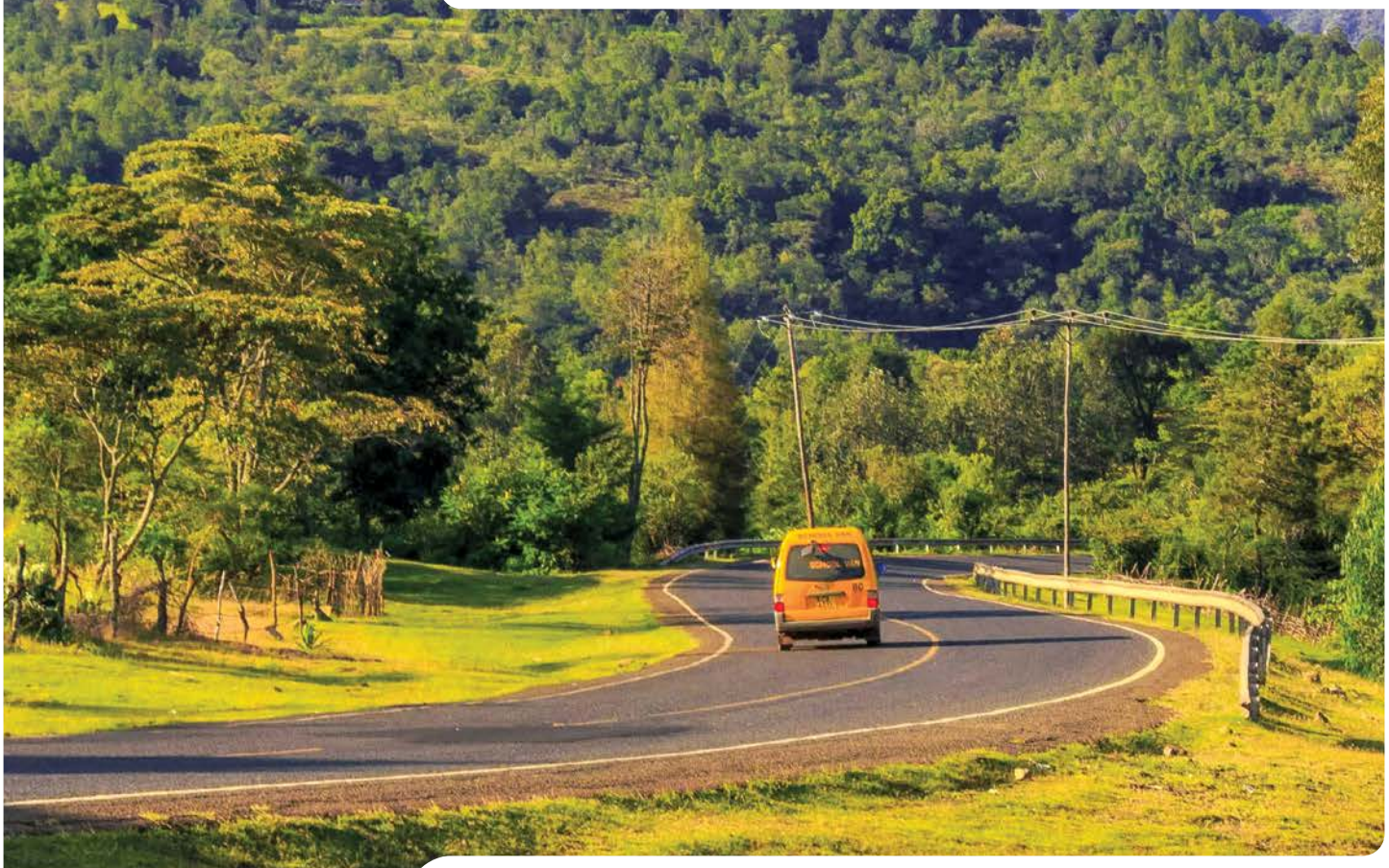
A Carbon Market Guidebook

for Kenyan Enterprises



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KEPSA KENYA PRIVATE SECTOR ALLIANCE

CSF CLIMATE SUPPORT FACILITY

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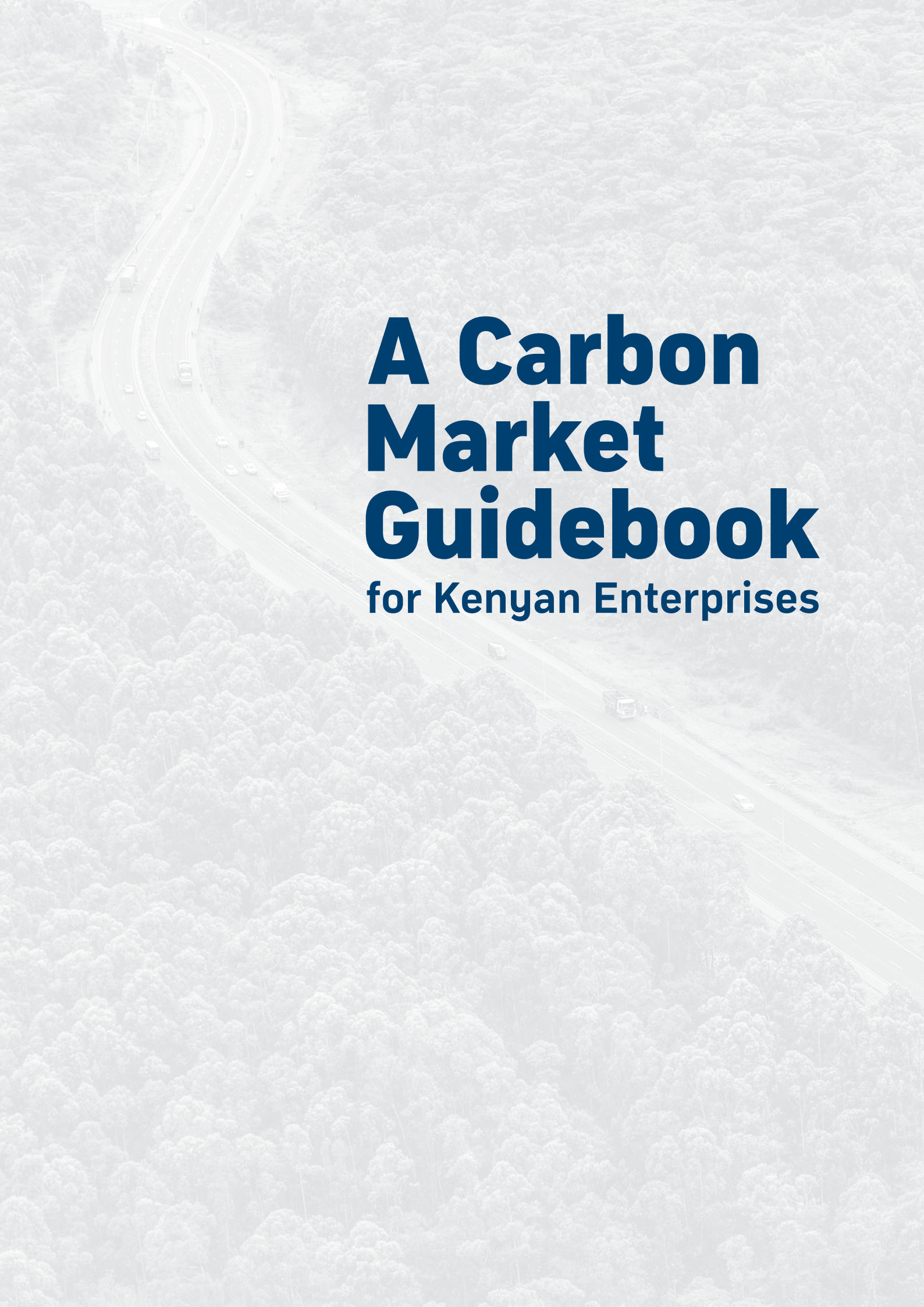

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Abbreviations and Acronyms

ACMI	African Carbon Markets Initiative
ACX	Air Carbon Exchange
AFOLU	Agriculture, Forestry, and Other Land Use
AUD	Avoided Unplanned Deforestation
BAU	Business as Usual
CCCF	County Climate Change Fund
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CO_2e	Carbon Dioxide Equivalent
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
CSF	Climate Support Facility
DAC	Direct Air Capture
DFI	Development Finance Institution
D-MRV	Digital Monitoring, Reporting, and Verification
ETS	Emissions Trading System
FPA	Forward Purchase Agreement
FPIC	Free Prior Informed Consent
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographic Information System
Gold Standard	The Gold Standard for Global Goals
IC-VCM	Integrity Council for the Voluntary Carbon Market
IFC	International Finance Corporation
IRR	Internal Rate of Return
JCM	Joint Crediting Mechanism
KEPSA	Kenya Private Sector Alliance
MDB	Multilateral Development Bank
MO	Mitigation Outcome
MRV	Monitoring, Reporting, and Verification
NDC	Nationally Determined Contribution
NGO	Nongovernmental Organization
NPV	Net Present Value
OTC	Over the Counter
PDD	Project Design Document
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SDG	Sustainable Development Goal
SME	Small and Medium-Sized Enterprise
UNFCCC	United Nations Framework Convention on Climate Change
VCM	Voluntary Carbon Market
VCS	Verified Carbon Credit Standard
VVB	Validation and Verification Body

Glossary[1]

Article 6 of the Paris Agreement: Article 6 of the Paris Agreement allows countries to voluntarily cooperate with each other to achieve emission reduction targets set out in their nationally determined contributions. This means that, under Article 6, a country (or countries) will be able to transfer carbon credits earned from the reduction of greenhouse gas (GHG) emissions to help one or more countries meet climate targets. Within Article 6, Article 6.2 creates the basis for trading in GHG emission reductions (or "mitigation outcomes") across countries on a bilateral basis. Article 6.4 is expected to be like the Clean Development Mechanism of the Kyoto Protocol, establishing a mechanism for trading GHG emission reductions between countries under the supervision of the Conference of the Parties—the decision-making body of the United Nations Framework Convention on Climate Change (UNFCCC). Article 6.8 recognizes nonmarket approaches to promote mitigation and adaptation. It introduces cooperation through finance, technology transfer, and capacity building, where no trading of emission reductions is involved.

Avoidance: Along with removal, avoidance is one of the two major types of carbon projects. Avoidance projects prevent the release of GHG into the atmosphere that would have otherwise been emitted, such as by preventing deforestation in an area with a high rate of logging or providing renewable energy in place of fossil fuel.

Carbon credit: A carbon credit is a tradable certificate that represents GHG emission avoidance or removal of one ton of carbon dioxide equivalent from the atmosphere.

Carbon project: A carbon project refers to a project that contributes to GHG emission avoidance or removals from the atmosphere. Carbon projects leverage carbon credits as a financing mechanism.

Clean Development Mechanism (CDM): Mechanism developed under the Kyoto Protocol for countries with emissions targets to finance emission reductions projects in developing countries in exchange for certified emission reductions, which count toward meeting Kyoto targets.

Corresponding Adjustment: An accounting mechanism established under Article 6 of the Paris Agreement intended to ensure that mitigation outcomes (MOs) are not "double counted"; that is, trading of MOs should not result in more than one country using the same MO to demonstrate achievement of their nationally determined contribution.

Crediting mechanism: A crediting mechanism designates the GHG emission reductions from project- or program-based activities, which can be sold either domestically or in other countries. Crediting mechanisms issue carbon credits according to an accounting protocol and have their own registry. These credits can be used to meet compliance under an international agreement, domestic policies, or corporate citizenship objectives related to GHG mitigation.

Crediting standards: A crediting standard outlines a set of detailed requirements that must be met for a mitigation activity to generate carbon credits using that standard. These standards are typically maintained by independent bodies and are established using expert inputs. Examples include the UNFCCC's Clean Development Mechanism, the Gold Standard, Verra's Verified Carbon credit standard (VCS), and the World Bank's Forest Carbon Partnership Facility.

Enterprise: In the context of this guidebook, a for-profit or nonprofit organization that proposes, owns, and has the legal right to execute the underlying activities behind a carbon project.

1 Builds on World Bank (2022), Defining Results-based Climate Finance, Voluntary Carbon Markets and Compliance Carbon Markets, World Bank (2022), What You Need to Know about Article 6 of the Paris Agreement, and World Bank (2023), State and Trends of Carbon Pricing.

Kyoto Protocol: International treaty adopted in 1997 that aimed to reduce the emission of GHGs and prevent global warming. The treaty committed industrialized countries and "economies in transition" to GHG reductions; established a GHG monitoring and review system; and created a set of "market-based mechanisms," including the CDM, that allow for emissions trading.

Leakage: Risk to manage in the design of carbon projects. It refers to the case where the direct impact of a carbon reduction activity is offset by its indirect impacts. For example, protecting a forest from logging leads to an increase in logging in surrounding forests.

Monitoring, reporting, and verification (MRV): Monitoring, reporting, and verification refers to the process of measuring the amount of GHG emission reduction by a specific mitigation activity over a period and independently verifying the results to ensure robustness and accuracy.

Nationally determined contribution (NDC): An NDC is a national climate action plan to cut emissions. Each country under the Paris Agreement is required to establish an NDC and update it every five years. NDCs are not legally binding unless they are transposed into national law.

Paris Agreement: The Paris Agreement is a legally binding international treaty on climate change. It was adopted by 196 parties at the United Nations Climate Change Conference in Paris, France, on December 12, 2015. It began on November 4, 2016. Its overarching goal is to hold "the increase in the global average temperature to well below 2°C above pre-industrial levels" and pursue efforts "to limit the temperature increase to 1.5°C above pre-industrial levels."

Permanence: Requirement to consider in the design of carbon projects. It describes whether greenhouse gas abatement will be undone over the medium to long term. Carbon dioxide has a half-life of over 100 years, so projects that secure emissions for only a few decades may not permanently and sufficiently reduce emissions.

Project developer: A project developer is the organization that is developing a carbon project, is the point of contact to the relevant crediting standard, and typically has legal ownership of the resulting carbon credits.

Reducing emissions from deforestation and forest degradation (REDD+): Framework for emissions-limitation programs focused on preventing deforestation that was negotiated under the United Nations Framework Convention on Climate Change. REDD+ credits are not allowed in the CDM but are common in the voluntary carbon markets.

Registry: A platform that maintains information related to the creation, transfer, use, and cancellation of carbon credits to enable tracking. The level of sophistication of a registry system can vary, with some serving as data repositories while others may include trading functions. They include voluntary registries such as Verra, Gold Standard, and Plan Vivo, and UN mechanisms like the CDM.

Removal: Along with avoidance, one of the two major types of carbon credits. Removal projects aim to absorb emissions from the atmosphere to reduce potential greenhouse effects. For example, engineered methods such as direct air capture and accelerated rock weathering can be used to absorb carbon from the atmosphere.

tCO_2e: Ton of CO_2 equivalent. Standardized unit for greenhouse gases expressing all emissions in terms of CO_2 with equivalent global warming potential.

Vintage: The year in which the emissions avoidance or removal underpinning the carbon credit took place.

Executive Summary

Enterprises in Kenya encompass a diverse and dynamic landscape, representing a crucial driver of economic growth and employment opportunities in the country. Small and medium-sized enterprises (SMEs), in particular, play a pivotal role, contributing significantly to the nation's gross domestic product (GDP) and accounting for 90 percent of the labor force. Enterprises must scale their climate action to meet Kenya's climate mitigation and adaptation goals. However, the lack of funding has limited their contribution to the climate agenda. Debt constitutes most of enterprises' funding, but the price of debt remains very high and loan tenors are short. The availability of patient capital, including private equity, is also low.

Carbon markets can be an important vehicle to support an enterprise's climate action. Crucially, carbon markets function as a source of non-debt, results-based financing that does not require prior assets or collateral, potentially enabling enterprises in Kenya that struggle to access other sources of climate finance to grow.

Despite this potential and the government of Kenya's commitment to scale carbon markets, Kenya's participation in international carbon markets remains concentrated, with most credits issued by a handful of developers. Many enterprises also have limited understanding on how they should develop and monetize carbon credits. The purpose of this guidebook is therefore to provide practical step-by-step guidance to help enterprises navigate the complex and fast-evolving landscape of carbon markets.

The life cycle of carbon projects follows three key stages: (i) project conceptualization and financing, (ii) project development and monitoring, and (iii) credit issuance and sales (Figure 1). These stages are summarized in Table 1.

FIGURE 1
Life cycle of a carbon project

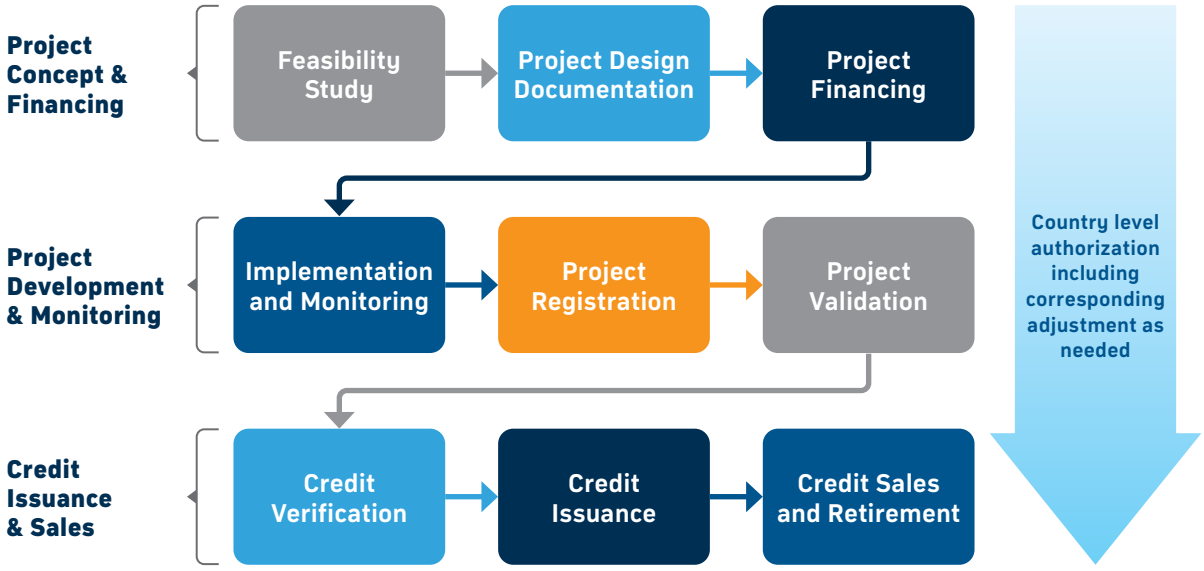


TABLE 1
Overview of the guidebook

1 Project Conceptualization

1. The first step is to determine whether the project is suitable for carbon credits. There are various strategic questions that need to be answered. For example, can the activity trigger a reduction in emissions from a business-as-usual baseline by either avoiding or removing emissions? Does the activity match a project type for which it is common to have carbon credits issued? Can the project satisfy the quality requirements of standards and principles in the market?
2. If the project has strong carbon potential, the next step would be to select the appropriate carbon credit standard and methodology to follow. Most Kenyan projects in the voluntary market are registered under two independent crediting mechanisms, the Verified Carbon Standard and the Gold Standard.
3. A detailed feasibility study will then be developed in close consultation with key stakeholders. This feasibility study typically covers four components:
    i. technical feasibility to assess the viability of the carbon project based on established carbon methodologies and the emission reduction potential of the project;
    ii. financial feasibility to assess the potential revenue, costs, and investment needed;
    iii. legal and regulatory feasibility to assess whether the project can comply with relevant laws, policies, and regulations;[2] and
    iv. organizational feasibility to assess whether the enterprise has sufficient capacity to engage in carbon markets and to what extent external support is needed.
4. Once the enterprise decides to pursue a carbon credit project, a project design document (PDD) needs to be developed. This should outline how the project will be implemented and how emission reductions will be calculated and monitored based on the selected methodology and standard.

2 Project Financing

1. Enterprises should carefully consider the financing costs required at different stages of the carbon project life cycle. At the project conceptualization stage, financing needs may include conducting a pre-feasibility study and a feasibility study and preparing the PDD. At the project development and monitoring stage, enterprises

2 The government of Kenya recently issued the Climate Amendment Bill, which provides the regulatory basis for carbon markets. Regulations are expected in the future to clarify how market actors can engage in carbon markets. Depending on the project type, other regulations and laws may also have to be considered (e.g., in relation to land ownership in the case of nature-based credits). It is important for enterprises to closely navigate the regulatory landscape in Kenya since it is fast evolving. Most notably, it is important to keep track of the government's expectations around Article 6 and corresponding adjustment, which can add an extra layer of approval and potentially lead to longer timelines for project development and implementation.

have to dedicate resources to validate the PDD and project implementation plan, facilitate project registration, and complete project implementation and monitoring. During credit issuance and sales, resources are needed to support the verification of emission reductions, the issuance of verified carbon credits, and pre-financing of pre-credit sales. The guidebook provides preliminary estimates of the costs associated with these different activities, noting that the cost could vary across project types.

2. There are various financing sources that could help enterprises attract capital for their carbon projects. This may include commercial financiers such as carbon funds, corporates with climate targets, commercial banks, and intermediaries. It could also include development financiers, such as governments, impact investors, nonprofit organizations, and multilateral development banks.

3. In terms of financing mechanisms, enterprises should consider the type of purchase agreement that would be used for the carbon project. This may include, for example, forward purchase agreements and carbon derivative–based contracts. Carbon credits may also be linked to equity and debt financing in some cases.

4. Finally, enterprises should consider potential risks that should be mitigated to lower the financing costs. This includes project-level risks (e.g., operational, community, and reputational risks) and macro-level risks (e.g., political risks, regulatory risks, and price volatility).

3 Project Development and Monitoring

1. The project will need to be listed under the registry of the selected carbon credit standard. This involves opening an account with the registry and submitting the necessary documentation.

2. Depending on the requirements of the selected carbon credit standard, project validation is usually the next step after the project is listed. Validation helps ensure that the project meets the established requirements of the standard. Validation entails three main steps: submission of documentation to a validation and verification body (VVB), review of submitted documentation and site visit by the VVB, and generation of a validation report.

3. After the validation process is completed, the project is ready to be registered under the chosen standard. To initiate project registration, the enterprise prepares and submits the validated PDD and supporting documentation to the registry of the chosen carbon credit standard for review and approval. Supporting documents may include a validation report, proof of contracts, technical specifications, and stakeholder consultation reports.

4. Monitoring involves measuring and tracking emission reductions for reporting at each credit issuance period. A carbon project monitoring plan is needed to track measurable parameters that will be used to calculate the project's impact. The plan will then guide enterprises on how to monitor the project and complete the monitoring report.

4 Credit Verification and Issuance

1. The verification process helps ensure that carbon credits are only issued for projects that have achieved real and measurable emission reductions and that buyers can trust these credits to achieve their climate change mitigation goals. The verification process is a rigorous, multistep process designed to ensure the integrity and credibility of carbon projects. The process involves the submission of emissions data and monitoring reports to a VVB and review by the chosen registry. Given the limited presence of VVBs in Kenya and the rigor of the process, an enterprise should expect a timeline of approximately two to six months for the verification process.

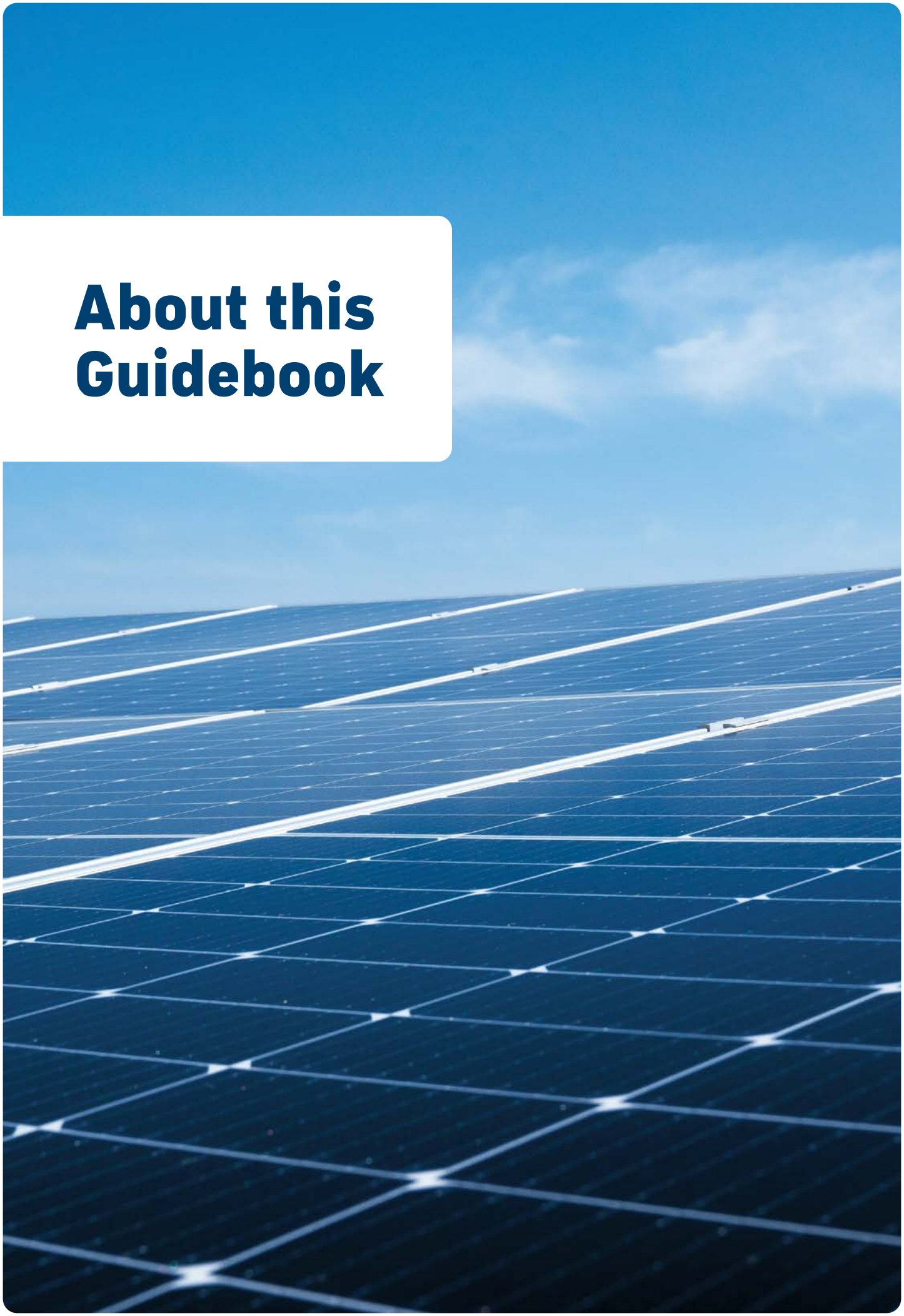
2. Credit issuance is the step in the carbon project life cycle where carbon credits are made available to the enterprise that developed the project. During the credit issuance process, the enterprise that developed the project needs to submit an issuance request and pay a carbon credit issuance levy, after which the registry deposits the carbon credits in the enterprise's account at the registry.

