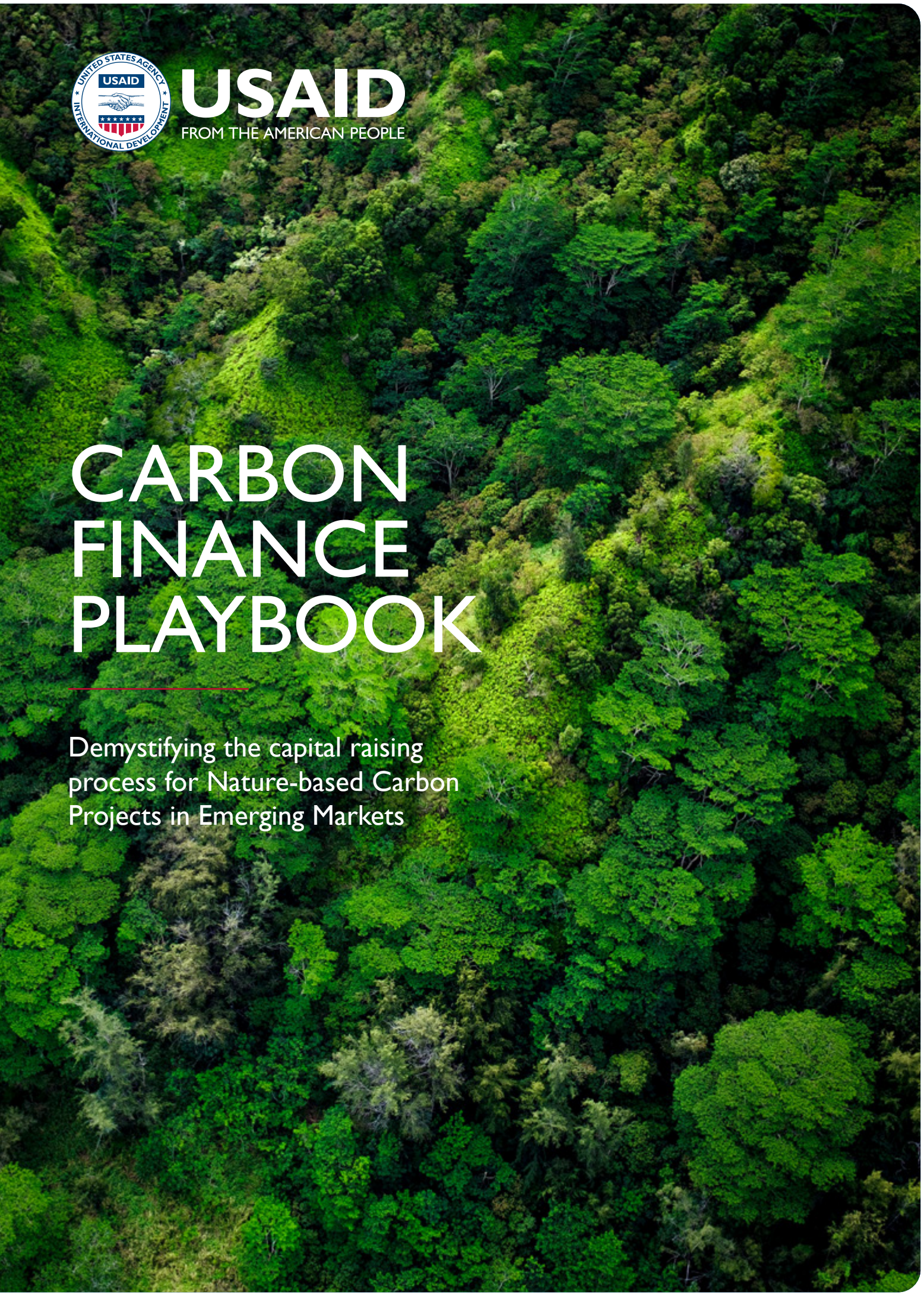

CARBON FINANCE PLAYBOOK

Demystifying the capital raising process for Nature-based Carbon Projects in Emerging Markets

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ACKNOWLEDGEMENTS

This Playbook was made possible by the support of the American People through the Mozambican mission of the United States Agency for International Development under the PLANETA program. The report was created by CrossBoundary LLC, the implementing partner for the PLANETA program.

The Carbon Finance Playbook aims to help address the lack of capital flowing to carbon projects in emerging markets by demystifying the investment process and reducing information asymmetries. It focuses on nature-based projects and projects that distribute emissions-reducing products that sell carbon credits in the voluntary carbon market (VCM). The Playbook builds on learnings from the USAID PLANETA program, a first-of-its-kind investment facilitation platform for carbon projects in Mozambique.

The Playbook was authored by members of CrossBoundary's Natural Capital team in the London and Nairobi offices including Kate Wharton, Marilia Martins, Christine Livet, Makari Krause, and Loujeine Boutar. All figures and charts without external sources were developed by this team and are a result of CrossBoundary analysis.

The drafting of the Playbook was supported by Eric Wilburn who provided valuable input and expertise with respect to community benefit sharing agreements.

The authors wish to thank the many individuals representing a wide array of stakeholders for contributing their time, expertise, and perspectives. Special thanks are extended to Moffatt Ngugi, João Fernando, David Lloyd, and Mike Casey.

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EXECUTIVE SUMMARY

Carbon markets are a mechanism through which climate finance can reach the world's poorest and most climate-vulnerable communities

There has arguably never been more capital available nor greater collective focus on climate finance, yet projects in emerging markets continue to face significant barriers to investment. The Carbon Finance Playbook aims to help address this disconnect by demystifying the investment process for carbon projects. It focuses on nature-based projects and emissions-reducing products such as cookstoves and solar irrigation pumps that sell carbon credits in the voluntary carbon market (VCM). The Playbook builds on learnings from the USAID PLANETA program, a first-of-its-kind investment facilitation platform for carbon projects in Mozambique, implemented by CrossBoundary.

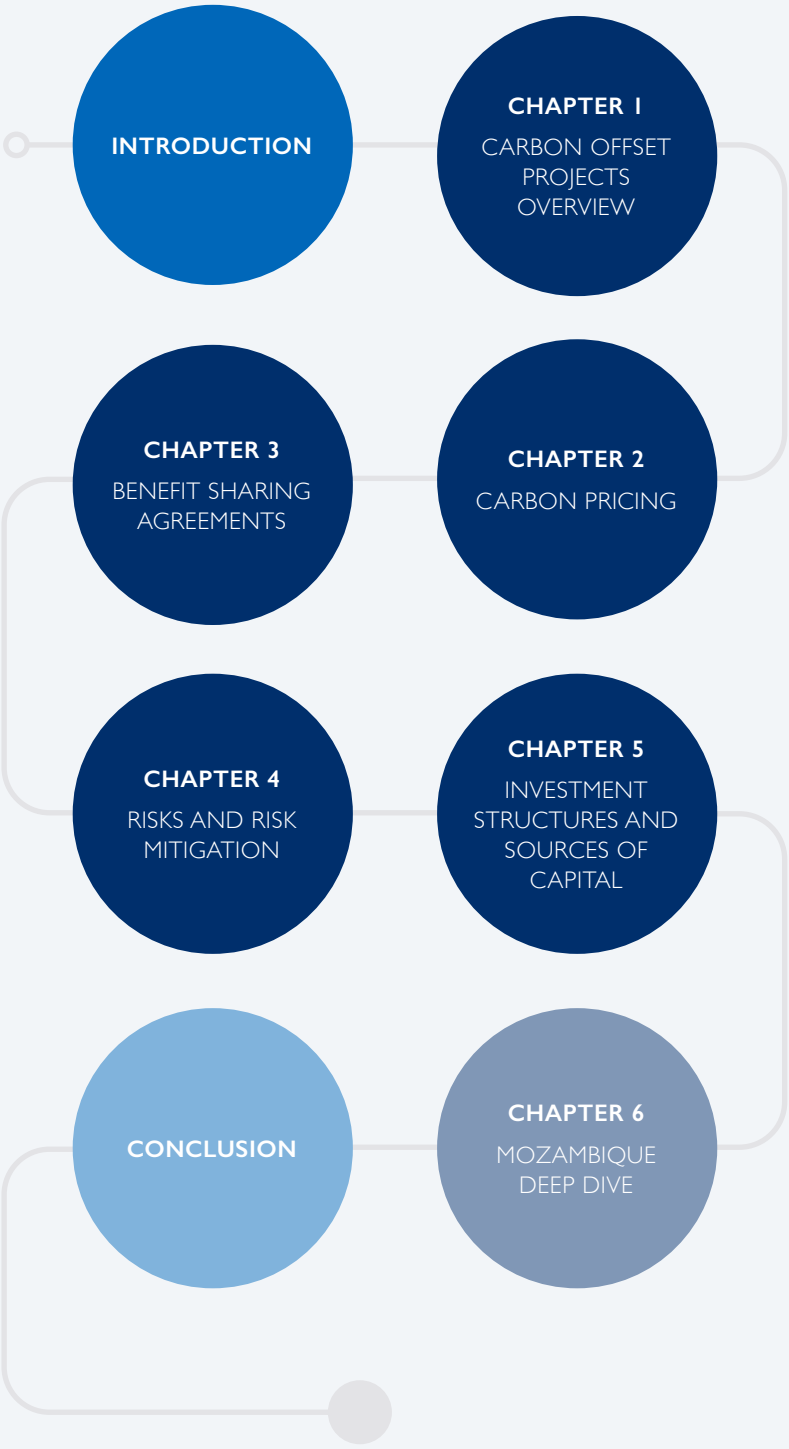


Image: © Makari Krause

CHAPTER 1
CARBON OFFSET PROJECTS OVERVIEW

Carbon offset projects create offsets either through emissions removal or avoidance, and within these categories, there are many different types of projects and methodologies through which a project can issue carbon credits. Regardless of project type, an important driver of a project's revenues and costs is its focus on carbon integrity and quality of co-benefits – and projects can go above and beyond the requirements of existing methodologies.

Selling carbon credits can be a stand-alone business model (referred to in the Playbook as "core-carbon"), or it can be one of several revenue streams available to the company ("non-core carbon"). Across these business models, the Playbook addresses three common nature-related project archetypes: capital-light activities for avoided emissions, capital-intensive activities for carbon removal, and use of credits to reduce price of emissions-reducing products.

CHAPTER 2
CARBON PRICING

While carbon credits are often thought of as a commodity, in practice, pricing varies greatly by project type, geography, co-benefits, vintage, and other characteristics – real or perceived. Spot prices today are wide-ranging, and there are mixed views on which future price projections are most realistic. Credits from certain regions and those that are perceived to be of higher quality continue to trade at a premium, even as 2023 has seen a decline in average prices. Today, selling into the voluntary carbon market is the most significant revenue opportunity for carbon projects in emerging markets, but compliance markets and Article 6 may provide new opportunities in the future.

Projects have a range of options for pre-selling credits, and a key question is price. Contracts for future delivery of credits can utilize fixed, variable, or cost-plus pricing. When pre-selling credits, there are trade-offs for the project between minimizing risk and maximizing potential return.

CHAPTER 3
BENEFIT SHARING AGREEMENTS

Benefit sharing agreements (BSAs) codify the financial relationship between local communities and the carbon project, and they are foundational for ensuring long-term durability of climate outcomes. Current standards and industry guidelines vary in their requirements for sharing and disclosure. However, there are a common set of guiding principles to ensure fair process and outcomes for indigenous persons and local communities (IPLCs) who are stakeholders in the project.

Designing the BSA is an iterative process through which the project developer, investors, and community members determine the total project value and allocate that value across stakeholders. BSAs must balance risk and return for communities. They should incorporate predictable payments to communities including in the years before the project is generating revenue, and they should also incorporate variable payments based on achievement of project outcomes – that is, the generation and sale of carbon credits. Additional decisions must be made around the distribution of benefits in practice, including who benefits, what form benefits take, how benefits will reach individuals, and how decisions are made on an ongoing basis. There are emerging approaches that center IPLCs as partners and owners in the project.

CHAPTER 4
RISKS AND RISK MITIGATION

A project's risk profile informs cost and availability of capital, as lower risk projects will receive better financing terms and may have a larger pool of potential investors. Risks may be alleviated through a variety of approaches and tools, but critically, both real and perceived risks matter. Indeed, perceived risks can be especially problematic in emerging and frontier markets, where there are fewer precedent deals and investors may have less on-the-ground experience and relationships.

Insurance is an important risk mitigation tool for large-scale projects in most industries, yet it is underutilized for carbon projects today. In addition to traditional insurance products such as political risk insurance and physical risk insurance, carbon project developers, investors, and buyers can access an emerging set of products designed specifically for carbon.

CHAPTER 5
INVESTMENT STRUCTURES AND SOURCES OF CAPITAL

Carbon finance from strategic investors is the most common form of financing for companies for which carbon is the core revenue stream (or "core-carbon" projects). Project-level commercial finance can play a significant role in scaling carbon projects, but it remains limited. Both core-carbon companies and companies where carbon is one of many revenue streams ("non-core" carbon projects) often rely on the developer's balance sheet as a source of capital in the early stages. Grants and concessional capital can play a key role in the early stages of carbon project development, particularly when it comes to de-risking, supporting innovation, and enhancing community impact. Non-core carbon companies have greater access to commercial capital from financial investors. Over the last two years, there have been several new and promising commercial investments into carbon projects and developers in emerging markets.

CHAPTER 6
MOZAMBIQUE DEEP DIVE

Mozambique is home to a bourgeoning ecosystem of carbon projects. As of October 2023, there were 60 Mozambican projects registered with Verra and Gold Standard – primarily cookstoves (29) and water and sanitation projects (27) – and an additional 31 forest-based projects in the Mozambican project registry. While Mozambique has an abundance of natural resources and clear patterns of ecological degradation, challenges include low levels of economic development outside of the capital city, vulnerability to extreme weather events, complexities of land tenure and carbon rights, and ambiguity around the government's position on Corresponding Adjustments. However, regulatory development is on the right path: beginning in late 2023, the African Carbon Markets Initiative (ACMI) will support the Government of Mozambique to develop a Carbon Market Activation Plan that seeks to bring clarity to Mozambique's position and regulatory framework for supporting and fostering both VCM and Article 6 carbon markets. This builds on the 2018 REDD+ Decree, which governs carbon credit development in the country today.

INTRODUCTION

Carbon markets can help unlock new sources of private capital and create sustainable, commercial business models delivering real impact on the ground.

Carbon markets enable the pricing and trading of greenhouse gases, usually in the form of a carbon credit which represents the avoidance or removal of one metric ton of carbon dioxide or its equivalent. Carbon markets play an important role in supporting transition in hard-to-abate sectors and where emissions reductions remain costly. They are also one of the best tools we have for channeling climate finance to projects in emerging markets that not only support mitigation outcomes, but also help protect biodiversity and support host countries to meet ambitious social and economic development goals such as creating green jobs, electrifying rural households, and improving the health of women and children.

Image: © Makari Krause

Nature-based solutions receive only about two percent of climate finance today, yet they hold more than a third of the necessary mitigation outcomes to meet the ambitious targets of the Paris Agreement.[1,2] At their best, carbon markets can unlock private finance for projects that in the past were only able to be funded through public and philanthropic sources. Carbon markets help close these gaps by creating sustainable, commercial business models that could link trillions in international flows of private capital with local organizations and communities delivering real impact on the ground.

The Carbon Finance Playbook focuses on carbon projects in emerging markets, particularly in Sub-Saharan Africa, and it includes a deep dive on Mozambique. The Playbook focuses on nature-based projects with benefits for communities and biodiversity, rather than on renewable energy or technology-based carbon removal projects. However, many of the key messages will be broadly applicable.

The voluntary carbon market (VCM) is currently the most significant revenue opportunity for carbon projects in emerging markets.

"Carbon markets" are indeed plural. Broadly, there are three types of carbon markets: voluntary, compliance, and Article 6 of the Paris Agreement (Figure 1).

Figure 1. Types of carbon markets

Article 6 of the Paris Agreement

Article 6.2 and 6.4 are market-based mechanisms for the trade of carbon credits to meet countries' Nationally Determined Contributions – applying corresponding adjusting to avoid double-counting

First issuances expected in 2023

Voluntary Carbon Market (VCM)

Voluntary action by corporates who purchase carbon credits to offset a portion of emissions, in addition to other actions taken to reduce emissions

~US$2B annually

Compliance Carbon Markets (CCM)

Carbon taxes and emissions trading systems (ETS) established by regulators to put a price on carbon in a particular jurisdiction or industry – offsets may or may not be allowed

~US$100B annually

Carbon Finance Playbook focus

1 Global Landscape of Climate Finance 2019, Climate Policy Initiative, 2019. https://climatepolicyinitiative.org/publication/ global-climate-finance-2019/

2 Natural climate solutions. Proceedings of the National Academy of Sciences 114: 11645–11650, Griscom BW, et al., 2017. https://www.pnas.org/content/114/44/11645

While compliance markets are the largest type of carbon market at ~US$100B annually, they primarily exist in industrialized economies such Europe and California, and make limited use of carbon credits.[3] When they do allow participants to use carbon credits, there are strict eligibility criteria that restrict geography of origin and methodology, making compliance markets a very limited opportunity for emerging markets projects today (with the exception of countries with a domestic compliance market such as China).

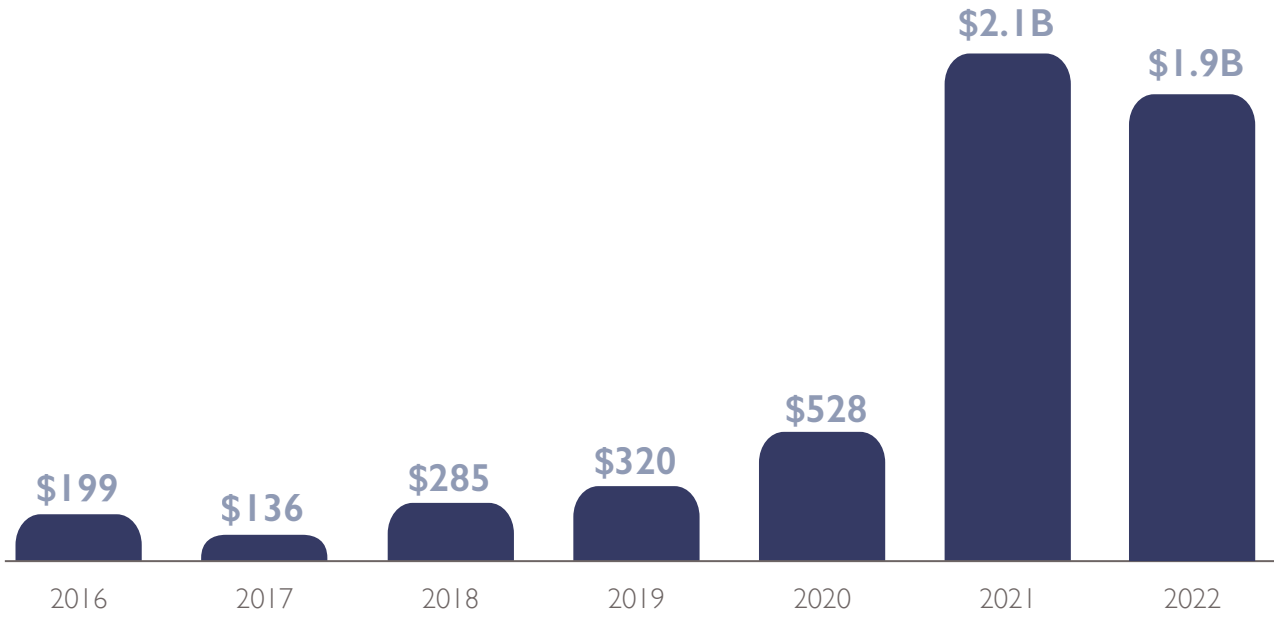
Article 6 of the Paris Agreement, which was agreed in 2021 at COP26 in Glasgow, includes two market-based mechanisms for the international trade of carbon credits to support countries in achieving their Nationally Determined Contributions (NDCs). Through Article 6.2, countries can trade bilaterally, and through 6.4 they will be able to trade through a centralized mechanism. Corresponding adjustments (CAs) are applied to these credits, called Internationally Traded Mitigation Outcomes (ITMOs), to ensure that the credit is only counted toward one country's NDC. Corporates can also purchase credits with a Corresponding Adjustment under Article 6, and these credits could be used in compliance schemes or could count toward the NDC of the country in which they are retired for either voluntary or compliance purposes. While Article 6 is an emerging opportunity for projects in emerging markets, it is conditional on the readiness and bilateral agreements of the host government, and the first credits under Article 6 are still pending as of October 2023.

Standing at just over US$2B annually today (Figure 2), the size of the voluntary carbon market is expected to grow rapidly in the coming decade, with conservative estimates ranging between US$10B and US$40B by 2050[4]. Voluntary markets, as the name implies, are based on voluntary action – primarily by corporates – to purchase carbon credits for the purpose of making either a claim or a contribution to global climate goals. Demand for carbon credits in the voluntary market is driven by the anticipation of future regulation in some jurisdictions, as well as by mounting pressure from consumers, employees, and the public for corporates to make and meet ambitious science-based climate commitments. While the voluntary carbon market is far from perfect today, there is a maturing ecosystem of standard-setting organizations managing and improving methodologies, registries tracking the issuance and sale of credits, intermediaries connecting supply and demand, technology companies offering state-of-the-art monitoring and verification services, and industry associations setting guidelines around the integrity of carbon credits being sold and the claims that can be made by buyers.

3 State and Trends of Carbon Pricing 2023, World Bank, 2023. https://openknowledge.worldbank.org/items/58f2a409-9bb7-4ee6-899d-be47835c838f

4 The Voluntary Carbon Market: 2022 Insights and Trends, Shell and Boston Consulting Group, 2022. https://www.shell.com/shellenergy/othersolutions/carbonmarketreports.html#vanity-aHR0cHM6Ly93d3cuc2hlbGwuY29tL2NhcmJvbmlhcmtldHJlcG9ydHMuaHRtbA

Figure 2. Voluntary carbon market size by value of traded credits (US$ million)[5]



The VCM is far from perfect, and critique of high-profile carbon projects in the media paired with legal action against buyers have put the conversation around integrity front and center.

This growth is not without its challenges. High-profile carbon projects such as South Pole's Kariba REDD+ project in Zimbabwe have come under public scrutiny for lack of transparency and integrity regarding the number of credits issued and delivery of benefits to local communities. At the same time, some buyers have faced backlash, and even legal action in the case of Delta Air Lines, which faces a lawsuit in California over its carbon neutrality claim. The impact of these headlines is already evident as buyers delay action or engage in "greenhushing" – not speaking about climate action that *is* taken – while waiting for clearer industry guidance on these topics. Now more than ever, projects must demonstrate strong integrity across the board and alignment with emerging industry guidance such as the Integrity Council on Voluntary Carbon Markets (ICVCM)'s Core Carbon Principles (CCPs) to sustain demand and boost prices. Likewise, investors must take integrity seriously as a means of reducing project risk. The good news is that this centering of integrity should result in stronger confidence in carbon and non-carbon outcomes including for local communities.

5 Paying for Quality: State of the Voluntary Carbon Markets 2023, Ecosystem Marketplace, 2023. https://www.ecosystemmarketplace.com/publications/state-of-the-voluntary-carbon-market-report-2023/

There has arguably never been more capital available nor greater collective focus on climate finance, yet projects in emerging markets face significant barriers to investment.

