legal foundation for carbon markets through the Environmental Protection Act (2025), which incorporates climate change and carbon-market provisions[35]. The Act designates the reconstituted Environmental Protection Authority as the national authority and provides for a Ghana Carbon Registry, a Carbon Market Committee and a Mitigation Fund.

The study assesses Ghana's overall readiness as the **highest** among the five countries examined. Its early participation in Article 6 transactions, legal framework and transparency arrangements demonstrate progress from readiness planning to transaction delivery.

3.5 Egypt

Egypt (GDP 2024: US$389 billion)[36] has a relatively large, carbon-intensive economy. The country registered 21 projects under the CDM, issuing a total of 24 million credits: 19.7 million from a single N_2O abatement project and a further 3.5 million from four wind projects. Following COP27, Prime Ministerial Decree No. 4664/2022 authorized the creation of a voluntary carbon marketplace on the Egyptian Exchange. Building on this, the Financial Regulatory Authority issued regulations in 2024 to govern the market.

The study assesses Egypt's overall carbon-market readiness as low-medium. The country has established foundations for an integrated carbon-trading platform, providing an example of market development through capital-market infrastructure. Policy commitment, regulatory clarity, institutional coordination and early private-sector engagement support an enabling environment for further carbon-market development.

The gaps identified across the five country case studies align with areas addressed by UNDP-supported readiness programming, which seeks to translate institutional reforms into operational market infrastructure and strengthen countries' capacity to undertake high-integrity carbon-market transactions.

4. Vulnerability and resilience

The assessment finds that Africa's carbon markets are particularly vulnerable to demand-side uncertainty and integrity-driven changes in market rules. Although Article 6 is expected to become an important source of future demand, the pace of implementation remains uneven. At the same time, Africa's dominant credit types face heightened scrutiny. Methodologies for REDD+ and clean cookstove projects have faced significant challenges during the integrity transition, including more stringent assessment requirements under the ICVCM Core Carbon Principles and evolving CORSIA eligibility criteria.

Although Article 6.4 has been formally operationalized through the adoption of the PACM standards, it is not yet fully implemented. While the Supervisory Body operationalized key foundational elements of the Article 6.4 mechanism in early 2025, critical infrastructure and guidance remain under development. The milestones still to be achieved include finalizing the registry, further methodology development for removal activities, and the revision of methodologies and tools originating under the CDM.

The United States initiated its withdrawal from the Paris Agreement in early 2025[37], adding to uncertainty surrounding multilateral climate cooperation and carbon-market confidence. Its implications for the pace and scale of demand under Article 6 remain uncertain. This policy shift has also raised questions about continued US participation in and implementation of CORSIA. US airlines are expected to account for a substantial share of demand for CORSIA credits[38], making national implementation and enforcement important factors in the scheme's demand outlook[39].

The VCM's integrity transition[7] presents challenges for Africa's historical carbon-project mix. The ICVCM Core Carbon Principles establish a benchmark for identifying high-integrity credits[40], while CORSIA applies distinct eligibility requirements. Buyers are becoming more selective, placing greater emphasis on credit quality, methodological robustness and eligibility for intended uses. Given the substantial share of African credit supply represented by REDD+ and clean cookstove projects, evolving requirements may affect near-term revenues. Strengthening existing methodologies and diversifying the pipeline could help improve resilience.

Reliance on a small number of major buyer markets exposes the continent to geopolitical shifts, regulatory changes and evolving corporate priorities. Demand concentration can also create imbalances in negotiating power, with a small group of sovereign buyers and multinational corporations influencing pricing, contract terms and integrity requirements[41]. In such conditions, host countries and developers may face constraints on negotiating favourable terms, including contract duration and the allocation of delivery risks.

4.1 Vulnerability assessment

The vulnerability assessment evaluates country-level carbon-market risks across three dimensions: exposure, sensitivity and adaptive capacity. Exposure and sensitivity capture the extent of potential risk, while adaptive capacity reflects the ability to respond and strengthen resilience.

- **Exposure.** Exposure reflects the likelihood that countries will be affected by carbon-market shocks. Key risks arise from tightening integrity requirements, including assessments of Verra and Gold Standard methodologies against the Core Carbon Principles; evolving offsetting rules; changes in participation by major countries and corporate buyers; and uncertainty surrounding the pace and scale of Article 6 implementation;
- **Sensitivity.** Sensitivity reflects the extent to which a country could be affected if these shocks materialize. The degree of impact depends largely on portfolio diversification and the strength of enabling institutions. Countries with highly concentrated project portfolios may be more vulnerable to integrity-driven market shifts;
- **Adaptive capacity.** Adaptive capacity refers to the ability of countries to navigate, mitigate and adjust to market shifts, potentially reducing their impact on future carbon-finance flows. Countries with established domestic private-sector networks and access to technical assistance are better positioned to address policy and institutional gaps.

Within this framework, the most vulnerable profile combines high exposure, high sensitivity and low adaptive capacity. This combination indicates greater potential impacts from market shifts and limited capacity to respond effectively. Conversely, low exposure, low sensitivity and high adaptive capacity indicate a stronger position to manage the assessed risks.