5 Credit Sales

1. There are several channels available for enterprises in Kenya to sell their issued carbon credits, including, for example, over-the-counter direct sales or brokered sales, exchange sales, and sales on auction platforms. Each sales channel has unique advantages and disadvantages. Enterprises need to understand the available sales channels to select a channel that fits their needs.

2. Enterprises should be aware that different project and macro-level factors could influence the price of carbon. Project-specific drivers may include, for example, the project's co-benefits, the quality and environmental integrity of the project, and the project type and vintage. Macro-level drivers may include, for example, market perceptions, buyer preferences, and regulations.

About this Guidebook



What is the purpose of this guidebook?

This guidebook aims to demystify the landscape of carbon (credit) markets in Kenya and share good practices across the carbon project development life cycle. It outlines the key steps involved in developing a successful carbon project and provides practical advice to enterprises on how to navigate these steps. The team, however, recognizes that the carbon market landscape is rapidly evolving and that the guidebook may need to be updated over time to reflect the latest market and policy developments in Kenya and globally.

Who should use this guidebook?

This guidebook is intended for enterprises interested in developing carbon projects in Kenya. It is particularly relevant for enterprises that are considering developing their first carbon project. For these enterprises, this guidebook provides practical advice on how to navigate each stage of the carbon project life cycle. For more experienced enterprises that have already started their first carbon project, the guidebook provides further information about subsequent steps and links to resources or support available in the market. Even though the target audience of the guidebook is enterprises, this guidebook could also help financiers and authorities better understand key barriers that limit enterprise engagement in carbon markets and what actions need to be taken to address these gaps.

Why was the guidebook developed?

The World Bank Group and KEPSA developed the guidebook to better understand how enterprises in Kenya can benefit from carbon credits, in conjunction with other financing tools. In doing so, the guidebook aims to inform World Bank's broader engagement and operations with private sector enterprises by exploring how carbon credits could complement other financing instruments to scale investments for climate action in Kenya.

How was the guidebook developed?

The guidebook was informed by a series of bilateral consultations with stakeholders, including but not limited to Ministry of Environment, Climate Change & Forestry, National Treasury, Capital Markets Authority, 4R Digital, ACX, BioLite Energy, Carbonaires, Cella Mineral Storage, Ceriops Environmental Organization, Circular Impact, Climate Asset Management, Climate Impact Partners, Earthbanc, Ecosecurities, Farm to Market Alliance, Hartree Partners, Howard Kennedy LLP, KawiSafi Ventures, Kita Earth, KOKO Networks, Komaza, Laikipia Conservancies Association, Mirova, Mount Kenya Trust, NCBA Group, Octavia Carbon, One Acre Fund, Regen Organics, the Nature Conservancy, UNDO Carbon, Verra, and Wildlife Works, the Deutsche Gesellschaft für Internationale Zusammenarbeit, Japan International Cooperation Agency, Japanese JCM, Japanese Ministry of Environment, Multilateral Investment Guarantee Agency, US Agency for International Development, McKinsey, and United Nations Industrial Development Organization.

Context

Global and regional context of carbon markets

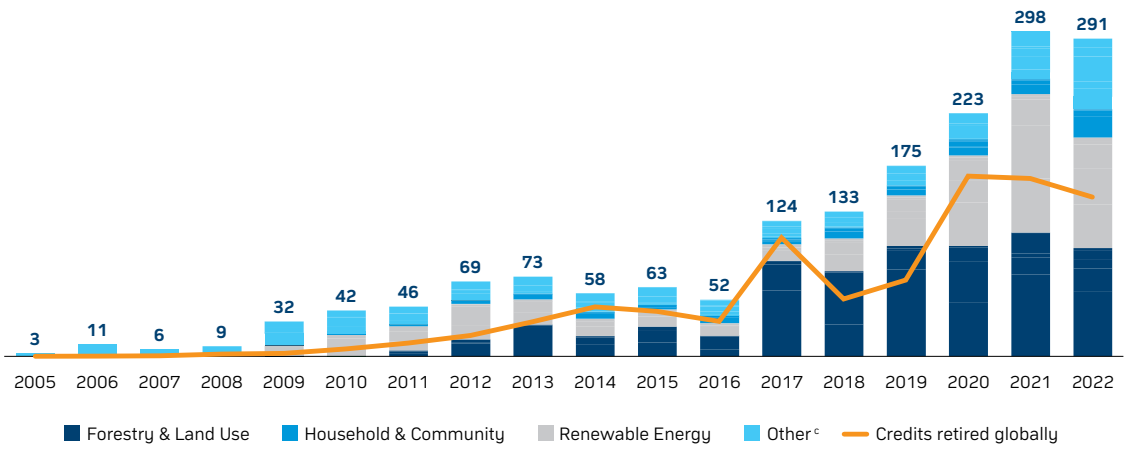
What are carbon projects and credits?

Carbon credit markets trade "carbon credits." Each credit represents the reduction of one metric ton of carbon dioxide equivalent (CO_2e) from the atmosphere. These credits are issued to verified carbon projects by carbon credit standards such as Verra, Gold Standard, or Plan Vivo. Once issued, carbon credits can be sold in carbon markets where organizations and individuals wishing to reduce their carbon footprint can buy and use credits to offset their own emissions.

Carbon credits are generated through voluntarily implemented emission reduction project- or program-based activities. These projects are undertaken by for-profit or nonprofit enterprises with activities that contribute to emission avoidance or removal. Carbon projects can be managed by enterprises directly responsible for emission reduction activities (e.g., a conservancy managing land and wildlife preservation or a waste management company with daily recycling operations) or can be managed by a third-party entity specialized in developing carbon projects on behalf of enterprises. Carbon projects are common in forestry and land use, agriculture, livestock management, energy activities, waste management, industrial activities, and transportation activities (Figure 2).

Carbon projects are typically segmented by how they reduce emissions: avoidance versus removal, and the nature of their emission reduction activities: nature based versus tech based. Avoidance projects reduce emissions by preventing their release into the atmosphere. Removal projects reduce emissions by removing emissions from the atmosphere. Nature-based projects protect, restore, or sustainably manage ecosystems. Tech-based projects leverage technologies to avoid or remove emissions. In 2022, credit issuances for avoidance projects made up 79 percent of global VCM credits. In the future, credit issuances for removal projects are expected to increase due to their higher perceived quality by market participants and the relevant technology becoming more commercially viable and scalable (Figures 2, 3).

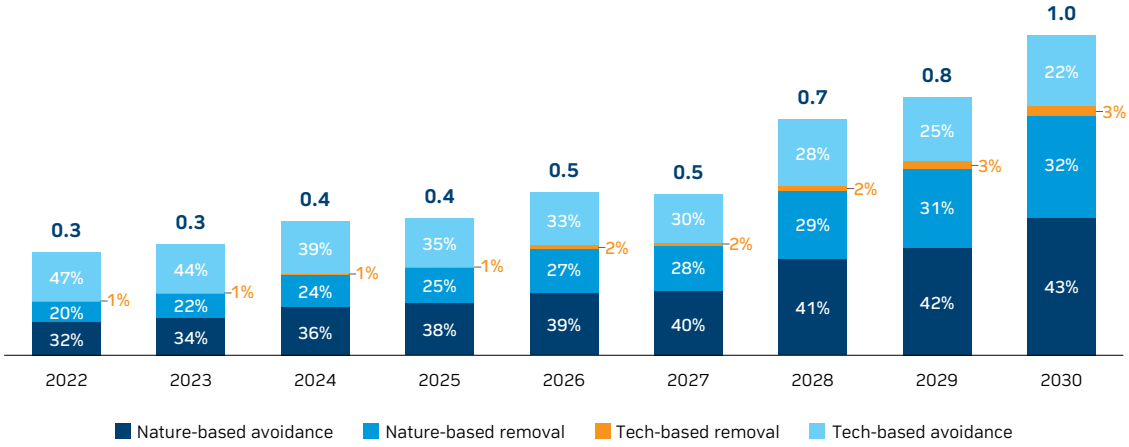
FIGURE 2
Carbon credits issued[a] and retired[b] globally by project type, millions of credits



Sources: Berkeley Carbon Trading Project Voluntary Registry Offsets Database (data from Climate Action Reserve, American Carbon Registry, Verra, and Gold Standard).

a. When registry issued the credits; **b.** When a credit is claimed against an organization or individual's carbon footprint; **c.** Includes agriculture, carbon capture and storage, chemical processes, industrial and commercial, transportation and waste management.

FIGURE 3
Projected carbon credit supply by emission reduction type, billions of credits



Sources: American Carbon Registry; Climate Action Reserve; Gold Standard, Verra; Carbon Offsetting and Reduction Scheme for International Aviation; International Maritime Organization; International Energy Agency; CDP; Company commitments; International Carbon Action Partnership; Fraunhofer Institute for Systems and Innovation Research; Ecosystem Marketplace; S&P Global Platts; Nori Carbon Removal Marketplace; Indigo Ag; Expert survey.

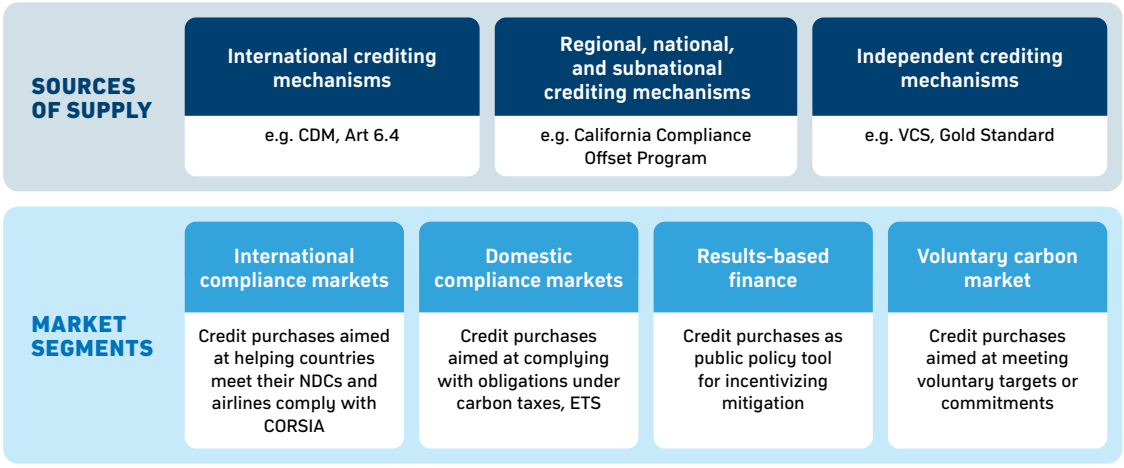
What are the sources of demand and supply for carbon credits?

The supply of carbon credit is represented by issuances from carbon crediting mechanisms, including (i) those established in international crediting mechanisms established under international treaties (e.g., Kyoto Protocol and Paris Agreement); (ii) domestic crediting mechanisms established by regional, national, or subnational governments; and (iii) independent crediting mechanisms/standards that are managed by nongovernmental entities (e.g., VCS, Gold Standard). There are various sources of demand, including (i) voluntary demand, mostly from private entities purchasing carbon credits to meet voluntary targets (e.g., net zero); (ii) domestic compliance demand, for companies seeking credits to meet their obligations under a domestic scheme (e.g., emissions trading scheme or carbon tax); and (iii) international compliance demand, including countries purchasing emission reductions to meet their mitigation targets under the Paris Agreement and airlines purchasing credits eligible for meeting their obligations under the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). Demand for credits can also come from results-based climate finance, where governments or international organizations incentivize climate action by purchasing carbon credits. However, it should be noted that results-based carbon finance involves the transfer of assets from one entity to another (Figure 4).[3]

Since the rules and procedures for engaging in Article 6 have not yet been finalized, and the implications of Article 6 of the Paris Agreement on voluntary carbon markets are unclear, this guidebook focuses on the current state of play of VCMs in Kenya, while recognizing that the guidebook may need to be updated over time to respond to the evolving regulatory landscape of carbon markets. However, section 1.3 does take note of potential reporting requirements that could emerge under Article 6, including in relation to corresponding adjustment.[4]

3 World Bank 2023, State and Trends of Carbon Pricing.
4 World Bank (2022), What You Need to Know about Article 6 of the Paris Agreement. Article 6.2 allows countries to trade emission reductions through bilateral or multilateral agreements which creates opportunities for developing countries to export carbon credits, provided that these credits are not double counted against national climate targets. Article 6.4 aims to establish a centralized mechanism for trading authorized emission reductions between countries and companies provided the projects are approved by the country where the projects are implemented.

FIGURE 4
Sources of demand and supply for carbon credits



Source: World Bank 2023, State and Trends of Carbon Pricing.

Kenya and regional context

Why does the carbon market matter for Kenyan enterprises?

Enterprises in Kenya encompass a diverse and dynamic landscape, representing a crucial driver of economic growth and employment opportunities in the country. Ranging from small-scale family businesses to large multinational corporations, Kenya's enterprise sector spans various industries, including agriculture, manufacturing, services, technology, tourism, and finance. Small and medium-sized enterprises (SMEs), in particular, play a pivotal role, contributing significantly to the nation's GDP and accounting for the majority of the labor force. Strategic documents, such as Kenya's National Climate Change Action Plan and the National Adaptation Plan, as well as the World Bank's draft Climate Change Development Report recognize the important role that the private sector, particularly SMEs, must play in achieving Kenya's NDC goals. With government initiatives aimed at supporting climate mitigation and adaptation activities in key sectors and attracting foreign investment, Kenya is positioned as a dynamic economic hub in East Africa, offering both opportunities and challenges for entrepreneurs and investors alike.

Estimates predict that the majority of financing for SMEs' climate activities needs to come from the private sector, given the growing fiscal constraints and limited amount of public finance available. The financial sector, Kenyan government, and international development finance institutions (DFIs) have mobilized capital to support SMEs, but the focus has largely been through debt instruments and de-risking products in the form of portfolio guarantees. Pricing of debt remains very high and loan tenors remain short in the SME sector due to the inherent risks of small size, limited experience, vulnerability to shocks, and lack of collateral, making it unaffordable or inaccessible. Private equity funding for SMEs in Kenya is very low, with most funds having a regional mandate, further decreasing the country's potential share of these resources.

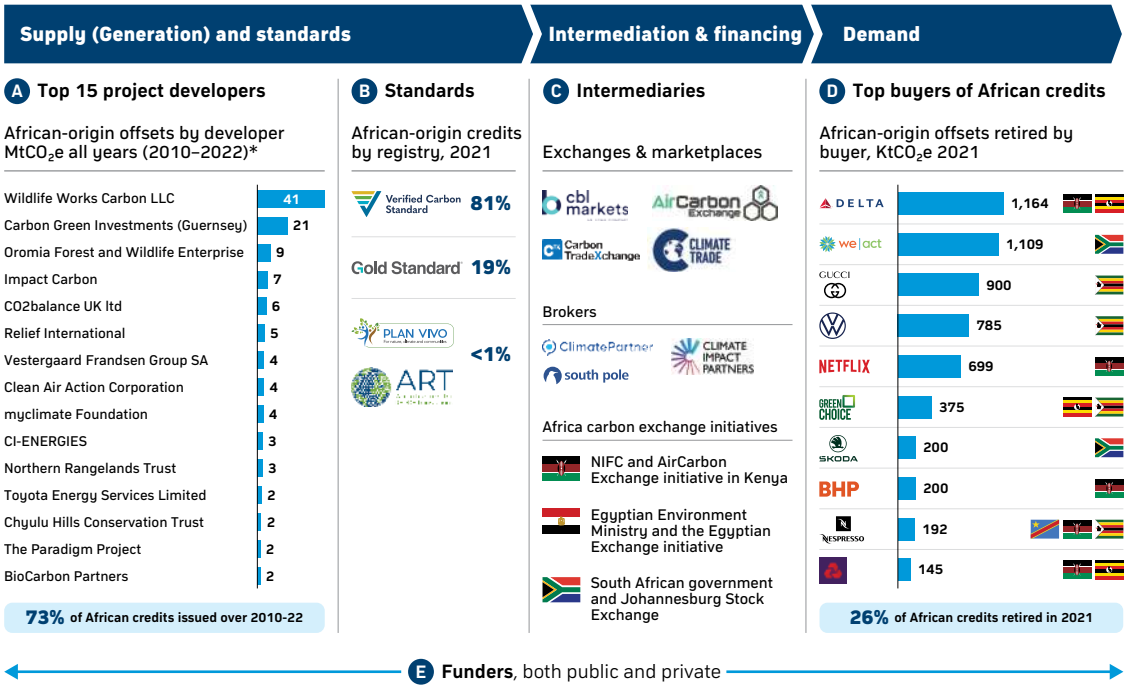
Carbon markets can complement other sources of financing by providing additional revenue streams that can improve the economics of a project. Crucially, for enterprises interested in exploring options to mitigate the impacts of climate change, carbon finance can function as a source of non-debt, results-based financing that does not require prior assets or collateral, potentially enabling enterprises in Kenya that struggle to access other sources of (climate) finance to grow. By offering a source of non-debt finance, carbon markets can potentially help enterprises in Kenya transition to green business models with less reliance on direct government subsidies, donor support, or debt instruments. In some cases, carbon credits could also be a tool for managing exchange rate risks, which is especially important for enterprises that are highly exposed to currency risks (e.g., agriculture exporters). Carbon credits are generally sold in US dollars, while project development and implementation costs are likely to be partially in Kenyan shillings. Carbon credits could therefore act as a mitigant against currency risks since carbon revenues offer a hard currency cash flow for climate projects.[5] While carbon financing alone may not be sufficient to develop a project, it can make a project financially viable. For example, revenues from the sale of carbon credits can offset the costs of implementing energy efficiency measures, making projects more financially attractive.

How have Kenya and Africa participated in the carbon market in the past?

African countries have historically missed out on carbon markets but have shown growing interest in scaling their engagement in carbon markets in the future. China and India accounted for 67 percent of credits generated under the Kyoto Protocol's Clean Development Mechanism, while Africa represented only 5 percent.[6] In the voluntary carbon market, demand for African-originated carbon credits has been growing, at a compound annual rate of 36 percent between 2016 and 2021, but the value of these credits remains low, with the retirement value of African carbon credits standing at only $123 million in 2021.[7] Large economies, such as India and China, dominate voluntary carbon markets, and only a handful of African countries and companies have been able to benefit from voluntary carbon markets to date. Voluntary carbon markets in Africa are fragmented, with a significant number of global players across the value chain. Project developers are generally small scale and limited in number, with around 100 project developers active on the continent over the past 10 years. Project developers focus on similar types of projects, with around 97 percent of African carbon credits issued in forestry and land use, renewable energy, and household devices (out of the total number of credits issued over 2016–22). There is limited local validation and verification body (VVB) presence and almost all credits from Africa are certified by independent standards (~80 percent from Verra, ~20 percent from Gold Standard). Demand for African credits is largely driven by major international companies (Figure 5). Estimates by the Africa Carbon Markets Initiative (ACMI) suggest that the region's participation in carbon markets is well below its technical potential, representing only 2 percent of Africa's maximum annual potential for carbon credit generation.[8]

5 OMFIF 2023, Leveraging Carbon Markets to Enable Private Investment.
6 World Bank (2018), Carbon Markets Under the Kyoto Protocol.
7 All dollar amounts in this report are US dollars unless otherwise indicated.
8 According to the Africa Carbon Market Initiative (ACMI), the 2030 technical potential of Africa-sourced carbon credits is estimated to be up to ~2,400 metric tons of CO_2e per annum based on existing, nascent, and innovative methodologies in sectors such as forestry and land use, agriculture, blue carbon, renewable energy, household devices, livestock, and waste management. ACMI (2022), ACMI Roadmap Report.

FIGURE 5
VCM credits issued for projects in Sub-Saharan Africa in 2022, millions of credits

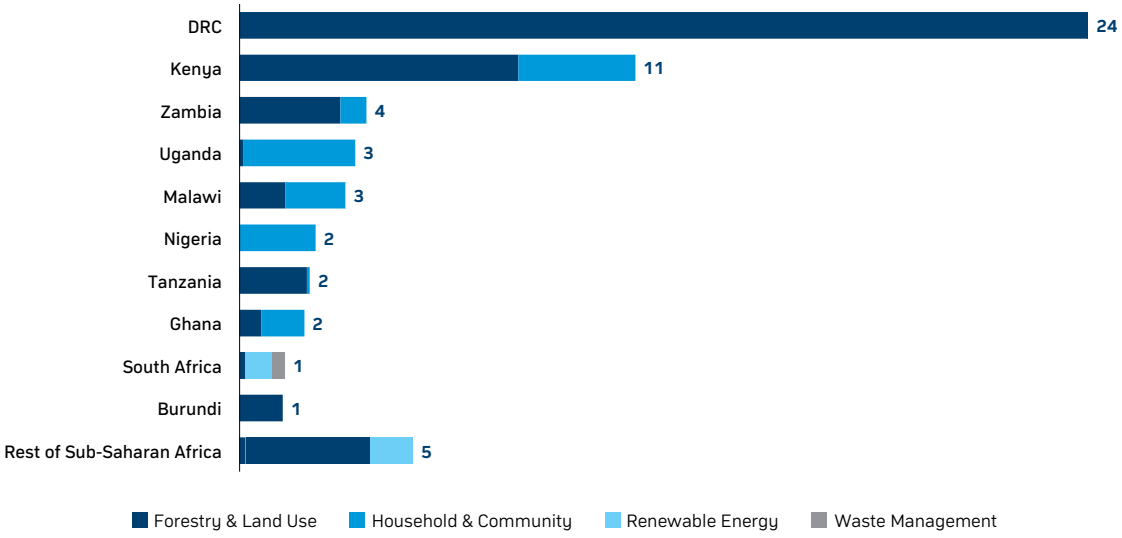


*First issuance year of African based projects was 2010.
Source: Data extracted from VCS, GS, CAR, ACR and Plan Vivo registries; Analysis of news articles and company websites.

Source: ACMI 2022
Note: Each credit represents the reduction of one metric ton of CO_2e from the atmosphere.

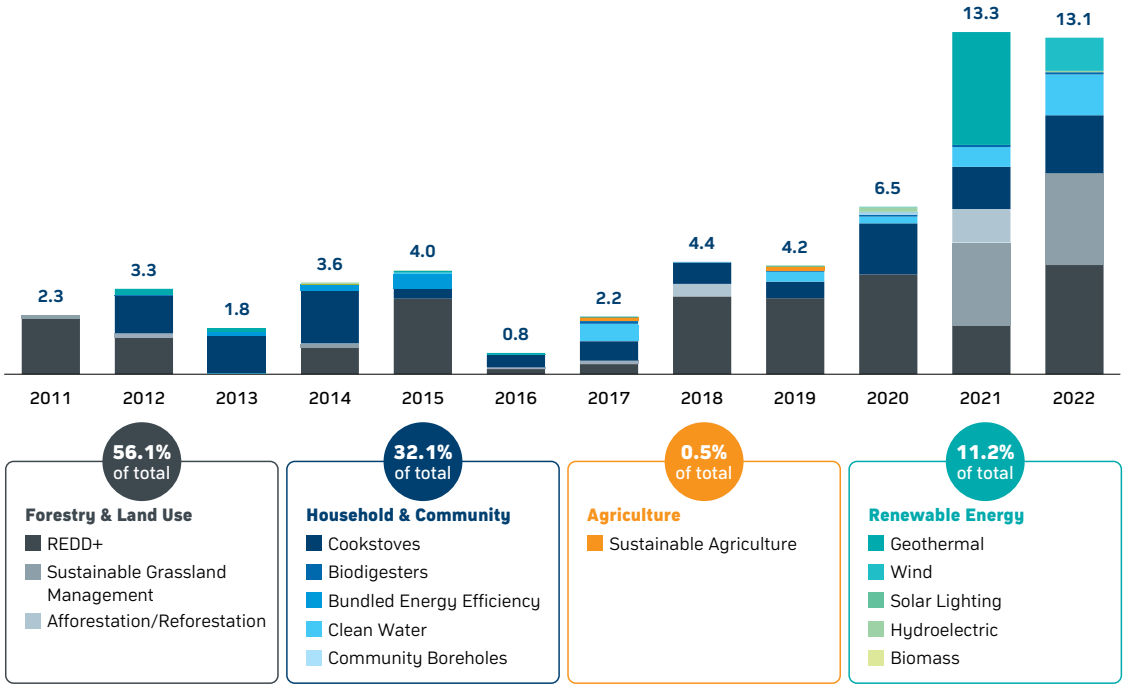
In 2022, Kenya was the second largest issuer of VCM carbon credits in Africa, after the Democratic Republic of the Congo (Figure 6). Since 2011, over 59 metric tons of carbon credits have been issued to projects in Kenya, 83 percent of which have been issued in voluntary markets (Figure 7). To date, most voluntary carbon credits issued in Kenya come from nature-based projects. Tech-based projects are nascent but emerging in the market. Most credits generated from Kenya in voluntary markets have been issued for forestry and land use projects. These credits have been issued to four developers, three of which are based in Kenya: Wildlife Works Carbon, Chyulu Hills Conservation Trust, and Northern Rangelands Trust. They have generated carbon credits through reducing emissions from deforestation and forest degradation (REDD+) and sustainable grassland management projects to support local environment conservation efforts. Household and community–based credits, specifically cookstoves, are another significant type of credit generated in Kenya. The enterprises behind these credits are more fragmented and largely rely on carbon credit revenue to achieve profitability. The primary buyers of VCM credits generated in Kenya have been corporations such as Air France-KLM, Apple, BHP, Delta Air Lines, Kering, Nedbank, Nespresso, Netflix, Shell, and Zenlen Inc. There is limited transparency on the prices paid for these credits as they have been sold over the counter with bilateral negotiations. A small portion of credits generated in Kenya have also been sold in compliance markets, issued through the Clean Development Mechanism.