Despite the enormous potential of emerging markets carbon projects to generate mitigation outcomes with global impact, they face many of the same investment challenges as other projects in underserved markets, in addition to some challenges that are unique to carbon. Common barriers to investment include country-level risks such as political violence, foreign exchange risk, and expropriation; under-development of hard and soft infrastructure; high transaction costs for investors unfamiliar with the local context; lack of precedent transactions; lack of trust between capital seekers and capital providers; and information asymmetry resulting in adverse selection risk. Barriers to investment unique to carbon projects include wider market uncertainty around the future price of carbon and potential regulatory change, lack of standard investment structures and terms, lack of understanding of carbon markets from many potential financial investors, and concerns about reputational risk.

Due to high real and perceived risks, most potential investors are unwilling to fund early-stage projects, leaving developers in a difficult Catch-22: investors require significant de-risking before being willing to commit capital, yet the developer requires capital to de-risk the project. In this early stage of carbon market development, there is a very important role for catalytic capital, discussed at length in Chapter 5.

The Carbon Finance Playbook aims to demystify the investment process for carbon projects in emerging markets

Chapter 1: Carbon Projects Overview begins with an overview of carbon project types and cashflow profiles that affect a project's capital raising strategy.

Chapter 2: Carbon Pricing discusses current and future carbon prices, and how projects can structure offtake agreements with investors and carbon credit buyers.

Chapter 3: Benefit Sharing Agreements provides an overview of best practices and guiding principles when designing community benefit sharing agreements (BSAs).

Chapter 4: Risks and Risk Mitigation discusses common risks faced by carbon projects and mitigation approaches including insurance products.

Chapter 5: Investment Structures and Sources of Capital provides an overview of capital sources and availability, investment instruments, and common deal terms.

The Playbook builds on learnings from the USAID PLANETA[6] program, which provides transaction advisory services to unlock carbon finance in Mozambique.

USAID/Mozambique launched PLANETA in May 2023 as a carbon-focused investment facilitation platform implemented by CrossBoundary. The program aims to facilitate carbon market access and investment for nature-based projects with strong environmental and livelihood impact.

Chapter 6: Mozambique Deep Dive provides an in-depth view of the Mozambican context for carbon project developers, including a discussion of opportunities, risks, and regulation. It serves not only as a resource for local project developers, but also as a case study for those looking to learn and draw comparisons across geographies.

6 *Plataforma de Ações Em Natureza Para Enfrentar As Transformações Ambientais*

CARBON OFFSET PROJECTS OVERVIEW

Understand common carbon project archetypes and how capital raising will be different for each

Carbon projects are complex and can vary significantly in the activities implemented depending on size, geography, methodology, and other factors. This means that not all carbon projects raise capital in the same way. This chapter first provides an overview of carbon project types and criteria for integrity and quality (1.1). It then summarizes the project development lifecycle, considering key activities that will shape a project's timelines, revenues, costs, and cashflows (1.2). Finally, it discusses three common project archetypes: capital-light activities for avoided emissions, capital-intensive activities for carbon removal, and the use of carbon credits to reduce price of emissions-reducing products (1.3).

1.1 Types of carbon projects

Carbon projects create offsets either through emissions removal or avoidance, and there are many different types of projects and many different methodologies through which a project can issue carbon credits.

Carbon removal occurs when projects take carbon out of the atmosphere using either biological or geological processes, and sequester it long-term in either biomass or rock. Carbon avoidance occurs when projects prevent the emissions of greenhouse gases that would have occurred under a business-as-usual scenario. While this Playbook is applicable to most methodologies, it is written primarily in the context of ecosystem restoration and protection projects, and secondarily, nature-related avoided emissions projects like cookstoves and solar water pumps. Examples of these project types are found in Figure 3.

Figure 3. Types of nature-related carbon projects (* denotes focus project types for this Playbook)

Example project types		Description
Emissions removal		
	Afforestation, Reforestation and Revegetation (ARR)*	Restoration of terrestrial forest ecosystems
	Enhanced rock weathering (ERW)	Spreading rock dust as a form of permanent carbon removal and as a lime replacement, enhancing soil quality
	Woody biomass burial	Growing and burying biomass for permanent storage via restoring and managing degraded land
	Biochar	Avoiding emissions from biomass burning and permanently storing carbon
	Blue carbon*	Protecting or restoring coastal and marine ecosystems including mangroves, seagrass meadows, and tidal marshes
	Net farm emissions reductions (including soil carbon)	Basket of activities that can reduce net farm emissions (e.g. no till, reduced fertilizer use)
Emissions avoidance		
	Improved Forest Management (IFM)	Avoiding emissions or enhancing sequestration in commercial forestry
	Reducing Emissions from Deforestation and Forest Degradation (REDD+)*	Forest protection by enhancing enforcement capacity and/or incentivizing land steward behavior
	Improved cookstoves*	Distribution and use of more efficient and/or alternative cookstoves, potentially with different fuels (e.g., ethanol, LPG)
	Water filters	Distribution and use of water filtration systems to avoid use of firewood or charcoal for boiling water
	Solar irrigation*	Use of solar irrigation system to avoid emissions from use of diesel pumps

Regardless of project type, an important driver of a project's revenues and costs is its focus on carbon integrity and quality of co-benefits.

The overall success of carbon markets as a financing tool for ecosystem restoration and protection hinges on the next generation of carbon projects delivering high-integrity and high-quality outcomes that can withstand scrutiny. Integrity is defined in this Playbook as the project's commitment to providing well-evidenced carbon impact data, and quality is defined as the well-evidenced additional benefits beyond carbon. Generally, projects with higher integrity and quality spend more to achieve those results – for example investing in more robust monitoring, reporting, and verification (MRV) systems, planting a variety of native species, and sharing a larger portion of the project's economics with local communities. They also typically receive higher prices if able to demonstrate integrity and quality.

There are six main components to every carbon project that are indicators of integrity and quality:

Additionality: Mitigation achieved by a project must be additional to what would have happened if the project, and its financially supportive credits, had not been realized

Non-leakage: Project activities must reduce or remove emissions on a global scale rather than merely shifting emissions from within the project area to outside of the project area

Permanence: The project must ensure that its carbon avoidance or sequestration outcomes endure for the long-term, which for nature-based projects means planning beyond the project life

Conservative baselining: In emissions avoidance projects where carbon credits are generated based on the difference between a baseline and the actual outcome, baselines should be conservative and grounded in reality

Co-benefits: Where applicable, high quality projects should generate co-benefits for Indigenous Peoples and Local Communities (IPLCs), biodiversity, water, soil quality, and more

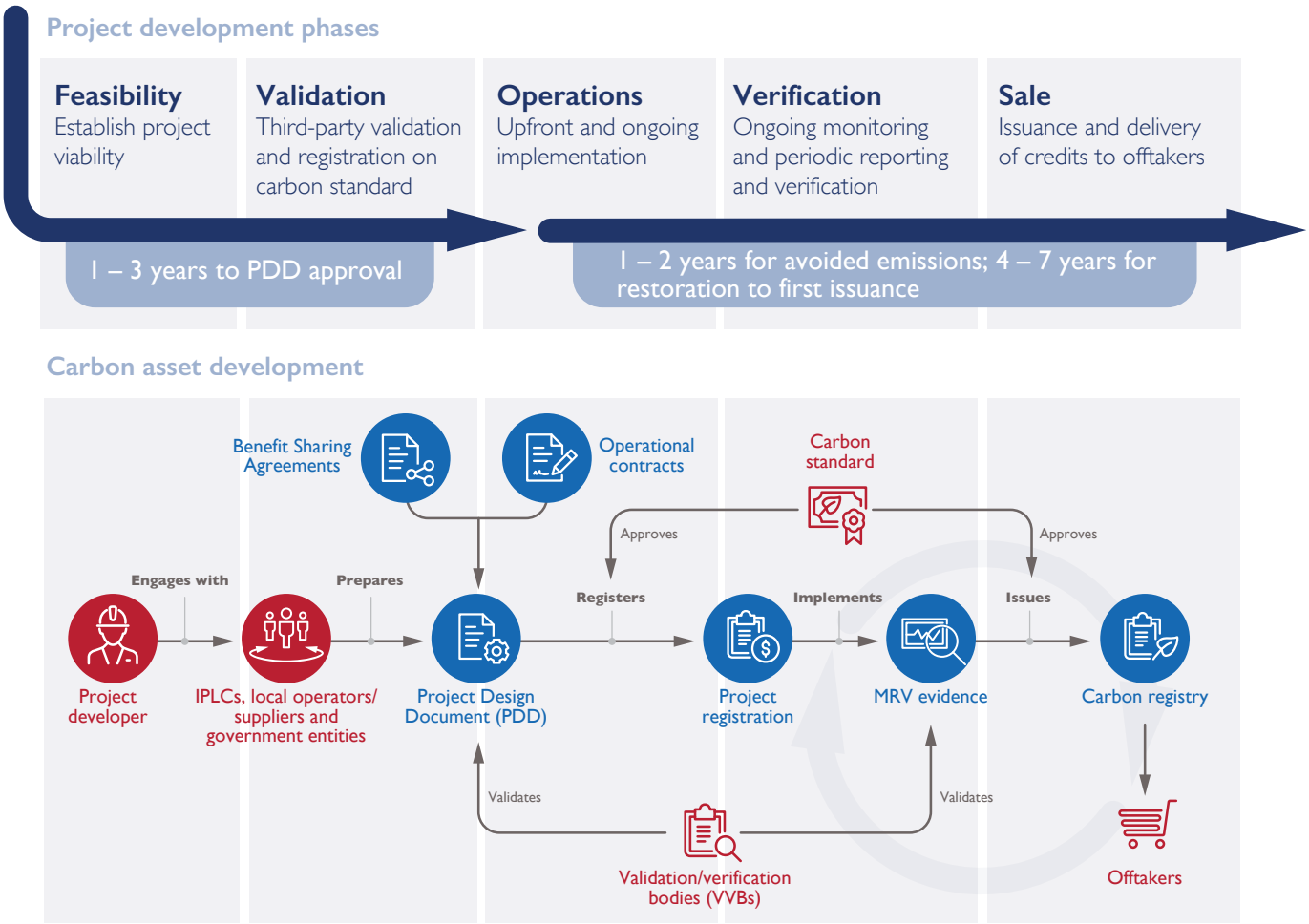
Monitoring, reporting, and verification: The project's MRV should provide rigorous, well-evidenced assessment of outcomes through frequent, accurate, and transparent data collection

1.2 Project development process

The project development process is dependent on the complexity of the project, especially if there are many different stakeholders within the project area.

Regardless of type, like any large-scale infrastructure project, a nature-based carbon project is governed by a set of contracts between diverse stakeholders who each perform activities to collectively restore or protect the project area. Ensuring that the right stakeholders have been engaged; contracts are clear, equitable, and fairly negotiated; and financial incentives are aligned is critical to the success of the project over the long-term. As a rule of thumb, projects that work with IPLCs and local governments will require more thoughtful engagement and time to negotiate contracts than projects that work with a single stakeholder, such as a private landowner. Figure 4 below outlines key steps for carbon project development.

Figure 4. Key activities throughout carbon project development[7]



7 VCM Guidebook and CrossBoundary analysis

Projects can go above and beyond existing methodologies to demonstrate high integrity and quality.

Carbon standards bodies develop and manage methodologies for credit issuance and centralize data related to project validation and verification. Methodologies are continuously reviewed and updated through a process that involves scientific review and public consultation, and projects are also subject to a public consultation period prior to validation. Registries are typically linked to standards and have the responsibility to report and track ownership, trade, and retirement of carbon credits. There are also meta-registries and initiatives such as CAD Trust which seek to harmonize and link registries. Validation/verification bodies (VVBs) conduct third party validation and verification of carbon projects.

Many buyers will only source credits from projects validated under ICROA-approved standards (see table 1). ICROA, the International Carbon Reduction Offset Alliance, is an industry trade group that endorses carbon standards and provides accreditation for organizations offering carbon credits that comply with the ICROA Code of Best Practice.

Table 1. Select ICROA-endorsed independent standard setting bodies

Standard	Overview
VERRA	• Issued 1B+ credits and registered 2,000+ projects (as of 2023) • Non-profit founded in 2007 • Largest credit registry globally
Gold Standard®	• Issued 266M+ credits and certified 1,600+ projects (as of 2023) • Non-profit founded in 2003 • Majority of credits issued in renewable energy and community services activities in Asia
CERCARBONO Certified Carbon Standard	• Latest standard to be endorsed by ICROA (in October 2023), Cercarbono was founded in Colombia in 2016 • Issued 78.4M+ credits with 173 projects registered – most of which in Latin America

table continues next page…

Standard	Overview
ART Architecture for REDD+ Transactions	• Issued 33.5M+[8] credits from 1 registered project (estimated, 2022) • Non-profit founded in 2018 • Focus on new jurisdictional-level avoided deforestation approaches including High Forest, Low Deforestation (HFLD)
PLAN VIVO For nature, climate and communities	• Issued over 7M credits with 28 registered projects (as of 2023) • Non-profit founded in 2007 • Focus on smallholder farmer and community-driven approaches
puro • earth	• Issued over 400K credits to date (estimated, 2023) • For-profit founded in 2019 • Focus on engineered carbon removal approaches only

Despite these safeguards, validation and verification under common industry standards like Verra's Verified Carbon Standard or the Gold Standard is not necessarily sufficient for ensuring that a project is of adequate integrity or quality. Going above and beyond what is prescribed in a methodology, such as taking a more conservative approach to baselining or dictating a higher amount of revenue share to communities, can help differentiate exceptionally high-integrity projects.

There are several industry-level initiatives to set clearer guidelines on integrity for both sellers and buyers of credits. The Integrity Council for the Voluntary Carbon Markets (ICVCM) was launched in early 2021 with the goal of setting high-quality, transparent, and consistent meta-standards for the VCM. ICVCM has now launched its Core Carbon Principles (CCPs), which aim to become one of the clear markers of integrity. The CCPs span three categories: emissions impact, governance, and sustainable development. ICVCM will first have program-level assessments which ICVCM defines as "standard setting programs that register mitigation activities and issue carbon credits" (these include Verra and Gold Standard). There will then be project-specific assessments, where projects will be held to standards tailored to their methodologies. Standards that are already approved under CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation – the compliance market for the aviation industry) will be fast-tracked, as ICVCM's own integrity and assessment approach is similar.

8 This represents all credits issued under the ART-TREES Guyana jurisdictional REDD+ HFLD project.

1.3 Project cashflows and capital raising

Selling carbon credits can be a stand-alone business model (referred to in this Playbook as "core-carbon"), or it can be one of several revenue streams available to a company ("non-core carbon").

Project cashflows and capital raising strategies vary based on the centrality of carbon to the business model, as well as the carbon credit production curve, price, and costs. This Playbook addresses three common nature-related project archetypes, shown in Figure 5.

Figure 5. Nature-related carbon project archetypes covered by the Playbook

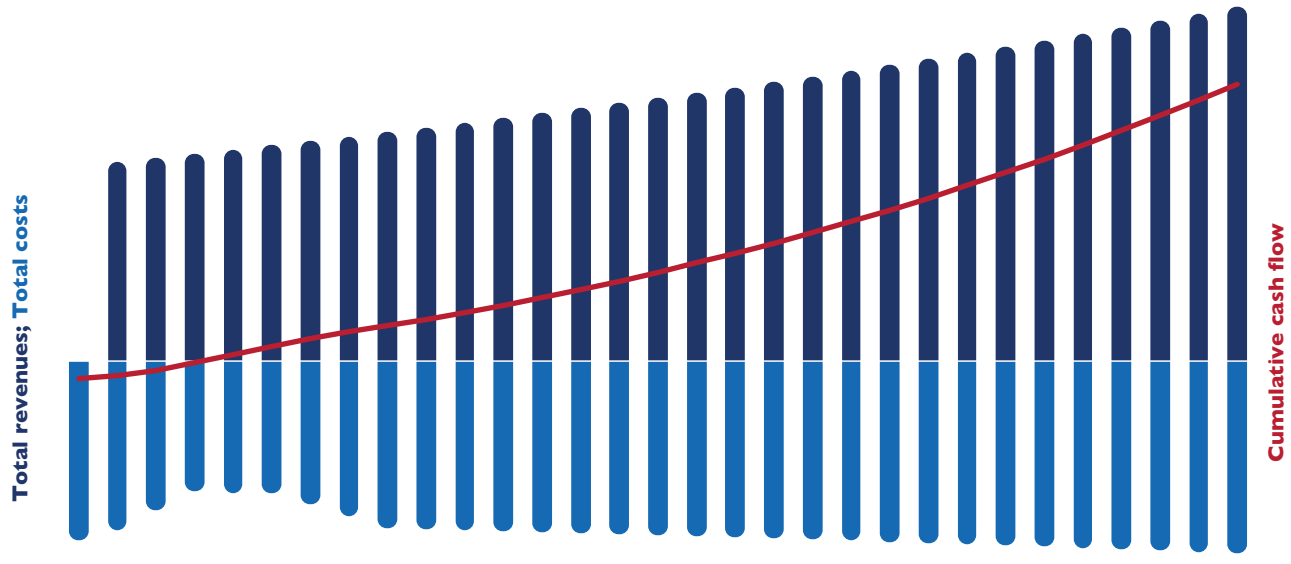
	Archetype 1 Capital-light activities for avoided emissions	**Archetype 2** Capital-intensive activities for carbon removal	**Archetype 3** Use of credits to reduce price of emissions-reducing products
Investment profile	Low upfront investment, relatively consistent revenue over time, and shorter time to break even	High upfront investment, revenue depends on biomass growth curve, and longer time to break even	Variable upfront investment and multiple revenue streams including carbon credits
Timeline	Typical 20-year project life, able to issue credits within 1-2 years of validation	Typical 20-30-year project life, only able to issue credits after years 4-5 based on speed of planting and biomass growth	Typical 10-year project life, able to begin issuing credits immediately after validation
Project types	Ecosystem protection projects such as avoidance of unplanned deforestation, including REDD+	Restoration projects in terrestrial and costal & marine ecosystems, including ARR	Avoided emissions projects including cookstoves, water filters, and solar irrigation systems

For simplification, the cashflow profiles below assume that credits are issued every year and that they are sold on issuance at the spot market price which increases gradually from today's prices. This will of course not be true for projects that pre-sell credits at a discount in exchange for upfront capital. We discuss the dynamics and trade-offs of pre-selling credits in Chapter 5.

Archetype 1: Capital-light activities for emissions avoidance

This archetype represents the most common type of nature-based carbon project based on total credit volume generated to date in the VCM: avoided deforestation or protection of natural ecosystems. Here, a project developer is working with local land stewards, which might be local communities or the government on either private land, community land, or public land in the form of concessions or national parks. Projects seek to address the root causes of deforestation or degradation, which may be from illegal or legal logging, or community-driven deforestation or degradation for agriculture, firewood, and charcoal.

Figure 6. Illustrative revenues, costs, and cumulative cash flow for Archetype 1



Cashflows

On the revenue side, carbon credits are generated based on the difference between the baseline deforestation rate and the effectiveness of the project to reduce the deforestation rate in the project area (also known as the effectiveness rate). The project will not necessarily eliminate deforestation immediately, but it should become more effective over time. At the same time, new threats such as population growth and changing government regulations may shift the project's carbon production curve either through the baseline or the effectiveness rate.

Changes that affect the baseline can be addressed by either "resetting" the baseline at a more frequent interval – say every two to five years – or using a dynamic baseline that does not attempt to predict future deforestation but rather looks at current deforestation in a closely matched control area. This allows the project to get a more accurate reading of how deforestation or degradation is happening over time and to generate credits based on the delta against these updated baselines. Standards bodies like Verra and Gold Standard are revising some methodologies to require projects to use more frequently updated baselines or dynamic baselining compared to the typical allowance of every ten years. These improvements should help to address the backlash around over-crediting stemming from baselines that were not updated even after host governments improved controls over deforestation. Using an appropriate baseline is critical to demonstrating ongoing additionality of the project. While in Figure 6, the revenue line is depicted as smooth, in practice there can be greater variance based on changes in carbon credit issuance and price.

Credits are typically first issued within one to two years of the project start. Projects that initiated activities prior to the project's registration may be able to issue credits immediately upon registration. Given the fixed costs of verification, credits are not typically issued every year, but rather every two years or even less frequently. If credits are not already pre-sold, the developer can also choose to wait and sell a steady stream of credits each year to smooth revenue or to hold credits until prices may rise in the future.

On the cost side, ecosystem protection projects have relatively low absolute upfront investment needs (usually around 10-20% of the total project costs), and the remainder of costs are typically evenly spread throughout the life of the project. The ongoing costs may increase over time, especially if the project developer is including community payments as part of operating expenses. Upfront costs include project design and validation costs, purchasing or leasing land where relevant (Figure 6 assumes land is leased), and activities such as training park rangers, building fences, and investing in monitoring infrastructure. Costs throughout the project life include providing incentive payments to communities or running community programs to reduce degradation, as well as more significant costs at certain periods, such those associated with verification and the re-digging of firebreaks. Costs may go up or down over time, depending on evolving threats to the project area.

As for cashflows, given that credit generation tends to be fairly consistent year-to-year rather than following a biomass growth curve, projects can break even more quickly – commonly between three to seven years depending on unit costs and price of credits. Pre-selling credits can improve this timeline to break even on a cash basis, but it requires a trade-off on price. As of October 2023, 2018-vintage REDD+ credits are priced around US$7/ton, but with a low of US$1.77 and high of US$17.91 across nearly two hundred projects – a range that reflects the perceived difference between projects, variability of unit costs, and importance of finding the right buyer.[9]

Investment needs

Capital raised for ecosystem protection projects typically comes in two phases:

- **Pre-PDD:** Project developers will need to raise anywhere between US$200K-1M to get through the PDD phase, of which the costliest activities are conducting the technical baselining and engaging local communities.[10] Costs vary depending on how much project development work can be done in-house versus via external consultants and service providers.
- **Post-PDD:** Given that upfront costs are modest (except if there is land acquisition) and payback relatively short, it is likely that a developer can secure the required financing in a single round.

Total costs can vary significantly, and factors include:

1. The size of the project,
2. Whether there are land purchasing or leasing costs, and
3. Terms of the community benefit sharing agreement.

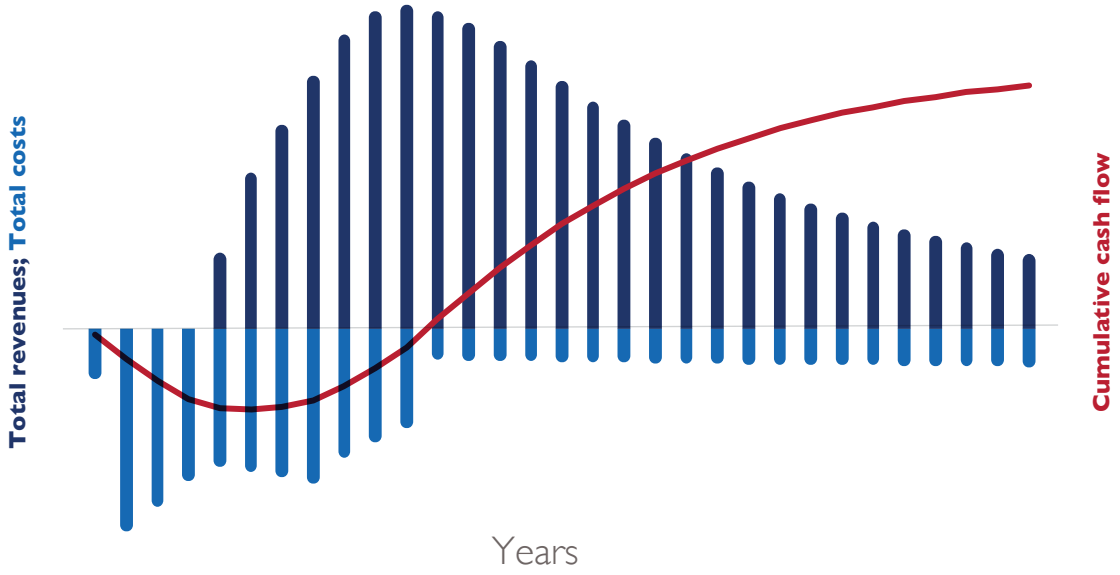
9 Viridios Weekly Voluntary Carbon Market Report Week 41 – 2023, Viridios AI, 6-13 October 2023.