In the evolving landscape, UNDP's emphasis on high-integrity carbon-market participation and readiness for compliance-market requirements directly addresses vulnerabilities associated with evolving standards and the pace of Article 6 implementation. Among the five

case-study countries, the assessment identifies Ghana as having the lowest exposure to the market shifts examined, while Kenya has the highest adaptive capacity. The DRC has a comparatively more vulnerable profile, reflecting greater assessed risks and constraints on its capacity to respond. Table 1 presents the vulnerability assessment results for the five country case studies.

Table 1. Vulnerability assessment results: Country deep dives

Country	Exposure	Sensitivity	Adaptive capacity
South Africa	Moderate	Moderate	Moderate
DRC	High	High	Low
Kenya	Moderate	Moderate	High
Ghana	Low–moderate	Moderate	Moderate
Egypt	High	Moderate	Low

4.2 Six archetypes: 20-country analysis

A limited-scope assessment of 15 additional countries was conducted using four key indicators related to exposure, sensitivity and adaptive capacity. This analysis resulted in six distinct country groupings, presented in Table 2.

Exposure: Of the 15 countries assessed, 11 received a low exposure rating, reflecting relatively modest political risk and limited reliance on project types exposed to tightening integrity requirements. The remaining four were rated as moderately exposed.

Sensitivity: Fourteen of the 15 countries assessed received high sensitivity ratings, indicating a heavy concentration of carbon market activity in a narrow set of project types.

Adaptive capacity: Adaptive capacity showed the greatest variation across countries. Using the share of the project pipeline eligible for CORSIA Phase 1 as a proxy, four countries demonstrated high adaptive capacity ratings, while nine received low ratings, reflecting a limited share of CORSIA-eligible projects in their pipelines. This indicator reflects access to an alternative demand channel rather than a comprehensive assessment of national adaptive capacity.

Table 2. Country clusters based on vulnerability assessment.

Group	Country	Exposure	Sensitivity	Adaptive capacity
Group 1: Protective buffer	Senegal	Low	Moderate	Low
Group 2: Sensitive adapters	Eritrea	Low	High	High
	Mozambique	Low	High	High
	Nigeria	Low	High	High
Group 3: Stretched adapters	Uganda	Low	High	Moderate
	Burundi	Low	High	Moderate
Group 4: Masked fragility	Zimbabwe	Low	High	Low
	Côte d'Ivoire	Low	High	Low
	Madagascar	Low	High	Low
	Rwanda	Low	High	Low
	Malawi	Low	High	Low
Group 5: Adaptive core	Somalia	Moderate	High	High
Group 6: Critical fragility	Ethiopia	Moderate	High	Low
	Tanzania	Moderate	High	Low
	Zambia	Moderate	High	Low

Source: Berkeley Database, Sylvera, S&P Global

What the archetypes show

- **Protective buffer (Senegal):** Low exposure, moderate sensitivity and low adaptive capacity. Senegal is less exposed to the assessed market shifts, but its limited adaptive capacity could constrain recovery if shocks occur. Strengthening private-sector participation, building institutional readiness and diversifying market participation could improve resilience.
- **Sensitive adapters (Eritrea, Mozambique and Nigeria):** Low exposure and high adaptive capacity, but high sensitivity. This group has relatively low exposure to the assessed risks, while its strong CORSIA-eligible project pipeline provides access to an alternative demand channel. The priority is to reduce sensitivity by diversifying project types and strengthening institutional capacity, limiting the potential for changes in a single methodology, buyer segment or standard to cause disproportionate value loss.
- **Stretched adapters (Uganda and Burundi):** Low exposure, high sensitivity and moderate adaptive capacity. This country group already participates in global carbon markets, but concentrated project portfolios and a limited share of CORSIA-eligible pipeline projects may constrain access to alternative demand channels as market requirements evolve. Diversifying credit supply could help reduce portfolio sensitivity.
- **Masked fragility (Zimbabwe, Côte d'Ivoire, Madagascar, Rwanda and Malawi):** Low exposure, high sensitivity and low adaptive capacity. Despite their low exposure to the assessed risks, these countries' high sensitivity and limited adaptive capacity could amplify the effects of adverse market shocks. Concentrated project portfolios and limited access to alternative demand channels may constrain their ability to respond to changing market conditions. Strengthening institutional readiness and diversifying supply could support access to CORSIA and Article 6 opportunities.
- **Adaptive core (Somalia):** Moderate exposure, high sensitivity and high adaptive capacity. Somalia's moderate exposure rating reflects the country-risk indicator used in the assessment, while its high sensitivity reflects supply concentrated in a small set of project types. Its high adaptive-capacity rating is driven primarily by an emerging CORSIA-eligible pipeline, indicating potential access to an alternative demand channel rather than a comprehensive measure of institutional capacity.
- **Critical fragility (Ethiopia, Tanzania and Zambia):** Moderate exposure, high sensitivity and low adaptive capacity. This combination indicates greater vulnerability to the assessed market shocks. If shocks materialize, concentrated supply and limited access to alternative demand channels could amplify their effects. Diversifying project portfolios and strengthening institutional readiness for additional markets could improve resilience.

The Maghreb region–Morocco, Algeria, Tunisia, Libya and Mauritania–faces varying levels of vulnerability to global political and market shifts. Within the assessment, exposure is rated high, reflecting the concentration of the region's approximately two million issued credits in renewable energy projects. These portfolios may be affected by evolving additionality requirements and buyer preferences, particularly where renewable energy deployment is increasingly commercially viable. Eligibility for CCP labelling depends on the applicable programme, methodology and assessment criteria. Strengthening project-level additionality assessments and diversifying credit supply could help reduce exposure to the integrity transition.