FIGURE 6
VCM credits issued for projects in Sub-Saharan Africa in 2022, millions of credits



Sources: Berkeley Carbon Trading Project Voluntary Registry Offsets Database (data from Climate Action Reserve, American Carbon Registry, Verra, and Gold Standard).
Note: DRC = Democratic Republic of the Congo.

FIGURE 7
Carbon credits issued in Kenya for voluntary and compliance markets, millions of credits



Sources: Berkeley Carbon Trading Project Voluntary Registry Offsets Database (data from Climate Action Reserve, American Carbon Registry, Verra, and Gold Standard); Clean Development Mechanism.
Note: Percentage of total refers to all credits issued from 2011 to 2022.

What area can Kenya grow its carbon market in?

Projects in forestry and land use, household and community, and renewable energy produced more than 99 percent of credits in Kenya since 2011. However, beyond these historically large sources of carbon credits, there are other project types with emission reduction potential that can be developed to expand Kenya's carbon market.

Based on an assessment of resource availability in Kenya, global interest from buyers, and potential to generate high-quality credits, project types with high carbon market potential include:[9]

- **Forestry and land use:** There is high potential due to large forest and wetland coverage in Kenya, with emerging opportunities driven by developments in jurisdictional REDD+ and buyer preference for removal-type forestry and land projects.

- **Agriculture:** There is high potential due to the size of the sector (approximately 33 percent of Kenya's GDP) and interest of market participants in climate-smart agriculture.

- **Industrial processes:** Kenya's industrial sector, especially the cement industry, offers significant opportunities for GHG emissions reduction. Cement manufacturing is traditionally a highly energy-intensive process, often powered by fossil fuels, which significantly contributes to the country's overall carbon footprint. The implementation of energy-efficient technologies and practices, such as improving kiln efficiency or substituting clinker (a major component of cement) with less carbon-intensive materials, can further reduce the industry's environmental impact.

- **Waste management:** There is high potential due to the large volume of waste generated and government attention with the recent Sustainable Waste Management Act (2022), with emerging opportunities including composting and methane recovery in water.

What are the challenges to growing the carbon market in Kenya?

To unlock the potential of carbon markets in Kenya, there are critical challenges across the carbon market value chain that require stakeholders' collaborative efforts to address.

- **Local knowledge and capacity:** As noted in the previous section, only a handful of Kenyan enterprises have managed to benefit from carbon markets so far. Most enterprises in Kenya have a limited understanding of carbon markets, and significant capacity building is needed to increase enterprises' technical understanding of how to develop and implement high-quality carbon projects. There is also limited local expertise and capacity for carbon project verification and validation, which is required to lower the barrier and transaction costs for carbon credit issuance. Project verification and validation must be completed by a third-party entity approved by the applicable certification standard, meaning that enterprises cannot control this limited capacity but can advocate for new verification and validation entities to be approved in the region.

9 Carbon capture and storage also has strong potential due to the availability of resources such as geothermal energy and basalt deposits. However, given the high up-front costs associated with these investments, these projects may not be suitable for carbon markets in the short run.

- **Access to financing:** Kenyan enterprises have limited access to affordable sources of financing for projects. This limits enterprises' ability to pursue carbon projects. At the same time, financiers in the market have limited tools to de-risk investments from high-risk projects, such as insurance.

- **Policy uncertainty:** Policies and regulations related to land rights and carbon credit ownership, taxation policy, and domestic Article 6 regulation and implementation have implications for enterprises implementing carbon projects, including in relation to the authorization and approval process. Currently, Kenya has passed the Climate Change Amendment Bill and is in the process of developing more detailed regulations for carbon markets, which is expected to provide further details on the expected approval process and reporting requirements for voluntary and compliance carbon markets (see section 1.3). However, these regulations are still under development, creating policy uncertainties for enterprises that wish to engage in carbon markets. Clarity on land rights and carbon credit ownership is also vital for enterprises pursuing nature-based projects to ensure project continuity and long-term risk mitigation. The private sector also needs clarity on how carbon credits are legally defined to address issues related to insolvency, and how to account for the purchase and sale of carbon credits on the balance sheet. Regulations related to the taxation of carbon credits could also affect the feasibility of carbon projects (Box 1). Enterprises participating in the Kenyan carbon market should remain aware of national and county-level legal, policy, and regulatory changes as they arise.

BOX 1

Taxation of carbon credits

Some countries are levying high taxes on revenues from selling carbon credits. Zimbabwe recently announced carbon credit proceeds will be taxed at 50 percent and Kenya published proposed amendments to its Climate Change Bill that stipulate 25 percent of aggregate earnings from carbon credit projects go to local communities. While the price of carbon credits is expected to increase in the next few years, offsetting to some degree the impact of any taxation for project developers, there is a lack of clarity around how carbon credits will be taxed in Kenya and other countries in the region.

- **Price level:** Carbon credit prices in the voluntary market vary by project type and fluctuate year-on-year. It typically requires at least two years from project conceptualization until carbon credits are generated and there is little guarantee of what the price for a carbon credit will be at that time.

- **Lack of local service providers:** Most certification standards developers, third-party verifiers, project developers, and other ecosystem actors are based outside of Africa, making it time-consuming and expensive to develop carbon projects on the continent and certify the resulting carbon credits.

What trends will shape the next decade of the market?

Global carbon markets are constantly evolving, driven by shifting market dynamics, technology innovations, and policy developments. The future of carbon markets is hard to predict but several key trends will shape their continued evolution over the next decade:

- **Market demand growth:** Demand growth for voluntary carbon credits is expected to be led by three key drivers: corporate commitments from companies aiming to reduce their carbon footprints, industry schemes with emission reduction targets (e.g., CORSIA), and new trading opportunities in compliance markets that allow foreign-generated carbon credits.

- **Focus on project quality and integrity:** Carbon credit buyers are expected to pay increasing attention to project quality and integrity to mitigate reputational risk from market participation. In recent years, registries have been criticized for issuing carbon credits for projects that do not deliver accurate emission reductions as claimed. Purchasing such types of credits can expose buyers to public backlash and greenwashing accusations. Therefore, as companies and industries strengthen their commitments to climate change mitigation, robust monitoring, reporting, and verification (MRV) will be a key consideration in credit purchasing decisions. Existing project MRV processes could be lengthy, costly, and require significant technical capacity. Digital MRV solutions are emerging to streamline MRV processes and decrease costs to make carbon markets function more efficiently (see further details in section 1.1).

- **Project type shift:** Perceived quality differences among project types will drive the composition of VCMs moving forward. Projects that remove emissions from the atmosphere, both nature based and tech based, are expected to command a greater share of VCM trading volumes and higher market prices. Growth of tech-based removal projects will be driven by technological advancements, leading to cost reductions for enterprises operating these projects.

- **Article 6:** Globally, governments are implementing policy frameworks and structures to cooperate under Article 6 of the Paris Agreement, creating opportunities for enterprises to participate in international compliance markets. For example, Ghana and Switzerland signed the first bilateral authorizations under Article 6.2 of the Paris Agreement, paving the way for project implementation under this mechanism. As such efforts continue to grow, enterprises should remain aware of Article 6 rules and implementation may impact their carbon project activities (see further details in section 1.3).[10]

- **Policy development:** To enable the growth of carbon markets, governments are developing or updating policies and regulations on land rights and credit ownership, establishing fiscal policies related to carbon credits, establishing domestic project registries to ensure market transparency, and more. These policy developments are evolving in Africa. For example, Malawi recently created an agency to regulate the industry, while Zambia is looking to put in place laws on carbon markets and negotiate with program owners to take a share of income (see further details in section 1.3).

10 For example, corresponding adjustments are outlined as the main tool for avoiding double counting within Article 6. These adjustments will determine which entity, a national government or private buyer, can count offset emission reductions toward their total emissions. Enterprises undertaking carbon projects should be clear on how their generated credits will be accounted for by the government to ensure buyers do not double count. Furthermore, enterprises seeking to register projects under Article 6.4 must comply with all Article 6.4 rules, even when selling credits to a private company. As such, these credits must be authorized by the country where projects are implemented, which will require engaging with the government to receive project authorization letters.

CHAPTER 1

Project Conceptualization and Design

1.1 How to determine if an activity is suitable to pursue carbon credits?

Enterprises with projects that could avoid or remove emissions should consider carbon markets by starting to conceptualize projects. Early consideration of carbon markets can ensure the chosen project activities reduce emissions in a way that will generate carbon credits.

Before the decision is made to develop a carbon project, the first step is to conduct a feasibility study. There are strategic questions that an enterprise needs to answer to determine whether it has a suitable activity to be turned into a carbon project. A feasibility study would need to be conducted to answer the strategic questions in a comprehensive way. However, given the costs involved in such a study, it is often helpful to have a high-level understanding of the following four questions before progressing:

- Can the activity trigger a reduction in emissions from a business-as-usual (BAU) baseline by either avoiding or removing emissions?
- Does the activity match a project type for which it is common to have carbon credits issued?
- Can the activity satisfy the quality requirements of standards and principles in the carbon market?
- Would the expected resource invested into the carbon project be justified by the expected revenue?

Activities' ability to avoid or remove emissions

Carbon credits are issued for either emission avoidance or removal activities. Having such activities is a prerequisite for enterprises considering developing a carbon project.

Carbon avoidance activities prevent or reduce the release of emissions into the atmosphere compared to a BAU baseline. An example of an avoidance project is the use of efficient cookstoves, which avoid emissions by reducing the amount of wood burnt for daily cooking.

Carbon removal activities remove emissions from the atmosphere. Examples of carbon removal include afforestation and reforestation, which increase the quantity of carbon held in land by planting new trees, or direct air capture (DAC), which removes emissions from the atmosphere through chemical or physical means.

Carbon project types

Enterprises should look for existing activities issued with carbon credits to compare if their activities similarly avoid or remove emissions and if such avoidance or removal activities are commonly accepted by registries. In Kenya, projects issued with carbon credits are common in forestry and land use, household and community, and renewable energy, providing 56 percent, 32 percent, and 11 percent of credits issued, respectively. Carbon projects can be broadly segmented into nature-based and tech-based projects. For tech-based projects in Kenya, avoidance projects are typically decentralized and require active community engagement, whereas removal projects are more centralized and, in general, may require less community engagement. An overview of each segment with project examples in Kenya is provided next. Additional information on credit generation by projects of different types in Kenya is available in "Global and regional context of carbon markets" on page 12.

Nature-based avoidance and removal projects protect, sustainably manage, or restore natural ecosystems. They require significant engagement with the local communities who own or live on the land. Projects in Kenya include:

- **Reducing emissions from deforestation and forest degradation (REDD+):** Activities that lower emissions by reducing deforestation or forest degradation (e.g., Wildlife Works developed Kasigau Corridor REDD+).

- **Afforestation, reforestation, and revegetation (ARR):** Activities that increase carbon stocks by establishing, augmenting, or rehabilitating vegetative cover via planting, sowing, and assisted natural regeneration of woody vegetation (e.g., Komaza developed Komaza Smallholder Farmer Forestry Kenya).

- **Avoided conversion of grasslands and shrublands (ACoGS):** Activities that lower emissions by reducing the conversion of grasslands and shrublands ecosystems to other land uses with lower carbon densities (e.g., Boomitra developed Boomitra Grassland Restoration in East Africa through Soil Enrichment).

- **Wetlands restoration and conservation (WRC):** Activities that remove emissions by restoring wetlands ecosystems or reduce emissions by avoiding the degradation of wetlands (e.g., Vlinder Austria GmbH developed Papariko - Restoration of Degraded Mangrove Areas in Kenya).

- **Agriculture land management (ALM):** Activities that reduce emissions on croplands and grasslands by increasing carbon stocks in soils and woody biomass and/or decreasing CO_2, nitrous oxide, and/or methane emissions from soils (e.g., Soil Carbon Certification Services developed Western Kenya Soil Carbon Project).

Tech-based avoidance projects typically work with local communities to avoid emissions by distributing more efficient devices, e.g., improved cookstoves, water filters, home biogas, and solar home systems and water pumps:

- **Improved cookstoves:** Activities that replace inefficient cooking technologies with improved stoves (e.g., Burn Manufacturing installed high-efficiency cookstoves in Sub-Saharan Africa).

- **Water filters:** Activities that provide access to clean and safe water without the need to boil the water (e.g., Offgridsun developed Maji Safi, Maisha Bora Project).

- **Home biogas:** Activities provide access to clean energy to replace traditional cooking and lighting and reduce emissions into the air from waste decomposition (e.g., Homebiogas Limited developed Homebiogas Programme in Kenya).

- **Solar home system/solar lanterns:** Activities that replace fuel-based lighting or heating systems (e.g., kerosene lamps) with solar systems that rely on renewable energy (e.g., MicroEnergy distributed approximately 600,000 solar lighting systems across Kenya).

- **Solar water pumps:** Activities that replace fuel-based pumps with a cleaner source of energy (e.g., SunCulture developed Solar Water Pump Project in Kenya).

Tech-based removal projects require less community involvement and typically capture CO_2 and store it safely in long-term storage. In Kenya, carbon capture and storage projects are still nascent. New projects can take longer to start due to technological and financial barriers. However, there are diverse initiatives from market pioneers:

- **Direct air capture:** Activities that capture CO_2 directly from the atmosphere using special materials or solvents that selectively bind to CO_2 (e.g., Octavia Carbon).

- **Carbon mineralization:** Activities that provide durable storage services by injecting CO_2 into volcanic rock (e.g., Cella).

- **Enhanced rock weathering:** Activities that accelerate naturally occurring rock weathering to permanently remove CO_2 from the atmosphere (e.g., UNDO).

- **Biomass fuel production:** Activities that convert organic waste (e.g., agricultural waste) into briquettes and pellets that provide an alternative fuel source (e.g., Tamuwa).

- **Biochar:** Activities that convert organic waste (e.g., agricultural waste) through pyrolysis and use resulting products as a soil amendment additive (e.g., Eco-Act).

As the carbon market evolves, accepted project types also change. For the most up-to-date information, refer to the latest guidelines from carbon credit standards and registries such as VCS, Gold Standard, and Plan Vivo, which dominate the voluntary carbon market in Kenya. Enterprises are also highly encouraged to go through documentation for specific projects of interest on the registries' websites for more details.

High-quality implementation

Environmental integrity has become an important topic as carbon markets have gained momentum globally. In recent years, carbon credits have been scrutinized for their underlying project quality and impact on emission reductions. Demonstrating the quality of carbon credits is therefore critical to protect the reputation of all stakeholders involved in the project life cycle. Even though there is no internationally agreed definition and methodology for assessing the quality of carbon credits, several voluntary initiatives have been established to guide buyers and suppliers in ensuring the quality of carbon credits.

On the supply side, the Integrity Council for Voluntary Carbon Markets released the Core Carbon Principles, which highlights key principles that standards/programs should abide by to help enterprises generate high-integrity carbon credit. These principles include:

1. **Effective governance** to ensure transparency, accountability, and continuous improvement.
2. **Tracking** (through a registry) to uniquely identify, record, and track mitigation activities and carbon credits issued.
3. **Transparency** to enable the scrutiny of mitigation activities.
4. **Robust independent third-party validation and verification**.
5. **Additionality** to ensure that GHG emission reductions would not have occurred in the absence of the incentive created by carbon credit revenues (Box 2).
6. **Permanence** of GHG emission reductions should be ensured. If there is a risk of reversal, measures should be put in place to address these risks and compensate for reversals.
7. **Robust quantification of emission reductions and removals** based on conservative approaches.
8. **No double counting**, meaning that GHG emission reductions from the mitigation activity will only be counted once toward achieving mitigation targets. This covers double issuance, double claiming, and double use.
9. **Sustainable development benefits and safeguards** based on industry best practices.
10. **Contribution toward net zero transition** by avoiding the lock-in of GHG emissions, technology, or carbon-intensive practices that are incompatible with the objectives of achieving net zero GHG emissions by mid-century.

On the demand side, the Voluntary Carbon Markets Integrity Initiative (VCMI) issued the Claims Code of Practice, which aims to improve buy-side integrity by guiding companies and other actors on how they can credibly use carbon credits as part of their climate commitments. The general premise of the code is to have companies shift from making "carbon neutral claims" to following the principles for Climate Mitigation Claims Credibility and adopting the silver, gold, and platinum badges of the VCMI Claims Code. The code is based on a four-step process:

1. **Comply with the foundational criteria:** To make an enterprise-wide VCMI claim, companies must (i) maintain and publicly disclose an annual GHG emissions inventory; (ii) set and publicly disclose validated science-based near-term emissions reduction targets and publicly commit to reaching net zero emissions no later than 2050; (iii) demonstrate that the company is on track to meet a near-term emissions reduction target and minimize cumulative emissions over the target period; and (iv) demonstrate that the company's public policy advocacy supports the goals of the Paris Agreement and does not represent a barrier to ambitious climate regulation.

2. **Select a VCMI claim to make:** There are three tiers of claims that companies can make. Each claim requires the purchase and retirement of high-quality carbon credits proportionate to the remaining emissions once a company has demonstrated progress toward meeting its near-term targets. Credits are not counted as internal emission reductions that a company undertakes to meet decarbonization targets. Rather, these purchases represent a contribution to both the company's climate goals and to the collective global mitigation effort to reach net zero emissions.

3. **Meet the required carbon credit use and quality thresholds:** VCMI refers to the CCPs and its assessment framework to ensure the quality of carbon credits.

4. **Obtain third-party assurance following the VCMI monitoring, reporting, and assurance framework** to ensure transparent reporting and assurance of information.

BOX 2

Concept of additionality[a]

Additionality is an essential element to ensure carbon credit quality. A proposed project activity is considered additional if it would not be implemented in the absence of the crediting mechanism (e.g., the price signal from the carbon credit market), holding all other factors constant. However, determining additionality can be challenging as it requires an assessment against a counterfactual (that is, what would have happened in the absence of the crediting mechanism). This is both challenging and has an element of subjectivity. Based on the World Bank's guide to developing domestic carbon crediting mechanisms, a summary of the typical tests is provided here, noting that these tests are not mutually exclusive and in practice, crediting mechanisms generally use a combination of tests to demonstrate additionality.

Additionality tests adopted by existing crediting mechanisms include:

- **A regulatory surplus test**, which asks whether the project activity is required by law, mandate, court order, or regulation. Required activities are deemed non-additional. Exceptions may be made when a policy or regulation is generally not widely followed or enforced.

- **A financial or investment test**, which analyzes whether the project activity is economically and financially viable. If the proposed project in question is economically viable without the carbon credit revenue, it would be deemed non-additional. This test is often operationalized in the form of an estimated internal rate of return for the proposed project relative to a contextually relevant investment benchmark. Another option is to compare the net present value of the project to a reference level. The project is considered non-additional if the internal rate of return is above the benchmark or the net present value of the project is higher than

a World Bank (2021), A Guide to Developing Domestic Carbon Crediting Mechanisms.

the reference level. In practice, the financial additionality test could be complex, given limited information and uncertainties around projected carbon price. The way in which these tests are structured also means that there is only a narrow corridor in which projects could go ahead: returns on projects must not be so attractive that they will happen without carbon credits and not so unattractive that they were unaffordable without these revenues.

- **A barrier test**, which identifies obstacles to project implementation. Additionality is demonstrated if the incentive from the crediting mechanism helps the project proponent overcome defined financial, technological, institutional, or regulatory barriers that otherwise are preventing the project activity.

- **A common practice test or technology/practice penetration level test**, which considers the proposed project's technology or practice within its context (e.g., sector, region, and industry). If the technology or practice is established common practice and would likely occur even without the crediting mechanism, then the project or program is deemed to be non-additional.

The difficulty of demonstrating additionality varies among project types. For example, it is generally easy to show that industrial gas destruction projects are additional, as only legal mandates or carbon credits provide practical incentives to undertake them. By contrast, renewable energy and energy efficiency projects require scrutiny, as they may be undertaken even in the absence of the crediting mechanism (e.g., because of revenues from energy sales). Crediting mechanisms have several options to increase the likelihood that activities are additional. This can be done through program-wide requirements (e.g., by excluding project activities unlikely to be additional, often called a "negative list"); methodologies that carefully specify their applicability conditions to filter out project activities that are likely to be non-additional; and intensive project reviews at the point of registration request.

Additionality can be determined on a case-by-case basis using a project-specific approach, or for a whole class of projects using a standardized approach.[b] In practice, the effect of a crediting project or program is typically context specific. For example, a crediting mechanism may incentivize a mitigation activity in one location or context (meaning it is additional there) but not in another. Furthermore, the additionality assessment will change over time (meaning an activity may be additional at present but not in 5 or 10 years). This highlights the benefits of a project-specific approach to determining additionality and is one reason why standardized approaches to additionality have been difficult to develop.

b Project-specific approaches determine additionality through a tailored analysis that typically uses a combination of tests to demonstrate that the project would not have been implemented without the crediting mechanism. In the project-specific approach, additionality tests are used as the basis for developing an additionality tool, such as the Clean Development Mechanism's "Tool for the demonstration and assessment of additionality." Standardized approaches determine additionality by applying conditions, requirements, a performance standard, a performance benchmark, or any combination of these tools. Projects must meet stated conditions and requirements, or outperform the performance standard or performance benchmark, to be considered additional. One way of implementing standardized approaches is through a "positive list," which identifies specific activities that are deemed to be additional and eligible to use certain methodologies. The standardized approach accepts that some non-additional projects will meet the applicability conditions and be deemed additional (false positives) and that some additional projects will not meet the conditions and therefore be deemed non-additional (false negatives). The risk of false positives and false negatives can be minimized, but not eliminated. Regular review, evaluation, and refinement of the methodology (particularly the additionality tests) reduces this problem.

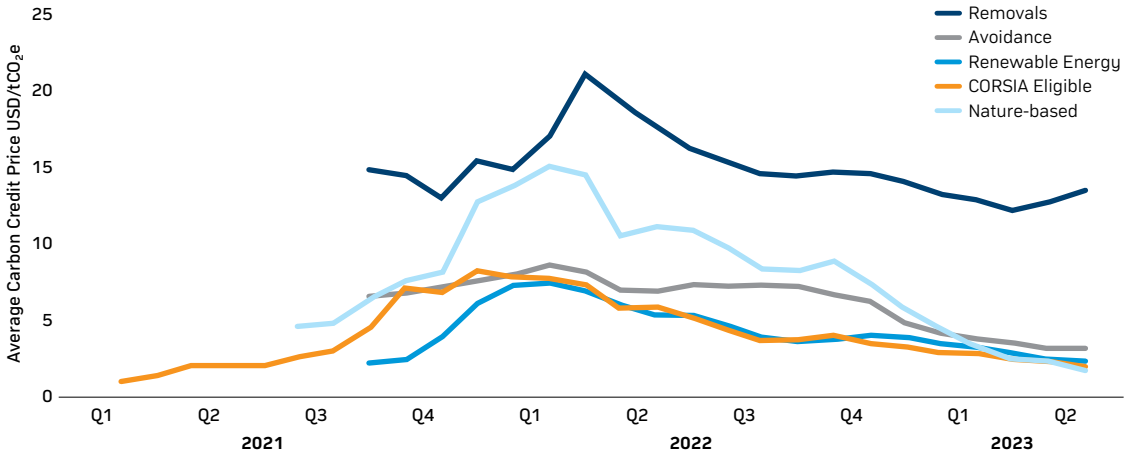
Cost-benefit comparison

Participating in carbon markets calls for sizable investments, including conducting a feasibility study, drafting a project design document, and paying for credit issuance fees. Some of the costs are fixed without significant variation due to project size, while others vary by the volume of credits to be generated. It is important to form an estimation of the potential revenue generated and resources needed before deciding to enter the market. Section 2.1 elaborates on the estimated costs incurred along the carbon project life cycle.

From a revenue perspective, the number of potential credits to be generated per year and the expected price per credit can provide a broad estimation of the potential revenue.[11] Sizing the credit potential of a carbon project requires technical knowledge of the project activities. For example, an estimate of the potential credits from a project based on using climate smart agriculture, analysis of local climate, soil type, and vegetation cover might need to be conducted; an estimate of the potential credits from a biogas production project that captures methane emissions from livestock, a scan of the local livestock population, livestock production practice, and current waste management practices would be necessary.

Further, the price per credit can vary significantly by project type. For example, agriculture projects reached up to $24 per credit in 2021, while renewable energy projects only reached up to $10 per credit due to additionality risks. Tech-based removal projects can reach more than $200 per credit given market confidence in the project quality. To get the best possible estimates, enterprises should look at the price of credits for similar projects, i.e., from the same project type, under the same carbon credit standard, and from the same region. The price of credits fluctuates; thus enterprises with projects should consider price trends in addition to historical prices. As shown in Figure 8, the average price of carbon credits fell in 2023. The extent of the decline varied across credit types, with nature-based credits experiencing

FIGURE 8
Prices of standardized carbon credit contracts, 2021 to 2023



Source: S&P Global Platts, 2022, by S&P Global Inc.
Note: Removals is a basket assessment of carbon credits from nature-based or technological projects that remove GHG emissions from the atmosphere. Avoidance is a basket assessment of carbon credits from projects that avoid GHG emissions. Nature-based reflects nature-based carbon credits from projects that either avoid or remove GHG emissions. Renewable energy reflects carbon credits from renewable energy projects that avoid GHG emissions. CORSIA eligible reflects carbon credits eligible for use in the CORSIA program. Prices shown are monthly averages.