10 Theoretically this cost should decrease as governments provide reference maps under the new Verra J-REDD methodology.

Archetype 2: Capital-intensive activities for carbon removal

Nature-based carbon removal projects restore terrestrial and coastal ecosystems, and they have the largest pipeline of credits today.[11] Here, a project is either restoring public, private, or community-owned land, and it is often providing employment to local communities doing the restoration work.

Figure 7. Illustrative revenues, costs, and cumulative cash flow for Archetype 2



Cashflows

On the revenue side, credits are generated as trees grow and sequester carbon, which tends to be at a higher rate during the forest's high-growth years (typically years 5-15) before decreasing and then plateauing as the forest reaches a steady state around years 30-40 (this is known as an "S-curve" of forest carbon generation).

11 Trove Research Webinar: 3Q23 VCM in Review – The Changing Landscape of the Global Carbon market, October 2023. https://www.youtube.com/watch?v=msd_duAgBEU

On the cost side, upfront costs are significant and typically spread over the first three to five years as teams reforest large swathes of land. Upfront costs can be 50-80% of total project costs and include buying or leasing land, sourcing seeds and setting up nurseries, training local communities on tree planting and monitoring, direct labor costs associated with planting, and scientific and technical expertise. In the final years of planting, costs should also account for survival rates of trees and any replanting required. Projects will also need to think about additional costs when it comes to community engagement and alternative livelihoods, such as investing in training and providing inputs for improved agricultural activities, as there will be less labor required after initial planting, and there is a need for long-term protection of the ecosystem that has been restored. In restoration projects, a higher portion of community benefits may come in the form of direct employment. Revenue sharing can also be an important element in later years, though restoration projects typically face the dual challenges of longer payback period and lower margin per credit compared to ecosystem protection projects. Ongoing MRV, community engagement, sales, and issuance costs may be 10-30% of total costs, spread through the remainder of the project post-planting.

As for cash flows, reforestation projects may become cash flow positive faster than traditional greenfield forestry projects as most credits are produced in the first half of the project before tapering off in the latter half. However, breakeven can take longer, around 8-15 years.

Investment needs

Capital raising for restoration projects may be done in multiple phases given the high upfront costs per hectare and phased planting approach typically used to reach scale:

- **Pre-PDD:** Capital will need to be raised during the project design phase, and the amount may be higher than the US$200K-1M for ecosystem protection if the project developer also wants to begin pilot operations. If the project is not on private land, significant time may also need to be spent engaging with communities, establishing land tenure, and identifying suppliers and other partners.

- **Pre-issuance:** The project developer will typically need to raise capital to implement the pilot phase, and this may or may not be enough to get the project to cash flow positive. Common capital requirements are between US$5-20M for project sizes up to 15K hectares.

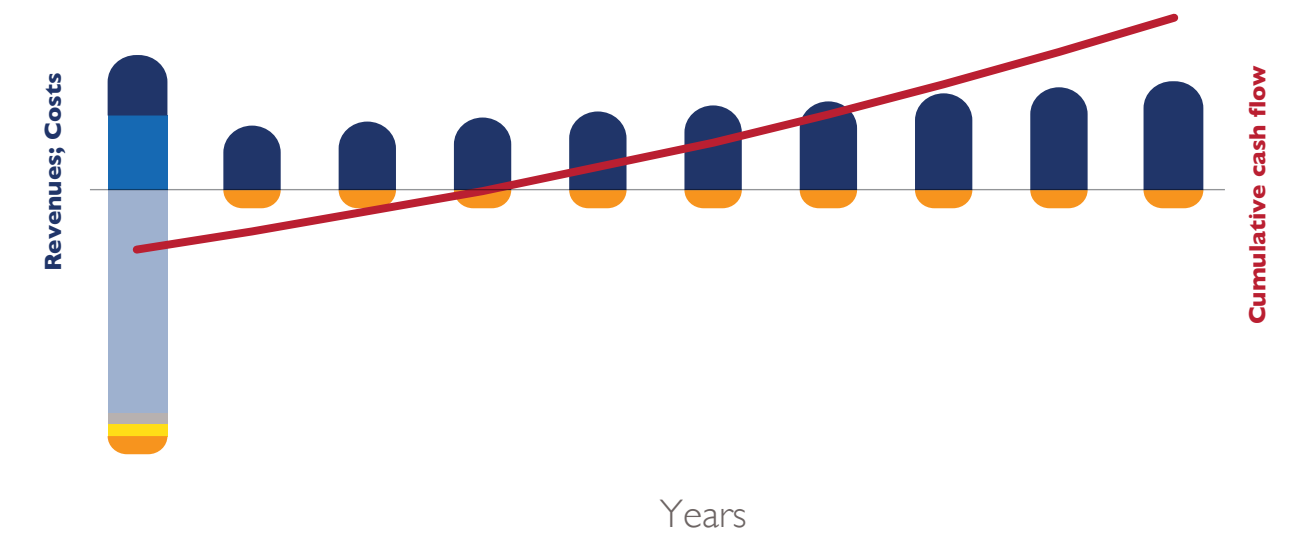
- **Scale-up:** Expansion of the project can be done either using revenues from the first phase, or through a subsequent capital raise for the new project area. By this stage, the project will be significantly more de-risked, and financing terms should be more favorable.

Archetype 3: Use of carbon credits reduce the price ofemissions-reducing products

The third archetype represents companies or projects that use carbon credits to reduce the price of emissions-reducing products such as cookstoves and water filters which can reduce or eliminate the use of firewood and charcoal, or solar-powered irrigation which can reduce or eliminate the use of diesel generators. Projects are typically 7-10 years long, in alignment with the useful life of the product itself. Use of carbon credits to reduce prices can be a more reliable, scalable, and long-term solution than relying on limited grant funding or public schemes. Many of these products also have significant impacts beyond carbon, including for climate adaptation, health, and economic development in rural communities.

Figure 8 is an illustrative depiction of revenues, costs, and cumulative cash flow per unit. In this case, the product is sold at a lower price upfront, and the company or project receives a stream of carbon credits based on the delta between the baseline emissions from the standard cooking methods fueled by firewood, charcoal, or diesel, and the new product fueled by ethanol, biomass briquettes, or solar.

Figure 8. Illustrative revenues, costs, and cumulative cash flow for Archetype 3, per unit

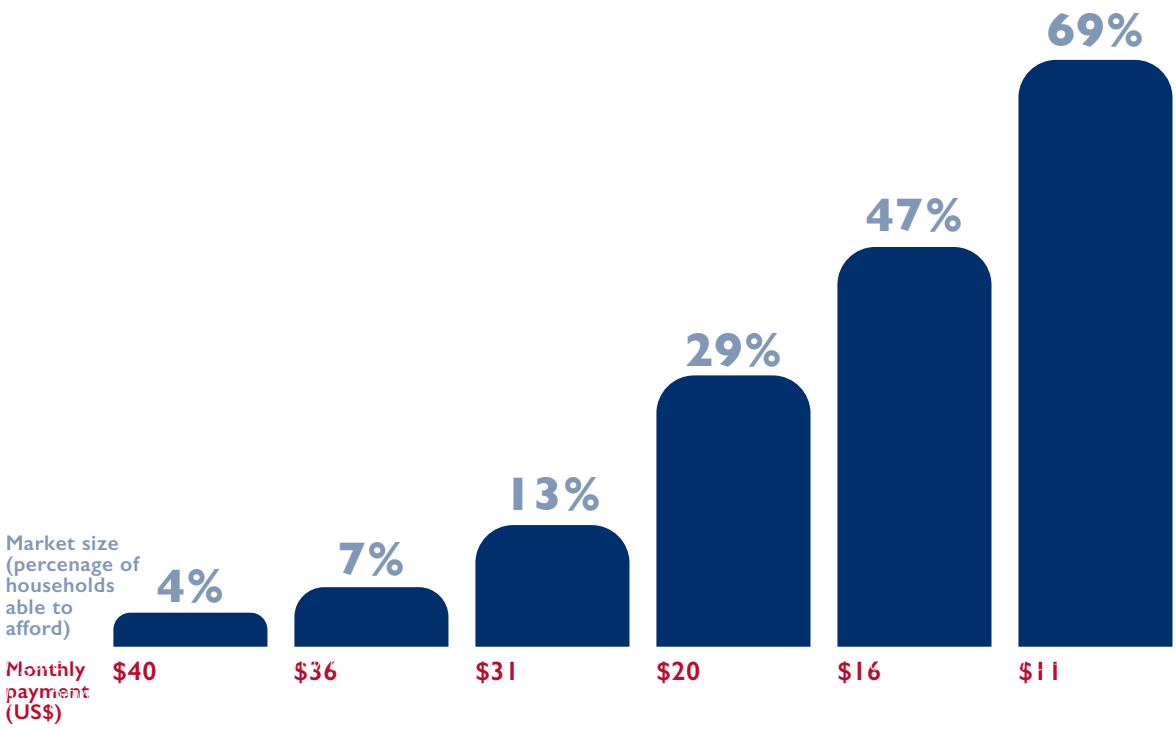


Cashflows

On the revenue side, there are generally carbon and non-carbon revenue streams, but these look different depending on the price of the product being sold and the degree of price reduction. Critically, reducing the price of the product can significantly expand the potential market size, and understanding this elasticity of demand is important for projecting revenue growth. This is especially important for more expensive products such as solar irrigation pumps for which price is a key constraint on market size.

Most projects under Archetype 3 are classified as avoided emissions projects with a price per ton of US$7-12, depending on vintage, methodology and project quality, with some projects achieving up to US$20/tCO2.

Figure 9. Growth of market size as monthly payment (US$) decreases for solar irrigation systems in Kenya, by % of households[12]



On the cost side, the core activities required to manufacture and distribute products are more or less the same regardless of the presence of the subsidy. However, if price reductions significantly increase sales volumes, the unit price may decrease due to economies of scale. In business models where a product is being actively marketed

12 SunCulture Annual Letter 2021, SunCulture, March 2022. https://sunculture.io/blog/2022/03/27/sunculture-annual-letter-2021/

Image: © Makari Krause

and sold commercially, there will be higher marketing and product development costs compared to an NGO-led project where distribution is free and households have already been selected to participate.

On benefit sharing, there is little available data on carbon revenue sharing with communities (or users) when credits are used for product price reductions. For lower-cost products like cookstoves, developers can generally recoup the cost of the product quickly and continue to generate per-stove carbon revenue after breakeven. This additional carbon revenue may be used to reduce the price of associated clean fuels for the same customers (if applicable), repay investors, or it can be re-invested into the company. Some cookstove projects choose to give this additional carbon revenue back to the user or communities – particularly if there is a scenario where a company must continue to incentivize the use of the product (for instance, if the price of alternative but more carbon-intensive fuels become cheaper, continued revenue sharing may be warranted).

For high-cost products like solar irrigation pumps or electric cookstoves, revenue from the carbon credit is more likely to be fully passed on to the customer as a price reduction of the product. For the company, the challenge becomes one of time and working capital – the reduction is given in year zero, and the company is repaid that reduction over the life of the product.

When the carbon credit is passed on as a price reduction to the customer, it is important that this is approach is clearly communicated and incorporated into sales contracts so that there is no misunderstanding about the ownership of the credit, or of the value received by the customer which is less visible than a cash payment.

As for cashflows, the use of carbon credits for companies already selling avoided emissions products will help move up the time to cash flow positive, as well as help reach a wider market as sale prices of these products decrease. Pre-selling credits can also help cover upfront costs, reducing the company's fundraising requirements or allowing it to access debt on more favorable terms.

SunCulture

Carbon credits used to reduce the price of solar irrigation systems

SunCulture is a climate technology company based in Nairobi, Kenya and serving several markets in Sub-Saharan Africa. It sells solar irrigation equipment to smallholder farmers using Pay-As-You-Grow credit. SunCulture has recently begun selling carbon credits to reduce the price of its product for customers. The reduction is fully passed on to the customer, which dramatically increases the addressable market for solar irrigation equipment in the region and increases sales velocity. SunCulture has also raised several Results-Based Financing facilities which can be paired with the carbon credit to mimic higher prices for carbon. In addition to reducing greenhouse gas emissions, SunCulture's products improve the climate resilience of smallholder farmers and increase food security in a region affected by drought and other near-term climate impacts.

Investment needs

Investment needs vary depending on the business model and product. Companies selling carbon-price reduced products will typically raise capital from a wide pool of traditional capital sources such as impact investors, local banks, and DFIs, and they can complement this with carbon finance including the pre-sale of credits. Critically, the use of carbon credits for reductions in price can create additional working capital needs as the reduction is an immediate outlay that is repaid to the company over time, and this must be taken into consideration in determining the funding needs.

2 CARBON PRICING

Understand the market price for carbon credits and how to negotiate future pricing for pre-purchase and offtake contracts

While carbon credits are often thought of as a commodity, pricing varies greatly by project type, region, co-benefits, vintage, and other characteristics – real or perceived.

Especially within the VCM, there is no established or easily referenced market price, and beliefs about the future of carbon markets are wide ranging. Each of these factors makes it difficult for projects to set appropriate assumptions around the price at which they will sell carbon credits, and to agree with buyers on pricing for credits that will be delivered in the future.

Carbon credits in the VCM can be sold in the primary market through over-the-counter (OTC) bilateral sales between a carbon project developer and a credit offtaker, or in the secondary market, which can also be OTC through a broker, retailer, or on an exhcnage. Almost all transactions in the VCM currently happen OTC rather than through an exchange.

Carbon credits can be sold in four ways: 1) on the spot market at prevailing market prices, 2) with an offtake contract for future payment on delivery, 3) with a pre-purchase agreement for a specified volume, and 4) through a streaming agreement that delivers a percent of all credits issued to the stream funder. The pricing considerations for each may vary due to a combination of timing, risk, terms, and capital outlay.

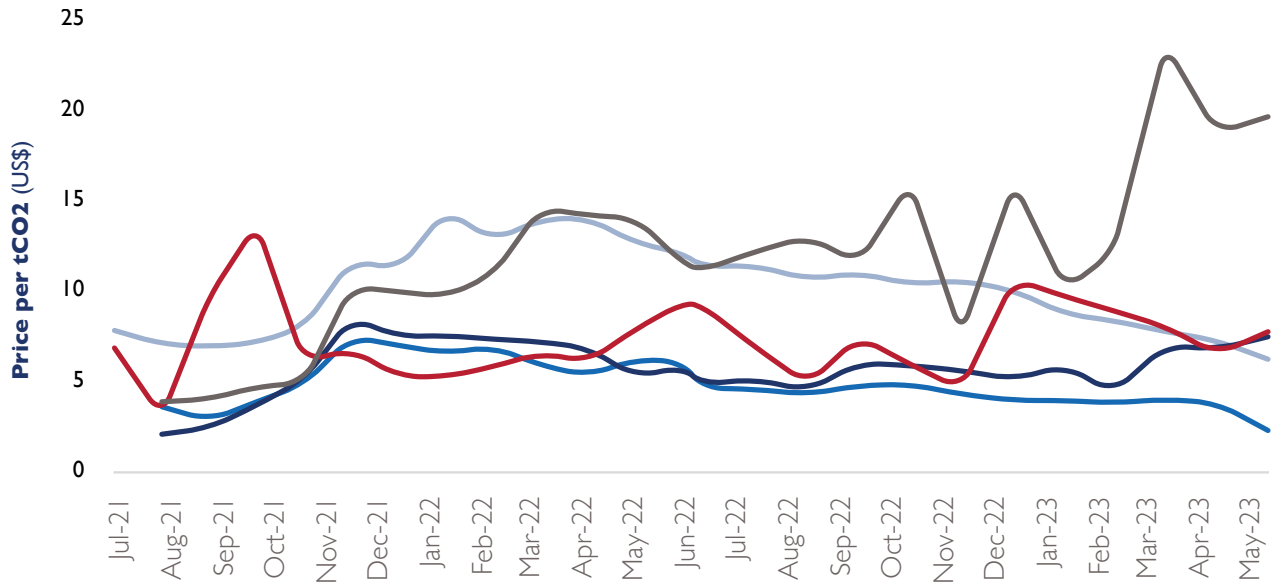
This chapter covers trends and drivers of carbon prices (2.1), and considerations for negotiating the future pricing for pre-purchase and offtake contracts (2.2). It also primarily focuses on pricing dynamics in the VCM, where nearly all emerging markets nature-based credits are sold, versus compliance markets.

2.1 Trends and drivers of carbon prices

Spot prices for carbon today have wide fluctuations, and there are mixed views on which future price projections are realistic.

Spot prices today have variances across carbon credit types, as seen in Figure 10, with nature-based carbon removal credits (e.g., ARR, blue carbon restoration, and some IFM) credits trading at a premium relative to nature-based avoided emissions credits. Throughout 2023 there has been a general decline in prices for other types of credits, which is primarily due to three factors. First, many of the credits that are currently being traded are from older vintages and are seen as lower integrity. Second, media scrutiny of projects has suppressed demand as buyers become more cautious and wait to see how the space develops before making new purchases. Third, the macroeconomic environment of the last year has seen the highest inflation in decades, putting pressure on non-essential corporate spending. This decline has occurred even as more corporates make net-zero commitments, which will help drive future demand for carbon credits.

Figure 10. Monthly weighted average Voluntary Emission Reduction (VER) price (US$/tCO2e)[13]



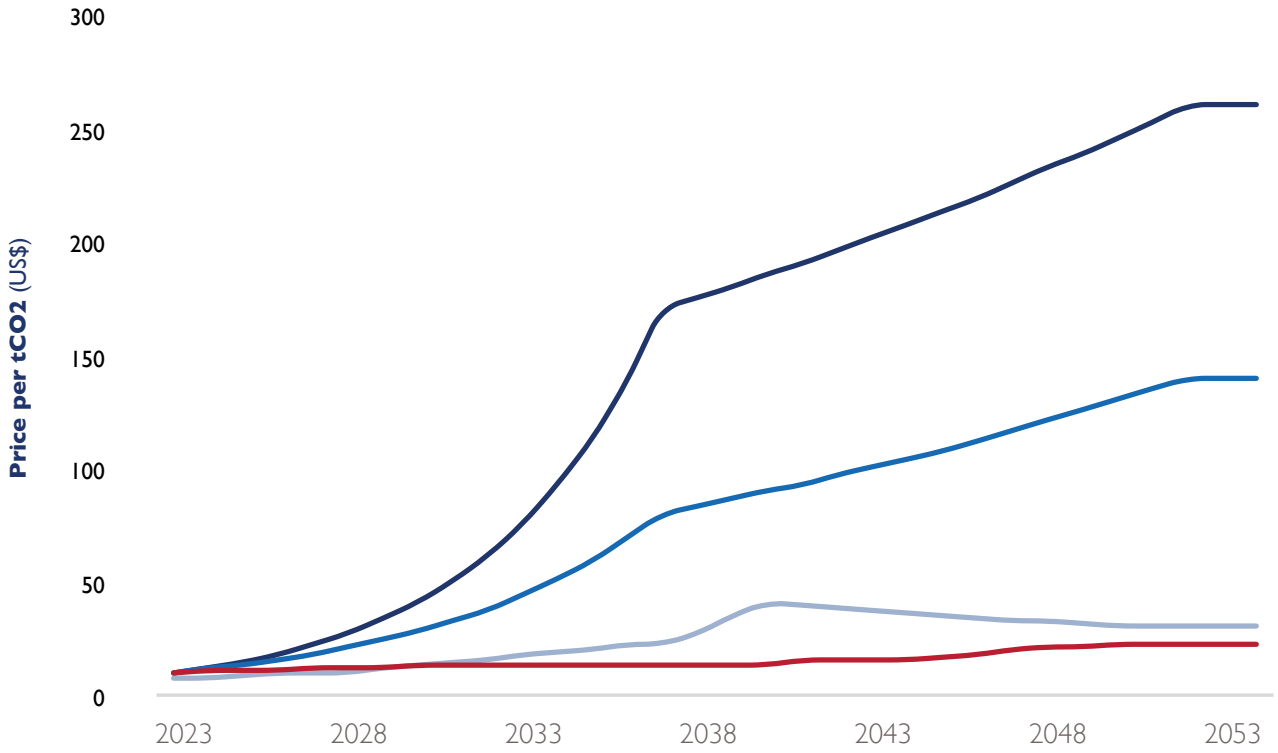
Several organizations produce future carbon pricing estimates, with organizations such as Trove, BloombergNEF (BNEF), and McKinsey & Company on the more conservative end (US$50-80/tCO2e by 2050), and the likes of EY and Credit Suisse on the more bullish end (US$150-200+/tCO2e by 2050). Trove's and BNEF's full 30-year pricing projections are commonly used and considered by some as more conservative, offering a defensible base-case scenario. However, any future price projection must be carefully tailored given the potentially wide price discrepancy based on individual project characteristics. These are reflected in Figure 11 (Trove's are non-public and therefore excluded).

These future pricing projections are based on a combination of current pricing and future demand and supply, based on different scenarios in government regulation and corporate action. For example, EY models across four scenarios assuming that higher unit supply costs, demand for quality, and scarcity of supply means high prices across all scenarios, but that if technology costs for engineered removals and avoided emissions fall more rapidly, prices could be at the lower end of their predicted range. For BNEF, they believe that if all credit types are allowed in future scenarios, prices will be on average US$18 per ton to 2050; if a removal-only market, this would increase to US$127 per ton. They also differentiate between a high and low quality bifurcation scenario, where prices would not exceed US$40 per ton, which they infer means potentially less investment into technology-based removals and impactful avoidance projects.

13 3Q23 Voluntary Carbon market in Review, Trove Research, October 2023. https://trove-research.com/en/report/3q23-vcm-in-review-the-changing-landscape-of-the-global-carbon-market

Figure 11. Comparison of future pricing projections from BNEF[14] and EY[15] scenarios (US$ per tCO2)

Legend: EY - Nature-enabled Net Zero; EY - Below 2°C scenario; BNEF Bifurcation scenario - High Quality; BNEF Bifurcation scenario - Low Quality



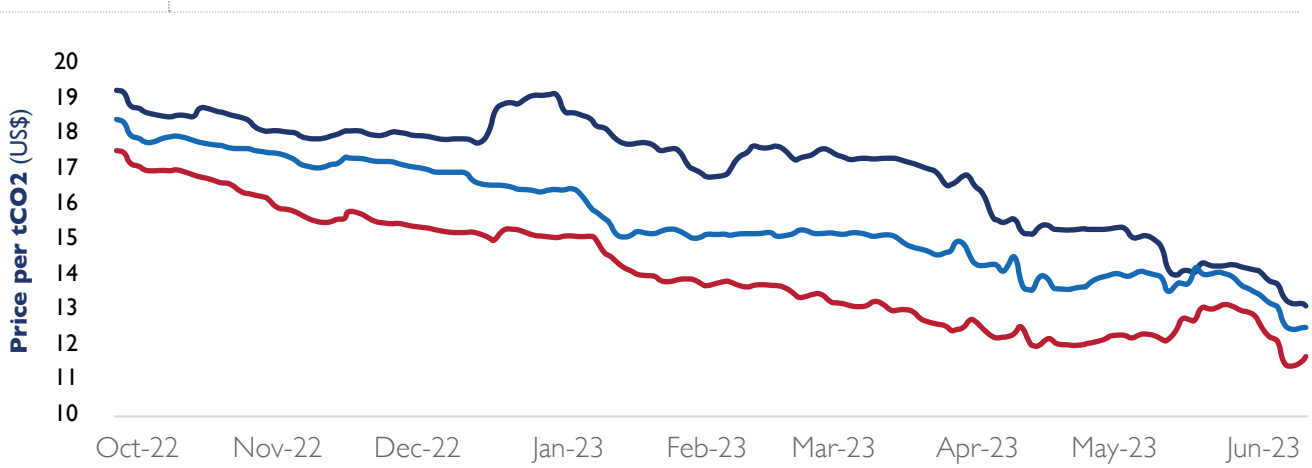
Credits from certain regions and those that are perceived to be of higher quality tend to trade at a premium, even as overall prices have declined in 2023.