4.3 Resilience framework

Strengthening adaptive capacity through improved MRV systems, stronger governance and market diversification aligns with UNDP's approach to supporting long-term resilience in carbon-market participation. Building this resilience requires coordinated action across several interconnected areas, tailored to national circumstances and priorities.

Foundations for high-integrity market access

Accessing markets for high-integrity credits depends on national action. Governments are custodians of accounting integrity, ensuring that carbon-market activities align with national climate goals, avoid double counting and maintain transparency. To enable this, countries need to integrate carbon-market mechanisms into their climate strategies to ensure NDC alignment; establish clear legal frameworks for carbon trading, safeguards and benefit sharing; and put the necessary institutions and infrastructure in place[42]. For Article 6 cooperation and relevant CORSIA transactions, national arrangements should define how mitigation outcomes are authorized, tracked and accounted for according to their intended use, including through corresponding adjustments where required[43].

Legal and regulatory frameworks should provide clarity and be developed in consultation with relevant stakeholders, including communities and market participants. Approval procedures, levies and benefit-sharing requirements should be designed transparently and proportionately, balancing investor predictability with public oversight, equitable benefits and national development objectives. Predictable and proportionate requirements can support investor confidence while safeguarding national interests[44].

Strengthening carbon project pipelines

African countries can position their carbon producers to capture emerging demand by fostering investment in high-integrity methodologies and high-quality projects, including carbon removals where feasible. This approach can complement strategic trade and industrial policy by guiding investment towards activities that generate greater domestic value and sustainable development benefits.

One mechanism under Article 6.2 is the publication of eligibility criteria or priority lists (positive lists) that communicate which activities may qualify for government authorization for international transfer. Informed by national mitigation priorities and NDC requirements, these provide developers with clearer policy signals for investment, while preserving project-level assessment and authorization procedures.

Second, governments can promote the adoption of high-integrity methodologies to strengthen market access and resilience to demand volatility. Incentives could include streamlined approval procedures for projects meeting recognized integrity requirements, without reducing environmental and social safeguards. CCP labelling and CORSIA eligibility involve distinct assessments and do not replace national authorization requirements. Building on existing REDD+ and cookstove portfolios, countries can support updated methodologies, stronger quantification and effective safeguards.

Third, governments can support the development of high-quality carbon-removal projects at scale, considering direct and indirect measures suited to national circumstances. Opportunities include nature-based activities, such as ARR, agroforestry and appropriate blue-carbon interventions, alongside engineered removals such as biochar and direct air capture, subject to technical, financial and environmental feasibility.

Finally, governments and development finance institutions can assess instruments to reduce demand uncertainty for strategically important project types. These may include demand guarantees or publicly backed purchase facilities. Such instruments should be considered alongside their fiscal implications, eligibility criteria and allocation of market and delivery risks.

Improving transaction outcomes

Market strategies include:

- **Expanding market access.** Given the fragmented demand landscape, host countries can support developers' access to multiple market pathways by aligning national policies, regulations and institutions to enable credit exports into higher-value markets such as CORSIA and Article 6, in line with national climate objectives and relevant eligibility requirements. Stakeholder interviews cited indicative prices for comparable African cookstove credits of approximately US$6 in the VCM, US$22 under CORSIA and up to US$45 in Article 6 transactions. These interview-based estimates illustrate potential price differences; actual prices depend on credit characteristics, authorization, delivery terms and buyer requirements;
- **Strengthening bilateral relationships**. Host countries can cultivate strategic relationships with Article 6 buyers and key trading partners to support long-term offtake agreements. Defined volumes, pricing arrangements and clear responsibilities can improve revenue predictability and support investment in larger, more capital- and technology-intensive projects;
- **Assessing domestic and regional carbon pricing.** African countries can explore domestic carbon-pricing schemes or regional approaches suited to their economic and institutional circumstances. South Africa's carbon tax, introduced in 2019, demonstrates how a pricing mechanism with an offset allowance can create domestic demand for eligible credits[45]. The value of this demand depends on applicable tax rules, offset eligibility and market conditions; it does not automatically establish a price floor for all projects. International sales remain subject to relevant approval, authorization and accounting requirements.

Intra-African carbon trading

Historically, buyers of African carbon credits in the VCM have predominantly been large multinational corporations rather than domestic or regional actors. Since 2019, the top 50 corporate beneficiaries have accounted for 45 percent of recorded African credit retirements. Offsets retired under South Africa's carbon tax represented approximately two percent of African credit retirements over 2019–2025. While the mechanism contributes to domestic demand, broader intra-African trading would require additional demand sources and enabling arrangements.

Pan-African partnerships can support coordinated and interoperable carbon-market systems across Africa. Collaborative platforms help strengthen country readiness, reduce fragmentation and amplify Africa's voice in carbon-market discussions. AUDA-NEPAD has announced a continental coordinating mechanism bringing together technical experts and focal points from the 55 AU Member States and regional carbon-market alliances[46]. Regional alliances also provide opportunities to address shared barriers to market access and climate finance. The West African Alliance on Carbon Markets and Climate Finance, for example, supports cooperation through peer-to-peer learning and the exchange of good practices[47].