11 At a high level, a project can estimate the number of potential credits by multiplying the number of units in the project (e.g., cookstoves, solar water pumps, etc.) by the number of annual emission reductions per unit from similar projects and the number of years the project is expected to run. For estimates of emission reductions per unit, project developers can search for benchmark numbers through project design documents of similar projects in the registries or conduct internet searches for articles from reputable sources, e.g., UNFCCC gives cookstove examples.

the greatest drop, from a high of around $16 to close the year at under $5. According to Ecosystem Marketplace, the downward price pressure may be a result of the increased use of standardized contract (including via exchanges).[12]

From a cost perspective, this guide provides more detailed information in the following chapters covering project development, MRV, and issuance. While project costs differ dramatically, in general, enterprises in Kenya developing a nature-based project could expect an up-front cost of $350,000 to $800,000 and recurring costs of $100,000 to $300,000 each time new credits are issued. Enterprises developing a tech-based project should expect an up-front cost of $200,000 to $400,000 and a recurring cost of $50,000 to $150,000 each time new credits are issued. Up-front costs include pre-feasibility and feasibility studies as well as project design document development and validation, which are detailed further in section 2.1. These costs do not include the implementation of the project, e.g., the purchasing and distribution of improved cookstoves. Recurring costs include those related to monitoring, verification, and issuance. Emerging technologies, e.g., digital MRV, may reduce costs and streamline processes related to carbon project development in the medium to long term. If the project requires external financing or intermediaries to connect to the end buyer, the financiers and intermediaries may request between 10 percent and 50 percent of project revenue, depending on the financing and intermediation required.[13]

In addition to the project costs, an enterprise should also keep in mind a variety of risks that could negatively affect the emission reductions from the project. Risks to consider fall into two broad categories: project-specific risks and macro-level risks. Project-specific risks relate to the circumstances of the carbon project or the enterprise and include operational, technical, and reputational risks. Macro-level risks relate to the broader market or geography that the enterprise engages in. Macro-level risks include political, regulatory, and currency risks as well as price volatility in the carbon markets. An enterprise entering the carbon markets should be aware of these risks and assess their potential impact on the carbon project. After considering the risks, an enterprise should plan mitigations for project-specific risks that are within their control. Section 2.4 includes more information to help enterprises identify potential risks and design mitigations for these risks.

In summary, during the project conceptualization and design stage, an enterprise needs to determine if its activity will be suitable for carbon credit generation based on the type of activity, the enterprise's ability to implement a high-quality project, and the cost-benefit considerations of the project. If there is high confidence that the activity satisfies these criteria, the enterprise can move to the next stage of planning for the potential carbon project—identifying the suitable carbon credit standard and methodology to use.

12 World Bank (2023), State and Trends of Carbon Pricing.
13 Based on discussions with project developers in Kenya.

1.2 How to select the carbon credit standard and methodology to follow?

After establishing that a project is suitable for carbon credit generation, the next important decision is selecting a carbon credit standard and methodology to use.

A carbon credit standard is a complete set of rules, procedures, and approved monitoring methodologies under which certified carbon credits are quantified and issued. A monitoring methodology is the set of parameters, criteria, and operations needed to calculate emission reductions from a carbon project during its lifetime. The decision on the carbon credit standard and methodology to use affects processes at later stages such as project registration, MRV, and markets where the credits can be sold. This chapter focuses on how to select the standard and methodology to follow for a carbon project, outlining the most important considerations in the selection process.

Carbon credit standard selection

There are various crediting standards in the carbon market developed for VCMs and others for compliance markets. Carbon credit standards operating in VCMs include the VCS, Gold Standard, and Plan Vivo. Carbon credit standards that are linked to trading schemes in compliance markets included CDM operated under UNFCCC, before its expiry, and the Korean Offset Scheme operated under Korea's ETS. The CDM is being replaced by the Article 6.4 mechanism and is no longer accepting new projects or issuing new credits. In addition to these carbon credit standards, there are others, such as the Climate Action Reserve (CAR) and American Carbon Registry (ACR), that mainly focus on projects in North America. The Inclusive Carbon credit standard, which launched in 2021 with the goal of widening access to the global carbon market, is open to projects of all types and geographic locations.

When selecting a carbon credit standard for a project, an enterprise must consider the following:

- **Markets where the carbon credit standard is accepted:** The target market where it wants to sell carbon credits, whether voluntary or compliance, should accept the selected carbon credit standard.
- **Project types that the carbon credit standard specializes in:** Whether the carbon credit standard has expertise and coverage in the type of project the enterprise intends to pursue; e.g., if a carbon credit standard has largely supported the generation of forestry credits or cookstove credits, it could signal to an enterprise that the standard has better expertise and credibility in these project types.
- **Lead time to register projects:** Amount of time taken by a typical project to complete registration.
- **Credit costs:** One-time, up-front, and recurrent costs related to credit generation and issuance.
- **Retroactivity and start date eligibility:** Whether the carbon credit standard allows backdating of credits for projects that receive certification later than the start date of the project.

Most projects in Kenya in the voluntary market are registered under either VCS or Gold Standard (Table 2). VCS issued 70 percent of all the carbon credits generated by Kenyan projects between 2005 and 2022, while Gold Standard issued more than 29 percent. PlanVivo accounts for less than 1 percent of issued credits from projects in Kenya.[14] A similar pattern is observed across Sub-Saharan Africa. Globally, VCS and Gold Standard led in credit issuance with 64 percent and 14 percent respectively, while North America-focused CAR and ACR contributed 22 percent of issuance. The higher shares of VCS and Gold Standard are due to their longer history in the market, broader coverage of project types, and wider geographic footprint.

TABLE 2
Summary of voluntary carbon credit standards

Standard	% of VCM issuances in Kenya	Main types of projects in Africa	Lead time	Credit Costs	Retroactivity*

VERRA – Verified Carbon Standard	**~70%**	• Agriculture, forestry, and other land use (AFOLU), including:
		  • Afforestation and reforestation
		  • Agricultural land management
		  • Improved forest management
		  • Reduced emissions from deforestation & degradation
		  • Avoided conversion of grasslands and shrublands
		  • Wetlands restoration and conservation
		• Emerging renewable energy (e.g., solar, wind, hydro, and geothermal) supplying national grids in emerging economies
			6-12 months	**Listing cost:** $4K
				Issuance cost: $0.20 / credit
					Allowed

Gold Standard	**~30%**	• AFOLU with a focus on afforestation and reforestation (e.g., planting trees, single-species plantations, and agroforestry) • Community service (e.g., cookstoves, renewable off-grid solutions, WASH, and waste management) • Emerging renewable energy (e.g., solar, wind, hydro, and geothermal) supplying national grids in emerging economies	12-18 months	**Listing cost:** $4-8K **Issuance cost:** $0.15-0.30 / credit	Allowed
Plan Vivo	**<1%**	• AFOLU with a focus on forest protection and management, agroforestry, agricultural improvement that benefit smallholders and local communities, and soil conservation	3-6 months	**Listing cost:** $6K **Issuance cost:** $0.35-0.40 / credit	Allowed

* Possibility for a project developer to receive credits for emission reductions within the project before the crediting period started.

In addition to these carbon credit standards, there are other certification programs available that an enterprise can pursue as an additional signal of carbon credit quality and integrity. Examples of Verra add-on standards include the Climate, Community, and Biodiversity Standard (CCB), which provides assurance that a forestation or land use project is delivering tangible climate, community, and biodiversity benefits; and the Sustainable Development Verified Impact Standard, which verifies that a project advances the global Sustainable Development Goals set forth by the United Nations. Enterprises can register their credits under the main carbon credit standards and the add-on standards. However, registering under multiple standards can incur significant extra certification costs. In addition to the standards, intermediaries who sell credits, e.g., Acorn Rabobank, build in additional requirements, such as project duration, minimum prices, or SDG contribution, as extra layers that ensure the quality of the credits they offer to buyers.

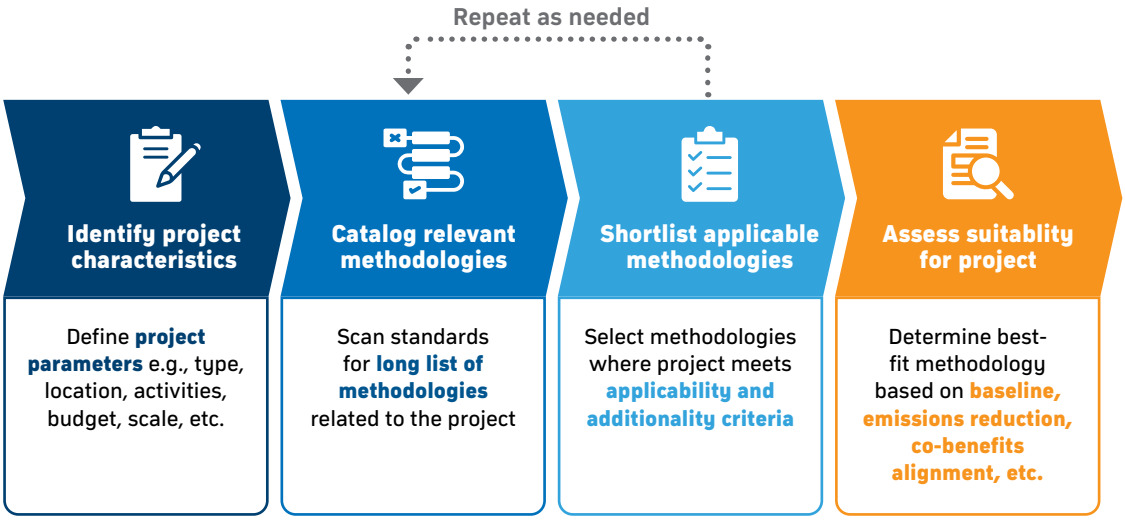
14 Berkeley Voluntary Registry Offsets Database, 2023

Beyond understanding the standards and certification programs described here, enterprises should also note the emergence of third-party quality rating agencies such as Sylvera, BeZero, and Calyx Global. These third parties evaluate and assign quality ratings for projects that are in the registries of the carbon credit standards, and thus could potentially play a role in the credit purchasers' decision-making, especially for larger projects or programs that are subject to higher levels of risks.

Methodology selection

After selecting a carbon credit standard, the next step is to select the most suitable methodology to develop the carbon project (Figure 9). Carbon credit standards typically have their own methodologies or approve the use of methodologies developed by other carbon credit standards (e.g., VCS accepts some methodologies under CDM). When evaluating a methodology's suitability, enterprises should ensure the methodology is applicable to the activities, locations, and technologies used in their project and that the project satisfies other conditions specified in the methodology. For example, for a high-efficiency firewood cookstove project to use Verra's VMR0006 Methodology, the cookstoves need to have a thermal efficiency of more than 25 percent, as specified in the methodology.

FIGURE 9
Process to identify most suitable methodology



Enterprises can refer to the websites of VCS, Gold Standard, Plan Vivo, and other carbon credit standards to find the most suitable methodology for their activities. If enterprises do not find active methodologies suitable for their emission reduction activities, there is also the option to work with other enterprises to develop methodology tailored to their projects, though the methodology approval process can take years to complete. An example of enterprises working together with sector experts to develop new methodology is found in enhanced rock weathering.

1.3 How to conduct a feasibility study of a carbon project?

Once a project is assessed to be suitable to pursue carbon credit opportunities, a more detailed feasibility study, developed in close consultation with key stakeholders, is helpful to provide clarity on the project's technical, financial, legal, and organizational feasibility.

Enterprises can use the study as the basis for making a final decision on market entry and can leverage the results to raise funds for the project. This section provides an overview of the components of the feasibility study and the steps required to complete it.

A feasibility study typically has four subcomponents: technical feasibility, financial feasibility, legal and regulatory feasibility, and organizational feasibility (Box 3). Some components are dependent on each other, e.g., financial feasibility assessment is dependent on the result of technical feasibility, which shows the potential number of carbon credits to be generated, so it is important to sequence the studies accordingly.

BOX 3

The use of a pre-feasibility study

A pre-feasibility study is common for enterprises to have a higher-level assessment before investing into the feasibility study which typically costs more, or sometimes to attract investment from third parties for the feasibility study. The pre-feasibility study can include local community surveys, carbon avoidance or removal estimations, and back-of-the-envelope cost-benefit analyses.

Technical feasibility

The technical feasibility study assesses the viability of a carbon project based on alignment with established carbon methodologies and the emission reduction potential of the project. This study also evaluates potential technical challenges that may arise during project implementation. For a nature-based solution, this technical feasibility study could involve examining the suitability of the ecosystem, climate, and topography for the project. For a tech-based solution, technical feasibility could include examining different technologies for removal of carbon dioxide, understanding various transportation options, and comparing potential storage locations.

The difference between the baseline emission and project emission scenarios shows the emission reduction potential. The baseline emission scenario refers to the BAU situation before the project is implemented, and the project emission scenario refers to the situation after the project is implemented. For example, the baseline scenario of a cookstove distribution project could be the project community using three stone cooking fires while the project scenario is the project community converting to using improved stoves; the baseline scenario of an afforestation project could be the biomass per hectare before the project plants trees while the project scenario is the biomass per hectare after new trees have grown.

Nature-based and tech-based solutions face different types of challenges in determining the baseline. Challenges that may arise for nature-based projects include quantifying carbon sequestration potential of ecosystems and accounting for deforestation rates where there are no readily available alternatives for comparison. Tech-based projects may face unique challenges given rapid changes in technology. To establish an appropriate baseline, a tech-based project would have to understand any existing industry benchmarks and account for improvements and efficiency gains that could occur over time.

Carbon project methodologies typically specify how to estimate the emission reduction potential. Once an enterprise identifies a methodology, it can choose to estimate the emission reductions leveraging internal technical expertise or can engage external experts to support the process. Baseline emissions and project emissions are recorded in the project design document, which is described further in section 1.4. Potential providers of support include project developers, academic and research institutes, and carbon market consultants. While the local pool of carbon experts is still limited, platforms such as the Nairobi Climate Network and conferences such as the Africa Carbon Forum are starting points to connect with carbon professionals in Kenya.

Financial feasibility

The financial feasibility study assesses the economic viability of a carbon project considering potential revenue, cost, and investment needed, and concludes with a sensitivity analysis to consider different organizational and market scenarios. Each of these aspects is detailed next.

Potential revenue

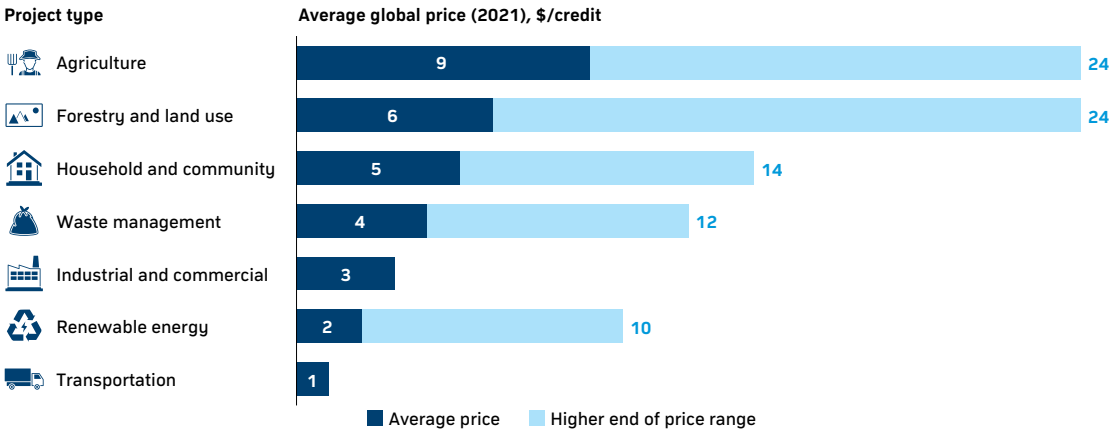
The revenue potential of a project can be estimated based on the total credit potential, the expected price per credit, and the other project revenues. Additional project revenues can arise from potential premiums that customers may be willing to pay for the decarbonized products of the carbon project, e.g., timber, cement, or fabric. It is important to consider revenue potential across the project's lifetime and on an annual basis for cash flow budgeting purposes.

Total credit potential is the result of potential emission reductions as estimated from the technical feasibility and the crediting period. The crediting period is a period defined by the carbon credit standard for which emission reductions of specific project types can be verified, which may be equivalent to or less than the project lifetime. For example, for a cookstove project that operates for 15 years, the crediting period specified under the VCS is 10 years and is renewable twice, for a maximum length of 30 years. The project will need to calculate its total credit potential based on the 10-year crediting period under the carbon credit standard instead of its 15-year lifetime. Once the credit period expires, projects can apply for crediting period renewal and be revalidated against the latest version of the standard.

From the total potential credits of nature-based projects, registries typically set aside a buffer to safeguard the validity of the carbon credits in case of leakage or impermanence. The buffer pool is a portion of carbon credits that cannot be immediately commercialized, and the amount is specified in the methodology. For example, Gold Standard requires a fixed 20 percent contribution from forestry projects to go into a pooled compliance buffer, while VCS provides non-permanence risk tools for agriculture, forestry, and other land use (AFOLU) and geologic carbon storage projects to calculate the share of buffer credits required from their project. Enterprises need to deduct the buffer from the total credit potential to understand the amount of credit that can be sold.

The expected price per credit varies due to several factors such as project type, quality, co-benefits, time frame, size, and availability. Use of an approved methodology from a trusted standard signals quality to buyers and can positively affect the price of a credit. Co-benefits, such as supporting a local community or improving biodiversity, demonstrate that the project is creating value beyond carbon credits and can raise the price of credits. When considering time frame, newer credits attract a higher price than older credits which can be perceived as lower quality and less attractive. Buyers with large climate commitments tend to seek credits from large scale carbon projects to fit their needs. Finally, the lower the availability of credits from a specific project type relative to demand for that credit, the higher the price. Recent market credit prices based on project type can be found in Figure 10 as reference.

FIGURE 10
Average credit price by project type, $/credit



Sources: Ecosystem Marketplace; S&P Global Platts; Nori Carbon Removal Marketplace; Indigo Ag.

Potential costs

Carbon project costs are incurred at every stage of the project life cycle: project conceptualization and financing, project development and monitoring, and credit issuance and sales. The key cost components of each are outlined here (see section 2.1 for more detail):

- **Project conceptualization and financing:** At this stage, costs are incurred to conduct the pre-feasibility and feasibility studies and to draft the PDD.
- **Project development and monitoring:** At this stage, costs are incurred by validating the project through a VVB and collecting and monitoring project data. Outside carbon market operations, project implementation also incurs costs (e.g., the costs for purchasing inventory and building distribution channels for a cookstove project).
- **Credit issuance and sales:** At this stage, costs are incurred by verifying the emission reductions by a VVB and issuing the credits by a registry. Credit transactions may include a transaction fee if credits are sold through a broker or exchange.

Potential investment needed and estimated return

The financial feasibility study also needs to consider investments needed to cover project costs before revenues can be generated. This analysis should estimate the investment needed and the estimated return on investment.

Various metrics can be used to calculate the estimated return and evaluate the investment attractiveness. Net present value (NPV) and internal rate of return (IRR) are commonly used. NPV is the difference between the present value of cash inflow and cash outflow, discounted at a specified rate that reflects time value of money, inflation, and project risk. A positive NPV indicates that the project is expected to generate a profit. IRR is the discount rate that makes the present value of cash inflow and outflow equal and the expected project return. An IRR greater than the required rate of return of an entity indicates that the project generates sufficient return to meet the entity's expectation. An example of a financial feasibility assessment based on a cookstove project is provide in Table 3.

TABLE 3

Example financial feasibility assessment for a carbon project based on improved cookstoves

Items	Year 1	Year 2	Year 3	Year 4	Years 5 to 10
Cash inflows from carbon activity					
Number of units sold (A)	10,000	10,000	10,000	10,000	60,000
Emission reductions per unit (tCO_2e) (B)	-	-	2	2	2
Emission reductions certified (tCO_2e) (A*B)	-	-	120,000	80,000	900,000
Buffer–assumed at 5% (tCO_2e) (C)	-	-	6,000	4,000	45,000
Net emission reductions (tCO_2e) (D) = (A*B) -C	-	-	114,000	76,000	855,000
Credit price ($/$tCO_2e$) (E)	-	-	5	5	5
Total carbon cash inflows ($) (F) = (D*E)	-	-	570,000	380,000	4,275,000
Cash inflows from cookstove sale ($) (G)	220,264	220,264	220,264	220,264	1,321,586
Cash outflows from carbon activity					
Project conceptualization & design ($) (H)	380,000	-	-	-	-
Project development & monitoring ($) (I)	44,500	250,000	250,000	250,000	1,500,000
Credit issuance & transaction cost ($) (J)	-	-	63,600	42,400	477,000
Total carbon cash outflows ($) (K) = (H+I+J)	424,500	250,000	313,600	292,400	1,977,000
Cash outflows from implementation activities ($) (L)	220,264	220,264	220,264	220,264	1,321,586
Initial expense to set up manufacturing operation	500,000				
Net cashflows ($) (M) = (F+G) - (K+L)	(924,500)	(250,000)	256,400	87,600	2,298,000
Net present value (NPV) (Discount: 10%) ($)	275,309				

Note: Project implementation activities include cookstove manufacturing, distribution, and overheads. Revenue from sales of cookstoves is assumed to be just enough to cover implementation costs. Items in the years 5 to 10 column are a summation of the cash flows expected between year 5 and year 10. Project NPV is calculated over a 10-year period.

Sensitivity analysis

Sensitivity analysis models the financial feasibility of carbon projects facing changes in variables such as market price, operational capacity, resource availability, or others that could affect project performance. The analysis typically groups the variable changes into multiple scenarios: base scenario considers the most likely scenario based on the current expectation; upside scenario provides a more positive outlook with potentially higher credit prices, abundant resources, and so on; downside scenario provides a more pessimistic outlook with potentially lower credit prices, limited operational capacity, and so on. While conducting a sensitivity analysis is not mandatory, the analysis helps enterprises to identify critical risks for the financial feasibility of their projects and prepare mitigation plans accordingly.[15]

15 To conduct the sensitivity analysis, enterprises should assign different upside and downside numbers for the main inputs of their financial model (i.e., on units sold, emission reductions per unit, and credit prices) and observe the impact of changing these assumptions on the profitability of the project. Examples of sensitivity analyses for carbon projects are available from Groasis Reforestation Project and Olkaria Geothermal Project.

Legal and regulatory feasibility

The legal and regulatory landscape for carbon markets in Kenya is fast evolving, so a legal and regulatory feasibility study is critical to assess whether a carbon project can comply with the laws, policies, and regulations that govern its operations. This study needs to identify the applicable laws, policies, and regulations and their requirements; assess the compliance risk of the planned project; and develop a plan to comply accordingly. The study also needs to outline any monitoring and reporting mechanism needed to ensure continuous compliance throughout the project life cycle. Given the technicality of these topics, legal and regulatory feasibility analysis is typically done together with experts on the local legal and regulatory environment.

For enterprises interested in developing carbon projects, examining existing and emerging regulations and policies related to topics such as climate change, land, renewable energy, and forestry can help avoid potential issues once the project is underway (Box 4).

BOX 4

Regulatory and institutional environment relevant for carbon markets in Kenya

In September 2023, the government released the Climate Change (Amendment) Act, which aims to provide the regulatory basis for carbon markets in Kenya. The act highlights several key regulatory components, but more detailed regulations are expected in the future to provide further guidance for market participants. Key aspects of the act are as follows:

- A carbon registry will be established to register key information relating to carbon projects and carbon credits.
- Project developers must complete an environmental and social impact assessment before initiating a carbon project.
- Every land-based project must be implemented through a community development agreement, which will be overseen and monitored by the national government and respective country governments.
- As part of the community development agreement, land-based projects are required to include a provision for annual social contributions of at least 40 percent of the projects' aggregate earnings, while non-land-based projects are required to include 25 percent of their aggregate earnings as the annual social contribution to the community.[a]

As part of the feasibility study, enterprises should evaluate whether they have the needed capacity and resources to accommodate the requirements of the act, including the required environmental and social impact assessment and the fees required for the community development agreement.

a "Aggregate earnings" means the total of all income in a carbon project without adjustment for inflation, taxation, or types of double counting.

In addition to the Climate Change Act, enterprises should also be aware of broader laws, policies, regulations, and strategies that could be relevant, depending on the project types. This may include:

- **Climate Change Act:** This act establishes the National Climate Change Council responsible for the coordination and implementation of climate change activities. It establishes a Climate Change Fund to finance climate change activities. It also describes the key institutions and procedures for monitoring and implementing climate actions, including through the National Climate Change Action Plan. The first five-year National Climate Change Action Plan was introduced in 2013, and the second plan was introduced in 2018 and concluded its mandate in 2022. The next plan has not yet been introduced.
- **National REDD+ Strategy:** This strategy provides the framework for reducing emissions from deforestation and forest degradation. It outlines the institutional arrangements for implementation and identifies priority areas for action.
- **Green Economy Strategy and Implementation Plan (2016–30):** A strategy that guides Kenya's transition to a sustainable path in infrastructure, building, natural resources management, resource efficiency, social inclusion, and sustainable livelihood.
- **Renewable Energy Policy:** This policy provides a framework to promote renewable energy. It outlines the government's commitment and incentives for relevant private sector investment.
- **Science, Technology, and Innovation Policy:** This policy outlines the government's commitment to promote the development and use of science, technology, and innovation in Kenya. It provides a framework to develop the technology sector and encourages private-sector investment in research and development.