Beyond the premium typically achieved by removal projects, there is emerging data from Viridios AI that shows credits from certain methodologies, vintages, and geographies also tend to achieve a price premium. On geography, ARR credits in Latin America tend to trade at higher prices than those from Sub-Saharan Africa or Asia, though prices may again be converging (Figure 12). Viridios reports that higher prices in Latin America are likely because there are more high-profile projects in the region, and also many large corporates such as mining companies wishing to source credits locally.

14 Long-term carbon offsets outlook 2023, BloombergNEF, July 2023. https://www.bloomberg.com/professional/blog/long-term-carbon-offsets-outlook-2023/

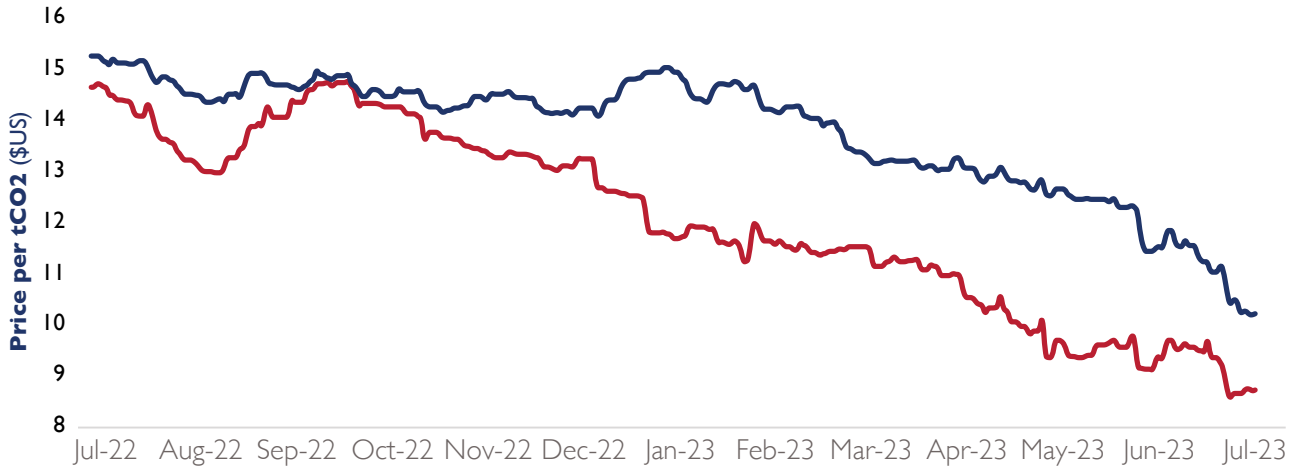
15 Essential, expensive and evolving: The outlook for carbon credits and offsets, EY, May 2022. https://assets.ey.com/content/dam/ey-sites/ey-com/en_au/topics/sustainability/ey-net-zero-centre-carbon-offset-publication-20220530.pdf

Figure 12. Variance of 2022-vintage ARR carbon pricing by geography[16]



On impact, Verra's CCB (Climate, Community and Biodiversity) verification or other indicators of co-benefits are often seen as markers for overall project quality and permanence. For example, projects with equitable and well-managed relationships with IPLCs will likely have fewer non-delivery and non-permanence risks. Co-benefits are also a selling point for buyers who are looking to tell a story that goes beyond carbon, and these buyers are willing to pay a premium for projects they can showcase publicly. Figure 13 shows differences in prices by high vs. low impact for REDD+ projects in Latin America.

Figure 13. Variance of carbon pricing for 2022-vintage REDD+ projects in Latin America based on high vs. low impact[17]



16 Analysis Reveals Carbon Price Drivers, Viridios AI, 2023. https://viridios.ai/insights/vai-analysis-reveals-carbon-price-drivers/

17 VAI Analysis Reveals Carbon Price Drivers, Viridios AI, 2023. Low impact is defined by Viridios as addressing 3 Sustainable Development Goals (SDGs) or less, and high impact is defined as addressing 4 SDGs or more.

There are also other available and emerging measures of quality that will likely drive future price premiums. These include Verra projects that meet CCB Gold standards and ICVCM's newly released Core Carbon Principles (CCPs). In September 2023, ICVCM opened applications for projects to apply for assessment against the CCPs. If approved, these projects will be able to tag their credits with an additional CCP certification. The addition of ICVCM as a third-party, independent standard setter is a positive development for the VCM and should serve to increase transparency in the market.

While compliance markets offer more durable demand, they are currently not a significant source of offtake for nature-based carbon projects in emerging markets.

Revenues from global compliance markets – including both emissions trading systems (ETS) and carbon taxes – was almost US$100B in 2022,[18] significantly larger than the size of voluntary markets (which reached US$2B in 2021).[19] Compliance markets offer another potential avenue for carbon project developers to sell their credits, often at a higher price. However, as of October 2023, these are not a viable channel for most carbon credits from emerging markets due to restrictions on geographic origin and type of projects that are eligible in compliance markets. As more emissions are covered under compliance markets, there should be greater demand and new avenues for sale of credits in select markets.

There are currently two main types of compliance markets – industry-specific and jurisdictional markets:

Industry-specific: In an industry-specific compliance market, a governing industry body implements a framework for its member organizations to reduce emissions. The most prominent example today is CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation), which is the aviation industry's scheme under which international commercial airlines are required to offset their emissions against a baseline of 85% of 2019's emissions from 2024 until the end of the scheme in 2035 - representing a more ambitious target than originally planned. CORSIA currently only applies to airlines in participating countries but starting in 2027 most countries will need to comply, enforced by ICAO (the International Civil Aviation Organization).[21]

Jurisdictional: There are currently 30 jurisdictions (cities, states, countries, regions, or other) that have active carbon taxes or ETSs. However, not all allow offsetting, and few accept carbon credits generated from projects outside the jurisdiction of the scheme. There are additional restrictions around acceptable project types and methodologies.

18 State and Trends of Carbon Pricing 2023, World Bank, May 2023. https://openknowledge.worldbank.org/entities/publication/58f2a409-9bb7-4ee6-899d-be47835c838f

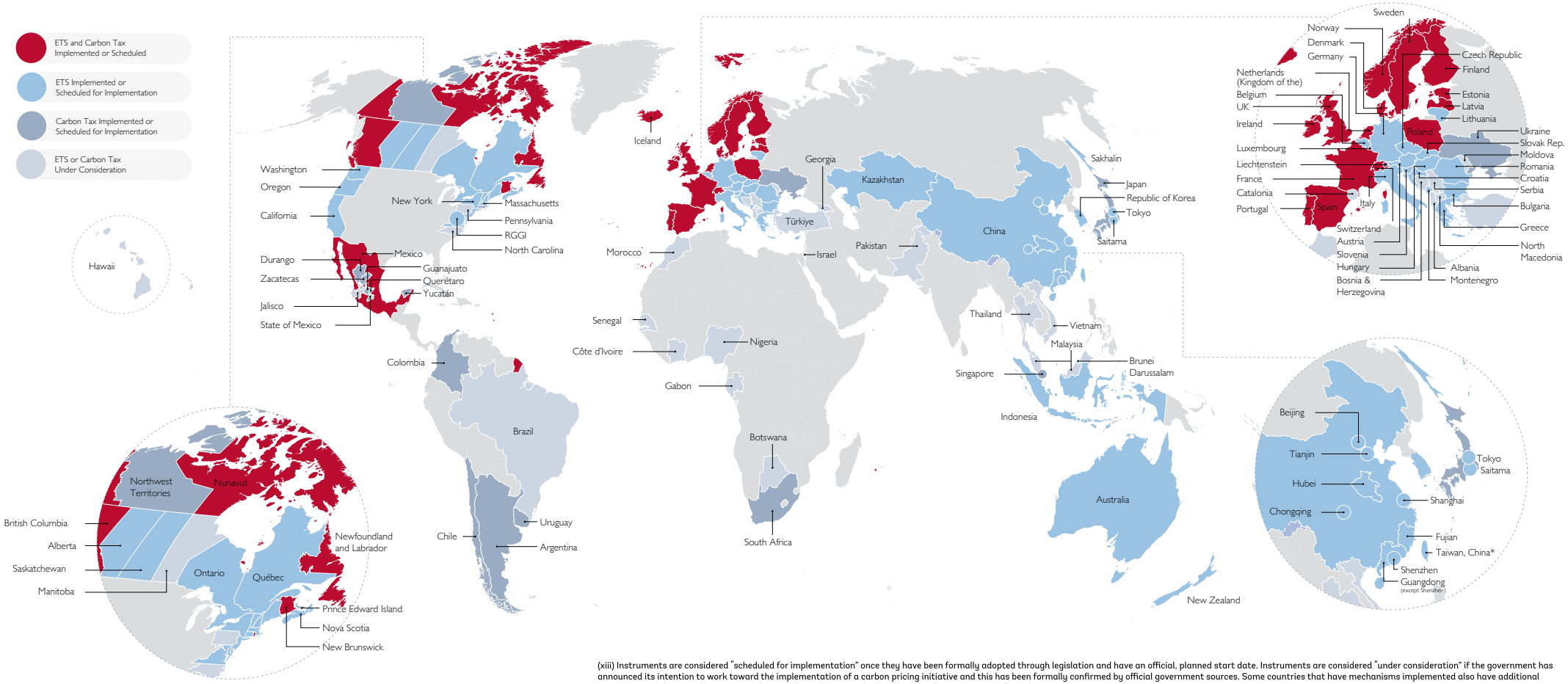
19 The State of the Voluntary Carbon Markets Q3 2022, Ecosystem Marketplace, August 2022. https://www.ecosystemmarketplace.com/articles/the-art-of-integrity-state-of-the-voluntary-carbon-markets-q3-2022/

20 State and Trends of Carbon Pricing 2023, World Bank, May 2023.

21 International Air Transport Association, https://www.iata.org/en/programs/environment/corsia/

Figure 14. More than a fifth of global emissions are now covered by a carbon market or tax[20]

Note For footnote 20, please refer to previous page



(xiii) Instruments are considered "scheduled for implementation" once they have been formally adopted through legislation and have an official, planned start date. Instruments are considered "under consideration" if the government has announced its intention to work toward the implementation of a carbon pricing initiative and this has been formally confirmed by official government sources. Some countries that have mechanisms implemented also have additional instruments under consideration. For subnational jurisdictions only the subnational instrument is reflected.

Today, the European ETS is the largest compliance market representing nearly 45% of total global compliance market revenue in 2022,[22] but it is comprised of emissions allowances and does not allow offsets from carbon projects as part of the scheme.

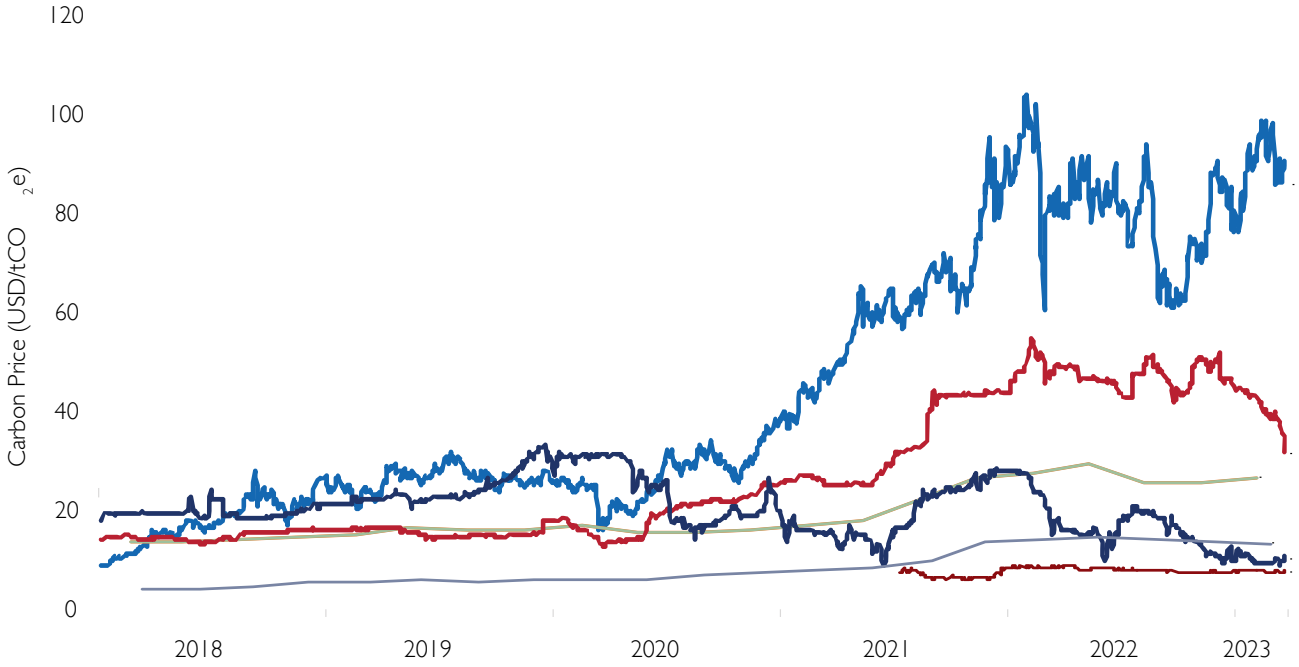
Two jurisdictional compliance markets that currently accept carbon credits generated from projects in select emerging markets, including countries in Africa, are South Korea and Singapore. In South Korea's compliance market, up to five percent of regulated emissions can be offset by carbon credits. Koko Networks, an alternative cooking fuels company company based in Kenya, is already selling credits into the South Korean compliance market. However, carbon prices in South Korea's ETS have fallen significantly to around US$8-12 per ton in 2023.

Singapore does not have an ETS but rather a carbon tax, which is currently set at US$5 per ton but will rise to US$80 per ton by 2030. The country is signing MOUs to develop bilateral agreements with countries such as Ghana, Sri Lanka, and Kenya from which it will allow eligible carbon credits to be used by Singaporean companies to offset up to five percent of their taxable emissions. As the carbon tax rises, demand for offsets from eligible countries is expected to rise considerably. Credits will need to be correspondingly adjusted, which is the act of transferring carbon credits from the project host country to the buying country – in this case, Singapore – for NDC accounting purposes under Article 6 of the Paris Agreement.

While demand in compliance markets might be larger and more durable than that in the VCM, prices are not always higher, as highlighted in Figure 15. Europe and New Zealand have significantly higher prices than most VCM credits, but in other compliance markets, prices are well under US$20 per ton.

22 State and Trends of Carbon Pricing 2023, World Bank, May 2023.

Figure 15.	Price evolution in selected ETSs from 2018 to 2023[23]
Legend	● EU ETS ● New Zealand ETS ● California/Québec ETSs ● RGGI ● Republic of Korea ETS ● China National ETS
Note	This graph is based on data from ICAP Allowance Price Explorer. Prices for the RGGI initiative and for California and Québec CaT, come from the primary market, whereas for the other systems the prices reflect the secondary market.



2.2 Negotiating future pricing in an offtake contract

Projects have a range of options for pre-selling credits that will be delivered in the future, and a key question is the price of carbon.

Projects can sell carbon credits either pre-contracted before the credit has been issued or in the spot market after the credit has been issued. Pre-contracted credits can be sold in fixed quantity or as a fixed proportion of issuances, and they may be either payment-on-delivery contracts or come with upfront financing (pre-purchase agreements). It may be

23 State and Trends of Carbon Pricing 2023, World Bank, 2023. https://openknowledge.worldbank.org/entities/publication/58f2a409-9bb7-4ee6-899d-be47835c838f

beneficial for projects to pre-contract a portion of credits, while also keeping a portion to sell in spot markets if there is a strong belief that prices will rise.

When it comes to agreeing on a future price for carbon, the developer must make a trade-off between a higher price and lower risk. For example, a floor price provides downside protection in case carbon prices drop in the future, but it is likely to be paired with a lower reference price/float or a ceiling that caps developer returns (discussed below). Likewise, the developer may hope to achieve a higher price by agreeing to sell at future market price, but if the price goes down instead of up, the project is fully at risk.

Time also matters. For pre-purchase agreements, the further into the future the credit will be delivered, the higher the price discount will be due to the time value of money. If an investor has a discount rate of 10% per annum and pays US$20 for a carbon credit today, it would pay US$18 for that same credit delivered in one year's time, US$16.20 for the credit delivered in two year's time, and US$7 for the credit delivered in ten years' time. Of course, the investor may believe that the value of the credit will be higher than US$20 in ten years' time and depending on the strategy may factor this in as well. Typical forward and future contracts seen in other markets are challenging to execute in the VCM today due to low liquidity and the over-the-counter nature of most trades.

Contracts for future delivery of credits can utilize fixed, variable, or cost-plus pricing.

Projects can agree to sell credits in the future at a fixed price known today, or at a price that varies with the future market price or with actual production costs. Projects may also be able to negotiate an upside share in the case that the buyer is selling credits onward in the secondary market.

Fixed price

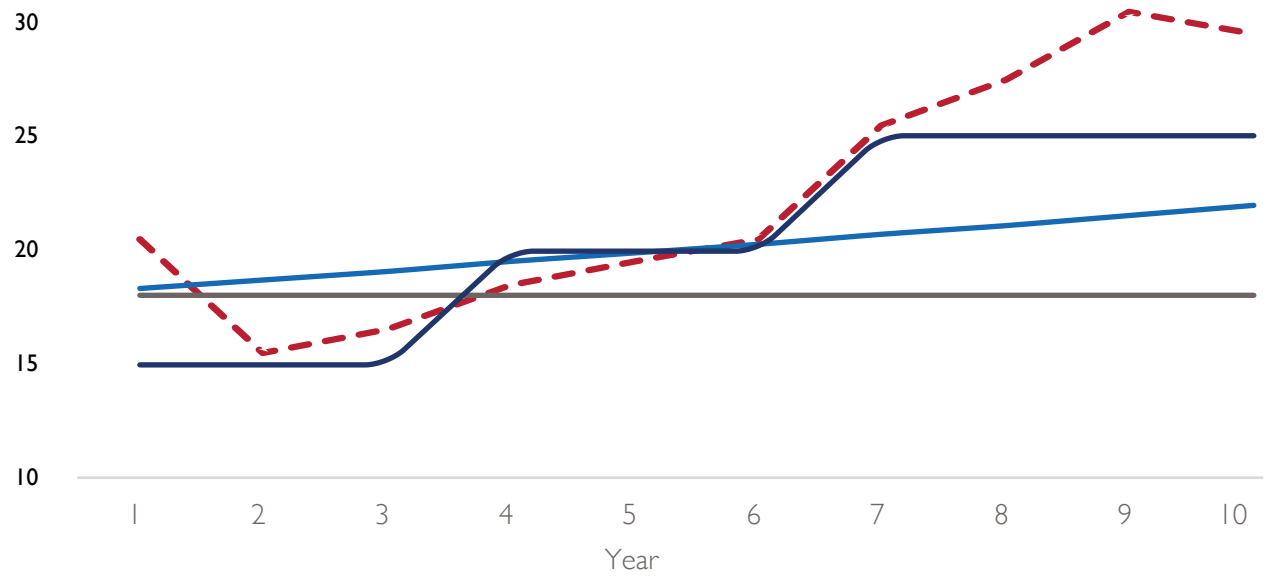
Fixed price contracts refer to offtake contracts where the price is agreed when the contract is signed. The price can take several forms:

- **Flat:** price does not change during the term of the contract
- **Smooth escalation:** the price increases steadily over time at an agreed rate
- **Stepped escalation:** the price increases by a specified amount at specified dates or when specified milestones are achieved

Fixed prices give both the buyer and seller certainty around future costs or revenues and may be appropriate when there is relatively high certainty of future price, or if there is a desire by the developer to reduce exposure to market volatility. In return for downside protection, the project loses its exposure to potential price increases in the future for that portion of credits. There can also be a trade-off between price and volume, with

buyers willing to pay a lower fixed price when contracting for higher volume. While this may reduce the project's revenues, it provides downside protection and can also reduce transaction costs associated with selling to many different buyers in small quantities.

Figure 16. Fixed prices in offtake contracts (US$) (illustrative)

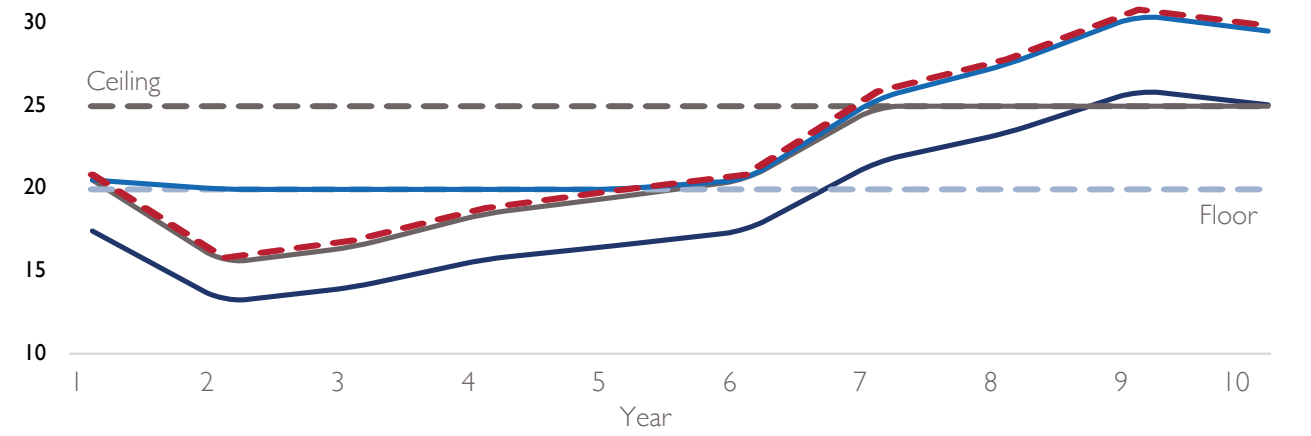


Variable Price

Variable price contracts place more price risk onto the seller by exposing them to carbon prices. The simplest approach uses a reference price plus a float. The reference price is an agreed benchmark that represents the market price. It can be the spot price of other credits sold from the same project, the average of broker quotes at the time of sale, or an index such as N-GEO (Nature-based Global Emissions Offset). However, current indices come with their own challenges and should be chosen carefully. The float price is an agreed premium or discount to the reference – for example, credits could be sold at 10% above or 10% below the reference price.

Alternatively, a floor and/or ceiling price can be used to cap downside or upside returns. Under a floor price model, the buyer would pay the maximum of the reference or floor price, and under a ceiling price model, the buyer would pay the minimum of the reference or ceiling price. As expected, there is a tradeoff between lowering risk and boosting returns when using a floor or ceiling. A floor and ceiling can also be combined to create a price band.