5. Gaps and opportunities

While the continent currently receives modest finance through carbon markets, this could increase as global demand for compliance-aligned credits expands. Forecasts cited in the report indicate potential combined demand under Article 6 and CORSIA of up to 700 million emissions units by 2030. Applying an assumed African market share and indicative prices suggests potential climate-finance inflows of US$5 billion to US$10 billion. Realizing this potential would depend on demand, supply readiness, authorization arrangements and integrity requirements; these estimates do not represent secured purchases. The Africa Carbon Markets Initiative's (ACMI) estimate of 2,400 $MtCO_2e$ in carbon supply potential underpins its ambition to mobilize up to US$6 billion in carbon finance for the continent by 2030.

5.1 Carbon credits as bankable revenue

For carbon markets to mobilize private capital at scale, carbon credits need to support bankable revenue streams. In this context, bankability refers to the potential of carbon-credit revenues to support debt financing, attract institutional investment and provide reliable cash flows within structured financial products. Accordingly, bankability depends on the policy and regulatory environment, MRV and governance institutions, financial architecture and project characteristics, including scale and revenue predictability.

The following enabling conditions can strengthen bankability and support projects in mobilizing long-term private capital:

- **Legal certainty.** The foundation of bankability is legal clarity. Financial institutions require certainty regarding carbon-credit ownership, transferability and contractual enforceability. Key policy enablers include clear definitions of carbon rights and their allocation among the state, landholders, communities and project developers, alongside clarity on the legal treatment of carbon credits under national law;
- **Policy stability.** Carbon finance is sensitive to policy changes and institutional uncertainty. Sustained government commitment can lower perceived risk and support longer-term financing. Credible signals include a national carbon-market strategy aligned with NDCs and transparent, consistent Article 6 engagement policies;
- **Financial sector recognition.** Regulatory and accounting clarity are important to integrating carbon credits into the financial system. This requires coordination among relevant national authorities, including central banks and financial regulators, to provide guidance on applicable accounting standards and tax treatment for issuance, transfer and retirement;
- **Environmental integrity and standardization.** Financial actors require confidence in the environmental integrity and reputational quality of carbon credits. Strengthening integrity requires alignment with internationally recognized standards and benchmarks, including the CCPs where applicable; transparent registry systems with serial-number traceability; and appropriate permanence safeguards, including buffer pools and reversal-management mechanisms. Environmental and social safeguards and transparent benefit sharing also support project credibility;
- **Risk mitigation instruments.** Carbon projects face regulatory, market, political, reversal and counterparty risks. Appropriate risk-sharing mechanisms can improve bankability, including reversal and performance insurance, political risk insurance, partial risk guarantees and blended-finance structures providing first-loss capital, subject to availability and eligibility;
- **Project scale.** Many carbon projects, particularly in least developed countries, are small and fragmented, which can constrain access to institutional capital. Governments can support aggregation through appropriate jurisdictional or programmatic crediting approaches and platforms for smallholder or community-based projects, while protecting participation rights and equitable benefit sharing;
- **Predictable revenue streams.** Lenders require sufficiently predictable cash flows to assess repayment capacity. Instruments that can strengthen revenue predictability include long-term offtake agreements, potentially spanning 5–15 years, and sovereign or multilateral-backed purchase facilities. Domestic carbon-pricing mechanisms with eligible offset provisions can also support demand, although they do not automatically establish a project-revenue floor.

5.2 Barriers limiting Africa's carbon market participation

Africa has significant potential to supply high-integrity carbon credits. However, realizing this opportunity requires addressing interlinked policy, institutional and market barriers. Readiness varies across the continent: some countries have advanced legal and governance frameworks, while others continue to develop regulatory arrangements, technical capacity and enabling investment conditions. The constraints identified in the study fall into two broad categories: (i) foundational systems and governance constraints; and (ii) human and transactional capacity constraints. Together, these barriers can increase uncertainty, raise transaction costs and constrain access to compliance markets and demand for high-integrity credits.

- **Policy and institutions:** Gaps in national legislation can limit legal clarity and increase uncertainty for market participants. At the time of the assessment, carbon-market legislation was absent or emerging in many African countries, with approximately one fifth having enacted regulatory provisions[48]. Unclear or incomplete authorization arrangements can constrain access to Article 6.2 transactions and CORSIA-eligible demand, narrowing developers' offtake options;
- **Human capital:** Limited locally available validation and verification body (VVB) capacity can increase costs and affect project scalability, particularly for smaller projects. Gaps in technical expertise can also constrain participation in carbon markets. Some countries face limitations in the technical capacity, institutional resources and market knowledge needed to implement Article 6 accounting, governance and reporting arrangements[49];
- **Financial capital:** African project developers often face difficulties securing the upfront finance needed to develop high-quality carbon projects. For example, the estimate cited in this study places administrative costs for a low-complexity AFOLU project to reach first issuance under a Verra methodology at US$150,000–US$300,000, excluding project implementation costs[50]. Access to capital remains constrained by limited availability of suitable risk-mitigation instruments and institutional investment;
- **Supply:** Africa's supply has relied heavily on emissions avoidance and reduction projects, which can deliver mitigation at relatively low cost. However, concerns about additionality, quantification and, where relevant, permanence have affected buyer confidence in some projects and methodologies. Smaller project scale can also raise transaction costs per credit. The dataset used in the study indicates median annual issuance of approximately 38,000 credits per African project, compared with 54,000 in Asia–around 30 percent lower;
- **Demand:** Differences across carbon-market rules can create uncertainty for policymakers and developers. While AU-led frameworks and regional initiatives support coordination, continent-wide arrangements for pooling supply and coordinating market participation remain under development. Limited domestic demand can also constrain opportunities to build transaction experience. South Africa's offset allowance under its carbon tax provides an established source of domestic compliance demand; comparable demand mechanisms remain limited elsewhere on the continent.