The development and implementation of climate policies in Kenya involves a wide range of government entities at the national and county levels (Figure 9). In addition to government support, there are several international agencies and initiatives actively supporting the growth of the carbon market in Kenya, such as the World Bank Group, United States Agency for International Development, Africa Carbon Markets Initiative, and Eastern Africa Alliance on Carbon Markets and Climate Finance. These entities are helping Kenya address key challenges related to the carbon market by providing capacity building and technical assistance support, reducing barriers to low-cost capital in the market, and supporting the Government of Kenya in policy and regulation development.

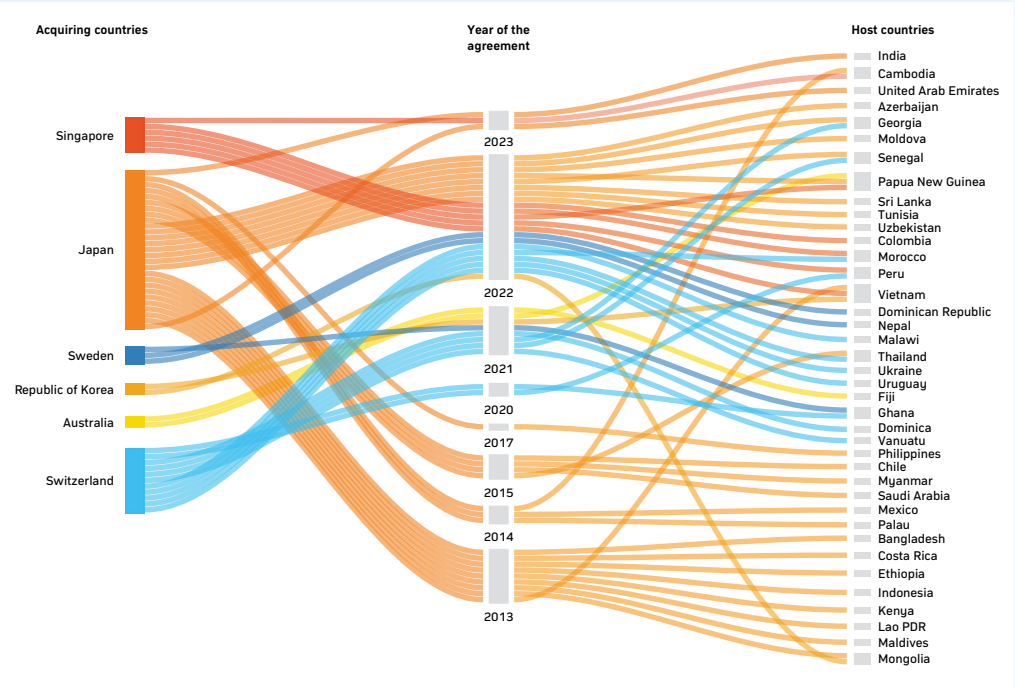
Under Article 6 of the Paris Agreement, countries are expected to maintain visibility of cross-border carbon credit trading to avoid double counting the emission reductions. Currently the relevant regulations in Kenya are still under development so it is important for market participants to keep track of the latest developments in the space to ensure alignments with the government's requirements. Once fully established, Article 6 will likely require projects to obtain letters of authorization from the government of Kenya entity that will be mandated to oversee this process. The government of Kenya will then commit to a corresponding adjustment of the credits covered under the letters of authorization so that these credits are not counted toward Kenya's NDC (Box 5).

BOX 5

The evolving regulatory landscape for Article 6[a]

Even though voluntary markets represent most of the market currently available to Kenya, international compliance carbon markets under Article 6 are expanding and could become increasingly relevant for Kenya in the future. A growing number of countries are developing bilateral agreements under Article 6.2, driven by a number of buying countries such as Singapore, Japan, and Switzerland (Figure B5.1).[b] For example, Ghana and Vanuatu, in partnership with Switzerland and the United Nations Development Programme, presented the first projects to generate authorized emission reductions under Article 6.2 and in February 2023, Thailand and Switzerland authorized the first Article 6 program in Asia.

FIGURE B5.1
Article 6 bilateral agreements as of April 1, 2023



Source: World Bank 2023

Despite this growing interest in Article 6, it will likely take time for Article 6 transactions to materialize as countries will need time to become acquainted with the newly set Article 6 rule book and prepare the domestic capacity, administrative rules, and infrastructure to facilitate the transfers. Some governments have started to develop their policies

a For further context and guidance, please see World Bank (2023), State and Trends of Carbon Pricing 2023 and VCMI (2023), VCM Access Strategy Toolkit: Chapter 3: Determining the Role for Carbon Markets in NDC Achievement.
b As described in the context section, Article 6 of the Paris Agreement provides the framework for international compliance carbon markets. Article 6.4 establishes a centralized mechanism supervised and governed by the United Nations Framework Convention on Climate Change, which is expected to be administratively like the Clean Development Mechanism of the Kyoto Protocol. Article 6.2 provides the basis for bilateral or plurilateral voluntary cooperation among countries.

and institutional frameworks, which address issues such as identifying priority activity types, designing national MRV approaches, and setting up the process for authorizing and transferring carbon credits (or "internationally transferred mitigation outcomes") under Article 6. For example, Rwanda is preparing an emissions trading and readiness framework for Article 6 and in February 2023, India published a list of 13 activity types eligible for carbon credits under Article 6.2. Ghana also published an administrative framework for Article 6.2 participation, which provides detailed guidelines on the carbon asset development process, including what methodologies and mitigation activities are eligible and what are the expected authorization requirements for voluntary carbon market and Article 6 transactions.

The way in which a country decides to engage in Article 6 and voluntary carbon markets could have a significant influence on the way enterprises engage in carbon markets. Under Article 6, emission reductions that have been authorized for transfer by the selling country's government may be sold to another country, but only one country may count the emission reduction toward its NDC. This means that it is critical to avoid double counting so that global emission reductions are not overestimated. Article 6 established an accounting mechanism known as "corresponding adjustment" to ensure that double counting does not occur. Ultimately, host countries have to decide whether—and to what extent—voluntary and compliance carbon market transactions will be authorized for trade with a corresponding adjustment or remain unauthorized, meaning that the carbon credit can count toward the host country's NDC. In some countries, governments may be predisposed to absorb many lower-cost emission reduction opportunities for their own NDCs before allowing corresponding adjustment for international carbon market transactions. Other governments, however, may allow voluntary carbon transactions to occur without corresponding adjustment to leverage voluntary commitments and attract investments to help achieve their NDCs.

Since Kenya's policy framework for Article 6 and voluntary carbon markets is still emerging, enterprises should pay close attention to policy developments and determine whether mitigation measures are needed to address any regulatory risks that could emerge. In Kenya, a key question is whether authorization and corresponding adjustment is required for any carbon credit that is transferred out of the jurisdiction (be it Article 6 or voluntary commitments). The Kenyan government's decision on this issue will have implications for enterprises because securing a commitment to corresponding adjustments from host countries for their projects may imply longer timelines for project development and implementation.

In the absence of clear guidance from the government on whether corresponding adjustment is needed, some corporate buyers are looking to mitigate regulatory risks by asking to buy credits that are backed by an authorization by the host country. Some organizations that operate independent crediting mechanisms, such as Gold Standard and Verra, are also investigating and/or making changes to their processes and registries so that a credit's authorization can be transparently recorded. Insurance against these risks is also being explored by entities such as the Multilateral Investment Guarantee Agency.

Organizational feasibility

The organizational feasibility study assesses whether an enterprise has sufficient capacity with the required knowledge and expertise or can mobilize required third-party resources to implement a carbon project.

Enterprises can decide the extent to which they would leverage external support to develop carbon credits. However, they will need some internal technical expertise to effectively steer and coordinate their projects among the parties involved, especially the following:

- **Carbon market structures:** Knowledge of market size and trends, key players in the market, and typical interaction models and dynamics among them.
- **Carbon accounting:** Knowledge of the requirements of the carbon credit standard and methodology that the planned project aims to be under and the relevant processes involved.
- **Project financing:** Knowledge of the financial return and cash flow estimation for the planned project, available financial resources and relevant funding structures, and risk mitigation mechanisms.
- **Local and international laws and regulation:** Knowledge of the legal and regulatory environment relevant for the local carbon market and the topics related to specific project types.

In addition to knowing the internal capabilities of the enterprise, it is important to develop a robust understanding of the social context in which the enterprise operates. The social context includes the cultural, economic, and political factors that could affect the implementation and monitoring of the project. To understand these factors, the enterprise needs to identify the different stakeholders affected by the project, the values and priorities of these stakeholders, the relationships between stakeholders, and any resources that flow between stakeholders. More details on stakeholder engagement during monitoring is included in section 3.4.

FIGURE 11
Decision guide to hiring an external consultant

Advantage Disadvantage

Decision factor	Advantages and disadvantages of hiring a consultant
Access to expertise	Consultants bring specialized skills and relevant experience to ensure comprehensive and accurate feasibility studies
Effective use of time	Consultants can complete feasibility studies faster than novices and free staff time to focus on important activities
Incurring extra cost	Consultants' costs may outweigh benefits for smaller projects and use money that could be directed to other business activities
Project context familiarity	Consultant may not be familiar with the industry or organization context, affecting accuracy of feasibility studies

1.4 How to prepare a project design document?

Once an enterprise decides to pursue a carbon credit project, a PDD needs to be developed to describe the details of the project in a structured format. Specifically, the PDD outlines how the project will be implemented and how emission reductions will be calculated and monitored based on the selected methodology.

Before a project can generate carbon credits, the enterprise must validate the PDD with a VVB and submit the PDD to the chosen carbon credit standard.

Creating an accurate and comprehensive PDD is a complex task, but when done effectively, it enables carbon market stakeholders, such as credit issuers and financiers, to understand the strengths and potential risks of a carbon project. Smaller enterprises may face specific challenges in covering the costs associated with developing the PDD or securing staff with the technical skills and expertise required to successfully navigate the process. Depending on the skills and capabilities available, the enterprise can choose to work with an internal team or engage an external expert to help develop the PDD (Figure 11). Enterprises can also form partnerships and coalitions with other enterprises developing projects of the same type in the same geography to distribute costs and share resources needed for developing the PDD.

Creating an accurate and comprehensive PDD is a complex task, but when done effectively, it enables carbon market stakeholders, such as credit issuers and financiers, to understand the strengths and potential risks of a carbon project.

While the required components vary across the carbon credit standards, PDDs typically include the following components:

- **Project overview:** This section provides a summary view of the project name, developer, location, activities, technologies to be used, and estimated emission reductions to be generated.
- **Project boundary:** This section lists all emission reductions under the control of project participants that are significant and can be attributed to the project (e.g., for a solar home lighting project, emission reductions from reduced kerosene use are included, but emissions from panel manufacturing are not). The relevant emissions that need to be included are set out in the methodology applied by the project.
- **Baseline scenario:** This section represents the activities and emissions that would occur in the absence of the project as the basis to estimate the project's emission reductions.
- **Application of methodology:** This section describes the eligibility of the project to the selected methodology and demonstrates how the project meets the defined applicability criteria.
- **Quantification of emission reductions:** This section calculates baseline and project emissions, and resulting emission reductions, as per the methodology used.

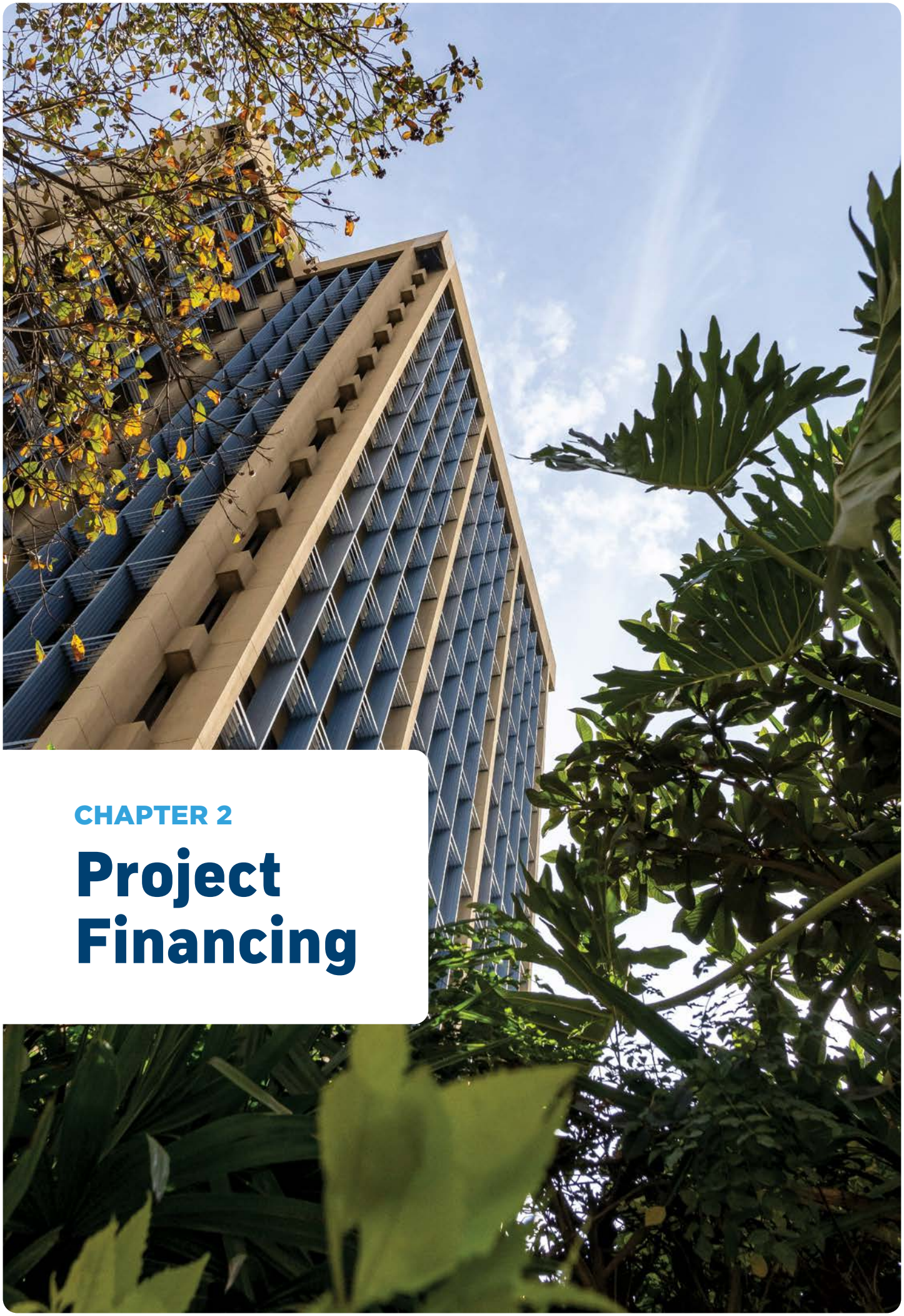
- **Crediting period:** This section defines the period during which the enterprise seeks to earn credits from the project.

- **Monitoring plan:** This section describes the specific data to be collected, frequency of collection, justification of the monitoring methodology selected, and controls to assess and estimate future leakage. Additional details on monitoring carbon projects are covered in chapter 3.

- **Stakeholder comments:** This section synthesizes the process and outcomes of stakeholder engagement. For a project to be accredited it must show that directly impacted communities and individuals have been consulted, have been informed in advance of the project, and have given consent without being coerced.

- **Safeguards:** This section details the social and environmental safeguards that are in place to ensure that both the communities and the ecosystem are not affected by projects that are implemented.

Some standards allow projects to submit draft PDDs for projects to be listed in the registry (e.g., VCS, Gold Standard). Others, such as Plan Vivo, only allow PDDs that have been validated VVBs to be submitted. More information on the validation process is provided in section 3.2. Enterprises are encouraged to review guidelines and templates provided by registries such as Verra and Gold Standard to familiarize themselves with their requirements, as well as review their databases of current projects to find submitted PDDs for reference.



CHAPTER 2

Project Financing

2.1 What are the expected costs to develop a project?

Revenue from carbon credit sales often comes years after initial costs are incurred due to long project development and MRV cycles. As such, enterprises considering carbon projects should have sufficient visibility and preparedness for the cash flows required for their projects.

Project costs vary across project types and are dependent on the specific context of individual projects. This chapter aims to give a reference to the range of pre-credit-sales costs along the carbon project life cycle to help potential market participants prepare accordingly.

Project conceptualization

The project conceptualization stage includes several development steps, including the pre-feasibility study, feasibility study, and PDD creation (Box 6). This section outlines expected costs for each step. The cost of financing depends on the amount of capital required and has therefore been omitted.

BOX 6

Feasibility study and project design document costs for nature-based and tech-based projects

Nature-based projects require more complex environmental impact assessments than tech-based projects, resulting in more detailed and expensive data collection requirements. For instance, nature-based solutions often require geographic information system mapping; remote sensing; baseline forest inventory assessments; and further research into drivers of deforestation, degradation, forest inventory, and biodiversity.

Tech-based solutions, on the other hand, generally have standardized emission reductions, which require less research. For instance, there are standard ways to estimate the reduced emissions from improved cookstoves with verified information from the product manufacturer.

For more details on differences between nature-based and tech-based projects, see chapter 1.

Pre-feasibility and feasibility studies

A pre-feasibility study can cost from $10,000 to $30,000,[16] depending on the activities involved, which can include local community surveys, emission avoidance or removal estimations, and back-of-the-envelope cost-benefit analyses. A more thorough pre-feasibility study may incur a higher cost, but it can also help facilitate subsequent steps and fundraising.

16 Based on interviews with entities and project developers in Kenya.

The feasibility study is a prerequisite for the project verification process and includes several components: a technical feasibility study, a financial feasibility study, a legal and regulatory requirements study, and an organizational feasibility study. Depending on the complexity and size of the project or program, the cost of a feasibility study for a nature-based project can range between $50,000 and $150,000; costs for a tech-based project can range between $50,000 and $100,000. Feasibility studies for nature-based projects typically cost more given the higher requirements for on-site travel and data collection.

Project design document creation

A project design document is a key document required for the registration of a carbon project (see section 1.4 for more information). Creating a PDD involves conducting a baseline assessment and drafting the PDD, among other steps. In total this can cost from $250,000 to $500,000 for nature-based projects and from $100,000 to $200,000 for tech-based projects.

Project development and monitoring

The project development and monitoring stage includes a variety of steps, including the validation of the PDD and project implementation plan, project registration with a registry, and project implementation and monitoring. This section outlines the expected cost types for each step.

Project validation and registration

To start the validation process, enterprises need to register an account and list their carbon projects with their chosen registries. This usually costs between $1,000 and $5,000 depending on the registry, carbon credit standard, and project type.[17] Subsequently, a VVB is required to validate the PDD and project implementation plan (see chapter 3 for more information). VVBs usually charge between $40,000 and $60,000 for the validation of nature-based projects, and between $20,000 and $40,000 for the validation of tech-based projects.[18] Nature-based projects are generally more expensive to validate because the PDD is longer and more complex (see Box 6 for more details).

BOX 7

Additional Verra standards to consider

When using the Verified Carbon credit standard, enterprises pursuing carbon projects can consider registering for additional Verra impact standards to demonstrate further project impacts and potentially increase the price of the generated credits. Nature-based projects can register under the Climate, Community and Biodiversity Standard, whereas tech-based projects can register under the Sustainable Development Verified Impact Standard. Additional standards require drafting and validating additional project design documents (PDDs), incurring similar costs to drafting the first PDD.

17 VCS has flat account opening and maintenance and pipeline listing fees totaling $2,000, whereas Gold Standard differentiates their preliminary reviews per project type. For instance, for land-use and forestry projects, Gold Standards issues a $4,500 registry and preliminary review fee, whereas most other projects incur a $1,900 fee.
18 Based on interviews with entities and project developers in Kenya.

Once the PDD is validated, the VVB typically registers the project by submitting the PDD to the chosen registry under the chosen carbon credit standard (Box 7). The registry reviews the PDD and charges a fee from $5,000 to $30,000[19] for the project registration depending on the registry. For the most up-to-date information about registration fees, enterprises can refer to the websites of the registries, such as Verra and Gold Standard.

Project implementation

Project implementation and operation generally incur the most cost, including setting up the project, purchasing any inventory or technology required for project implementation, executing the project, and maintaining relationships with landowners and communities. Project implementation costs are highly dependent on the project size and type and should be estimated during the feasibility study.

Project monitoring

To issue carbon credits, registries require a VVB to verify project emission reports and their underlying data. Enterprises need to monitor this data and draft an emissions report for every issuance cycle (i.e., the period when new credits are expected). The key cost components for project monitoring are data collection and analysis and drafting of the monitoring report. These costs are included in the project implementation costs.

Data collection and analysis efforts and costs are often higher for nature-based projects because of detailed and complex measuring activities, e.g., biomass changes from the baseline. Tech-based offset projects regularly come with monitoring gadgets or require sample-based monitoring. For instance, solar home systems can automatically relay data on monitored parameters to the project database. Therefore, VVBs also require higher verification fees for nature-based projects.

19 VCS has a flat project registration ($2,500) and yearly VVB fee ($5,000), and in addition charges for reviewing new methodologies or any changes to existing methodologies ($6,000–$15,000). Gold Standard generally requires $0.05 to $0.15 per credit of the first year issuance, which means the project design review costs depend on the project size.

Credit issuance and sales

The credit issuance and sales stage includes a variety of steps, including the verification of the emissions report by a VVB, the issuance of credits, and the sales of credits.

Project verification

Project verification requires significant engagement from the VVB (see section 4.1 for more details) and can cost from $100,000 to $300,000 for nature-based projects and from $50,000 to $150,000 for tech-based projects per issuance cycle.[20]

Credit issuance and sales

Before credits are sold, the issuance of a verified carbon credit will incur an issuance levy from the registry. The levy costs anywhere between $0.002 and $0.15 per carbon credit, depending on the registry, standard, and number of carbon credits being issued. More information on the issuance costs and process of a carbon credit can be found in section 4.2.

Pre-financing all pre-credit-sales costs may require external financing, which will incur a financing fee. Finally, the sale of a carbon credit may incur transaction fees, depending on the sales process (see section 5.1 for more information on carbon credit sales processes; also see Table 4).

TABLE 4
Approximate costs along the carbon project life cycle for reference

		Nature-based projects	Tech-based projects
One-off costs	Pre-feasibility	$10-30K	$10-30K
	Feasibility	$50-150K	$50-100K
	PDD	$250-500K	$100-200K
	Listing	$1-5K	$1-5K
	Validation	$40-60K	$20-40K
	Registration	$5-30K	$5-30K
Ongoing costs	Implementation & monitoring	Depends on scale and project type	Depends on scale and project type
	Verification	$100-300K / cycle	$50-150K / cycle
	Issuance	$0.002-0.15 / credit	$0.002-0.15 / credit
Total costs (rounded)	One-off	**$350-800K**	**$200-400K**
	Ongoing	**$100K+ / cycle**	**$50K+ / cycle**

20 Based on interviews with entities and project developers in Kenya.

2.2 How to find suitable financing sources?

An understanding of available financing sources and mechanisms can help enterprises attract the capital that is appropriate for their carbon projects. In Kenya, both commercial financiers and development financiers are potential financing sources.

In this section, the most common commercial and development financier types for carbon projects in Kenya are described. For each, there are examples of projects in Kenya that have received financing from these sources.

Commercial financiers

Commercial financiers provide financing with the main objective of obtaining a profit. The most common commercial financiers in Kenya are carbon finance funds, carbon credit buyers, commercial banks, and intermediaries.

Carbon finance funds

Carbon finance funds are investment funds that specialize in or have available funds for financing carbon projects. These can be private equity funds, venture capital firms, asset management companies, and so on. They provide capital for enterprises pursuing the development of carbon projects and can often provide project development expertise as well. In exchange, these funds typically take a share of the generated credits or a share of the revenue generated from the sale of carbon credits. Some funds may make an investment in exchange for equity in the enterprise instead. Carbon finance funds can finance most stages of the life cycle of a carbon project, including project conceptualization, implementation, and MRV.

Taita Hills REDD+: The Althelia Climate Fund invested $10 million in the Taita Hills REDD+ project. The fund provided financing for the verification process and the implementation of the project, and in return, received a share of the carbon credits generated by the project.[21]

21 Ecosystem Marketplace, 2014

Carbon credit (corporate) buyers

Carbon credit buyers are typically companies that purchase carbon credits to offset their own emissions. They provide funding to enterprises before the credits are generated in exchange for carbon credits coming from the project in the future. Carbon credit buyers usually prefer to finance enterprises whose projects have completed the feasibility stage as they require the assurance of future credits to offset their emissions. The largest carbon credit buyers in Kenya are currently Shell, Netflix, Kering, Nedbank, Apple, BHP, Nespresso, Delta Air Lines, Air France-KLM, and Zenlen Inc.

Kasigau Corridor REDD+: Microsoft and Coca-Cola invested in the Kasigau Corridor REDD+ project to support the verification process and project implementation in exchange for a portion of the generated carbon credits.[22]

Commercial banks

Commercial banks can provide capital to a variety of enterprises, including those pursuing carbon projects. Commercial banks typically provide loans, but they can also make equity investments or other forms of investments to support carbon projects. Commercial banks can also play a role in the structuring and management of other financial entities such as carbon finance funds. In the future, banks will even function as aggregators of carbon credits for smaller enterprises, but this concept has yet to be explored in the context of Kenya (Box 8). Commercial banks can finance all stages of the life cycle of a carbon project, assuming the enterprise pursuing the project can provide sufficient collateral. When financing the earlier stages of project development, commercial banks require a higher return than when financing the later stages of project development or implementation. This is due to the longer repayment period and the higher risk of the project not reaching completion. Most Kenyan banks are still at a nascent stage of considering carbon credits as part of their business model but are gradually providing funding toward projects that could potentially generate carbon credits in the future; for example, KCB recently secured $150 million IFC credit to fund green projects and NCBA Group has launched their own tree-planting initiative and is currently defining their sustainable finance strategy.