Figure 17. Variable prices in offtake contracts (US$)



Cost-Plus

Under a cost-plus model, the carbon credit price is based only on the cost of production, plus some margin to the developer. This is more commonly used when the developer is an NGO or other organization prioritizing cost coverage, and when the project is capitalized by a single investor. In this case, the developer serves as a long-term service provider, managing operations in return for a margin. It can also be used when a corporate is funding projects in or around its own supply chain. Cost-plus contracts provide downside protection for communities but no exposure to upside – a situation that can become problematic if prices rise considerably and the offtaker is selling credits in the secondary market at significant premium.

Upside Sharing

When the offtaker is selling credits onward in the secondary market, there may be opportunity for the project to negotiate an upside share, in which a portion of the increase in the future price over a specified minimum price of the credits is returned to the project. This model helps to ensure alignment of incentives across the life of the project, so that if prices rise considerably, the operator and communities share in this windfall. This is especially important in preventing perception of unfairness or exploitation of local communities. However, not all brokers and retailers are willing to incorporate an upside share as it has the effect of disclosing commercially sensitive information about their margins on trades, and so can be difficult to implement in practice.

3 BENEFIT SHARING AGREEMENTS

Understand why benefit sharing agreements matter, and how to ensure fair process, terms, and distribution of benefits

Benefit sharing agreements (BSAs) codify the financial relationship between local communities and the carbon project, and they are foundational for ensuring long-term durability of climate outcomes.

Stakeholders in carbon projects may include landowners, communities managing lands, or individual land stewards with varying land tenure rights. Agriculture, Forestry and Other Land Use (AFOLU) projects in emerging markets are often predicated on some behavior change by local communities, such as planting and nurturing trees, using clean cooking technologies, or adopting climate-friendly agricultural practices. While this Playbook uses the common terminology of "Benefit sharing" it acknowledges the very active and central role that indigenous persons and local communities (IPLC) play in the design and implementation of successful carbon projects, rather than being passive recipients of income. It also acknowledges the fraught history of resource extraction in the Global South and seeks to provide practical guidance to ensure more equitable outcomes in the context of carbon markets today.

Local communities are not only the managers of approximately half of the world's land but also, in many cases, rightful beneficiaries of economic value created from carbon projects.[24] It is in this spirit that this chapter addresses the question of how project income is shared with communities.[25]

The shortcomings of benefit sharing agreements when it comes to fairness bear elaboration. Communities without formal land rights have been excluded from key project decisions and benefits; those lacking experience negotiating commercial contracts have locked in terms allowing windfall profits for investors yet little compensation for themselves; promises have been broken and benefits not delivered. The list goes on. From a climate justice standpoint alone, benefit sharing agreements should be fair.

However, often overlooked is the importance of a well-designed benefit sharing agreement for the integrity of a project's climate outcomes. Most fundamentally, benefit sharing must more than offset the opportunity cost of alternative land use in order to sustain the behavior change required to generate carbon credits. BSAs must align incentives with communities over many decades to ensure long-term participation and permanence of climate outcomes. They must also avoid inciting real or perceived injustices that devalue carbon credits generated by the project, or that result in a negative headline. Buyers care not only about the climate outcome, but also about the accompanying social and environmental outcomes such as supporting community livelihoods – and the good reputation that comes with investing in these projects.

The bottom line is that investors and project developers have both a moral and commercial motivation for getting community benefit sharing agreements right.

Current standards and industry guidelines vary in their requirements for terms and disclosure of benefit sharing agreements.

Because there is no consensus across carbon standards and industry guidelines for what good benefit sharing looks like (see table 2), projects today have a high degree of discretion on the design and implementation of BSAs. At the same time, carbon credit buyers and investors lack clear benchmarks for assessing the quality of a project's benefit sharing. This assessment is further complicated by limited disclosure and contextualization of benefit sharing processes and outcomes. Fifty percent of revenues going to communities may be an excellent outcome for one project and a poor outcome for another – and information asymmetry between buyers and sellers of carbon credits can make it difficult to weed out the "lemons."

24 "It's About Time: The Climate Community Invests in Securing Community Lead", World Resources Institute, November 2021, https://www.wri.org/insights/climate-community-invests-securing-community-land

25 This chapter uses "communities" as a catch-all for local communities, indigenous persons, landowners, and land stewards.

Table 2. Benefit sharing and disclosure requirements across industry-leading standards and guidelines

Plan Vivo	Requires that 60% of project revenues go back to communities and disclosure of the proportion of income from Plan Vivo Certificate sales that will be allocated to each project stakeholder within the PDD, with annual audits to verify outcomes.
ACORN	Requires that 80% of project revenues go back to communities and definition of that amount within the PDD, with annual audits to verify outcomes.
Gold Standard	Projects "must demonstrate clear benefits to sustainable development through completion of a Detailed Impact Assessment." There is no requirement around revenue or benefits sharing or disclosure of the BSA.
Verra: Community, Climate and Biodiversity Standards (CCB)	Project must "generate net positive impacts on the well-being of communities and the community groups within them over the project lifetime." There is no requirement around revenue or benefits sharing or disclosure of the BSA.
ICVCM Core Carbon Principles (CCP)	Future iterations of the Assessment Framework will provide guidelines to ensure "transparency on use and management of revenues for benefit sharing".

Carbon Tanzania's Yaeda Eyasi Project

High revenue-sharing with communities

Carbon Tanzania is a social enterprise based in Tanzania that has been operating community-based REDD+ carbon projects for the last decade. For the Yaeda Eyasi project, Carbon Tanzania followed the certification requirements of the Plan Vivo Standard to ensure that a minimum 60% of gross sales revenues flow directly to communities. Regular audits have verified that this threshold has been achieved. Contractual agreements with communities are signed with village governments under the supervision of the District administration, and 10% of the community revenue share is paid to the District government recognizing the political and security function played by this authority. Contracts with communities define management responsibilities and reporting requirements so that resource owners and those tasked with protecting those resources receive equitable and appropriate compensation for their efforts and the risks they shoulder in implementing the land use choices on which the carbon project depends. When revenues are received, they are allocated according to the needs of the communities, with funds often providing educational support for children, to resource the local health clinics, and to build infrastructure such as police posts and schoolteacher housing.

All benefit sharing agreements should follow a common set of guiding principles to ensure fair process and outcomes for communities.

While many conversations on benefit sharing focus narrowly on the percent of revenues shared with communities, benefit sharing must be fair at three levels: process, terms, and distribution. Across the board, self-determination is the key feature – from choosing to engage in a project at all, to the form in which revenues will be shared back with community members.

The Nature Conservancy's Beyond Beneficiaries Report (2023) outlines the ideal process for engaging with IPLCs, and Conservation International's Safeguard System (2022) is a risk management approach to considering and working with IPLCs in a fair and just manner. Both are excellent resources for carbon project developers to use in the development of community engagement strategies.

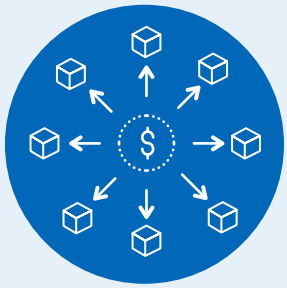
Figure 18. A framework for fairness in benefit sharing for carbon projects

Fair Process

- **Communities determine if, how, and when** to engage in projects
- All stakeholders have **access to the same information** (e.g., translated to local language)
- Communities have capacity or external resources (e.g., legal representation) to **negotiate on fair grounds** with other counterparties
- Complete an in-kind contribution analysis to **fully understand costs borne by communities**
- Follow an **iterative process** that incorporates both community and investor input

Fair Terms

- **Downside risks are minimized** (e.g., through fixed payments), especially in contexts where communities incur costs or change livelihoods as a condition for participation
- **Upside participation** alongside other stakeholders should compensate communities for risk taken, should carbon prices rise substantially in the future



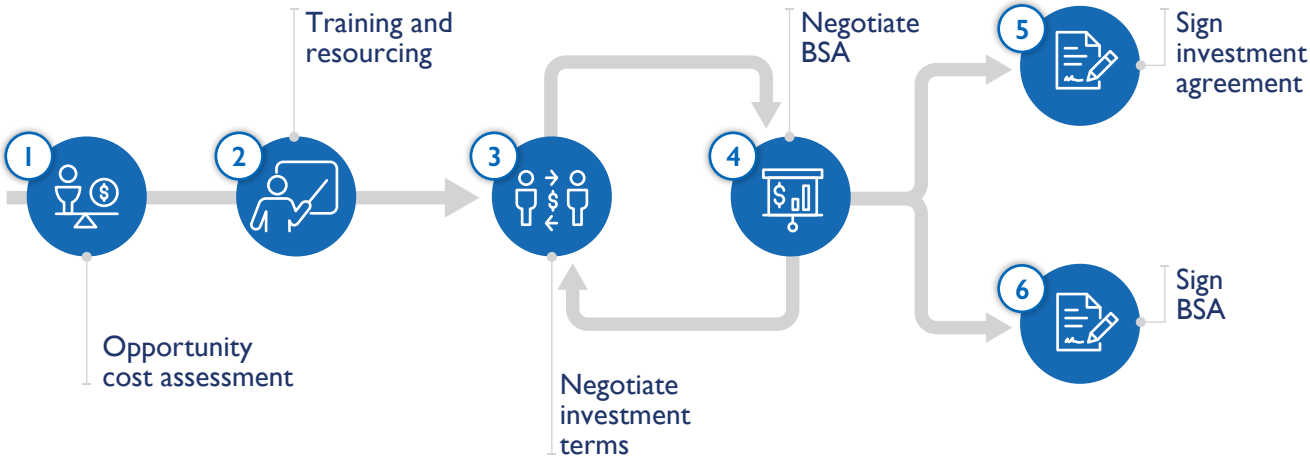
Fair Distribution

- Communities determine the form in which **benefits will be received** (e.g., cash, in-kind)
- Communities have **clear and legally enforceable** and tenure/rights
- Governance and systems are in place **for traceability and accountability** for distribution of benefits
- Special consideration should be made for **vulnerable persons including women, youth, and the disabled**

Designing the benefit sharing agreement is an iterative process through which the project developer, investor, and community members determine the total project value and allocate that value across stakeholders.

Figure 19 illustrates at a high level the process through which the project developer negotiates benefit sharing with a community following best practices.

Figure 19. Iterative process for designing a benefit sharing agreement



(1) The process begins with assessing the opportunity cost for communities to participate in the project. This cost becomes the absolute floor for benefits that will be required to encourage and sustain a behavior change, such as use of clean cookstoves rather than harvesting of mangrove wood for fuel. This assessment may be carried out by a third-party, such as a local university specializing in anthropological research.

(2) Next, the project developer should ensure that communities receive appropriate training on carbon markets and other topics relevant to the project. Communities should also be provided access to third party legal counsel that can advise them throughout the negotiation if needed. Contracts and other project materials should be translated into the local language and made available to all relevant stakeholders.

(3) The project developer may then begin negotiating investment and/or carbon credit offtake terms with interested financiers. The role of the developer in this phase is to ensure that the project is valued fairly and that there is an appropriate balance of downside protection and upside exposure at the project level. The goal of the financier is to ensure that its target investment return is met as part of the fiduciary responsibility to its investors. The investment terms effectively set the *"size of the pie"* to be shared with communities.

(4) With indicative investment terms in hand, the developer can then begin negotiating a benefit sharing agreement with the community to determine the *"slice of pie"* that each

party will receive. **(5)** Based on the outcomes of this negotiation, the developer can finalize terms with the investor. **(6)** Once funding is in hand, the developer can finalize terms of the benefit sharing agreement with the community.

One consideration is whether there should be specific opportunities - negotiated in advance - to re-negotiate benefit sharing agreements throughout the project lifecycle, after there is more data and experience from project implementation and more certainty in the carbon markets. This would allow projects to make adjustments as needed for exceptional or poor performance, and to ensure that the balance of risk and return is appropriate for communities over time as the world changes.

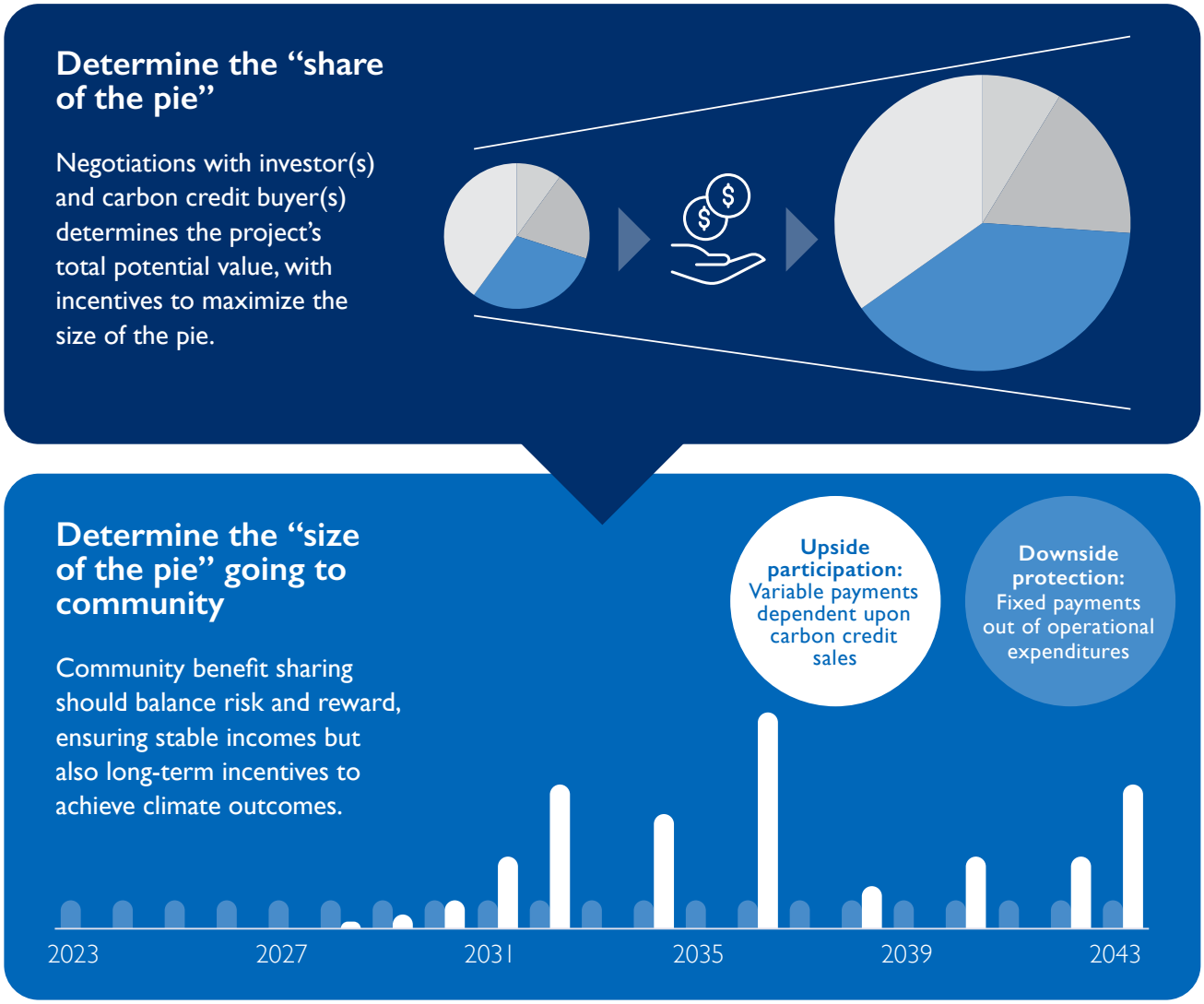
While this Playbook focuses on negotiations with communities for benefit sharing, many projects will also need to undertake negotiations with national and sub-national government stakeholders. Requirements for revenue- or carbon credit-sharing with government vary by jurisdiction, project type, and the nature of government support (e.g., if the government is leasing public land to the project). In some cases, government and community preferences may not be aligned, for example when a government prefers to receive project revenues directly and then distribute to the community – a process which may lack accountability if there are not robust governance structures in place. It is important that developers understand the local regulations around benefit sharing with government and communities, and that they remain informed of ongoing regulatory discussions and decisions relating to benefit sharing.

Benefit sharing agreements should balance risks and returns for communities.

Chapter 5 will cover the ways in which the "size of the pie" is set between the project developer and investor and/or carbon credit buyer. This chapter focuses on the second phase of negotiations, in which the "slice of the pie" for the community is determined (Figure 20). However, it is important to remember that at the beginning of a project when the benefit sharing agreement is negotiated, there is likely still uncertainty around the total volume of credits that will be produced and the market price of these credits. Some projects may have more uncertainty than others when it comes to the future "size of the pie," and this must be taken into consideration.

It is not only investors who take risk in the project – local communities are often making dramatic changes to their livelihoods, and this risk, too, should be financially compensated.

Figure 20. Conceptual framework for balancing risk and reward in benefit sharing agreements



In any transaction, there is a tradeoff between risks and returns. Higher risk is compensated by higher return, and lower risk receives lower return. Each stakeholder in a carbon project has its own appetite for risk and its own assumptions about the future. It is important for the community negotiating a benefit sharing agreement to have clarity on its own appetite for risk and corresponding expectations of return as it will need to make trade-offs between the two during the negotiations (Figure 20).

When valuing total community benefits, there is not consistent guidance for what "counts," nor is there a consistent approach for which terms are included in the benefit sharing agreement itself versus simply part of the project's operational budget. For the purposes of this Playbook, we include any project outlay with value to the community. This includes cash payments, salaries, in-kind investments in hard and soft infrastructure, and direct share of proceeds from the sale of carbon credits.

For most communities, the optimal benefit sharing agreement will balance downside protection with upside participation.

- **Downside protection** can be achieved through annual payments that begin at the start of the project, even before it has begun generating carbon credits. This payment comes out of the project's operating expenses and is paid before taxes and before investor and developer returns. It is not dependent upon project outcomes – the payment occurs whether or not credits are issued and sold. Financing raised by the project is intended to fully cover these expenses before the project reaches profitability.

- **Upside participation** typically takes the form of variable payments dependent upon carbon sales. It can be thought of as an outcome-based payment linked to project performance. Payments to communities can be in cash or credits, come out of revenue or profits, be fixed or dynamic, and may also incorporate special treatment of profits from secondary sales. Regardless of the form, community participation in the upside of project outcomes is key to incentivizing community participation over the long term.

Tree Aid's Burkina Faso Project

Downside protection paired with upside participation

Tree Aid, an NGO based in the UK with 30+ years of operations across the Sub-Saharan Africa region, is running a ~13,000 ha community-based ARR project in Burkina Faso. Tree Aid is the project proponent and is working on behalf of community entities which hold customary land rights over this land. Communities will also own the rights to the carbon sequestered through this project, as well as products such as the non-timber forest products generated by landscape restoration. Tree Aid has secured upfront investment for project implementation on behalf of the communities. Out of the carbon credits that the project will generate over its lifetime, a portion will go to the investor/offtaker, and the remainder stay with the project. The decision then sits with the communities as to whether they want to sell the credits with a pre-purchase agreement, reducing exposure to the market, or wait and sell credits on the spot market. Through the up-front investment, Tree Aid has structured contracts with communities such that the communities receive direct employment, capacity development in sustainable land management practices that address soil fertility and water harvesting, value chain development and marketing, and direct financial benefits which serve as the floor compensation in addition to exposure to market upside via direct participation in future credit sales.

Benefit sharing should incorporate predictable payments to communities including in the years before the project is generating revenue.

Project revenues can vary from initial projections for a variety of reasons including delays in project execution, lower than expected production volumes, lower than expected prices, disruption due to natural disaster or political violence, and regulatory changes, among others.

It is important for communities participating in projects to be protected from potential downside scenarios in which revenues are less than expected. It is also important for communities participating in projects to be paid during early years of the project, when revenues are still low or non-existent. Predictable payments ensure that community benefits always exceed the opportunity cost for alternative land use.

These benefits can take many forms, but the critical characteristic is *predictability*. Examples include guaranteed annual cash payments, short- and long-term income-generating opportunities, legal support to secure land rights, socioeconomic development programing funded from the project's operating budget, and revenues from non-timber forest products and agricultural commodities associated with project activities. These benefits may be formally included in the BSA, or they may be part of the project's operating budget.

Benefit sharing should also incorporate variable payments based on achievement of project outcomes – that is, the generation and sale of carbon credits.

Above and beyond the *predictable* benefits, communities may also receive benefits that are contingent upon project performance. While these benefits are less predictable, and could be zero in any given year, they offer communities exposure to the same potential upside as other stakeholders and help create long-term financial alignment. It is important that communities fully understand the implications and trade-offs of each of these options with unbiased information to make a decision for themselves.

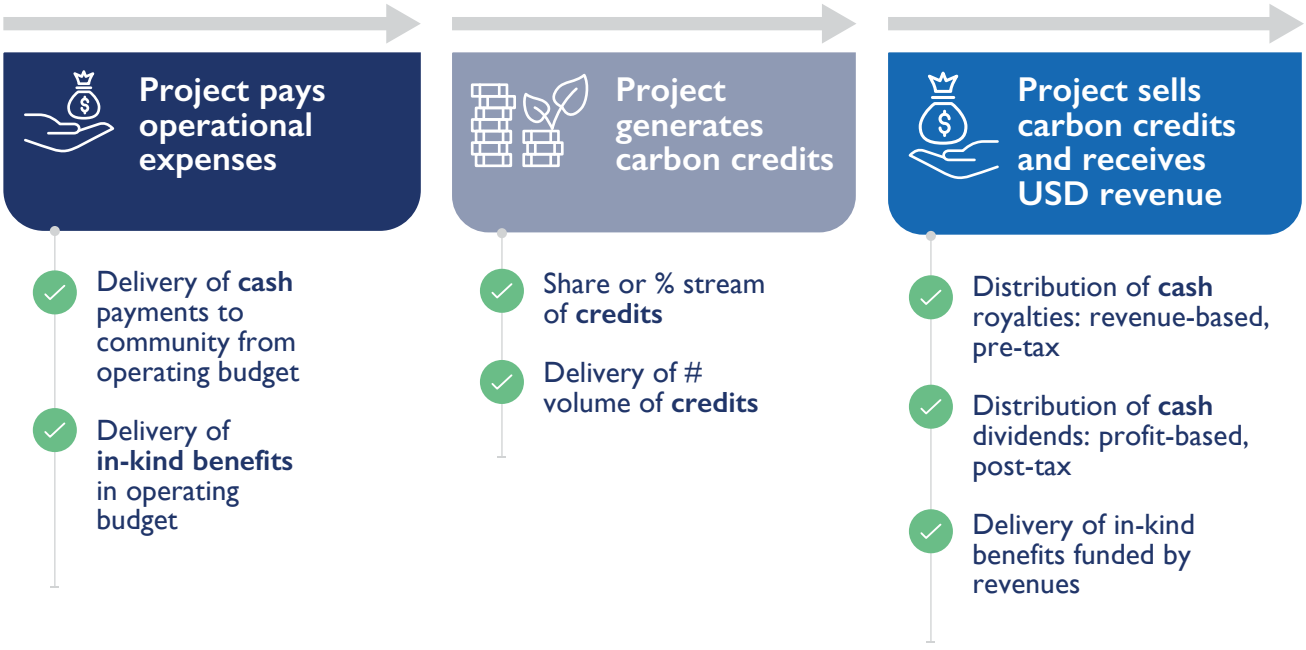
In designing the performance-linked component of a BSA, there are three key decisions:

1. Cash, carbon credits, or in-kind?

Performance-based proceeds can be distributed either as a share of cash or a share of carbon credits (Figure 21). In the case that the community is allocated a volume or percent of credits generated by the project, the community could gain decision-making power over to whom, when, and at what price to sell credits – that is, greater agency in determining the level of risk when it comes to carbon market exposure. However, the community would also take on the responsibility for the sale of credits, which would most likely require engagement of a third-party broker. The percent of credits going to the community must also take into consideration the project's cash requirements for operations, ensuring that revenues are sufficient to cover costs throughout the project lifecycle.