5.3 Opportunities

Policy and institutions

Africa has a near-term opportunity to use governance reforms, policy development and strengthened MRV systems to access compliance-market demand and higher-value transactions. Sound enabling environments provide legal clarity and strengthen investor confidence. To create policy certainty and stimulate investment, governments can publish a methodology[51] eligibility or priority list specifying which types of initiatives may qualify for Article 6 authorization and corresponding adjustments. This should be informed, where feasible, by a marginal abatement cost curve (MACC) study, ranking mitigation options by cost to support decarbonization planning and safeguard NDC achievement[52].

Human capital

Developing a domestic carbon-services industry can retain a greater share of carbon-market value within the country while reducing the time and costs associated with developing and transacting high-integrity credits.

For instance, ACMI launched an auditor training programme intended to accelerate the qualification of auditors in African VVBs, reducing the typical training period from 18 months to approximately six months. Increasing locally available validation and verification capacity can strengthen domestic pipelines, reduce project-processing timelines and improve access for smaller local firms.

Financial capital

Technical assistance facilities can help translate Africa's mitigation potential into bankable, investment-ready carbon-project pipelines by covering early-stage preparation costs that local developers may struggle to finance. A major initiative is the African Development Bank's (AfDB) proposed Africa Carbon Support Facility that aims to address structural barriers by strengthening regulatory frameworks, market infrastructure and project-developer readiness. African countries can also mobilize private-sector finance through blended finance–the strategic use of

public or concessional instruments to reduce investment risks and mobilize commercial capital[53].

Supply

Africa has substantial untapped mitigation potential. In 2023, ACMI estimated the continent's minimum technical potential at 2,400 $MtCO_2e$ annually, spanning forestry and land use, agriculture, blue carbon, renewable energy, household devices, livestock, waste management and engineered carbon dioxide removals[54]. ACMI's ambition to scale annual African carbon-credit volumes to 300 $MtCO_2e$ by 2030 is associated with potential annual revenues of approximately US$6 billion and support for 30 million jobs. Realizing these ambitions would depend on project-level feasibility, policy and regulatory conditions, integrity requirements and sufficient market demand.

Selecting methodologies eligible for CCP labelling or approved under Article 6.4 can support alignment with recognized integrity requirements. Updated methodologies for REDD+ and clean cookstoves provide opportunities to strengthen credit quality[55]. However, methodology approval alone does not establish project-level integrity: robust implementation, verification, safeguards and compliance with applicable market requirements remain essential.

Demand

Article 6 transactions and CORSIA provide African project developers with opportunities to access additional demand and potentially higher credit prices. Article 6 supports transactions linked to national climate commitments and other authorized international mitigation purposes, while CORSIA creates sector-specific demand from aviation through applicable offsetting requirements[56]. Forecasts cited in the report suggest CORSIA credit prices could range from US$27 to US$91 during the latter stages of Phase 2, from 2033 to 2035[57]. These estimates remain subject to supply, eligibility and demand conditions.

Forecasts cited in the report indicate combined Article 6 and CORSIA demand could reach 700 million emissions units by 2030[58]. Applying Africa's 2024 VCM retirement share of 25 percent to this demand would imply approximately 175 million units. At indicative Article 6 prices of US$30–US$60/tCO_2e, this would suggest potential climate-finance flows of US$5.25 billion–US$10.5 billion. This calculation is illustrative: it assumes that Africa can achieve a comparable share of compliance demand and that the price range applies across those sales. It does not represent confirmed purchases or a forecast of secured revenues.

Demand for high-quality credits creates opportunities for Africa to strengthen its market position. The report's illustrative estimate suggests that increasing Africa's share of high-quality retirements to 21 percent could generate approximately one million additional credit sales and US$21 million in revenue, subject to the underlying market and pricing assumptions. Domestic compliance mechanisms with eligible offset provisions could also create policy-driven demand while reducing reliance on international buyers.

Table 3 summarizes the main findings from the market-readiness assessment, vulnerability analysis and mapping of gaps and constraints, highlighting their implications for opportunity development. This synthesis connects the assessment findings with the proposed strategy.

Table 3. Findings and implications for opportunity development.

Analytical lens	Key finding	Implication for Africa's carbon markets	Why this matters for opportunities
Market readiness assessment	Readiness is improving, with early movers operationalizing Article 6 frameworks, while others lag	Africa's participation is uneven, creating risks of concentration but also scope for replication and learning	Early-mover experiences can be scaled and adapted to unlock broader participation
Vulnerability analysis	Heavy reliance on a narrow set of project types and voluntary demand exposes Africa to integrity and demand shocks	Markets are sensitive to rule changes and buyer preferences	Diversification towards high-integrity, compliance-aligned credits becomes a strategic priority
Institutional and MRV gaps	Weak MRV systems, registries and limited local VVB capacity raise costs and deter smaller developers	Transaction costs remain high and local value capture is constrained	Digital MRV, local capacity building and shared infrastructure offer high-impact opportunities
Finance and demand constraints	Limited domestic demand and dependence on foreign buyers and ODA persist	Revenue volatility and external dependence undermine resilience	Domestic pricing instruments, blended finance and carbon-linked fiscal tools can stabilize demand
Regional coordination	Fragmented national approaches limit bargaining power and scale	Africa captures less value than its mitigation potential suggests	Regional cooperation and joint platforms can improve pricing, scale and credibility