Commercial banks can finance all stages of the life cycle of a carbon project, assuming the enterprise pursuing the project can provide sufficient collateral.

Turkana Wind Power Project: A consortium of banks, including Standard Bank, provided over $600 million in financing to the Turkana Wind Power Project, Africa's largest wind farm.[23]

22 The Kasigau Corridor REDD+ project in Kenya, 2017
23 Africa Business Communities, 2014

BOX 8

Potential role of aggregators

While there is no specific size limit for enterprises to participate in the carbon markets, the costs and capacity needed to generate credits may hinder smaller enterprises from participating. In sectors with many small-scale players, such as agriculture and waste management in Kenya, aggregation can help distribute project development costs and navigate the credit generation process. For example, Boomitra partners with the Farm to Market Alliance to enable smallholder farmers to participate in carbon markets by registering farmers onto a digital platform, collecting data on soil carbon remotely, marketing credits to buyers, and distributing revenues to farmers.

Aggregation facilities that pool multiple enterprises' carbon projects can help overcome some of the scale challenges to access finance and attract large-scale private-sector capital, including through carbon credit-backed debt issuances, into smaller segments of the market. Additionally, an aggregation facility can help mitigate multiple risks for investors and carbon project developers. For investors, aggregation could enable diversification across carbon project activities and reduce the risk of financial loss if one project underperforms or experiences a default that affects the delivery of carbon credits. Diversification mitigates credit risk and operational risk and may help mitigate market risks if the carbon projects financed range across sectors and carbon project types (e.g., energy efficiency, soil carbon, renewables). For developers, an aggregation facility could provide standardized processes for carbon crediting activities, conduct due diligence on the activities, and provide technical assistance to help ensure their effective design and avoid greenwashing.

Intermediaries

Intermediaries support enterprises to develop their carbon projects and facilitate the exchange of carbon credits between enterprises and credit buyers. Project developers typically have a set of credit buyers in their network who look for specific types of carbon credits and can provide technical expertise and experience to guide enterprises to develop these carbon credits. Carbon credit brokers are entities that buy carbon credits from enterprises that develop carbon credits and sell these credits to entities looking to offset their emissions. Most project developers and credit brokers offer financing in exchange for future carbon credits. Large project developers and brokers typically finance and support a portfolio of enterprises throughout the project development journey, from the pre-feasibility study to project implementation and credit issuance.

Mangrove restauration project: The Nature Conservancy, a project developer, provided financing and support to a project focusing on mangrove restoration in Lamu County.[24]

24 The Nature Conservancy, 2022

Development financiers

Development financiers provide financing with the objective of maximizing their impact with the funds available and may do so through a for-profit or a nonprofit model. The most common development financiers in Kenya are DFIs and multilateral development banks (MDBs), foreign governments, the government of Kenya, impact investors, and nongovernmental organizations (NGOs), donors, and international organizations.

Development finance institutions and multilateral development banks

DFIs and MDBs are specialized financial institutions that provide long-term financing for sustainable development projects in developing countries. They play a critical role in carbon markets by providing patient capital and technical assistance to support project development along the project life cycle. For instance, DFIs and MDBs can offer concessional loans to finance pre-feasibility and feasibility studies and long-term equity investments to grow enterprises that are developing carbon projects.

Olkaria IV Geothermal Power Project: The French Development Agency and KfW Bankengruppe provided over $200 million in financing to support the verification process and project implementation of the Olkaria IV Geothermal Power Project in the form of concessional loans.[25]

Foreign governments

Some foreign governments provide up-front financing to enterprises that develop carbon projects in exchange for future carbon credits. They aim to count these credits toward their NDCs, which are country-specific emissions targets, allowing them additional emissions under their NDCs. To allow this, foreign governments require a bilateral agreement as outlined in Article 6.2 of the Paris Agreement with the government of Kenya. The government of Japan has such an agreement in place under the country's JCM, and Switzerland's KliK Foundation recently signed a memorandum of understanding covering bilateral agreements under Article 6.2 with the government of Kenya. Foreign governments prefer to finance enterprises whose projects have completed the feasibility stage and have a connection or partner in their country as they require assurance of future credits to offset their emissions.

Krystalline Salt Ltd: The government of Japan provided funding for a solar energy project at the Kaysalt Salt Factory on the Kenyan coast. The funding was arranged through a Japanese partner, Pacific Consultants Co. Ltd. To date, the project has delivered nearly 1,000 carbon credits through the JCM.[26]

Government of Kenya

The government of Kenya has developed an enabling environment for carbon markets through enactment of several polices and laws that include the Kenya Climate Change Act 2026, the Green Economy Strategy and Implementation plan, the NDC, and the national climate change action plans. Kenya's NDC has provided for the use of a market mechanism to finance climate mitigation actions. The

25 UNFCCC, 2021
26 Global Environment Centre Foundation, JCM, 2023

government has also developed the carbon market regulations to guide operationalization of Article 6 of the Paris Agreement and streamline the voluntary carbon market mechanism.

Kenya actively participated in the CDM by supporting geothermal energy plants as well as other CDMs through establishment of the Kenya National Cleaner Production Center and appointment of the Designated National Authority, Kenya's national environmental management authority, to support the approval process for carbon trading. Nearly all county governments have also developed the County Climate Change Fund Act that establishes the county climate change fund for funding locally led climate action projects prioritized by communities at the ward level.

Impact investors

Impact investors provide financing for enterprises making a positive social or environmental impact while obtaining a financial return, including for enterprises mitigating climate change through carbon projects. Not all impact investors can offer technical carbon project development expertise, and most are likely to invest in businesses in exchange for an equity stake. Impact investments can be used to cover general business costs as well as costs at various stages of the carbon project life cycle.

BioLite Energy: KawiSafi Ventures, a Kenya-based impact investor, invested $5 million in BioLite, a company bringing clean cooking and solar home energy products to customers in Kenya. BioLite has over 40 projects registered under Gold Standard across East Africa and India.[27,28]

NGOs, donors, and international organizations

NGOs, donors, and international organizations are entities that provide noncommercial funding. They may provide grants, concessional loans, or donations to help enterprises overcome financial barriers to conceptualize or implement their carbon projects. Donors, NGOs, and international organizations generally finance pre-feasibility and feasibility studies because these are the hardest to finance, especially for new enterprises developing projects. However, some may finance other stages of the carbon project life cycle. Typically, NGOs, donors, and international organizations have limited financing available, which they dedicate to select projects that meet their eligibility criteria. However, due to economic development co-benefits in Kenya, significant donor and grant funding is available to enterprises in Kenya developing carbon projects. Grants, concessional loans, donations, and further support to carbon projects in Kenya have been given by Absa Bank Kenya, the Clinton Foundation, the Nature Conservancy, the United Nations, the World Bank, and the World Economic Forum. For instance, the Nature Conservancy runs the Africa Forest Carbon Catalyst and Natural Climate Solution Accelerator to grow carbon projects in Africa.

Ceriops Environmental Organization: The World Economic Forum provided a grant to Ceriops Environmental Organization for the pre-feasibility and feasibility study phases of Ceriops Environmental Organization's carbon project development focused on mangrove restoration on the Kenyan coast.

27 KawiSafi Ventures, 2020
28 Gold Standard Impact Registry, 2023

2.3 How to decide among the financing mechanisms?

Financiers of enterprises in Kenya pursuing carbon project development as described in section 2.2 use a variety of financing mechanisms. For example, a carbon finance fund may be willing to provide debt financing or equity financing.

The most common financing mechanisms in Kenya are forward purchase agreements (FPAs), equity financing, and debt financing. In addition, some enterprises may be able to finance their carbon projects through donations or grants. The overview that follows describes each mechanism, including the factors that determine their costs of capital and their advantages and risks for enterprises developing carbon projects.

Types of purchase agreements (non-exhaustive list)[29]

Forward purchase agreements

A forward purchase agreement is a contract between an end buyer or intermediary and an enterprise generating carbon credits that specifies the purchase, payment, and delivery of an agreed-upon number of credits at a future date under specific conditions and commercial terms. These conditions include the delivery amount and timelines of credits and the agreed-upon price.

A forward purchase agreement is a contract between an end buyer or intermediary and an enterprise generating carbon credits that specifies the purchase, payment, and delivery of an agreed-upon number of credits at a future date under specific conditions and commercial terms.

The cost of capital of an FPA is determined by the current demand and expected future price of carbon credits, the creditworthiness of the enterprise developing the credits, and the payout structure. The current demand and price of carbon credits influence the negotiations of the agreed-upon price of credits in the FPA. The difference between the future price of carbon and the agreed-upon price creates the cost of capital. High creditworthiness, indicating a lower perceived risk of default, reduces the cost of capital for enterprises pursuing financing through an FPA. Different payout structures also lead to varying costs of capital: payment up front, payments at predefined milestones, and payment upon credit delivery. Table 5 demonstrates the advantages and disadvantages for each payout structure.

29 World Bank (2022), Invest for Climate: Opportunities for Monetizing Emission Reduction Credits.

TABLE 5
Payout structures of forward purchase agreements

Payout structure	Description	Example
Payment up front	An up-front lump sum payment means the enterprise developing the credits receives the entire value of the FPA up front from the buyer of the credits. This agreement provides the enterprise developing the credits with immediate cash flow. The advantages for enterprises developing the credits include access to the full amount of capital needed without requiring additional fundraising and the ability to make large investments early to rapidly scale the project. The disadvantages for the enterprise are a higher cost of capital and significant up-front effort to convince a financier to provide payment up front; in general, this is not the preferred option of financiers given the substantial risk of project delivery in the early stages of the carbon project life cycle.	**The Livelihoods Carbon Fund (LCF):** LCF provides up-front financing to enterprises developing carbon credits for large-scale project implementation and maintenance over 10 to 20 years. LCF receives repayments from the enterprises in the form of carbon credits. LCF financed the Hifadhi project in Embu County, which distributed 60,000 improved cookstoves.[30]
Payment at predefined milestones	This payout structure means that the buyer or intermediary makes payments at agreed-upon milestones to the enterprise developing the carbon credits if the milestones are met. The milestones are defined in the PFA and can include an up-front payment for a feasibility study, payment upon completion of the feasibility study, completion of the verification process, operational milestones, and issuance of credits. The advantages for enterprises developing the credits include a predictable revenue stream and the ability to raise further investment based on guaranteed payouts at milestones. The disadvantages for the enterprise are significant additional reporting requirements at each milestone and pressure to meet milestones within agreed-upon deadlines.	**Climate Asset Management (CAM):** CAM provides financing and technical expertise to enterprises developing projects. They provide payments to enterprises based on milestones set out in an FPA and they have multiple projects in Kenya.
Payment upon credit delivery	This payout structure is similar to the payment at predefined milestones, but with the issuance of credits as the milestone. Therefore, the enterprise delivering the carbon credits will need to fund all project development costs before any payments are made under the FPA. However, the FPA can be used as a guarantee of future revenues, which can help the enterprise secure loans from other financiers. The most significant advantage for the enterprise is a lower cost of capital compared to other FPAs. The disadvantages are the potential need to raise up-front capital elsewhere, a higher risk of nonpayment at contract completion, and pressure to meet credit delivery milestones.	**Frontier Climate:** Frontier is an advance market commitment to buy an initial $1 billion of permanent carbon removal credits between 2022 and 2030. For larger suppliers, Frontier forms FPAs with payment upon delivery and Frontier has an agreement with Cella in Kenya.

30 Livelihoods Fund, 2023

Carbon derivatives-based contract (futures and options)

Derivatives play an important role in carbon markets, including by providing enhancing transparency through the provision of forward information on the underlying asset. Commonly traded types of carbon derivatives include futures, options, and swaps. Futures and options are standardized products that are traded on exchanges and centrally cleared. In a futures contract, counterparties agree to trade a carbon credit at a certain price on a certain date in the future. A futures contract is not necessarily enacted. It could also be satisfied by a payment based on the current market price at the agreed time of maturity. In an options contract, the holder of an options contract has an option to either buy (a call option) or sell (a put option) credits at the price agreed in the contract. The contract holder pays a premium for this right. Several derivative exchanges offer standardized futures and options derivative contracts on carbon credits. For example, CME launched nature-based global emission offset futures and global emissions offset futures. Swaps are an example of an over-the-counter (OTC) derivative, which allows one party to exchange (or "swap") cash flows or value of one asset for another.[31]

Equity financing

Equity financing agreements involve investors gaining partial ownership of the enterprise that is developing the carbon project in exchange for providing up-front capital. As a result, the investors will have access to revenue from future carbon credit sales and any other revenues. If the enterprise or the carbon project fails, the investor also shares in the losses. Therefore, the investor takes a higher risk when providing equity financing, resulting in a higher cost of capital. The cost of capital of equity financing is determined by the quality of the business plan and the exit opportunities for the investor. A strong business plan with high expected profits can convince equity investors to assign a higher valuation to the enterprise and provide more capital for less equity. Few opportunities to sell equity, which is likely in Kenya, may increase the cost of capital.

The most significant advantage for enterprises developing carbon credits is to receive up-front financing without the burden of debt repayment. The disadvantages for enterprises include losing partial ownership and/or control over their businesses and a high cost of capital.

KawiSafi Ventures: KawiSafi Ventures invests in clean and affordable energy businesses across East Africa and has been involved in carbon markets for approximately 20 years. KawiSafi provides up-front financing in exchange for equity if their financing can be used as an accelerant. They are active in Kenya and have multiple ongoing investments in the country.

Debt financing

Debt financing involves a lender, such as a bank, providing funds to an enterprise developing a carbon project with the expectation of repayment with interest. To de-risk the loan, financiers will generally require collateral that can be seized if repayment obligations are not met. Repayments can be made over

31 ISDA (2021), Role of Derivatives in Carbon Markets.

multiple years, and they can be made in cash or in carbon credits depending on the agreement. Debt financing agreements should plan for repayments starting from when the enterprise expects to receive revenue from the credit sales. The cost of capital is determined by the creditworthiness of the enterprise, the quality of the business plan, the repayment terms, and the central bank's interest rate. Debt financing has lower risks for the financier and a lower cost of capital than equity financing. Commercial banks in Kenya currently experience challenges in identifying appropriate collateral for debt financing. This may change as commercial banks grow their presence in the carbon finance space. Currently, commercial debt financing is mostly used as blended finance in combination with noncommercial debt or other financing for large carbon projects with significant collateral.

The advantages for enterprises developing carbon credits include financing their projects without losing ownership of their businesses and establishing a positive credit history for future loans. The disadvantages for enterprises include the requirement to provide collateral and the requirement of ongoing repayments—even if enterprises experience unexpected cash flow challenges.

European Investment Bank (EIB): The EIB provided a loan of approximately $130 million to the Olkaria IV Geothermal Project with a 4.85 percent interest rate. The repayment term is 20 years with no repayments required in the first 5 years. For the last 15 years, yearly payments of over $15 million are required. The project reduces over 650,000 CO_2e per year and is registered under the CDM.[32]

Grant and donation financing

Grant and donation financing involves an enterprise funding the development of their carbon project through grants and donations. Most enterprises are not eligible for grants or donations and may require other forms of financing. If grants or donations are available, there is no cost of capital. The advantages for the enterprise developing the carbon project include full control over the project and the ability to retain all revenue generated from the credit sales.

32 UNFCCC, 2021

2.4 How to mitigate project risks to have lower financing cost?

Enterprises pursuing financing for their carbon project development and implementation in Kenya need to ensure they are sufficiently attractive for financiers to invest. This includes developing strong business plans, providing solid emission reduction evidence, and demonstrating transparent business processes.

Carbon project financing can be perceived as a high-risk activity, especially in emerging markets. A variety of factors influence risk, such as political instability, skepticism related to certain credit types, fluctuating credit prices, and operational challenges to meet credit volume expectations. Meanwhile, few risk mitigation options are available. This section provides an overview of the key project-specific and macro-level risks that financiers typically consider and suggests actions to address these risks for enterprises seeking carbon financing.

Project-specific risks

Project-specific risks can be unique to each enterprise, carbon project, or project type. Financiers assess these risks through a variety of methods, such as feasibility and due diligence studies. Through these methods, enterprises that are pursuing investment for their carbon projects need to show how they address key risks. The most important project-specific risks are operational risks, community risks, technical risks, and reputational risks.

- **Operational risk:** Operational challenges will reduce the credit issuance volume or delay issuance. This covers a broad set of factors that could result in delays in project implementation or project underperformance. For instance, an improved cookstove project may be unable to distribute as many cookstoves as the enterprise had expected, which reduces the number of carbon credits generated from the project. Enterprises pursuing finance need to provide tangible operational plans (e.g., overviews of distribution channels and networks they plan to leverage to enable rapid growth) to support their business plans in order to persuade financiers of the feasibility of the timely delivery of their projects. This risk is especially present for enterprises developing their first project and for enterprises pursuing project types that are currently under review, e.g., renewables.

- **Community risk:** Local communities are an integral part of many carbon projects in Kenya. Communities are often partial landowners of areas where nature-based projects are implemented and are regularly users of new appliances distributed in tech-based projects, e.g., the users of clean cookstoves. Therefore, local communities' continued consent and support is crucial for high-quality project implementation.

- **Technical risk:** Tech-based projects have an additional operational risk, especially for projects under new methodologies. The product that avoids or removes emissions may experience challenges reducing the emission avoidance or removal. These can happen during product development, e.g., a DAC machine is not as efficient as planned, or during product use, e.g., biogas stoves start leaking after extensive use. Enterprises pursuing financing for tech-based projects will need to show how they are mitigating technical risks, e.g., by providing solid evidence for their technology or by demonstrating maintenance processes for their products.

- **Reputational risk:** Carbon credit buyers and financiers in VCMs often connect their names to the carbon projects they invest in. This generally has a positive reputational benefit. However, if the project's impact is disproven, financiers may experience adverse reputational consequences. For example, fossil fuel distributor Primax has been accused of unethical practices after using carbon credits from REDD+ projects in Colombia, where the Mataven REDD+ and Kaliawiri REDD+ projects were accused of overstating their impact by millions of tons of CO_2e emissions avoided.[33] Enterprises need to demonstrate integrity and transparent monitoring processes to reassure financiers they are mitigating reputational risks. This risk is especially present for projects from enterprises developing their first project and smaller enterprises with fewer resources for transparent monitoring and communication.

- **Reversal risks:** In nature-based carbon projects where the carbon is sequestered or conserved, such as afforestation or wetland conservation, the carbon can be released back into the atmosphere in the future. This can result from unexpected events like forest fires, pest infestations, or human interventions like deforestation. Such reversals undermine any carbon credits issued to the project, making it imperative to have measures in place to mitigate and compensate for potential reversals.

Macro-level risks

Macro-level risks are geography- or market-related risks that cannot be directly or fully influenced by individual enterprises pursuing carbon opportunities in Kenya. Financiers generally assess these risks before entering the Kenyan carbon market. Political, regulatory, price, and mitigation risks exist in Kenya. In addition, VCMs have some global risks, including price fluctuations, transparency, and market confidence.

- **Political and regulatory risk** can be perceived in Kenya because the current regulatory environment is under review and subject to potential changes. For example, potential new regulations for Article 6, e.g., regarding credit allocations toward Kenya's NDC commitments or carbon credit revenue sharing, can affect the price of credits and the financial attractiveness of Kenyan projects. The lack of a carbon market legal framework and coordination challenges across county- and national-level authorities could also lead to uncertainties. For example, the county government of Kajiado recently issued a public notice, indicating that the "Climate Change Act of 2016 [...] does not specifically address how trading in carbon credits as a climate change response will be regulated in the Country" and that the county government will therefore revoke all carbon credit agreements signed for a project that was considered to be fraudulently engaging with various land group ranches and community conservancies. Potential regulations around carbon revenues could also reduce incentives to engage in carbon markets. For example, new regulation on mainland Tanzania now requires the owner(s) of the property or land of the project receive 61 percent of gross revenues accrued from the sale of carbon credits. Zimbabwe similarly announced a regulation that requires 50 percent of carbon revenues from programs in the country to go to the state. This regulation may make projects unattractive for financiers, who require a return on their investments. As Kenya's regulations develop, this risk may prevent some financiers from entering the Kenyan market (see section 1.3).

- **Price volatility** is another concern because of fluctuations in global demand and supply, a lack of price transparency, low market confidence and sentiment, and quality concerns.

33 Carbon Market Watch (2021), "Colombian fossil fuel companies abuse forestry offsets to avoid taxes."

- There are **limited risk mitigation mechanisms** for financiers in Kenya to address these risks. For instance, there are only nascent insurance solutions to mitigate the risk of nondelivery of credits, natural or man-made disasters, and regulatory changes in the Kenyan carbon context. Given the limited risk mitigation options, financiers with a lower risk appetite or a smaller portfolio that cannot be diversified are not joining Kenya's carbon market.

Enterprises pursuing carbon projects should be aware of these risks, as some can be partially mitigated through innovative financing mechanisms. For instance, a loan in US dollars with regular repayments could mitigate some currency and price risks for financiers. In this case, the enterprise pursuing the carbon project will own these risks. That is if the price of carbon credits decreases, the debt repayments will stay the same, which will affect the profitability of the carbon project. Other mitigation efforts could be considered, such as pursuing an FPA with a carbon credit buyer in Kenya, implementing currency hedging strategies, or incorporating potential upcoming regulations into the project.

TABLE 6
Overview of key carbon financiers in Kenya

Financier type	Financier examples in Kenya	Financing mechanism	Project and enterprise examples in Kenya
Carbon finance funds	• Catalyst fund • Climate Asset Management • Green Climate Fund • Hartree Partners • Livelihoods Carbon Funds • Mirova	• FPA • Equity • Debt	• Hifadhi Project • Kasigau Corridor REDD+ • Octavia Carbon • Taita Hills REDD+ • Upper Athi River Catchment Area
Carbon credit buyers	• Shell • Netflix • Kering • Nedbank	• FPA	• Cella Mineral Storage • Kasigau Corridor REDD+ • Northern Kenya Rangeland Trust
Commercial banks	• Equity Bank • Standard Bank	• Debt	• Corner Baridi Wind Farm • Olkaria IV (geothermal) • Turkana Wind Power
Intermediaries	• C-Quest Capital • Climate Impact Partners • CO2balance • DGB Group • Earthbanc • EcoAct • Ecosecurities • South Pole	• FPA • Equity • Debt	• CO2balance Kenya community handpumps • Hongera Reforestation Project • Mwangaza Light • South Pole Biodigesters • Trees Kenya • TakaTaka Recycling
DFIs and MDBs	• African Development Bank • European Investment Bank • The World Bank	• Debt • Concessional debt	• Olkaria I (geothermal) • Olkaria IV (geothermal)
Foreign governments	• Government of Japan	• FPA	• Krystalline Salt (solar) • Unga Farm Care (solar)
Government of Kenya	• Kenya Climate Ventures • County Climate Change Fund	• Equity • Debt	• Sistema.Bio
Impact investors	• Acorn (Rabobank) • KawiSafi Ventures • Spark+ Africa	• FPA • Equity • Debt	• BioLite Energy • BURN Manufacturing
NGOs, donors and international organizations	• Absa Bank Kenya • Clinton Foundation • Conservation Internationali • The Nature Conservancy • The World Bank • World Economic Forum	• Grants • Donations • Concessional debt	• Ceriops Environmental Organization • Mikoko Pamoja

CHAPTER 3

Project Development and Monitoring

3.1 How to get a project listed?

Listing refers to the process of creating a basic profile of a carbon project under a carbon credit standard of a registry. Examples of registries where projects are listed include the Verra Pipeline Registry and Gold Standard Impact Registry.

The process of listing adds a project into the pipeline of a registry and helps build awareness about the project. Some carbon credit standards such as VCS and Gold Standard require listing of a project through submitting a draft project design document, while others such as Plan Vivo do not. An enterprise may list a project into the pipeline in the early stages of development and, in the case of VCS, also specify whether the project is under development or under validation.

Listing makes the carbon credit standards aware of the enterprise's intent to implement the project under a specific methodology. Listing helps carbon credit standards to plan and communicate in advance any changes to methodologies that might affect the project. It also allows the project to benefit from any grace periods required to adjust the project to the changes in methodology.

The carbon credit standards sometimes accept partially completed PDDs with indicative information that at least include a brief overview of the project with details of the location, project type, technology to be used, methodology to be used, and estimated emission reduction. Carbon credit standards provide an overview of required documents for listing projects on their websites, e.g., VCS Pipeline Listing Process and Gold Standard Preliminary Review by SustainCERT. The carbon credit standards also provide templates on their websites for any supporting documents required, e.g., a listing representation deed for VCS and a stakeholder consultation report for Gold Standard.

To list a project, the enterprise needs to open an account with the registry, which costs approximately $1,000 depending on the carbon credit standard. This account will be used to manage the project and submit relevant documentation throughout the carbon project life cycle. Submitting a project for listing attracts a fee that ranges from $1,000 to $4,000, depending on the carbon credit standard and project type. The latest fee schedules are available on the registries' websites, e.g., Verra and Gold Standard.

3.2 How to validate a project?

Project validation is the next step after the enterprise completes the project design document and lists the project under a registry. Validation helps ensure that the project meets the established requirements of a specific carbon credit standard.

Validation entails three main steps: submission of documentation to a VVB, VVB review of submitted documentation and site visit, and generation of a validation report. This section outlines the process of validating a carbon project.

There are no active VVBs based in Kenya as of May 2023, but multiple VVBs have a focal point in Kenya who can support the validation and verification of projects and emission reductions in Kenya. For instance, Carbon Check has accredited personnel in Kenya who can support VVB services for carbon credit standards under both Verra and Gold Standard. Ecolance has accredited personnel in Kenya who can support VVB services for carbon credit standards under Verra. TÜV Nord has the capacity to bring accredited personnel from their global offices to Kenya for VVB services for carbon credit standards under both Verra and Gold Standard. The capacity of VVBs and complexity of validation can increase validation timelines by up to six months for nature-based projects and up to three months for tech-based projects. Registries are currently working on increasing the number of VVBs or the capacity of VVBs across the African continent (Box 9).