For these reasons, allocation of credits is not typically well-suited for community benefit sharing. It is more common to allocate cash or in-kind benefits linked to revenues as explored in the next section.

Figure 21. Potential value distribution to communities across project stages



However, this also depends on the type of carbon project. For Archetype 2 projects such as reforestation, communities are likely being employed by the project, providing job opportunities and fair wages. However not all community members will be able to be employed and therefore additional cash or in-kind benefits should be provided. For in-kind benefits, this might be training on agroforestry, provision of planting materials and other goods, or investments into critical community infrastructure. These types of in-kind benefits are also similar for Archetype 1 projects such as REDD+, where communities are being asked to change their behaviors or livelihoods.

Image: © Makari Krause

For Archetype 3 projects such as clean cookstoves, the in-kind benefits are the price reduction of the product itself. Additional credit revenues that go beyond total cost of producing and distributing the project, and repaying investors, should either go back into further reducing the price of the product to reach a wider market, or be paid back to the product owner in cash or similar as an incentive for continued use of the product. For some cookstove projects, this lack of long-term incentive paired with poor MRV has led to over-crediting as cookstove owners phase out their use of the product.

Many carbon projects to date have distributed non-monetary benefits in the form of building community infrastructure such as hospitals, schools, and roads, with less emphasis on cash transfers. While infrastructure is a key aspect of community development, it has its own complexities (Who will pay for hospital staff salaries over time? Who will pay for and maintain the road over time?). Cash, particularly if given directly, gives agency to individuals and enables households to spend this money in the way they think is best – and there is a wealth of evidence on the effectiveness of cash transfers in long-term poverty alleviation and improved wellbeing of children and youth. Both monetary and non-monetary benefits should be considered in a BSA.

2. Revenue or profit share?

There is no standard for the use of revenue vs. profit share within carbon projects, but as transparency around benefit sharing increases through a combination of voluntary action and new requirements from governments and standards, benchmarks should emerge.

One consideration is that it is easier to compare projects and build benchmarks over time if the share is distributed based on revenue. Profit share requires disclosure of annual profits, which is commercially sensitive information, and so it may be more difficult to enforce or encourage transparency of benefit sharing outcomes. Revenue share, on the other hand, is more straightforward to calculate and to communicate to stakeholders.

Below is a summary of additional pros and cons of revenue versus profit sharing for both the community and the project at large:

Figure 22. Comparison of revenue-share vs. profit-share terms

Illustrative income statement	
Revenues	$100
Cost of sales	($10)
Gross Profit	**$90**
SG&A	($50)
D&A	($1)
Operating income	**$39**
Interest	($4)
Earnings before taxes	**$35**
Income taxes	($5)
Net income	**$30**

Revenue

Revenue-based payments to communities may be part of operating expenses and paid pre-interest, pre-tax

- ✓ Paid regardless of project's profitability in a given period
- ✓ More resilient to low-price scenarios and cost over-runs
- ✗ In downside scenario, may leave project unable to cover costs
- ✗ Not paid in periods without revenue, e.g., between crediting years

Profit

Dividends are paid out of retained earnings (a function of net income) and are paid post-tax

- ✓ Less risk to project viability in down-side scenario
- ✓ Paid from retained earnings, which may be positive even in unprofitable period
- ✗ Less resilient to low-price scenarios and cost over-runs, which reduce profitability
- ✗ May be less tax-efficient for recipient in certain jurisdictions

3. Fixed or dynamic share?

Revenue or profit share can be issued at a fixed or dynamic percentage. A fixed percentage may be more straightforward to calculate and communicate, but a dynamic percentage may offer communities a more appropriate balance of downside protection and upside exposure. This dynamic percentage can be variable based on price, year, or credit volume. There may also be opportunity for special treatment of upside sharing if the buyer is selling onward into the secondary market. This upside share would send an additional percent of profit gained in secondary sale back to the project – and the percent share for the community could be higher from the upside portion of revenues than from the initial sale.

Additional decisions must be made around the distribution of benefits in practice – including who benefits, what form benefits take, how benefits will reach individuals, and how decisions are made on an ongoing basis.

Questions related to the distribution of benefits include:

- **Direct transfer to individuals vs. community fund:** There are trade-offs between direct transfer to households and the use of an intermediary community fund. Direct cash transfers to households reduce the risk of potential leakage of payments. However, community funds may better align with the community's values and decision-making processes, though community leaders do not always represent the best interests of all members of the community. Community funds need strong transparency, accountability and governance structures to ensure that benefits are distributed as required under the BSA.

- **Equal vs. differentiated payout:** Performance-based payments where different households or communities within a project area receive different payments may create a clear positive incentive for behavior, but it may also create unhealthy tensions within or between communities.

- **Special consideration for vulnerable populations:** When working through existing community structures, there is a risk of exacerbating existing systems of exclusion. Projects will need to balance respect for local customs with avoiding the exclusion of women, youth, religious or ethnic minorities, the disabled, and other potentially marginalized populations. They should take sufficient care upfront to understand the current and potential impacts of the project through existing best-in-class approaches, such as Conservation International's Safeguard System.

There are emerging models for benefit sharing that focus on centering IPLCs as partners and owners in the project.

An emerging theme in benefit sharing is the call for a shift away from IPLCs as "beneficiaries" and towards IPLCs as "partners" or "shareholders." In addition to the best practices and considerations for ensuring community self-determination within AFOLU carbon projects that have been laid out in this chapter, project developers should seriously consider how to engage communities as shareholders in the project. Investors, and buyers should consider only certifying, financing, and purchasing credits from projects that include communities as partners or shareholders – and where these contracts were fairly negotiated with adequate information, capacity-building, and/or third-party legal and strategic counsel.

The specific agreements and process by which carbon rights are determined and revenues are distributed among shareholders is context specific, but without proper guardrails and increased adoption of best practices, not only will the market likely see continued exploitation of indigenous peoples and local communities, but the world will miss a critical opportunity to see IPLCs take a leading role in the conservation and restoration of native ecosystems and regenerative stewardship of productive lands. This chapter aims to contribute to the literature in defining best practices and highlighting key design

considerations to put more power in the hands of community stakeholders. The next step is for carbon standards, particularly the ICVCM, to define a minimum bar that projects must meet regarding benefit sharing agreement processes, distribution of benefits, and transparency of outcomes.

Forest Carbon's Indonesia Project

Supporting the development of community-owned projects in buffer zones

Forest Carbon is based in Indonesia and has been developing nature-based carbon projects for over a decade. Its flagship project is a wetlands restoration project that has restored 22,000 hectares and improved livelihoods and provided community development benefits in surrounding areas. The core project area was previously licensed by the government as a productive forest, for timber or pulp and paper production. With most villages and development programs more than an hour away by boat, the company wanted to expand its impact, create a strong buffer zone, and empower communities to participate directly in environmental markets as project owners. As such, ~20% of the profits from the project's anchor carbon credit buyer, Nestle, have been used to catalyze a new community forestry project, fully licensed by the Indonesian government to protect an additional 4,000 hectares.

This model expands the reach of the project to actively manage community-owned land in regions around the core project area, creating a buffer zone into nearby Berbak national park for tigers and other endangered species. Communities have 100% ownership of the project and directly manage it through their own cooperative, with free technical and sales support from Forest Carbon. Communities receive 100% of the profits, tapping into a new mechanism for them to grow their own wealth and reinvest funds into projects that improve their quality of life. The goal is for the initial communities to then work with and train additional surrounding communities to launch their own projects that generate revenue from carbon or other payments for ecosystem services, enabling community-owned and -managed projects to scale across the region.

4 RISKS AND RISK MITIGATION

Understand the risks faced by carbon projects and the available tools and approaches to mitigate those risks

Maturing and scaling the carbon ecosystem requires identifying and mitigating risks. A project's risk informs cost and availability of capital, as lower risk projects will receive better financing terms and may have a larger pool of potential investors. This, in turn, leads to a faster path to scale. The cost of financing the project not only matters to the developer, but also to communities who rely on the developer to negotiate fair terms and deliver their share of value created. Better financing terms allows for greater potential benefit sharing with communities and increases community buy-in. Furthermore, a failure to mitigate risks could lead to failure of a project, which can have wide-ranging impacts on the development of a nascent voluntary carbon market. Reputational risks, in particular, can be damaging by undermining the trust of investors, policymakers, and the public at large.

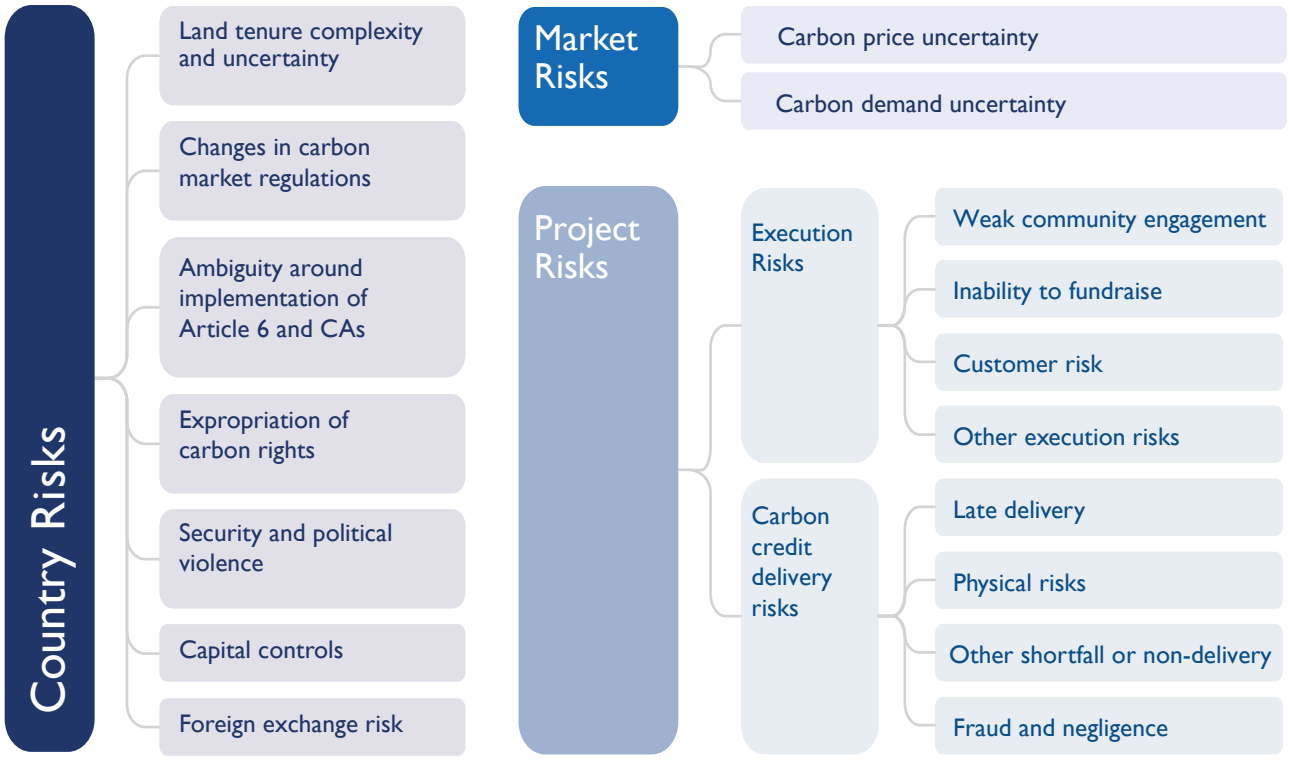
This chapter begins with an overview of risks and mitigants for carbon projects (4.1), and then discusses insurance products for carbon projects (4.2).

4.1 Overview of risks and mitigants

Projects face market-, country-, and project-level risks throughout their lifecycle, with varying degrees of impact and likelihood.

Figure 23 illustrates key market, country, and project risks for carbon projects in emerging markets. These may be alleviated through a variety of approaches and tools, but critically, both *real* and *perceived* risks matter. Indeed, perceived risks can be especially problematic in emerging and frontier markets, where there are fewer precedent deals and investors may have less on-the-ground experience and relationships.

Figure 23. Overview of carbon project risks



Country risks

Carbon projects can face various country-level risks that are primarily regulatory in nature. These range from land tenure challenges, to carbon-related policy changes, to capital controls and foreign exchange risks. These risks can have various degrees of impact and their likelihood of occurring is mostly jurisdiction dependent.

Table 3. Key country risks faced by carbon projects

Description	Impact of risk	Likelihood of risk	Mitigation
Risk: Land tenure complexity and uncertainty			
Potential conflict with government and communities when land tenure is not clearly defined. Project delays due to time required to secure land tenure, particularly when carbon rights are tied to land rights. Risk of land expropriation and/or overriding of permits	**Medium** Additional costs and delays when securing land tenure or resolving related conflicts **High** Can be high impact when community land titles do not exist	**Dependent on jurisdiction and project type**	• Understand land ownership and tenure rules and processes required to secure permits – these are often specific to project type, developer legal status, and current landowner or tenant • Understand full costs associated with obtaining land rights • Include sufficient lead time in project planning if land rights have not been secured • Engage credible local partners to support land tenure processes with communities if necessary • Purchase political risk insurance covering expropriation of land
Risk: Changes in carbon market regulations			
Adverse changes to carbon markets regulations including new permitting processes, changes to accepted methodologies or jurisdictions, or higher taxes	**Dependent on jurisdiction** Changes in carbon rights, taxation, and benefit sharing requirements have the potential to significantly impact project economics and cause unexpected delays	**High** Likelihood is higher in countries with poorly defined carbon regulations and limited carbon markets development. Most emerging markets do not have clear regulations and may or may not grandfather in existing projects	• Understand existing regulations in the host country, as well as policies under development • Proactively engage with relevant policymakers

table continues next page…

Description	Impact of risk	Likelihood of risk	Mitigation
Risk: Ambiguity around implementation of Article 6 and Corresponding Adjustments (CAs)			
Inability of project to secure CA (if required or expected from investor or buyer) due to lack of agreement with host country government or lack of infrastructure in host country to provide this authorization	**Low** Low risk if CAs are not a condition for investment or purchase of credits **High** High risk if CAs are a condition for investment or purchase of credits	**High** Most countries are still in the early stages of implementing Article 6, including determining which VCM projects would be eligible for CAs and do not yet have the institutional capacity and infrastructure to issue authorizations	• Understand country-level regulations and implementation status of Article 6 • Proactively engage with relevant policymakers to inform Article 6 implementation • Avoid over-promising on obtaining CAs from the project until receiving clarity and/or precedence from the host country
Risk: Expropriation of carbon rights			
Expropriation-like actions of host government preventing some or all of a project's credits from being sold and exported. A host country may take such actions to reserve credits for use in NDCs or for sale as ITMOs	**High** Unexpected reduction in the number of credits available for sale. Directly impacts revenue and profitability	**Low** Varies by jurisdiction, but generally low as this action can be detrimental to future carbon projects and private investment writ-large in the country. Where this has been attempted (e.g., Zimbabwe), it has been quickly walked back[26]	• Engage proactively with the host country government and relevant policymakers, with the support of multilateral partners when possible • Understand host country's stance on the VCM and Article 6 • If possible, purchase political risk insurance covering expropriation of carbon credits (note: typically cannot be insured as the activities described do not meet the definition for expropriation – an issue discussed in the following section)

table continues next page…

26 In May 2023, Zimbabwe declared that all existing carbon offset deals in the country were void and that the government would take 50% of all future carbon credit sales and ringfence another 20% for local communities. The government backtracked on this decision in the wake of concerns from investors and carbon market participants. As of October 2023, the government will receive 30% of carbon credit sales (down from 50%) and no longer mandates revenue allocation to communities, which allows project developers to keep 70% of revenues. The government plans to allocate its revenue share to communities and climate initiatives.

Description	Impact of risk	Likelihood of risk	Mitigation
Risk: Security and political violence			
Risk of civil unrest, governments instability, and threat from rebel groups on project implementation and outcomes. The impact could be a delay, destruction of the asset, or full project shutdown	**Varies based on severity of conflict** Additional delays and costs incurred; impact can range substantially depending on severity and duration of conflict	**Dependent on jurisdiction and project type**	• Assess political and security risks in early stages of project development and ensure access to high-quality information on evolving risks • Purchase political risk insurance covering political violence where appropriate
Risk: Capital controls			
Risk of currency inconvertibility, restrictions on capital repatriation, restrictions on investment instruments, complexity of disbursement, etc.	**Low** Unless investment or carbon purchases must be fully onshored, impact can be low if buyer is also international and funds can flow directly	**Dependent on jurisdiction**	• Engage local counsel to understand, navigate, and mitigate capital controls prior to securing funding • Purchase political risk insurance against currency inconvertibility and transfer restriction where appropriate
Risk: Foreign exchange risk			
Risk of financial loss resulting from exchange rate fluctuations, particularly the depreciation of currency in which revenue is realized or the appreciation of currency in which cost is incurred	**Low** Unless investment or carbon purchases must be converted to local currency, impact is low	**Low** Investments are typically denominated in hard currency, and carbon credits are sold in hard currency. For investment that will be repaid in carbon credits, there is no hard currency debt	• Align currency of investment with currency of revenues • Evaluate currency risks for potential costs incurred • Pursue FX hedging strategies as needed

Carbon market risks

Carbon projects are subject to high-impact risks associated with uncertainty of demand and price for carbon credits. Developers can mitigate these risks by implementing high-quality and high-integrity projects and protecting against downside scenarios.

Table 4. Key carbon market risks faced by carbon projects

Description	Impact of risk	Likelihood of risk	Mitigation
Risk: Carbon demand uncertainty			
Lower demand for carbon credits because of changes in the market, such as methodology changes or cancellations, negative perception of some project types, and changes in guidance around claims that can be made by buyers of carbon credits	**High** Direct impact on project's forecasted revenues, financial viability, and attractiveness to investors	**Medium** VCM demand is continuing to grow, though credit retirements slowed in 2022. Corporate climate commitments continue to grow, creating structural demand for carbon credits into the future, especially as credible guidance around integrity and claims are advanced	• Use ICROA-certified standard • Negotiate offtake or pre-purchase agreements for a portion of credits to ensure demand • Focus on project types and methodologies that may be more resilient to future demand, such as removal credits, and those with co-benefits, as well as those that can achieve Core Carbon Principles (CCP) certification • Consider adding non-carbon revenue streams when applicable • Establish direct relationships with buyers
Risk: Carbon price uncertainty			
Lower prices for carbon credits in the voluntary market than forecasted. This could be a market-wide decline or specific to the project type, methodology, or geography	**High** Direct impact on project's forecasted revenues and profitability	**Medium** Dependent upon the project's price assumptions; third-party price forecasts range considerably, and price discovery can be challenging	• Use conservative pricing in project financial models to ensure that the target returns are achieved in a conservative base-case scenario • Follow best practices for high integrity projects to achieve a price premium • Consider fixed price offtake or pre-purchase agreements that protect against downside price scenarios • Maintain flexibility to sell credits when price is higher

Project risks

Execution risks can severely impact carbon projects, particularly when they relate to community engagement and fundraising. Carbon projects also face carbon credit delivery risks, such as delivery shortfalls, physical hazards, and fraud & negligence, which have various degrees of impact on project revenues and reputation.

Table 5. Key carbon market risks faced by carbon projects

Description	Impact of risk	Likelihood of risk	Mitigation
Risk: Carbon demand uncertainty			
Weak community engagement			
Conflicts or failure to develop strong relationships with local communities and government stakeholders relevant for project execution. Real or perceived unfairness or failure to deliver agreed benefits to local stakeholders	**High** Can jeopardize the longevity of the project, reduce integrity and quality including co-benefits, and cause reputational damage. May also result in negative press that suppresses price and demand for credits	**Dependent on project type and geography** Community engagement is a complex and time-intensive process with many potential points of failure	○ Follow best practices and allocate resources to develop strong relationships with communities and other local stakeholders ○ Secure Free, Prior, and Informed Consent ○ Develop equitable and well-socialized benefit sharing agreements ○ Publicly disclose information around revenue share percentages and BSA ○ Go beyond Climate, Community and Biodiversity (CCB) or other standards
Customer risk			
Risk that customer is unable to fulfill payment of offtake on delivery	**Low** Generally low unless market conditions change. Higher if project has a concentrated customer base	**Low** Generally low if selling to large multinational private sector companies that are highly creditworthy	○ Sign long-term contracts with blue-chip customers with strong credit profile

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Description	Impact of risk	Likelihood of risk	Mitigation
Inability to fundraise			
Challenges accessing funding which can cause project delays, prevent developers from accessing expertise, and in the worst-case lead to developer insolvency	**High** Potentially significant impact on project feasibility and continuity	**Medium** Access to finance remains limited for carbon projects; new project developers and those in underserved geographies are likely to face additional challenges fundraising	• Start fundraising early and cast a wide net of target investors to maximize likelihood of successful fundraise • De-risk the project as much as possible during feasibility stage • Use a phased approach to scale up • Implement strong planning and cost controls
Other execution risks			
Other execution risks that can cause project failure or poor performance, including poor cost management, poor design leading to high tree mortality, challenges recruiting and training staff, local partner issues, and others	**High** Potentially significant impact on project viability and investability	**Medium** Depends on the project developer's track record; risk is higher for first-time developers with limited operational experience	• Assess capabilities across all areas, acquire in-house capabilities to the extent possible, or alternatively partner with developers and consultancies with complementary expertise, and receive support from ecosystem enablers such as existing accelerator programs • Draw from commercial expertise in adjacent sectors like commercial forestry • Derisk the project as much as possible during feasibility stage • Use a phased approach to scale up • Implement strong planning and cost controls
Risk: Carbon credit delivery risks			
Late delivery			
Failure to deliver carbon credits on the agreed date due to delays in project implementation and validation and/or verification by standards bodies	**Medium** Delay in issuance of delays revenue. Especially impactful if the investor has an IRR-based hurdle or when there is a rigid due date for delivery	**Medium** Delays for validation and verification are currently common as the number of carbon projects globally scales while both standards and VVBs are under-resourced	• Factor potential delays into project planning • Share lessons learned with other developers to avoid common pitfalls that could result in further delays • Pay attention to investment terms that are contingent upon PDD validation timelines • Develop a strong relationship with a preferred VVB

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Description	Impact of risk	Likelihood of risk	Mitigation
Physical risks			
Risk of fire, typhoon, and other weather-related hazards, which can cause a reversal of carbon emissions and damage project assets. Higher reversal risk requires a larger buffer pool of credits	**Project type dependent** Varies by project type and severity of the hazard	**Geography dependent** Note increasing risk of fire and natural disasters due to climate change	• Assess physical hazard risks in early design stages (required by standards) • Build physical risk mitigation into the project design from the beginning • Developer or investor may purchase insurance against physical risks, which could include parametric weather insurance, so that the investment can be recovered
Other shortfall or non-delivery			
Lower-than-expected issuance of credits due to factors such as inaccurate baseline carbon stocks, inaccurate project carbon stocks, project cancellation and/or invalidation, and changes in methodology	**High** Direct impact on project revenues and developer reputation	**Medium** MRV science is improving carbon projections. Methodologies are continuously improving, a risk if the project's methodology is considered outdated in the future	• Use technology-based MRV for better assessment of carbon and co-benefits • Use conservative modeling and analysis of scenarios • Keep a pool of credits unsold, in addition to the buffer pool • Developer or investor to purchase non-delivery insurance
Fraud and negligence			
Reduction or invalidation of carbon credits caused by fraud, neglect, or other wrongdoing on the part of the project developer	**High** Likely requires restructuring; high reputational impact for developer	**Dependent on the developer's integrity and governance**	• Conduct extensive due diligence of key personnel • Implement strong governance, information rights, and financial controls and oversight • Investors may purchase insurance against fraud and negligence of the developer

4.2 Insurance in carbon markets

Insurance is an important risk mitigation tool for large-scale projects in most industries, yet it is underutilized for carbon projects today.