6. Strategy roadmap

Global and regional market shifts are reshaping incentives, creating a rapidly evolving environment in which African countries must navigate risks while strengthening their market participation. Rising demand for high-integrity carbon credits presents an opportunity to mobilize climate finance, strengthen economic and climate resilience, and advance long-term development priorities. Although carbon finance has historically accounted for less than one percent of Africa's annual US$50 billion climate-finance inflows[59,7], changing market dynamics suggest this contribution could grow to 10–20 percent[60], depending on market demand, country readiness and project viability. Carbon finance could therefore provide an additional source of funding that complements official development assistance and other climate-finance flows.

UNDP's vision for carbon markets in Africa

UNDP's vision for carbon markets in Africa is to mobilize high-integrity carbon finance as a driver of sustainable development, climate resilience and economic transformation. This vision recognizes that developing countries will require trillions of dollars in climate finance by 2030, and that carbon markets, particularly under Article 6 of the Paris Agreement, can contribute to mobilizing this finance[61,62]. Participation should advance national development priorities, safeguard NDC achievement and ensure transparent, equitable benefit sharing.

UNDP implements this vision through its carbon-market service lines and facilities, including the Carbon Payments for Development Facility. Its support includes strengthening national institutions, developing high-integrity, investment-ready project pipelines, mobilizing finance and supporting countries' participation as trusted market partners. This encompasses technical assistance and capacity-building for governments and project developers in project preparation, Article 6 framework development, agreement negotiations, authorization procedures and implementation monitoring.

The roadmap

The roadmap translates UNDP's strategic vision for high-integrity carbon markets into sequenced implementation actions. It is intended to support African policymakers in navigating market opportunities, risks and uncertainties, with implementation adapted to national circumstances and readiness. As international demand evolves, African countries can strengthen their position as suppliers of high-quality credits while advancing their NDCs. This requires building on existing participation through coordinated market positioning, strengthened institutional readiness and strategic engagement with emerging compliance markets and demand for high-integrity credits.

The roadmap rests on six pillars:

- **Policy and legal foundation:** Establishing a policy and legal foundation aligned with national climate and development priorities and relevant international and domestic carbon-market opportunities;
- **Governance, institutions and data integrity:** Enabling carbon transactions through clear institutional responsibilities, sound governance and reliable data and accounting systems;
- **Project pipeline:** Building a bankable pipeline that delivers development benefits and realizes domestic mitigation potential, taking account of evolving buyer preferences. This includes supporting high-integrity credit types that meet target-market requirements and can attract long-term offtake arrangements;
- **Market strategy:** Developing market entry approaches across voluntary and compliance markets to access multiple demand channels. A diversified market strategy can strengthen resilience by reducing dependence on any single source of demand;
- **Finance architecture:** Mobilizing appropriate finance and reducing project-development risks to attract private capital, support local developers and strengthen domestic value retention;
- **Risk management:** Managing carbon supply risks, including permanence and leakage, while strengthening environmental and social safeguards. This includes meaningful participation, respect for land and resource rights, compliance with applicable consent requirements, gender-responsive benefit sharing and accessible grievance mechanisms.

To inform decisions on authorizing mitigation outcomes for international transfer, countries can develop a MACC alongside assessments of NDC implementation needs and mitigation potential. This can help identify cost-effective mitigation needed for domestic targets and assess the opportunity costs of international transfers. Countries can then establish eligibility criteria or priority lists (positive lists) for authorization, considering national circumstances, buyer requirements and the implications of corresponding adjustments. These arrangements can help prevent over-authorization while safeguarding national climate commitments. Eligibility should reflect the intended use and accounting treatment of mitigation outcomes, rather than whether credits are sold through voluntary markets or issued under Article 6.4.

Governments should consider establishing or designating a coordinating institution, such as a national carbon office (NCO), based on existing mandates and national circumstances, to serve as a single window for day-to-day Article 6 engagement and voluntary carbon-market activities. This institution would coordinate ITMO approval and authorization processes, corresponding adjustment arrangements and relevant voluntary-project procedures, in line with the responsibilities of competent national authorities. Coordinating these functions can strengthen consistency and efficiency in carbon-market participation.

Robust registry and tracking arrangements are essential infrastructure for market integrity. They support environmental credibility and investor confidence through transparent accounting of mitigation outcomes. Countries should establish or access suitable registry services according to their participation needs. Core features should include:

- **National registry core:** A secure database that issues unique serial numbers for every carbon credit and tracks each credit's full life cycle, from issuance to retirement. Uniquely identifying each credit enables full traceability and helps ensure the same tonne of reductions is not counted twice; Secure records of unique unit identifiers, authorization status and relevant life cycle events, including issuance, transfer, retirement and cancellation. These records support traceability and help prevent double counting[63];
- **Interoperability:** The national registry should enable secure information exchange with the Article 6 international registry and relevant voluntary-market registries, consistent with applicable technical requirements. System design should support integration, data reconciliation and the prevention of double counting, using appropriate interfaces such as RESTful APIs;
- **Audit trail and provenance:** A secure, auditable record of each unit's origin and status changes, allowing competent authorities, auditors and buyers to verify its provenance and authorization history.