BOX 9

Validation and verification in Kenya

Except for a low VVB capacity in the region, Kenya offers a suitable environment for validation and verification services. Compared to other countries in the region, Kenya has strong infrastructure, expertise, and technology solutions.

In Kenya, most projects can be easily and safely reached by paved road infrastructure. In addition, reliable telecommunication networks allow for live monitoring and validation of results.

Kenya has a wide array of experts covering key validation and verification components, such as drone and GIS experts, MRV professionals, etc. In addition, Kenyan universities have accredited laboratories that can perform globally recognized monitoring tasks, such as analyzing soil samples.

Enterprises in Kenya still encounter challenges with national data accuracy. For example, cookstove projects must provide addresses where cookstoves are distributed, while address data in rural Kenya may be inaccurate. Inexistent poverty and other demographic data can also prevent projects from getting additional certification (e.g., Climate, Community, and Biodiversity Standard or Sustainable Development Verified Impact Standard).

Documentation submission to a VVB

Before a project is validated, the enterprise needs to select an independent auditor approved by the carbon credit standard's registry as a VVB. Carbon credit standards provide the most updated lists of approved auditors on their websites, e.g., VCS VVBs and Gold Standard VVBs. To initiate validation, the enterprise submits the PDD and supporting documentation, such as evidence of project ownership and a monitoring plan, to the VVB.

Documentation review and site visit

After receiving the project documentation from the enterprise, the VVB conducts an initial desk review of the material to ensure it meets the eligibility criteria and requirements of the carbon credit standard.

Once the project documentation passes the desk review stage, the VVB conducts a site visit to the project to confirm that the project is being implemented as described and that adequate monitoring systems are in place to capture emission reductions. During the site visit, the VVB or their accredited personnel interact with project stakeholders to confirm that they were appropriately involved in the project conceptualization and design. The enterprise should prepare the itinerary for the VVB to allow for effective movement between project areas and productive interactions between the VVB and all relevant stakeholders. In the case of accredited VVB personnel supporting the validation, multiple live calls with the VVB headquarters may be required. In this case, cellular service and access to electricity should be considered for the site visit.

Validation report generation

After the site visit, the VVB prepares a validation report that summarizes their findings and any areas of non-compliance to be addressed by the enterprise. The VVB shares the validation report with the enterprise. The enterprise is responsible for providing solutions for any concerns raised by the VVB. Once the VVB accepts the project design, implementation plan, and monitoring plan, they can recommend the project for registration under the carbon credit standard. After the project receives the validation report from the VVB, the enterprise can apply for project registration.

The validation process for tech-based projects tends to be more straightforward and take a shorter time compared to that for nature-based projects. This is mainly because emission reductions for tech-based projects depend primarily on the effectiveness of technology used, while for nature-based projects, other factors including land, vegetation, and community stakeholders play a bigger role. Thus, validation for tech-based projects tends to focus on the technology and project implementation, whereas validation for nature-based projects must also account for broader factors including impacts on the land, vegetation, and community. Consequently, some standards, such as VCS, require validation of specific safeguards for AFOLU projects they do not require for non-AFOLU projects.

The time to complete validation varies depending on availability and capacity of the VVB, clarity and comprehensiveness of project documentation, and responsiveness of the enterprise to the queries from the VVB.

3.3 How to register a project?

After completing the validation process successfully, a project is ready to be registered under the chosen carbon credit standard. Registration means enrolling a carbon project officially under a specific carbon credit standard so that it can generate carbon credits.

A project can be registered under any carbon credit standard chosen by the enterprise if it meets the eligibility criteria defined by the carbon credit standard. This section covers the process an enterprise should follow to register their project under a chosen carbon credit standard.

To initiate project registration, the enterprise prepares and submits a validated PDD and supporting documentation to the registry of the chosen carbon credit standard for review and approval. Supporting documents may include a validation report, proof of contracts, and stakeholder consultation reports. Updated lists of required supporting documents are available on the websites of each carbon credit standard. (The process for project validation is described in section 3.2.) Registries provide templates for supporting documents on their websites, e.g., VCS and Gold Standard. Registries also specify whether the PDD and supporting documents may be submitted online or in hard copy. Nature-based projects, especially those in AFOLU, are required by carbon credit standards to submit specific documentation that has also been validated by the VVB, whereas tech-based projects will not face the same requirement.

After documents are submitted, the registry will review them for completeness and accuracy. The completeness review ensures that the documents are complete, appropriately signed, and validation was done within the required time frames that are specified in the carbon credit standard rules for different project types. During the completeness review, the registry also checks that emission reductions have not been issued under other carbon credit standards and baseline and additionality have been assessed correctly. After the completeness review, the registry may also choose to conduct an accuracy review of the submitted documentation to ensure adherence of validation to rules of the carbon credit standard and the applied methodology.

A project can be registered under any carbon credit standard chosen by the enterprise if it meets the eligibility criteria defined by the carbon credit standard.

After the completeness and accuracy reviews, the registry sends any arising queries to the VVB. Once the VVB receives the queries, it will respond directly to the carbon credit standard and, where needed, contact the enterprise with the carbon project activities. The registry may also request the enterprise to update relevant documents to reflect the latest project information before they are reviewed. The project registration process may take several months to complete. To minimize delays from clarifications, the enterprise should ensure all documents are present and clear. To ensure carbon credits can be issued, the project must remain valid under the carbon credit standard by continuing to comply with the carbon credit standard's monitoring and reporting requirements. Details of how to monitor a carbon project are covered in the next section.

3.4 How to monitor a project?

Monitoring project emission reductions is crucial to complying with the verification process required to demonstrate project quality and receive carbon credits. Monitoring involves ongoing measurement and tracking of emission reductions and co-benefits for reporting at each credit issuance period.

This section outlines the components of a carbon project monitoring plan and how to conduct project monitoring for a carbon project.

Carbon project monitoring plan

A carbon project monitoring plan aims to track measurable parameters that will be used to calculate project impact. The monitoring plan defines the operational and management system for regular data collection and quality assurance. It is prepared by the enterprise as a part of the PDD in compliance with the requirements of the chosen carbon credit standard and approved during the registration stage along with the rest of the PDD. A monitoring plan typically includes:

- **Project overview:** This section provides a brief description of the project, including project type, location, activities, and methodology applied. It also includes an overview of the monitoring plan, including its purpose and the stakeholders involved in the monitoring process.

- **Monitoring objectives:** This section outlines the emission reduction targets and defines the parameters to be used to track emission reductions.

- **Baseline and emission reduction calculation:** This section includes the baseline emission assessed under the selected methodology and the ways to estimate future leakage. It also describes the methodologies and equations that will be used to calculate emission reductions associated with the project.

- **Data collection and quality control methods:** This section outlines procedures for gathering data, frequency of data collection, and the locations where data will be collected. It also describes data quality assurance procedures, including instrument calibration, data validation, and third-party verification.

- **Monitoring and reporting schedule:** This section describes the monitoring start and end dates, frequency of monitoring activities, and timeline for reporting. It lays out formats and frequencies of reports as guided by the chosen carbon credit standard and the parties responsible for preparing and submitting reports. Carbon credit standards provide specific requirements and templates to guide enterprises in emission reduction reporting, e.g., VCS and Gold Standard.

- **Risk management:** This section identifies the potential risks and challenges that may arise during the monitoring process and outlines the procedures for addressing these risks.

To generate carbon credits, the enterprise needs to implement activities described in the project design document and monitor activities as described in the monitoring plan. On their websites, carbon credit standards keep up-to-date templates and guidance on how to develop a monitoring plan, e.g., VCS and Gold Standard. Monitoring for nature-based projects tends to be more complex than for tech-based projects, mainly because it involves baselining and tracking changes in biomass and can also involve monitoring outside the project area to detect leakage. Monitoring for nature-based projects may also require recruitment of field assistants to conduct field surveys over vast areas of land, or use of satellite imagery to track ecological changes. Tech-based projects can include in-built equipment to continuously track and report on emission reduction performance, allowing enterprises to have a near real-time view of the emission reduction of the project.

Monitoring implementation

Once the project starts, the monitoring plan guides the enterprise on how to monitor the project and complete the monitoring report.

The enterprise implementing the project is responsible for implementing the monitoring plan by collecting, recording, and analyzing data on emission reductions. Depending on the type and scale of the project, the enterprise could set up an internal monitoring team or seek the services of a consulting company. The enterprise will then collect, verify, and analyze the data according to the monitoring plan (Box 10). After completing the analysis, the enterprise submits the results of the monitoring process to the VVB.

BOX 10

Monitoring, reporting, and verification considerations

MRV can be resource-intensive, especially for large and complex projects. It is important to consider the resources needed for successful MRV, including:

- **Data collection:** Collection of accurate and reliable data is crucial but can be time-consuming and costly. The enterprise may need to invest in technology, staff training, and partnerships with community groups or representatives to ensure accurate and reliable data.
- **Skill availability:** Depending on the size and complexity of the project, specialized skills currently not present in the enterprise may be required, e.g., carbon accounting and project financing. The enterprise should seek experts with these skills during the project conceptualization and finance stage.
- **Stakeholder engagement:** Effectively engaging stakeholders, including local communities and project beneficiaries, is important for successful MRV. Stakeholders can provide valuable feedback and support for data collection, and their participation can enhance project credibility.

The output from the monitoring process is the monitoring report. A typical monitoring report will include the following sections:

- **Project overview:** This section provides a brief description of the project, including project type, location, activities, and methodology applied.
- **Safeguard implementation:** This section covers the environmental and social safeguards in place to ensure the project does not negatively impact the environment, local communities, or other stakeholders.
- **Methodology application:** This section describes the methodology used to calculate the estimated emission reductions associated with the project. Calculations should be in accordance with the methodology approved by the carbon credit standard under which the project is registered.
- **Emission reduction estimation:** This section includes estimates of the emission reductions expected over the project lifetime, based on the methodology selected.
- **Monitoring system description:** This section outlines the monitoring system used by the project to measure and report emission reductions, including the monitoring parameters, data collection methods, and quality control procedures used.
- **Emission reductions achieved:** This section provides the actual emission reductions achieved by the project during the monitoring period. These should be compared to the estimated emission reductions.
- **Stakeholder inputs:** This section details input from stakeholders, including local communities, project partners, and other interested parties, regarding the environmental and social impact of the project. Box 11 offers more details on how to communicate with and engage stakeholders during the process of project development and monitoring.

BOX 11

Stakeholder engagement during project development and monitoring

Stakeholder engagement can help build trust and ensure project alignment with stakeholder needs and priorities. Stakeholder engagement should be an ongoing process that involves regular communication, consultation, and feedback. Stakeholder engagement is essential for enterprises to design systems that ensure ongoing consultation, including grievance redress procedures to resolve any conflicts that may arise between the enterprise and local stakeholders.

Before engaging stakeholders, it is important to identify all relevant stakeholders and develop a strategy for engaging them effectively. Engagement may involve community meetings, surveys, focus groups, and other forms of communication. Enterprises can invite engagement by advertising on signposts, print media, or social media, and by sending letters. It is important to collect evidence of engagement, including photos, copies of letters, attendance records, and signatures of official representatives of groups in attendance.

Examples of stakeholders that need to be engaged include:

- **Local communities:** Individuals, associations, and representatives of communities who are directly or indirectly affected by or participating in the project.
- **Landowners:** Stakeholders with land-tenure rights for any area directly affected by the project.
- **Local government:** Local policymakers and representatives of local authorities.
- **National government:** National government officials or national bodies responsible for the project, especially in nature-based projects or projects involving land rights.
- **Nonprofits:** Local and international NGOs and women's or youth groups working on topics relevant to the project or with communities who are likely to be affected by the project.

Free prior informed consent (FPIC) is necessary from project participants. Especially in nature-based projects or projects involving land, FPIC can ensure that project participants understand risks related to the project and are able to give permission for the project to be implemented and carbon rights to be generated from the project.

The enterprise also needs to consider developing partnerships with other stakeholders, including accelerators, carbon consultancies, and financiers, who can help to access funding, expertise, and other resources. Government engagement can help develop policies and regulations that create an enabling environment for carbon projects.

While monitoring is a continuous process across the project life cycle, including between credit issuance periods, reporting and verification are often done periodically. After the enterprise completes the monitoring report, the monitoring report is submitted to the VVB for verification, a process which is detailed further in chapter 4. The enterprise is also expected to share the same report with local stakeholders to keep them informed of project progress. Box 12 describes emerging interest developing digital MRV (D-MRV) systems to address challenges associated with current MRV processes.

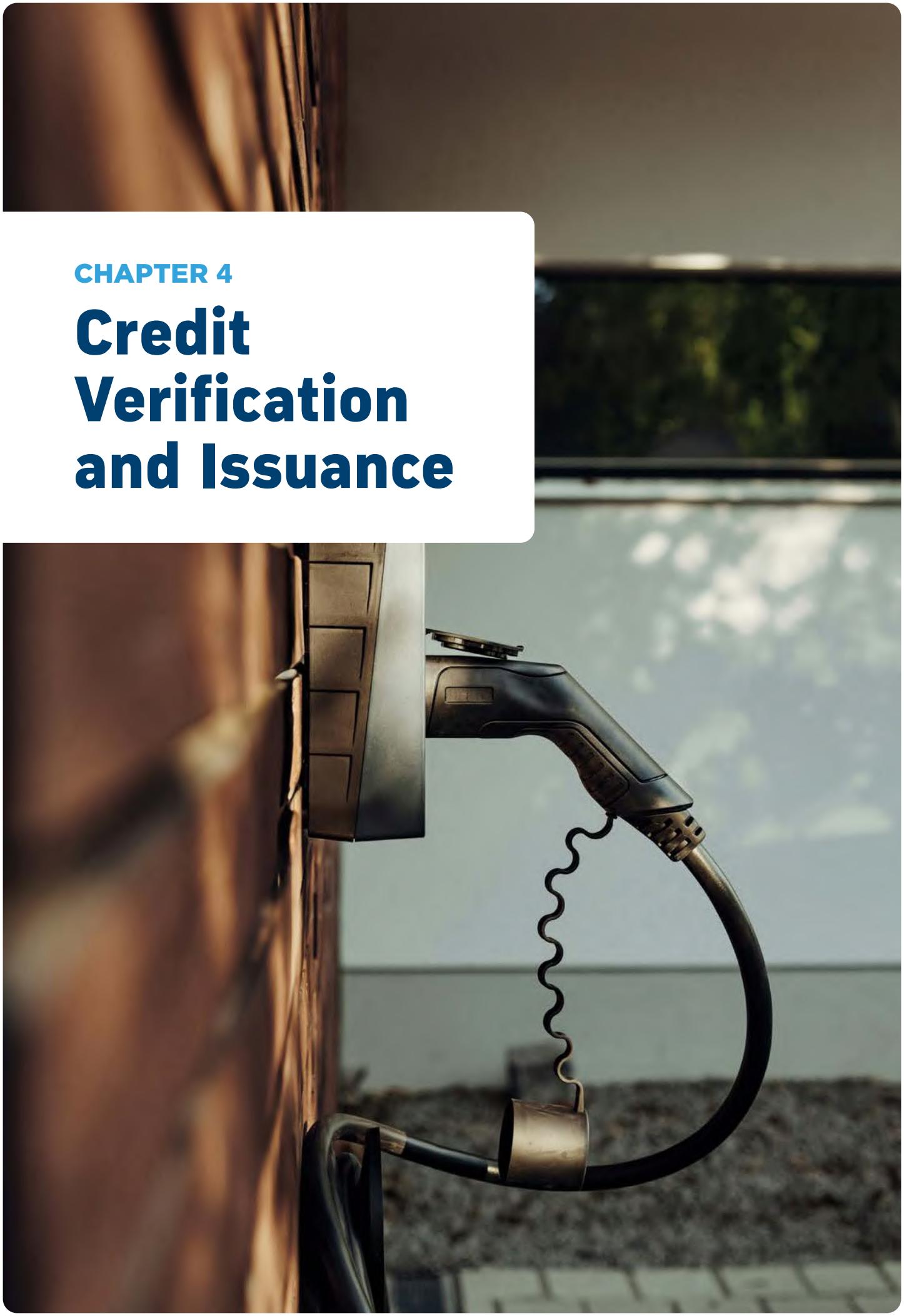
BOX 12

Digital MRV

The MRV process is often costly, time-consuming, and susceptible to error, as it relies on manual information recording or in-person surveys. To address these challenges, independent standard organizations are adapting their MRV protocols to allow for digitally collected, validated, and verified data. For example, allowing for one-off, on-site validation using a D-MRV system certification, followed by recurring remote verifications, would increase the speed of validation and verification while reducing the overall cost of generating carbon credits.

While D-MRV offers significant potential, there are several barriers ahead that need to be considered. For example, the cost of emerging technologies can be significant, especially for developing countries. D-MRV systems can capture sensitive data, thus requiring additional privacy control to be put in place. Developing countries may lack capacity to use emerging digital technologies. Moving forward, governments could consider what policies and actions need to be taken to address these barriers to create an enabling environment for D-MRV system. For example, governments and relevant institutions could develop policies or guidelines that clearly state how sensitive information may be collected, used, and stored. Governments also need to ensure that the required infrastructure, power, and data networks are available for digital technologies to be effectively implemented. These networks are largely in place in Kenya. Where appropriate, strategic tax incentives can also promote the use of desired emerging technologies. Once the up-front costs and increased technical complexity of implementing a D-MRV system are overcome, the effort to replicate or scale the system is likely much less than for a conventional MRV system.

For more information, please see World Bank (2022), Digital Monitoring, Reporting and Verification Systems and their Application in Future Carbon Markets.



CHAPTER 4

Credit Verification and Issuance

4.1 How to verify a project at the end of each period?

The verification process helps to ensure that carbon credits are only issued for projects that have achieved real and measurable emission reductions, and that buyers can trust these credits to achieve their climate change mitigation goals.

The verification process is a rigorous, multistep process designed to ensure the integrity and credibility of carbon projects. The process involves the submission of emissions data and monitoring reports to a VVB, verification by the VVB, and review by the chosen registry. Given the limited presence of VVBs in Kenya (see section 3.2) and the rigor of the process, an enterprise should expect a timeline of approximately two to six months for the verification process (Box 13).

BOX 13

Verification for nature-based and tech-based projects

Tech-based projects are easier and quicker to achieve due to more standardized emission reductions. Therefore, a significantly lower verification cost is incurred, and verification can be done more regularly to receive carbon credits. For example, some cookstoves projects in Kenya have conducted quarterly verifications whereas afforestation projects have used verification every two to five years. For REDD+ and ARR, ample time between verification cycles is required to demonstrate forest-level biomass changes.

Monitoring report submission

Once the monitoring report is complete, the enterprise needs to submit the report to a VVB recognized by the chosen carbon credit standard. The VVB will review the monitoring report and ensure that it meets the requirements of the carbon credit standard. Some methodologies or registries do not allow the same VVB to validate the monitoring plan and verify the monitoring report, or to conduct two subsequent verifications for the same project. Also, some registries such as Gold Standard require notification by the enterprise once it starts the verification process with a VVB. Failure to do so may result in a delay in the registry's review of the verification report. Therefore, enterprises need to review their chosen carbon credit standard's requirements for the verification process. See the VCS verification requirements and the Gold Standard principles and requirements documents for more details; also see Box 14.

VVB verification

Once the VVB receives the monitoring report, its role is to verify that the project is implemented as described in the monitoring report and that the project is delivering the expected emission reductions. The VVB typically undertakes three main steps in the process: conduct field visits, review the monitoring report, and draft the verification report.

BOX 14

Verification process per carbon credit standard

Each carbon credit standard has varying requirements and processes aligned with the generalized verification process outlined in this chapter. For example, VCS credits issued by Verra require verification for each issuance whereas Gold Standard conducts a performance review every five years to certify projects under their carbon credit standard. Enterprises should check the latest verification requirements on their chosen carbon credit standard. Verra presents its latest processes for VCS and active VVBs on its website. Gold Standard also presents its principles and requirements and active VVBs online.

Conduct field visits

The VVB conducts a field visit to the project site to verify the data in the monitoring report. During the field visit, the VVB undertakes a range of activities, including conducting interviews with project stakeholders such as local communities and inspecting the project site. For example, for a cookstove project, a VVB will request a list of all cookstove users and visit a random sample from the list. Depending on the carbon credit standard, the VVB will verify that, in addition to the reported emission reductions, the project also creates other social and environmental impacts in line with the UN's Sustainable Development Goals.

Review the monitoring report

After the field visit, the VVB will conduct a detailed review of the monitoring report to ensure that it meets the requirements of the chosen carbon credit standard. This includes cross-checking data from the monitoring report with field visit data, reviewing the methodology used to calculate the emission reductions, and any other appropriate carbon credit standard auditing practices.

Draft the verification report

Once the VVB has completed the field visit and reviewed the monitoring report, it will draft a verification report that outlines its findings, including issues or concerns identified and recommendations for improving the project's environmental or social impact. The enterprise developing the project will have the opportunity to review and respond to the verification report before the VVB submits it to the registry, and the VVB will work with the enterprise to resolve any questions or concerns. Project developers can be contracted to provide support services to enterprises in the verification process.

Registry review and approval

After the VVB completes the verification report, the VVB submits the report for review to the registry that manages the chosen carbon credit standard. The registry reviews and approves the verification report using an independent review panel or committee to ensure that the verification was conducted in accordance with the applicable carbon credit standards and procedures. The review panel may include experts in emissions accounting, project management, and environmental science. If necessary, the review panel sends their findings or clarifying questions to the VVB for response. When all information is received, the review panel makes a final determination on the project's eligibility for carbon credits.

4.2 How to have credits issued?

Credit issuance is the step in the carbon project life cycle where carbon credits are made available to the enterprise that developed the project.

During the credit issuance process, the enterprise that developed the project needs to submit an issuance request and pay a carbon credit issuance levy, after which the registry deposits the carbon credits in the enterprise's account at the registry (Box 15).

BOX 15

Issuance processes per carbon credit standard

Each carbon credit standard has unique requirements and processes along the generalized issuance process in this chapter. For example, Verified Carbon Standard (VCS) credits can be issued in batches whereas Gold Standard credits can only be issued in the entire volume of emission reductions specified in the verification report. In addition, Gold Standard allows issued credits to be sold on their online marketplace. Enterprises must check the latest issuance process documentation of their chosen carbon credit standard. Detailed issuance processes exist online for VCS and Gold Standard.

Issuance request

When the registry approves the verification report, the enterprise can submit an issuance request through their account with the registry. Once the registry receives the issuance request, it will create records of the project and the carbon credits described in the verification report. The registry subsequently creates serial numbers for the carbon credits. For nature-based projects, a given percentage of carbon credits is not issued and will be held as a buffer by the registry. For instance, for land use and forestry projects registered under Gold Standard, this can be up to 20 percent of credits.

Issuance levy

To receive the remaining serialized carbon credits, enterprises must create an issuance request and pay a carbon credit issuance levy. For VCS, Verra charges between $0.002 and $0.02 per credit, depending on the number of credits issued. Gold Standard charges up to $0.15 per credit. Once the issuance levy is paid, the registry deposits the carbon credits into the enterprise's account at the registry. Subsequently, the credits can be transacted. (The sales processes for carbon credits are outlined in chapter 5.) For subsequent carbon credit issuance cycles of the same project, the verification and issuance processes may be simplified, and the issuance levy is often lower.

4.3 What are the actions recommended after credits are issued?

After the first credits of a project are issued, there are several recommended actions to ensure credits will continue to be issued in subsequent issuance cycles. This chapter provides recommendations on project maintenance and credit issuance in subsequent cycles.

Project maintenance

Enterprises must take proactive measures to maintain the carbon credits issued to them as registries can revoke issued credits or suspend projects. The project maintenance involves keeping up with the required maintenance and quality assurance activities.

Project maintenance activities refers to the required verification cycles of a project, including the project's emission reductions. Failure to go through the verification process within the carbon credit standard's requirements may result in a suspension of the project and/or its credits. For instance, VCS requires each project to submit at least one verification report to the registry every five years, even if

no issuance requests are made. Failure to do so results in a written notice by Verra to provide evidence that the project is still active. An inadequate response will result in the project status being changed to inactive, which means the project may no longer receive future credits.

In addition, the enterprise needs to ensure that the project continues to meet the eligibility criteria set by the relevant carbon credit standard, including additionality, leakage, and quality. For instance, Gold Standard requires proof of ongoing financial need of carbon credit revenues to keep project implementation financially feasible at recertification every five years. Evidence may include contracts, correspondence with financial institutions, board meeting minutes, or newspaper articles. If the enterprise cannot prove needing credit revenues to implement the project, the additionality criteria is not met, and the project can be suspended.

Project quality assurance activities refers to upholding existing robust, transparent, and ethical business processes. Registries are often, at their own discretion, allowed to review registered projects and issued credits. This can happen when registries have concerns about adherence to the carbon credit standard's rules or the applied methodology. Quality reviews can be triggered by a variety of actions, including project stakeholders, such as local communities, expressing concerns to the registry, registries identifying errors in reporting, or newspapers publishing information on the project.