While insurance is common to most large-scale infrastructure projects in adjacent sectors such as renewable energy, it is not yet common for carbon projects. As the voluntary carbon markets scale and larger pools of more traditional capital look to fund projects, insurance will become increasingly utilized alongside other common investor protections.

Many existing insurance products can be used by carbon projects in their current form – most notably political risk insurance and physical risk insurance.

Political risk insurance

Political risk insurance (PRI) provides coverage against non-commercial risks including:

- **Currency inconvertibility:** Losses from an inability to legally convert local currency into hard currency to pay international investors
- **War and civil disturbance:** Losses or damages to assets caused by war or civil disturbance, including acts of sabotage and terrorism pursuing a broad political or ideological objective
- **Expropriation:** Losses from discriminatory government actions including nationalization and confiscation, creeping expropriation such as gradual changes in tax regime, and expropriation of funds; or deprivation of substantial benefit constituting a fundamental right essential to the project's overall financial viability
- **Breach of contract:** Losses arising from a government's breach of a contract with the project, which could potentially include a Letter of Authorization requiring the country to provide a Corresponding Adjustment for either the voluntary market or Article 6

There are two main providers of PRI in emerging markets:

The Multilateral Investment Guarantee Agency (MIGA) is a member of the World Bank Group and provides political risk insurance and credit enhancement to encourage foreign direct investment (FDI) in developing countries. MIGA provides investment guarantees to eligible foreign equity investors and lenders for qualified investments in MIGA's member countries, safeguarding against certain political risks. MIGA Political Risk Insurance (PRI) products are typically long-term agreements for periods up to 15 years, occasionally 20 years.

The U.S. Development Finance Corporation (DFC) is the U.S. development finance institution which provides direct and fund investments spanning equity, debt, mezzanine, concessional finance, and risk mitigation across sectors. In addition to providing PRI, DFC can reinsure licensed international insurance companies to increase underwriting capacity in countries where investors have difficulty obtaining PRI.

Due to the nascent nature of the carbon credit market, developers face challenges related to political and regulatory uncertainty including revocation of carbon ownership rights, ban on carbon credit export, change in taxation or benefit-sharing requirements, and repudiation of corresponding adjustment. Expropriation is a government action that takes away fundamental rights of an investor, for example ownership or control of an investment, without proper compensation. PRI coverage on expropriation risk may be relevant in the case of land expropriation, confiscation of forestry assets, or revocation of permits to develop and operate a carbon project. Applicability of expropriation coverage to carbon credits themselves may vary country-to-country based on local law, and PRI providers may take different stances on their ability to cover expropriation of carbon credits. Breach of Contract coverage provides protection against losses arising from a government's breach or repudiation of a contract with an investor, which leads to non-enforcement of arbitration award. This guarantee can be relevant to cover carbon-related risks if a binding agreement between the government and the developer is in place. Arbitration under a bilateral

investment treaty (BIT) can also be covered if the carbon investment is eligible investment under the relevant BIT. However, in all such cases, litigation can be lengthy. War and Civil Disturbance coverage may be deployed against the risks of political violence leading to damage or loss of assets or permanent closures of the carbon project.

Physical risk insurance

Insurance products covering physical risks can be used to protect against the loss of carbon credit revenues caused by wildfire, typhoons, and other extreme weather events. These risks are increasingly covered by parametric insurance, which pays out a pre-determined amount based on specific, measurable events rather than traditional loss assessments. This makes compensation more transparent and enables faster payouts. Selected providers of these products include:

Nephila Capital, an insurance-linked securities (ILS) manager and reinsurance company, offers weather and climate resilience insurance policies. Their coverage includes natural disasters for carbon projects, such as typhoons and sea level rise for blue carbon projects.

Africa Specialty Risks, a private insurance company offering a range of insurance solutions tailored to support investment and business activities in Africa, has recently underwritten a US$35M cyclone reinsurance policy for the Government of Mozambique's National Institute of Disaster Management (INGD) which aims to protect the most vulnerable populations from the impact of cyclones. The parametric insurance uses windspeed and rainfall and will provide the state insurer with a payout if certain levels are reached. The policy was structured by the Insurtech start-up PULA in collaboration with the World Bank.[27]

Descartes, a global insurance provider offering technology-driven corporate insurance that covers natural catastrophes and extreme weather exposures, recently supported **African Risk Capacity Group (ARC)**, an agency of the African Union, in designing an insurance coverage for the Government of Djibouti. The multiyear agreement between ARC Group and the Government of Djibouti provides the government access to capacity building in disaster risk management as well as insurance coverage for Djibouti's most prevalent hazards – drought and excess precipitation.[28]

27 "The Mozambique National Institute of Disaster Management, Africa Specialty Risks, the World Bank, and Pula launch the inaugural Mozambique cyclone parametric reinsurance program", AFRICA SPECIALTY RISKS, March 2023. https://www.asr-re.com/2023/03/22/launch-of-the-inaugural-mozambique-cyclone-parametric-reinsurance-program/

28 "Agreement with Djibouti government to protect most climate-vulnerable communities", Descartes, March 2023.

In addition to traditional insurance products, carbon project developers, investors, and buyers can access an emerging set of products designed specifically for carbon.

An increasing number of partnerships are being formed to pilot, improve, and scale some of the offerings. These include:

Founded in 2021, **Kita** is a UK-based start-up and approved Lloyd's coverholder specialized in providing insurance to reduce carbon credit risks. In February 2023, Kita announced securing £4M in seed funding to launch its Carbon Purchase Protection Cover which covers non-delivery related risks post-validation. It covers non-delivery, shortfall delivery, project cancellation by standards, as well as major loss caused by major natural and financial events. The product currently only covers removal credits, and it does not cover change in law that renders the transaction illegal or unenforceable. Kita's clients receive pay-outs in the form of cash or replacement carbon credits. Replacement carbon credits for eligible claims will be distributed from the Carbon Supplier Pool, comprised of Vertree, Everland, Pachama and Respira.

Founded in 2022, **Oka** is a carbon insurance company aiming to de-risk the voluntary carbon market for buyers and sellers of carbon credits. Oka raised US$7M in seed funding in 2023 and is developing its first policy to ensure carbon credits against post-issuance quality risks that may cause credit invalidation, such as non-additionality, over-crediting, permanence, and fraud, as well as post-issuance physical and weather risks.

Howden and reinsurance company **Nephila** partnered with carbon broker **Respira** to develop an insurance product that provides post-issuance coverage to voluntary credits in Respira's portfolio. This insurance product provides buyers with a monetary pay-out that covers the value of their investment if carbon credits are impacted by fraud or negligence. The partnership, announced in September 2022, is designed to give buyers of voluntary carbon credits greater certainty and adds an extra layer of security to Respira's portfolio of verified credits.

5 INVESTMENT STRUCTURES AND SOURCES OF CAPITAL

Understand ownership structures, capital sources and availability, investment instruments, and key deal terms for carbon projects

For project developers, understanding the landscape of potential capital providers based on project features (business model, corporate structure, geography, size, risk profile) can help unlock new sources of capital and ensure the fundraising process is as targeted and efficient as possible. Likewise, it is helpful for donors and philanthropic organizations looking to catalyze private finance for carbon projects in emerging markets to understand who is investing in these projects today, and how, in order to design impactful interventions. And for investors not yet focused on carbon, understanding the broader investment landscape can help contextualize their own approaches to the market.

This chapter begins with an overview of capital availability based on core and non-core business models (5.1). It then discusses ownership structures (5.2), investment instruments (5.3), and other deal terms (5.4) for carbon projects. Finally, it addresses sources of capital including an illustrative capital map for projects in Sub-Saharan Africa (5.5).

5.1 Capital availability for carbon projects

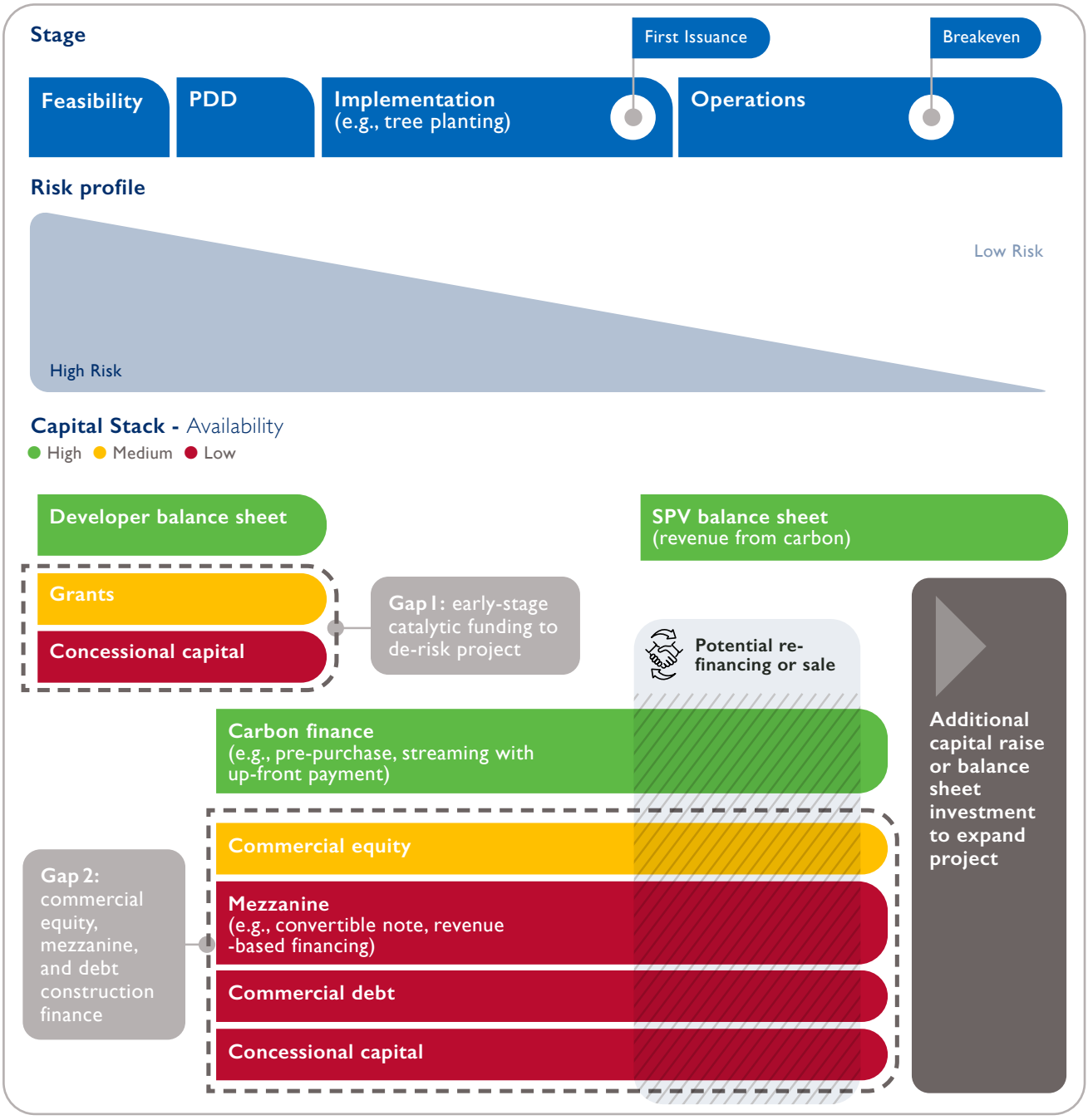
Access to capital for carbon projects varies greatly based on the developer's core business model. The business model can be thought of as a spectrum based on how core the sale of carbon credits is to the commercial viability of the business. More diversified business models, in which carbon is non-core, can access more traditional pools of capital in addition to carbon finance. Less diversified businesses in which carbon is the majority or sole revenue source are able to access carbon finance but may struggle to access traditional pools of capital. This is primarily due to the novelty of the business model, challenge of assessing project risk, and uncertainty of demand and pricing within the voluntary carbon market. Archetype 1 (capital-light activities for emissions avoidance) and Archetype 2 (capital-intensive activities for emissions removal) projects tend to have core-carbon business models, while Archetype 3 projects (use of carbon credits to reduce the price of emissions-reducing products) tend to have non-core-carbon business models.

Access to capital for core-carbon projects is limited today, with funding coming primarily from carbon investors and grant facilities rather than financial investors.

Developers typically fund early feasibility work either off their own balance sheet or through grants. For project scale-up, carbon finance is the most widely available capital source, and it is typically raised either by pre-selling credits or by selling streaming agreements for a share of credits. Commercial and concessional financial investments are both limited at the project level – particularly in Sub-Saharan Africa – except where the project has been sufficiently de-risked and the developer has a strong track record. As carbon markets become more established and the sector matures, more traditional investment instruments such as debt and equity are expected to become available for carbon projects, as they are in other mature adjacent sectors like renewable energy and forestry. Carbon-focused project developers can, however, access financial investment at the corporate level. This is discussed in more detail below.

Figure 24 shows capital availability at the project level, highlighting the gap between the type of capital required and the type of capital available in the market today. Most notable are the gaps in 1) early-stage concessional capital, and 2) commercial equity, mezzanine, and debt finance for initial project implementation – the equivalent of "construction finance" in an infrastructure project.

Figure 24. Capital availability for core-carbon projects



Source: CrossBoundary

Non-core carbon companies have greater access to commercial capital from financial investors.

Due to their diversified and more predictable revenue streams, non-core carbon companies have greater access to financial investors, particularly when they are integrating carbon into already profitable, non-carbon business models. Financial investors will evaluate opportunities holistically through the lens of their existing investment mandates.

5.2 Ownership structures for carbon projects

Investments can be made at the company-, project-, or fund-level, and the carbon project developer will need to set up an appropriate structure depending on investor preferences and requirements.

There are many ways to structure the ownership in a carbon project, but for-profit, carbon-focused project developers generally tend to take a project finance approach of setting up a project-specific Special Purpose Vehicle (SPV). This approach is common across sectors including infrastructure and energy. In this model, a holding company (HoldCo) can also be set up to hold equity ownership in one or more project-specific SPVs. Multiple HoldCos may be used, particularly if there is a desire to group projects based on geography, type, or other attribute. Project finance allows large, capital-intensive projects to be funded off-balance sheet, and investors are repaid through the project's cash flows, with project assets and rights held as collateral.

A project finance approach offers several advantages to projects and investors:

- **Ringfencing:** Project-specific cashflows and assets are ring-fenced within the SPV, giving the investor exposure only to the project rather than the full set of activities undertaken by the developer. This can be useful for developers that implement a broad range of project types when attempting to raise capital from an investor that has a narrow interest in a specific type of project.

- **Nonrecourse:** Investors that fund the SPV have no or limited recourse to the general assets of the developer unless the developer provides a guarantee. In the case of project failure, investors have access to the project SPV's assets and rights only.

- **Tax optimization:** For developers operating in multiple jurisdictions, project-specific SPVs and HoldCos allow for better tax optimization and investor protections, while adhering to local laws.

- **Access to local capital:** A local entity can, in some jurisdictions, help unlock funding from local capital providers such as commercial banks, pension funds, and governments.

While the HoldCo-SPV structure is common for multiproject developers, it may not be suitable for single-project developers due to the added costs and administrative complexity. In such cases, a single company structure could be more practical, and the developer can reevaluate the structure as it scales.

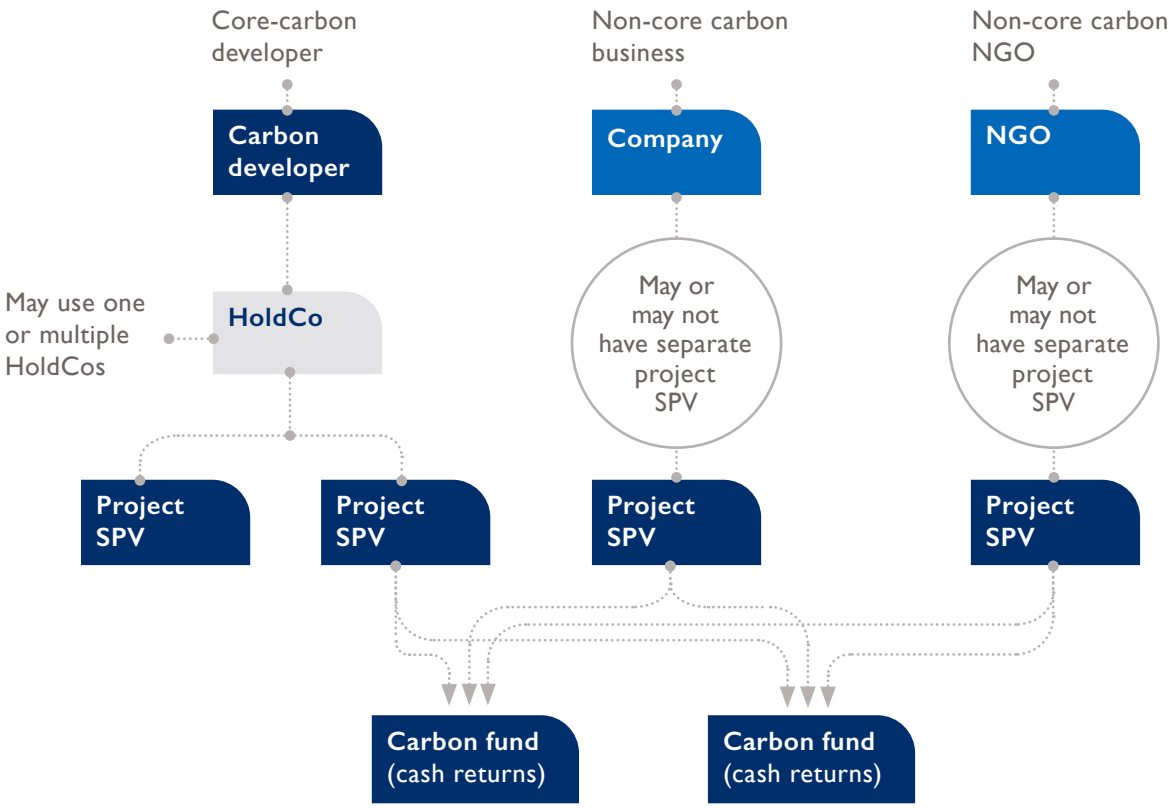
Finally, some project developers have set up alternative but less common structures such as:

- **Development company (DevCo):** DevCo entities can be established to initiate, manage, and operate specific projects or portfolios of projects. Funding can be raised into the DevCo before the project SPV has been established. The DevCo may also be funded by a specific investor for the creation of project pipeline.
- **GP/LP Fund:** Project developers can establish funds, raising from capital providers who become the fund's Limited Partners (LPs), while the developer takes on the role of the fund's General Partner (GP). This structure may be more commonly used by developers whose business model requires acquiring land and reselling the appreciating asset following value enhancing activities (such as regenerative agriculture) or with large, already established project developers.
- **Public company:** Developers can publicly list an investment company through an IPO process to raise large amounts of capital to invest into projects. Carbon Streaming Corporation is an example of a publicly listed streaming company in Canada.

Companies and NGOs that are not solely focused on carbon project development are more likely to take investment into the company or non-profit entity, though they may also choose to set up SPVs for their projects.

Figure 25. Potential corporate structures for carbon project investment

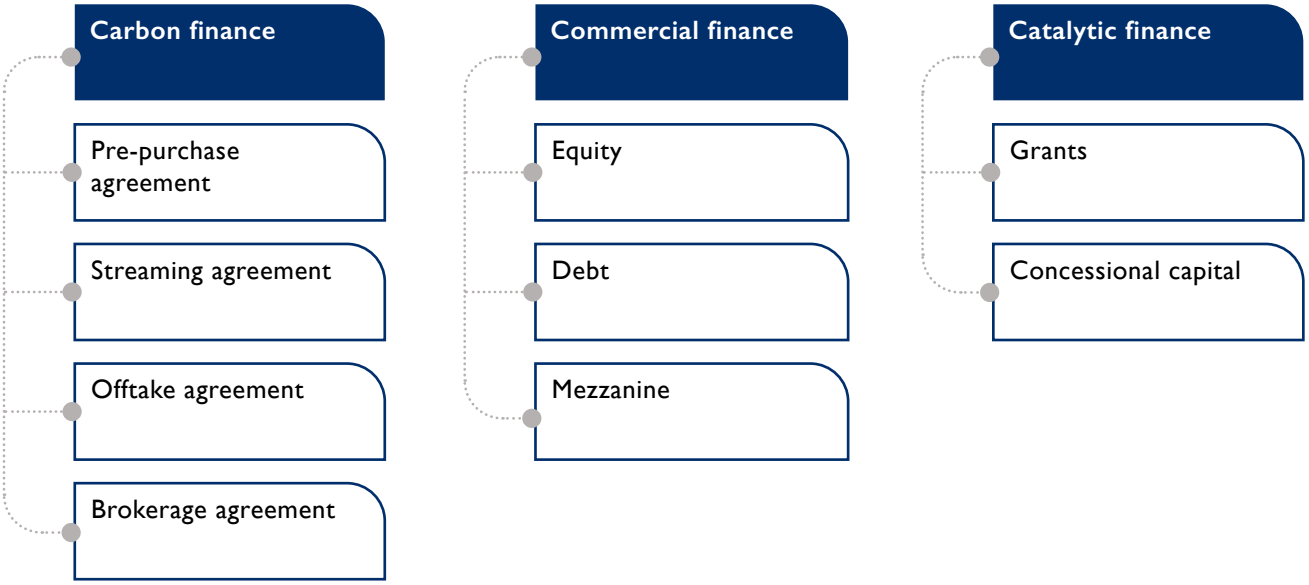
Legend: ● Non-core carbon ● Core carbon



5.3 Investment instruments for carbon projects

Available instruments for carbon projects span traditional commercial and concessional debt, equity, mezzanine instruments; grants; and a range of carbon specific instruments (Figure 26).

Figure 26. Summary of investment instruments for carbon projects



Carbon finance from strategic investors is the most common form of financing for core-carbon projects today.

Carbon finance refers to investments that seek returns in carbon credits rather than cash. Carbon finance can be provided directly by corporate buyers, but today it is more commonly provided by intermediaries such as carbon brokers and retailers. Carbon finance instruments provide upfront funding and/or agreement for future purchase of carbon credits, which provides greater certainty of future revenues. However, this comes at the expense of a discounted price for the carbon credits.

There are four key carbon finance instruments used today: pre-purchase agreement, streaming agreement, offtake agreement, and brokerage agreement.

Pre-purchase agreement

In a pre-purchase agreement, the buyer provides upfront capital to support project development in return for delivery of carbon credits when they are issued. Typically, a pre-purchase agreement specifies a fixed volume of credits to be delivered to the buyer, as well as the price at which the buyer is pre-purchasing these credits. For instance, a pre-purchaser might buy 500,000 credits at US$8 per ton, resulting in a US$4 million up front payment to the project. Pre-purchase agreements can be used to fund the project in various stages, including earlier stages, although it is typically provided after the submission of the PDD. Pre-purchase agreements typically include non-delivery clauses for the developer. Section 5.4 discusses various ways that a developer may be required to compensate the buyer if credits fall short of the agreed volume.