An electric bus in Marrakech, Morocco.
Photo by: UNDP

7. Country playbook

The country playbook sets out a sequenced implementation pathway across three horizons (Figure 3). Rather than a standalone checklist, it provides actions to be adapted to each country's readiness, national circumstances and the decisions needed before progressing. This sequencing helps avoid premature policy complexity and reduce implementation risks.

7.1 Horizon 1 (years 1–2)

Horizon 1 focuses on enabling participation across markets by putting the foundations in place. Countries define their national carbon-market strategy, legislate the essentials and establish the core policy and legal foundation. The emphasis is on establishing the essential rules, systems and institutional roles for credible participation in voluntary and Article 6 pathways. At this stage, clarity and credibility take priority over complexity or scale.

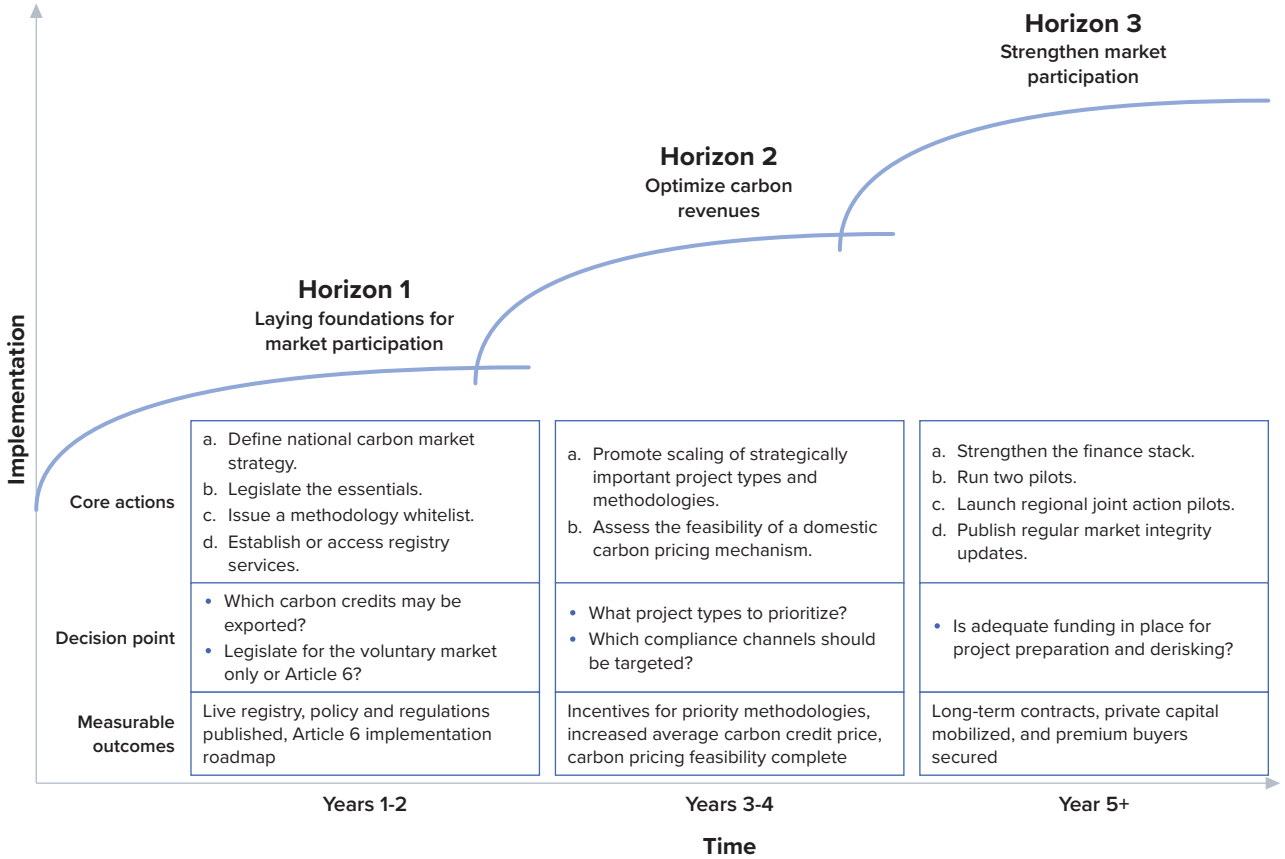
7.2 Horizon 2 (years 3–4)

Horizon 2 focuses on optimizing carbon revenues by shifting from basic readiness to strategic positioning. Once core rules and systems are established, countries can scale strategically important project types and methodologies, strengthen project pipelines and assess options for domestic demand creation, including the feasibility of a domestic carbon-pricing mechanism. The emphasis is on improving transaction outcomes, strengthening alignment with demand and building a resilient, bankable pipeline that meets evolving integrity requirements. Countries begin shifting from initial participation towards greater value capture and development benefits.

7.3 Horizon 3 (year 5+)

Horizon 3 focuses on strengthening market participation by moving from transaction readiness to sustained market performance. Countries strengthen financing arrangements, build on transaction pilots, launch regional joint-action pilots to test interoperability and coordinated

Figure 3. Three-horizon pathway for high-integrity carbon-market participation.



approaches, and publish regular market-integrity updates. The emphasis is on building credibility at scale, reducing transaction barriers and sustaining participation through transparency, predictable rules and stronger regional coordination. The horizons are indicative; countries can undertake pilots earlier once the necessary legal, accounting and safeguard arrangements are in place.