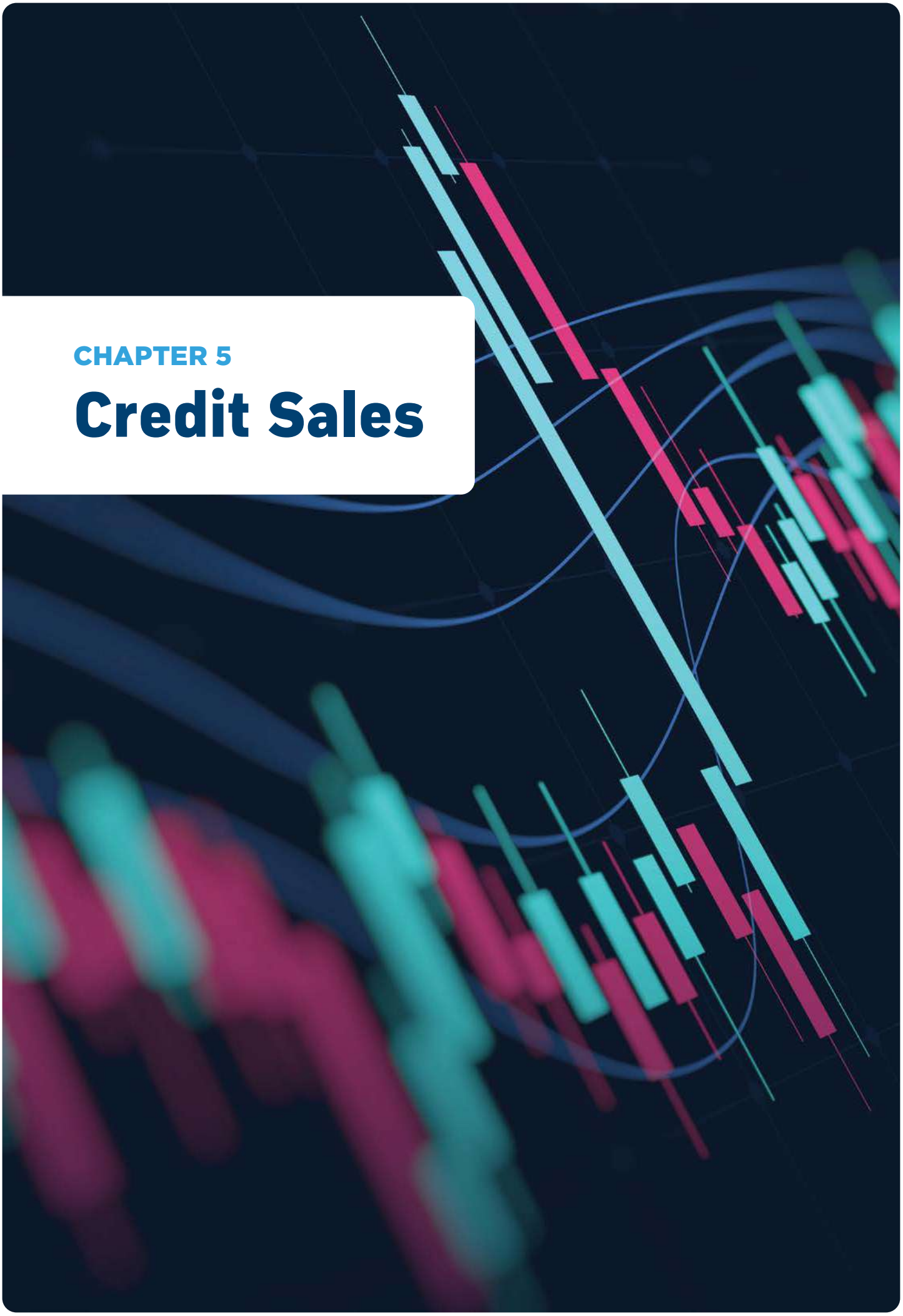
Enterprises must take proactive measures to maintain the carbon credits issued to them as registries can revoke issued credits or suspend projects. The project maintenance involves keeping up with the required maintenance and quality assurance activities.

Subsequent issuance cycles

Enterprises that have successfully received their first carbon credits can often apply for additional carbon credits in subsequent issuance cycles. The process of applying for additional carbon credits varies depending on the registry used to verify the project.

For projects verified under VCS, enterprises can apply for additional carbon credit issuance by submitting a new monitoring report and undergoing verification through a VVB. The new monitoring report should demonstrate the project's continued eligibility and the carbon credits' additionality. After successful verification, the enterprise can receive additional carbon credits.

For projects verified under Gold Standard, enterprises need to provide annual update reports to maintain their certification and eligibility for subsequent credit issuances. Enterprises need to recertify their projects every five years. The certification renewal process involves submitting a new PDD, undergoing verification through a VVB, and demonstrating that the project meets Gold Standard's eligibility criteria. Once successfully verified, the enterprise can receive additional carbon credits.



CHAPTER 5

Credit Sales

5.1 What sales channels exist for carbon credits?

There are several channels available for enterprises in Kenya to sell their issued carbon credits.[34] Each sales channel has a distinct sales process with unique advantages and disadvantages (Figure 12). Enterprises need to understand the available sales channels to select a channel that fits their needs.

Direct sales

A direct sale of a carbon credit involves selling an agreed-upon volume of future or issued carbon credits directly to a buyer at a given price. This channel is most common for large projects in which an enterprise has the capacity to market and sell their credits independently. Direct sales usually generate the highest revenue for the enterprise that developed the credits. For an enterprise that develops credits, the direct sales process includes connecting with the credit buyer, negotiating a sales price and volume, and delivering the agreed-upon credits. To deliver the credits, the enterprise needs to initiate the transfer from their account with the registry to the buyer's account with the registry. Subsequently, the buyer will need to verify the transaction through their account to receive the credits. Direct sales through FPAs are common in Kenya as many enterprises require external financing to grow their projects and an FPA with an end buyer or project developer is a regular external financing mechanism (Box 16).

Wildlife Works: Wildlife Works has developed the Kasigau Corridor REDD+ project registered under VCS in Kenya. They market and sell the carbon credits on their website. Microsoft is a notable confirmed buyer of their credits.

BOX 16

Direct sales through FPAs

Forward purchase agreements (FPAs) can be used to structure the direct sale of a future carbon credit to a carbon offset buyer. In this case, the sales process takes place before the credit issuance to arrange the project financing. More information on forward purchase agreements can be found in section 2.3.

34 Builds on internal note by the World Bank Invest for Climate Initiative (2023), "Opportunities for monetizing emission reduction credits."

Brokered sales

A brokered sale involves engaging the services of a credit broker to market and sell carbon credits on behalf of the enterprise that developed the credits. Usually, the broker receives a commission on the sale of the credits or negotiates a set revenue per credit for the enterprise that is under the market rate. This can reduce total credit revenues for the enterprise that developed the credits, compared to direct sales. For enterprises that develop credits, the brokered sales process includes negotiating a price or commission and credit volume with the broker and delivering the agreed-upon credits to the credit buyer or broker.

Earthbanc: Earthbanc sources investments from entities seeking to offset their emissions and supports enterprises that develop carbon projects worldwide. After credit issuance, they sell the credits to their investors, take a commission, and share the remaining credit revenue between the community and the enterprise that developed the project.

Over-the-counter

OTC transactions link sellers with buyers in domestic and international markets on spot or forward terms. OTC transactions, which are executed between counterparties, provide greater flexibility as transactions can be customized more precisely to a company's particular risk management needs. OTC markets may also provide access to assets not available on standard exchanges. Additionally, OTC markets operate at a lower degree of regulation and oversight than do exchange-traded markets, retaining a higher degree of privacy. However, fewer regulations on the OTC market may lead to a lower degree of transparency than exchange-traded markets. Additionally, OTC markets are less liquid than exchanges and may carry higher levels of settlement and counterparty risks compared to exchanges.

BOX 17

Carbon credit tokenization

Tokenization of carbon credits is a nascent technology that enables a carbon credit, with all its underlying information (e.g., methodology and project type), to be represented as a token on a blockchain. Tokenized credits can be exchanged by anyone who owns a crypto wallet. Proponents of tokenization claim it can increase market liquidity, bring transparency to carbon prices, and improve financing conditions for enterprises developing carbon projects.

Exchange sales

An exchange sale involves registering and trading issued credits on a carbon exchange or auction platform.[35] Typically, the platform verifies the carbon credits, bundles carbon credits from similar projects into contracts (larger bundles of similar credits) and lists these contracts on their platform for sale. The platform receives a commission on the sale of the credits. For enterprises that develop credits, the exchange sales process includes registering with the exchange, following the exchange's verification process, and delivering the agreed-upon credits to the exchange.

AirCarbon Exchange (ACX): ACX is the world's first fully regulated voluntary carbon exchange, which allows licensed financial institutions to participate on the platform. ACX offers ten-plus standardized contract types based on carbon credits from projects around the world. Contract types can be differentiated by their corporate commitment scheme, vintage, project type, and so on. ACX already has a number of Kenyan projects registered and has sold cookstove projects developed across Africa. In addition, ACX is working with the Nairobi International Financial Centre and the Nairobi Securities Exchange to develop a Kenya Carbon Exchange.

FIGURE 12
Advantages and disadvantages of different sales channels

	Advantages	Disadvantages
Direct sales	• Likely highest revenue through direct sales • Control over how credits are marketed	• Likely higher marketing costs • Likely slower sale of credits • Potential lower sales price if marketing efforts are unsuccessful
Brokered sales	• Likely faster sale through existing marketing and sales channels • Potential to sell to buyers with higher willingness to pay	• Reduced revenue share due to brokerage commission
Exchange sales	• Transparent trading platform and prices • Can bundle credits to meet the demands of larger credit buyers	• Likely lowest revenue through exchange sales • Potential upfront fee to register

35 In an auction, the seller provides its carbon credits to an auction provider who holds the credits in trust or encumbrance state in the seller's account and puts these credits up for auction under specific conditions agreed with the seller (e.g., auction duration, certain floor price per auctioned). Other information required from the seller may include proof of carbon credit issuance from an accredited carbon standard, information on significant co-benefits, or third-party ratings of project leakage and permanence risks. During the auction process, multiple potential buyers compete and outbid each other. The carbon credits are awarded by the auction provider to the highest bidder, and this requires a contract with the auction provider. Auctions do not require signing ERPAs with individual buyers but instead offer multiple potential buyers the opportunity to purchase carbon credits through a competitive process. Auctions can facilitate price discovery and transparency. Auction services are normally provided by auction platforms or big exchanges such as CME Group, Intercontinental Exchange, or Xpansiv CBL. When sellers list their credits on an auction platform, there is an obligation to sell as opposed to listing credits on an exchange, where the seller would have a choice to opt out.

5.2 How to determine the price of carbon credits?

Unlike other assets, such as oil or gold, global VCMs have not yet established mechanisms to create full price transparency. Various project-specific and macro-level drivers impact global supply, demand, and prices. This section outlines key drivers and highlights how enterprises can influence these drivers to affect the sales price of their credits.

Project-specific drivers

Project-specific drivers refer to the characteristics of a carbon project that affect the value of its carbon credits on the voluntary carbon market. Enterprises considering a carbon project need to understand the drivers of project-specific carbon credit prices, such as project co-benefits, project quality, project type, and vintage.

Project co-benefits

Additional benefits beyond emission reductions, known as co-benefits, can increase the demand for and the price of a project's carbon credits. Project co-benefits can make a project eligible to register under a more rigorous carbon credit standard which can help in the marketing of a carbon credit. For example, Gold Standard–certified credits are usually sold at an approximately 30 percent higher price than VCS credits because Gold Standard only certifies projects with additional social, environmental, and sustainable development impact. Enterprises that develop credits should consider which co-benefits can be created with their projects and select appropriate carbon credit standards that recognize these co-benefits. For example, a project that promotes sustainable land use practices should consider registering under a rigorous carbon credit standard that measures co-benefits as the project may also improve soil health, support biodiversity, and provide economic benefits to local communities (Box 18).

BOX 18

ACX prices influenced by co-benefits

The AirCarbon Exchange (ACX) issues the Sustainable Development Goal Tonne contract, which covers carbon credits with additional certifications or labels for sustainable development benefits aligned to the UN Sustainable Development Goals. The listed price for these carbon credits is a multiple of other ACX contracts.

Project quality

Like project co-benefits, other desirable qualities can increase the price of a project's carbon credits. For instance, robust monitoring processes and ethical standards may reduce perceived reputational risk and increase prices. Other project qualities, such as specific project locations or positive media attention,

may also increase credit prices. Some buyers have started to contract carbon credit rating agencies to assess carbon credit quality.

The Kasigau Corridor REDD+ project is the first successfully validated and verified REDD+ project under the VCS and CCB standards. It has attracted positive media attention and was selected as a Natural Climate Solutions Lighthouse project for outstanding project quality. Carbon credits are sold for $20.

Project type

The type of carbon project is the largest driver of the price of carbon credits. Generally, projects that focus on avoiding carbon emissions, such as energy efficiency or fuel switching, tend to have lower prices than those that remove carbon from the atmosphere, such as reforestation or land-use projects. Within avoidance projects, nature-based project credits have historically been sold at higher prices than tech-based project credits, e.g., forestry and land-use projects' carbon credits were sold for between $6 and $24 per credit whereas waste management projects' carbon credits were sold for between $4 and $12 in 2021 (see section 1.3 for more information). Within removal projects, tech-based project credits have historically been sold at higher prices than nature-based project credits. Enterprises that develop carbon credits need to understand carbon pricing and trends for credits from their project type at the project conceptualization stage to determine the financial feasibility of the project.

Vintage

Vintage, the year an emission reduction occurred or offset credit was issued, can also influence the price of carbon credits in the voluntary carbon market. Generally, the older the vintage, the cheaper the price per credit. Enterprises that develop carbon credits may consider differentiating between the asking prices of their credits, depending on their vintages.

Macro-level drivers

The prices of carbon credits in the voluntary carbon market are also influenced by a range of macro-level drivers that are beyond the control of individual enterprises that develop carbon credits. Enterprises that are considering a carbon project should evaluate these macro-level drivers, such as market perceptions, preferences, and regulations, before developing a project.

Perceptions of the expected supply and demand for carbon credits

Perceptions of the carbon market play a critical role in driving demand for carbon credits (Figure 13). Positive perceptions can increase demand, while criticisms of certifiers and carbon projects can lower demand for carbon credits. In some cases, emerging perceptions from the market may affect the long-term existence of certain project types, such as the perceived lack of additionality for some renewable energy projects.[36] In general, current market perceptions are positive, and a recent BCG survey suggests that the demand for carbon credits is expected to outgrow the supply by 2030.[37] The growth in demand, especially in the short run, is expected to be driven by corporations' use of credits to offset part of their commitments to reduce their carbon footprint (e.g., via net zero targets). Industry schemes, such as the use of offsets to comply with emission reduction targets from the aviation industry through CORSIA, are also expected to drive demand. Compliance markets may also contribute to increase in demand (e.g., the use of credits to comply with specific emissions trading schemes and carbon tax schemes).

FIGURE 13
Expected demand trends of carbon markets affecting Kenyan carbon credits

Several macro-trends pointing to affect demand	Confidence level
▲ New industry compliance schemes like CORSIA forcing enterprises in these industries to purchase offsets	■■■
▲ Societal and regulatory pressure on emission disclosures causing large corporates to act	■■■
▲ Progress on Article 6 allowing foreign countries to purchase Kenyan credits that count toward their NDCs	■■
▼ Reduced relative attractiveness of Kenyan credits given potential tax implications on Kenyan project developers	■■
▼ Further reductions in confidence on nature-based projects and methodologies, and public scrutiny on greenwashing deterring corporates to VCM credits	■■

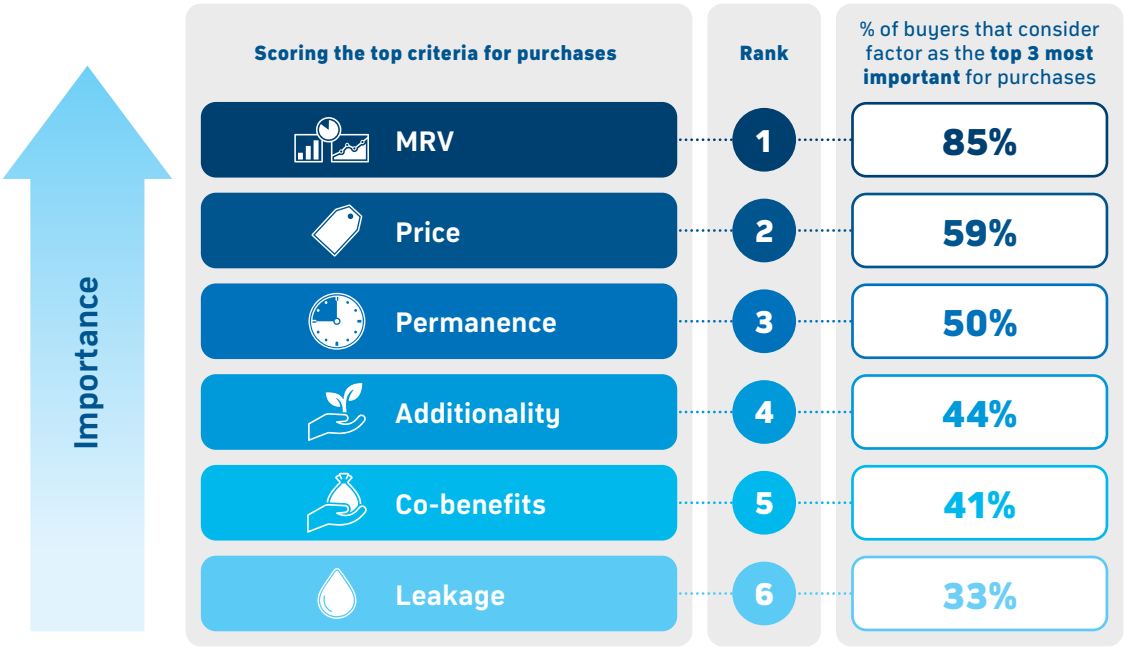
▲ Factors to increase demand ▼ Factors to decrease demand ■■■ High ■■ Medium ■ Low

36 S&P Global, 2022
37 BCG runs an annual survey to understand buyers' perspectives on key issues related to carbon markets (e.g., in relation to carbon credit types, portfolio strategy, or price expectations). The figures reflect some of the key findings from the 2022 survey, which included 200 participants across the globe.

Buyer preferences

Shifting carbon credit buyer preferences can also affect demand for carbon credits. Certain projects with high perceived integrity or impact can be in higher demand. For example, recently BCG-surveyed carbon credit buyers expected to grow removal carbon credits in their portfolios in the coming years, which will likely increase the price of removal credits. The survey also showed that MRV is the top consideration for carbon market buyers (Figure 14), which demonstrates the importance that many buyers place on the integrity of the carbon credit.

FIGURE 14
Decision criteria for buyers



Source: BCG 2022

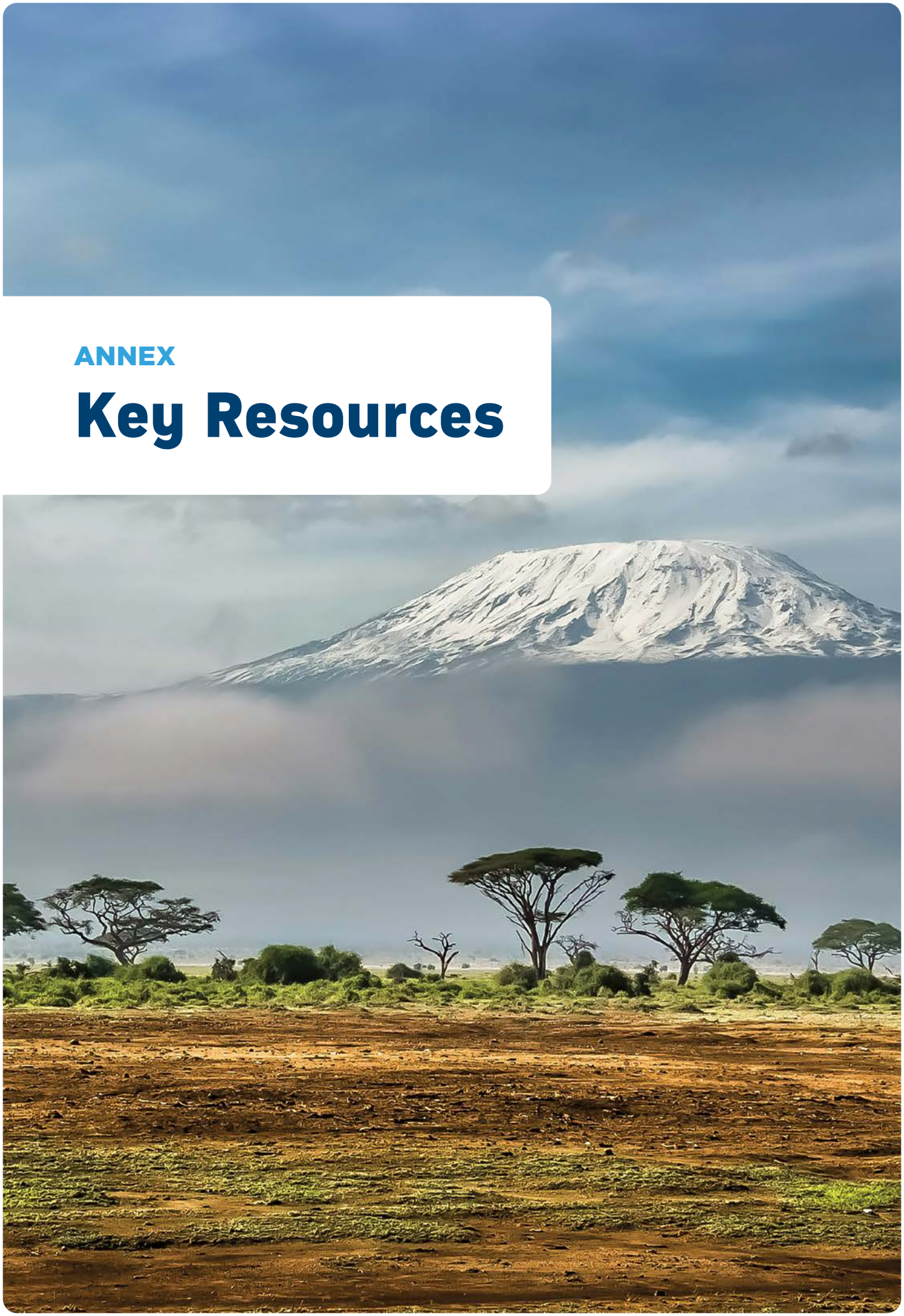
Carbon market trading and taxation regulations

Carbon market trading regulations can significantly affect demand for carbon credits. International compliance markets opening to foreign generated credits can increase demand for Kenyan carbon credits, while implementing a cap-and-trade system within Kenya or East Africa could grow local demand. Finally, tax treatment of revenue from carbon credits can affect the profitability of local carbon projects and therefore lower credit supply. For instance, the United States introduced a federal policy giving businesses a $35 to $50 tax credit per ton of CO_2 captured through DAC. This may increase the supply of businesses pursuing DAC projects and could lower the price over the long term.[38]

38 World Resource Institute, 2022

ANNEX

Key Resources



Annex: Key Resources

There are several resources available to support Kenyan enterprises at each stage of the carbon project life cycle in addition to those referenced throughout the guidebook. The list of resources in this annex is non-exhaustive, as new local and international initiatives are continuously emerging to support carbon market growth in Kenya and across the globe.

General

- **Carbon Asset Development Process:** The note builds on existing practices among different independent standards to streamline and harmonize process flows and ensure that country governments have greater clarity on the process for engaging in carbon markets.

- **A Guide to Developing Domestic Carbon Crediting Mechanisms:** This guide is intended to assist national and subnational policymakers considering whether and how to establish a carbon crediting mechanism in their jurisdiction.

- **VCM Access Strategy Toolkit:** The toolkit was developed by VCMI to provide guidance for countries to engage in high-integrity voluntary carbon markets.

Project conceptualization and financing

- **County Climate Change Fund (CCCF):** Provides financing to Kenyan subnational governments and communities to support localized climate adaption and resilience building efforts. To date, eight Kenyan counties have operational CCCFs that have made over $3 million in investments.

- **Kenya Climate Innovation Center (KCIC):** Offers incubation, capacity building, and financing options to small and medium-sized enterprises (SMEs) that are developing innovations to address the challenges of climate change. To date, KCIC has incubated nearly 300 SMEs and mobilized $44 million in funding for climate change.

- **Kenya Climate Ventures (KCV):** Invests in companies with climate-smart business models focused on agribusiness, water, commercial forestry, renewable energy, and waste management. To date, KCV has invested over $4 million in 20 climate-smart enterprises in Kenya.

- **The Catalyst Fund:** Invests in early-stage startups improving the resilience of climate-vulnerable communities in emerging markets. The Catalyst Fund aims to invest $40 million through a pre-seed fund and accelerator.

- **Africa Forest Carbon Catalyst:** Provides access to financing, specialists, and external experts that can provide project incubation, technical, financial, or operational support. The Catalyst aims to support 20 projects with $10 million in philanthropic funding and $300 million in financing.

Project development and monitoring

- **VCS templates:** VCS provides regularly updated templates for project documents, including project descriptions, monitoring reports, verification reports, and other required documentation.

- **Gold Standard templates:** Gold Standard provides regularly updated templates for project documents, including preliminary project review, stakeholder consultation report, monitoring reports, and other required documentation.

Credit issuance and sales

- **Carbon project registries (Verra, Gold Standard):** Provide up-to-date information on new methodologies, updates to existing carbon credit standards, and other developments related to project monitoring, reporting, and verification and credit issuance.

Background information on carbon market developments

Various macro-level market stakeholders provide up-to-date information on trends in the carbon market and predictions on future developments:

- **African Carbon Markets Initiative (ACMI):** Roadmap Report

- **East Africa Alliance on Carbon Markets and Climate Finance:** Kenya Carbon Market Profile

- **World Bank Group resources:** State and Trends of Carbon Pricing, 2022 Report; Climate Warehouse

- **International Emissions Trading Association (IETA) reports:** The Evolving Voluntary Carbon Market, 2023 Update; Greenhouse Gas Market Report, 2022 Report

- **Ecosystem Marketplace State of the Voluntary Carbon Markets:** Q3 2022 Report

- **The Integrity Council for the Voluntary Carbon Market (IC-VCM):** Core Carbon Principles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