7.4 Country playbook priority actions

- **Define a national carbon market strategy.** Invest in a sound evidence base to support decisions, including a MACC study where feasible, to inform the authorization of mitigation outcomes for international transfer. MACCs can help governments understand opportunity costs and identify cost-effective mitigation needed for domestic NDC achievement;
- **Legislate the essentials.** Ensure climate policies, including NDCs, reflect national carbon-market priorities and assess project-pipeline alignment with target-market requirements. Provide legal and regulatory clarity on carbon rights, project approval processes and taxation. Embed safeguards for meaningful participation, land and resource rights, applicable consent requirements, transparent and gender-responsive benefit sharing, and accessible grievance mechanisms;
- **Issue a methodology whitelist for Article 6 targets.** Countries pursuing Article 6 cooperation can publish criteria identifying activities or methodologies that may qualify for authorization. These should reflect national mitigation priorities, NDC requirements and buyer expectations, informed by MACC analysis and relevant integrity frameworks. CCP assessments can inform this process but do not replace Article 6 requirements or project-level authorization decisions;
- **Establish or access registry services.** Assess whether national, shared or UNFCCC-provided registry services best meet the country's needs. Where a national system is developed, use a modular approach covering relevant unit identifiers, life cycle events, authorization status and accounting information. Plan secure information exchange with relevant systems and define consistent data fields from the outset[64]. These arrangements support traceability and market integrity;
- **Promote strategically important project types.** Consider targeted incentives or grant funding for high-integrity projects aligned with national development objectives and climate goals. Support developers in meeting applicable CCP-labelling, CORSIA or Article 6 requirements, while maintaining project-level assessment and safeguards. Incentives should reflect fiscal capacity, demonstrated need and the potential to mobilize additional investment;
- **Assess the feasibility of domestic carbon pricing.** Consider domestic economic and institutional conditions, distributional impacts and international trade competitiveness, including the implications of trading partners' climate-related trade instruments. Carbon-pricing mechanisms with eligible offset provisions can create domestic credit demand, although their effect on project revenues depends on policy design and market conditions[65];
- **Strengthen the finance stack.** Mobilize technical assistance, blended finance, guarantees and insurance to support project preparation and reduce investment risks. Explore support from AfDB and other relevant facilities according to their mandates and eligibility requirements. Assess the availability and terms of non-delivery and reversal insurance. Appropriate credit enhancement and guarantees can support access to commercial lending;
- **Undertake transaction pilots.** Where appropriate, undertake an Article 6.2 pilot and a voluntary-market pilot involving private-sector buyers. Use these to test authorization procedures, transaction documentation, registry operations, reporting and safeguards before scaling. Pilots can reduce execution risks and demonstrate feasibility to investors;
- **Launch regional joint action pilots.** Test cross-border registry interoperability and coordinated MRV approaches to assess opportunities for regional cooperation. Such pilots can generate lessons for policy and system design, support compatible market infrastructure and strengthen Africa's contribution to international carbon-market discussions.
- **Publish regular market integrity updates.** Report on the state of the national carbon market, including authorizations, corresponding adjustments, issuances, retirements, community benefit distributions and audit outcomes. Reporting frequency should reflect national capacity and applicable requirements. These updates can support transparency, ease buyer due diligence and strengthen confidence in market participation.

Conclusion

Africa's position in global carbon markets is being shaped by evolving market rules, integrity requirements and international demand. Growing interest in high-quality mitigation outcomes presents an opportunity for the continent to strengthen its role as a supplier of high-integrity carbon credits. This could enable countries to mobilize climate finance, strengthen economic resilience and advance broader development priorities. Historically, carbon finance has contributed less than one percent of Africa's approximately US$50 billion in annual climate-finance flows. Estimates discussed in this report suggest this share could potentially grow to 10–20 percent, depending on demand, country readiness and project viability. Carbon finance can therefore complement official development assistance and other financing sources.

Article 6.2 buyer commitments and CORSIA could together generate demand for an estimated 700 $MtCO_2e$ by 2030 in exported credits, with Article 6 cooperation projected to unlock up to $250 billion annually by 2030. Recent estimates suggest that African retirements could increase about eightfold by 2030, from 37 $MtCO_2e$ in 2024 to approximately 300 $MtCO_2e$ (ACMI target). African countries are party to about one third of bilateral Article 6.2 agreements. Africa represents over 20 percent of voluntary market issuance in 2024, underscoring its emerging importance as a global carbon supplier and providing a foundation for further market development.

However, these opportunities exist within a dynamic and complex environment. Fragmented market rules, shifting geopolitical priorities, evolving integrity requirements and varying levels of country readiness create risks for African suppliers. Meeting integrity expectations is essential to maintaining buyer confidence and market access. Strengthening national institutions, developing investment-ready project pipelines, mobilizing appropriate finance and diversifying demand channels can help countries manage these risks.

Realizing this potential requires coordinated, country-led action that safeguards NDC achievement, respects community rights and ensures transparent, equitable benefit sharing. Through strengthened institutional systems and strategic market engagement, African countries can translate mitigation potential into lasting climate and development benefits.



A team reviews plans beside a solar installation.

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