Streaming agreement

In a carbon streaming agreement, the buyer provides upfront capital (the "streaming deposit") to fund project development in return for a percentage of future credits issued over a specified period, known as a "stream." Streaming agreements were first pioneered in mining to fund early stage exploration of a site whose production volume was unknown. They are beneficial to the developer because the risk is fully shared – if the project produces more than the expected volume of credits, both developer and investor benefit, and if it underproduces both share in the downside. The instrument has characteristics of both equity and debt. It is equity-like in the risk-sharing and lack of dollarized repayment obligations or covenants, and debt-like in typically holding a senior, secured position in the project.

The buyer will set the size of the streaming deposit based on expected production and an implied price. However, the actual volume of credits delivered is entirely based on the project's performance. For example, a stream funder may pay US$10M to receive 50% of credits, at expected total production of 2,000,000 credits – an implied price of US$10 per credit. If the actual production is 4,000,000, the stream funder receives 2,000,000 credits – an implied price of only US$5 per credit. However, if actual production is only 500,000 credits, it will receive 250,000 credits – an implied price of $40 per credit.

Offtake agreement

Under an offtake agreement, the buyer commits to purchasing a predetermined volume of carbon credits in the future, after these credits have been issued, at an agreed fixed or variable price. In contrast to pre-purchase and streaming agreements, offtake agreements do not provide upfront funding. However, by providing a commitment to purchase credits in the future, these agreements help provide certainty around future project revenues, which is key to unlocking project finance.

Offtake agreements are commonly used in infrastructure projects and in commodity markets to manage risk and secure financing. One of the most common types of offtake agreements is a Power Purchase Agreement (PPA) in the energy industry. In theory, offtake agreements should enable carbon projects to attract lower risk equity or debt capital. However, long-term offtake contracts are not commonly used today outside of large carbon credit buyers in the energy sector, and some brokers and retailers of credits. Corporates still largely prefer the flexibility of purchasing on the spot market post-issuance. However, as demand continues to grow and supply of high-quality projects is limited, offtake agreements may become a more common tool for corporates wishing to secure future supply of credits, and to price carbon liabilities on their balance sheets.

Brokerage Agreement

In its simplest form, a brokerage agreement (or marketing agreement) is a contract through which a carbon broker agrees to sell all or a portion of the carbon credits generated by a project in exchange for a percentage commission on the value of the credits sold. Under the agreement the broker typically receives the exclusive right to sell a specified volume of carbon credits. This arrangement helps the developer ensure that credits are sold efficiently to a range of buyers, at a high price. However, it does not guarantee future revenues to the developer as the broker bears no legal liability if it fails to sell the credits.

Simple brokerage agreements do not provide any upfront financing and the brokers typically earn commission (5-10 percent). The higher the commission, the more valuable the brokerage agreement is to the broker. As a result, high-commission brokerage agreements can be sold to brokers to raise project development capital. The higher the commission, the more a broker will be willing to pay upfront. These types of high-commission brokerage agreements can exist as standalone contracts, or they can be combined with pre-purchases or other types of upfront financing.

Project-level commercial finance can play a significant role in scaling carbon projects, but it remains limited today.

Equity

Equity is capital invested in return for an ownership stake in a project or company. Equity investors typically realize their returns through cash dividends, sale to another investor, or through management buy-back. Some equity investors require majority stakes and accompanying governance rights, while others are happy with a minority position as long as there are sufficient investor protections in place.

Equity is limited at the project level. This is because most private equity investors – including impact investors – are not comfortable with the risk associated with pure carbon projects. They usually do not have the expertise required to properly diligence carbon market risk, and their investment thesis may not support a high degree of exposure to carbon prices. Offtake agreements that guarantee revenues may alleviate some of this market risk and make the project more attractive to new investors. However, offtake agreements may also limit potential returns, making it difficult to achieve the typical 20%+ IRR required by equity investors in these markets. Finally, equity investors will have questions about exit opportunities for carbon projects, as there are currently no robust secondary market or comparable transactions to benchmark potential exit valuations.

Debt

Lenders look primarily to cash flows as the source of repayment, and to the assets of the project or company as collateral for the loan. Loan terms including interest rate, repayment schedule, and covenants vary and are structured to align with expected cash flow to ensure that the loan can be successfully repaid.

Debt for carbon projects typically needs a longer tenor, and it may also need a lengthy grace period particularly for restoration projects where it can take up to five years for credit issuances to begin. For the project, benefits of debt include tax-deductible interest payments, a lower cost of capital than equity, and the ability to retain ownership of the project and credits. However, debt can increase financial risk if the project's cash flow is not sufficient to service the debt, for example, if there are delays in issuance and verification, or if an extreme weather event impacts the project and is not covered by insurance.

The availability of debt has been limited for pure carbon projects for several reasons including lack of risk data, difficulty liquidating assets in the event of default, difficulty in many jurisdictions to use land as collateral, difficulty predicting cashflows given carbon credit price uncertainty, and lack of internal expertise with lenders to originate and evaluate creditworthiness of carbon projects.

As carbon markets become more established, multiyear offtake agreements may become more common, which would help unlock project-level debt by providing certainty of future revenues. An operational project with an offtake agreement in place would present significantly lower risk to a lender. This is especially true given that the primary remaining risk would be the credit risk of the offtaker which is typically a blue-chip multinational company with low risk of non-payment.

Mezzanine

Mezzanine financing is a hybrid of debt and equity. Mezzanine financing is usually subordinated to debt from senior lenders such as banks and other financial institutions, but it has priority over equity investors. Mezzanine financing is higher risk than debt and lower risk than equity, so it is typically priced somewhere between the two. Structures may include paid-in-kind interest and conditions for conversion from debt to equity (e.g., warrants). Mezzanine structures are often used in the impact investing space in emerging markets because they offer greater flexibility.

Mezzanine instruments are emerging in the carbon space and include:

- **Convertible debt:** Convertible debt is short-term debt that converts into equity at the occurrence of a triggering event, such as a subsequent qualified financing round. It carries a principal amount, an interest rate, and a maturity date. However, the interest is typically accrued and eventually converted into equity along with the principal amount. If the conversion-triggering event does not occur within the specified timeframe, the company or project is obligated to repay the debt to the investors. To compensate investors for taking on the early-stage risk associated with convertible debt, investors benefit from terms that make conversion to equity advantageous relative to new investors in the same round.

- **Revenue-based financing:** Revenue-based financing provides carbon projects with upfront cash in return for a percentage of future revenue over a specified period of time, or until the investor reaches a target IRR or cash multiple.

Both core-carbon and non-core carbon projects often rely on the developer's balance sheet as a source of capital in the early stages.

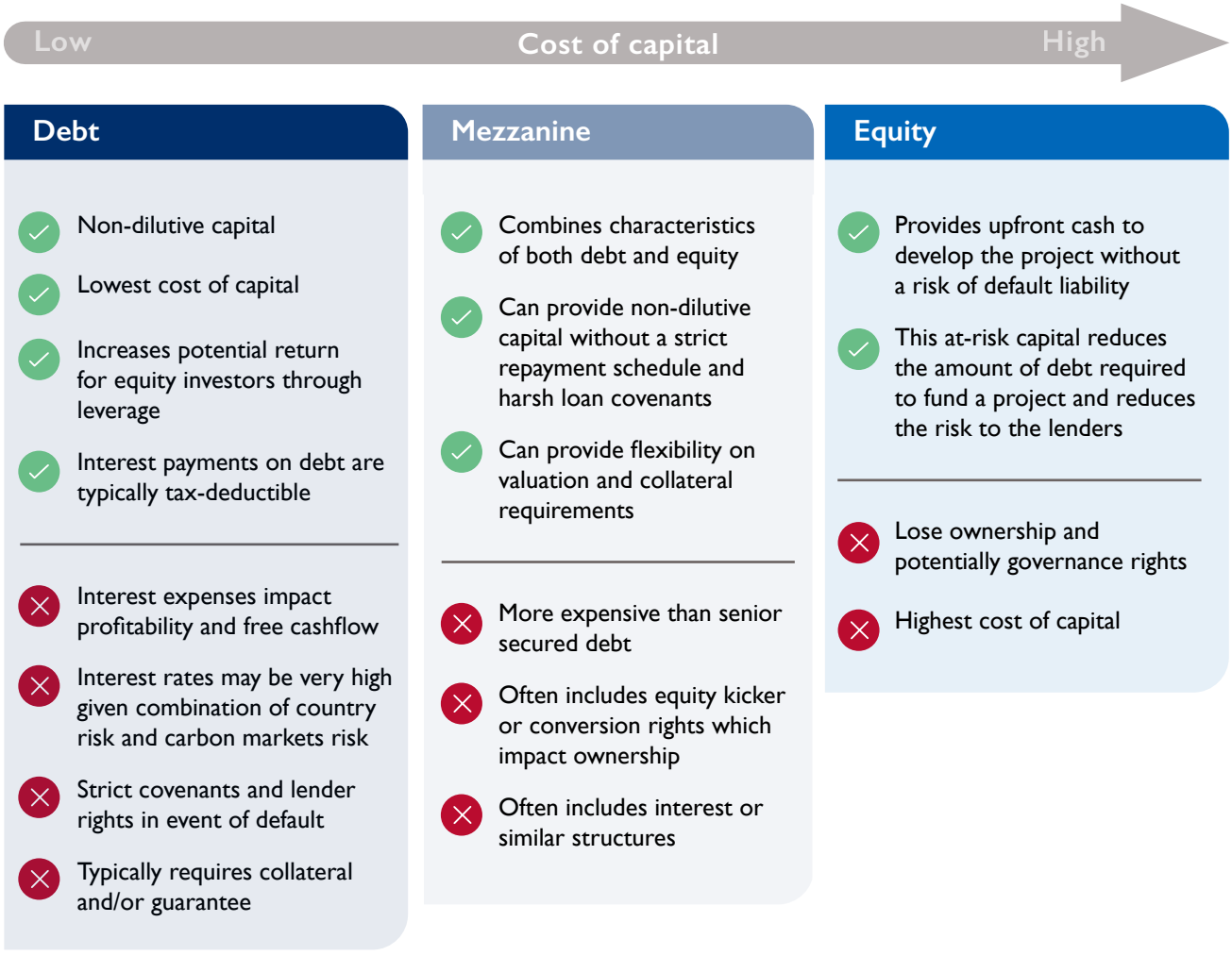
Companies and carbon project developers typically use their own balance sheets to fund the early stages of project development. To this end, they may utilize existing financial resources or engage in fundraising activities at the company level to secure the necessary funds to conduct feasibility studies and other early-stage activities.

Companies with business models beyond carbon have greater access to financial investors, but they may also raise carbon finance at the company level. Carbon project developers likewise can secure financial investment in the form of equity, mezzanine, or debt which is

then used to fund project development. They can also raise carbon finance or equity from strategic investors who are seeking preferential access to the portfolio of projects that will be developed.

Equity investment into the developer not only ensures that the developer is well-resourced to develop the desired projects, but it also increases alignment between the investor and the developer. The equity investment may come with a Right of First Refusal to finance the developer's pipeline, or to purchase or broker credits. Equity investment into the developer is typically targeted towards more sophisticated developers with strong potential for growth and scale.

Figure 27. Advantages and considerations for commercial financial instruments, from the developer's perspective



Grants and concessional capital can play a key role in the early stages of carbon project development, particularly when it comes to de-risking, supporting innovation, and enhancing community impact.

Grants and Concessional Capital

Concessional capital refers to funding provided under more favorable or flexible terms than those available in the market. Capital can be concessional on the target return (with grants being the most concessional), hurdle rate, interest rate, tenor, grace period for repayment, subordination, collateral requirements, or other terms – sometimes but not always in combination. It is typically provided by organizations with a social or environmental mission, such as governments, development finance institutions, international NGOs, impact investors, foundations, and some family offices.

Concessional funding is a scarce and valuable resource, and when evaluating its potential uses in an investment context, it is critical that it does not crowd out private capital, but rather plays a catalytic role in the transaction and crowds *in* participation from the wider market.

Concessional funding can be uniquely impactful in supporting pioneering carbon companies, projects, and funds. Unlike in established markets, carbon project developers and other first-movers face a **"pioneer penalty"** whereby they face higher costs yet generate public goods that benefit those who follow.[29] For carbon projects, these costs can come in the form of:

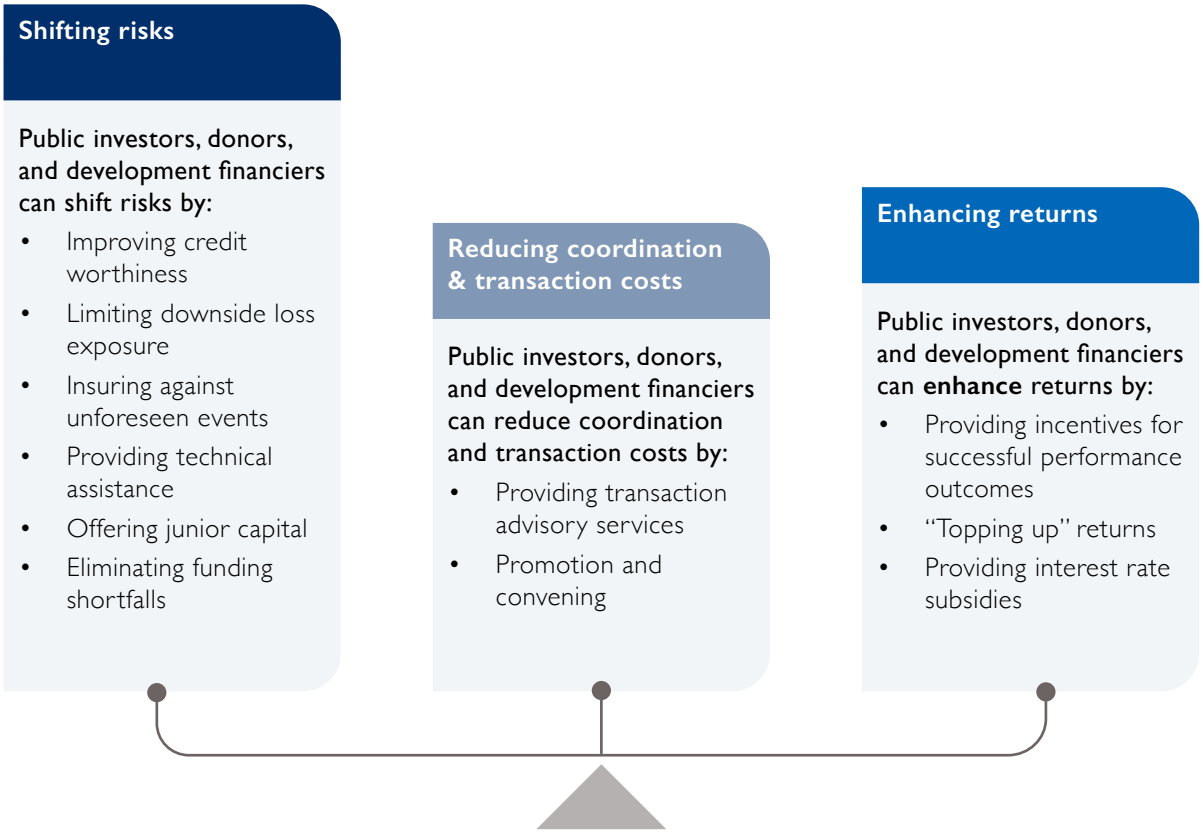
- Investment in training to equip the local workforce with the skills to manage carbon projects
- Testing of the regulatory environment, educating government stakeholders, and informing policy development in real-time
- Vertical integration to fill infrastructure or value chain gaps such as setting up tree nurseries
- Buyer education in a growing but low-trust market
- Developing new carbon methodologies
- Conducting ecological surveys and data collection in regions where this information is not provided by the national government
- Supporting local communities to secure land tenure and establish legal community organizations in order to have a counterparty for negotiation of carbon rights and benefit sharing agreements
- Educating the public about the project's integrity and impact on the ground
- Educating investors about carbon markets and local context

29 Collier, et al. Pioneering Firms in Fragile and Conflict-Affected States Why and How Development Finance Institutions Should Support Them, Policy Research Working Paper 8774, World Bank and International Finance Corporation, 2019. https://openknowledge.worldbank.org/handle/10986/31400

These costs are not fully covered by carbon credit buyers, and so they cannot be recuperated by commercial investors. However, these activities not only support the individual project's success but have wide-ranging impact on the market at large, making it easier and less costly for others to follow. This gives strong justification for subsidizing first-movers through targeted grants and concessional capital.

Within the context of a specific transaction, **blended finance** is the use of catalytic capital to de-risk a project or increase its returns, thereby crowding in commercial investors to an opportunity that would otherwise not meet their required risk/return. Blended finance can also reduce coordination and transaction costs. Figure 28 illustrates these goals.

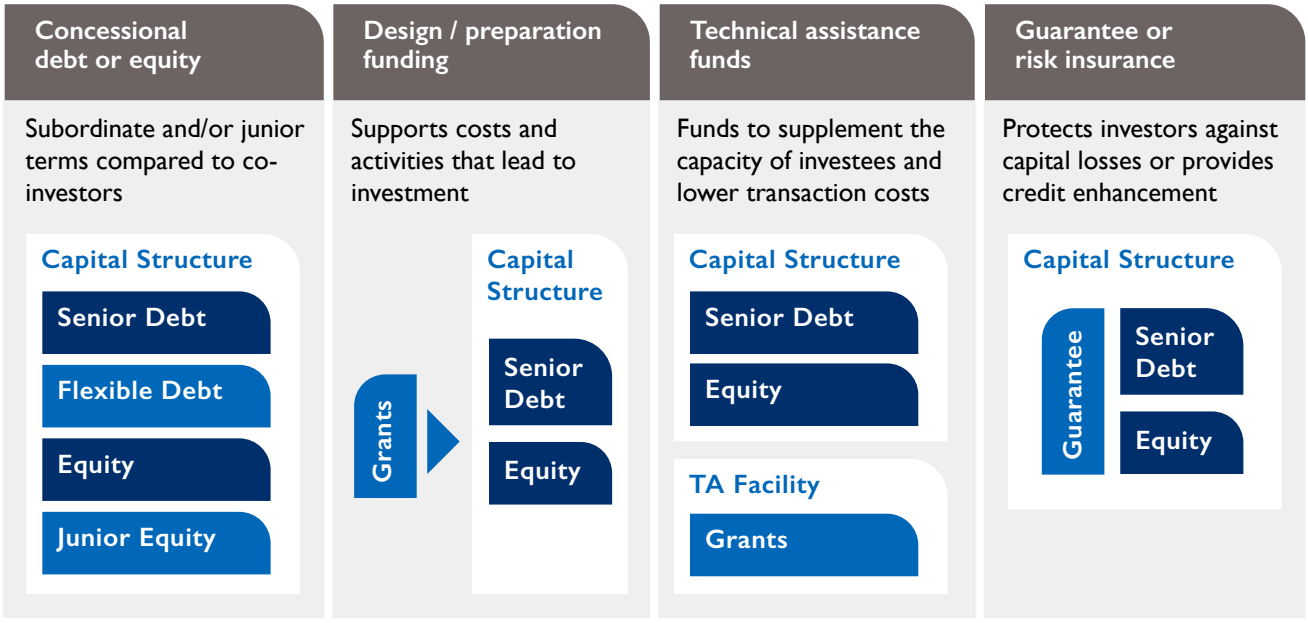
Figure 28. Advantages and considerations for commercial financial instruments, from the developer's perspective[30]



Blended finance typically takes one of four forms: concessional debt or equity, design or preparation funding, technical assistance funds, and guarantee or risk insurance (Figure 29).

30 CrossBoundary, Adapted from Convergence Blended Finance

Figure 29. Blended finance structures[31]



5.4 Other deal terms

Carbon finance agreements also include terms related to non-delivery of credits which can have significant implications for the management of a project.

Carbon finance agreements include clauses defining the consequences of non-delivery of carbon credits. Agreements also include a clear definition of events triggering these non-delivery consequences, as well as resolution mechanisms. Non-delivery triggers can include, amongst others:

- Credit issuance that is a certain percentage lower than anticipated over a certain timeframe
- Failing to meet an agreed minimum production volume over a certain timeframe
- Receiving a certain rating from a credit rating agency or other industry body
- Cancellation of the project by the carbon standard
- Major loss event(s) due to natural disaster
- Failing to meet certain quality standards such as the application of Corresponding Adjustments

31 Convergence Blended Finance

The consequences of non-delivery can vary, with some terms less favorable for sellers than others (Figure 30).

Figure 30. Key terms for consequences of non-delivery and their implications on developers

Range of non-delivery terms	Implications for developer
Termination	
The buyer terminates the agreement if the seller fails to deliver the specified carbon credits.	This is typically the minimum consequence for non-delivery. Termination would be included alongside other terms.
Replacement of credits	
The buyer may stipulate that compensation should be in the form of carbon credits. This requires the developer to provide credits from its other projects or purchase credits from third party projects, often with specifications matching those of the non-delivered credits, such as carbon credit type, quality, and vintage.	If the project has failed, the developer may not have sufficient cash to purchase credits from third-party projects, and supply constraints may make it difficult and costly to purchase matching credits. Meanwhile, cross-project delivery guarantees mean that the developer cannot ringfence risk, and so a single project failure could put the entire company including its other, unrelated projects at risk.
Cash penalties	
The developer may face an obligation to pay the buyer the cash value of the non-delivered carbon credits, or other financial penalty for non-delivery. The pricing of these credits can be tied either to the offtake price or spot market price. The obligation can sit at the project level, or it can be backed by the parent company.	If the project has failed, the developer may not have sufficient cash to repay its obligations. If there is recourse to the parent company, this can be a significant risk to the developer. If the project has not failed but is under-delivering, payment will substantially reduce the developer's returns.
Conversion to equity	
The buyer has the option to convert the value of non-delivered credits into equity in the project or developer at pre-defined conversion terms. This provision can be linked to specific project milestones. For instance, if the project is not validated by a specified deadline, the buyer has the right to convert its investment into equity.	Although this entails the developer relinquishing some ownership, it may be preferable to default or cash repayment.
Step-in rights	
The buyer steps in to replace the developer to execute the project (either themselves or a third party depending on the entity's capabilities).	Developer loses control over the project and carbon rights which sit with the SPV. The developer may exit the project altogether through sale of equity stakes.

There are additional terms related to security, rights, and governance that are common across carbon finance and investment agreements.

Below is a non-exhaustive list of other terms that may be present:

Governance

- **Voting rights:** Specifies how much power each shareholder gets when voting on decisions such as payout of dividends, issuance of new shares, liquidation of the company or project, and more
- **Board rights:** Specifies which investors sit on the board and what rights they have – including representation on committees – generally pertaining to aspects such as hiring or firing of senior management, compensation, audit, and dividend policies
- **Information rights:** Specifies the frequency with which the company is required to share information with investors and what type of information must be shared

Security

- **Collateral:** Specifies the assets that the lender can seize and sell in case of non-repayment of debt. Collateralization may be more difficult for carbon projects, given the lack of assets and the fact that land rights may sit with the community or government rather than the developer
- **Parent company guarantee:** Specifies the terms under which the parent company legally guarantees that the project will meet its contractual obligations. The guarantee may make the parent company liable for any breach of contract

Other rights

- **Drag-along:** If company or project is sold, minority shareholders must exit at the same terms as the majority shareholders
- **Tag-along:** Minority shareholders have the right but not the obligation to join in any action with majority shareholders
- **Redemption:** Investors have a right to demand redemption of their shares within a specific timeframe

Unlike in more mature sectors, there are not yet clear market-standard terms for investments into carbon projects. Given the complexity and potentially significant operational and financial impacts of investment and offtake agreements, projects should ensure that they have high-quality legal and tax counsel appropriate to the jurisdiction, transaction advisors as needed, and that terms are analyzed across a wide range of downside and upside scenarios and edge cases.

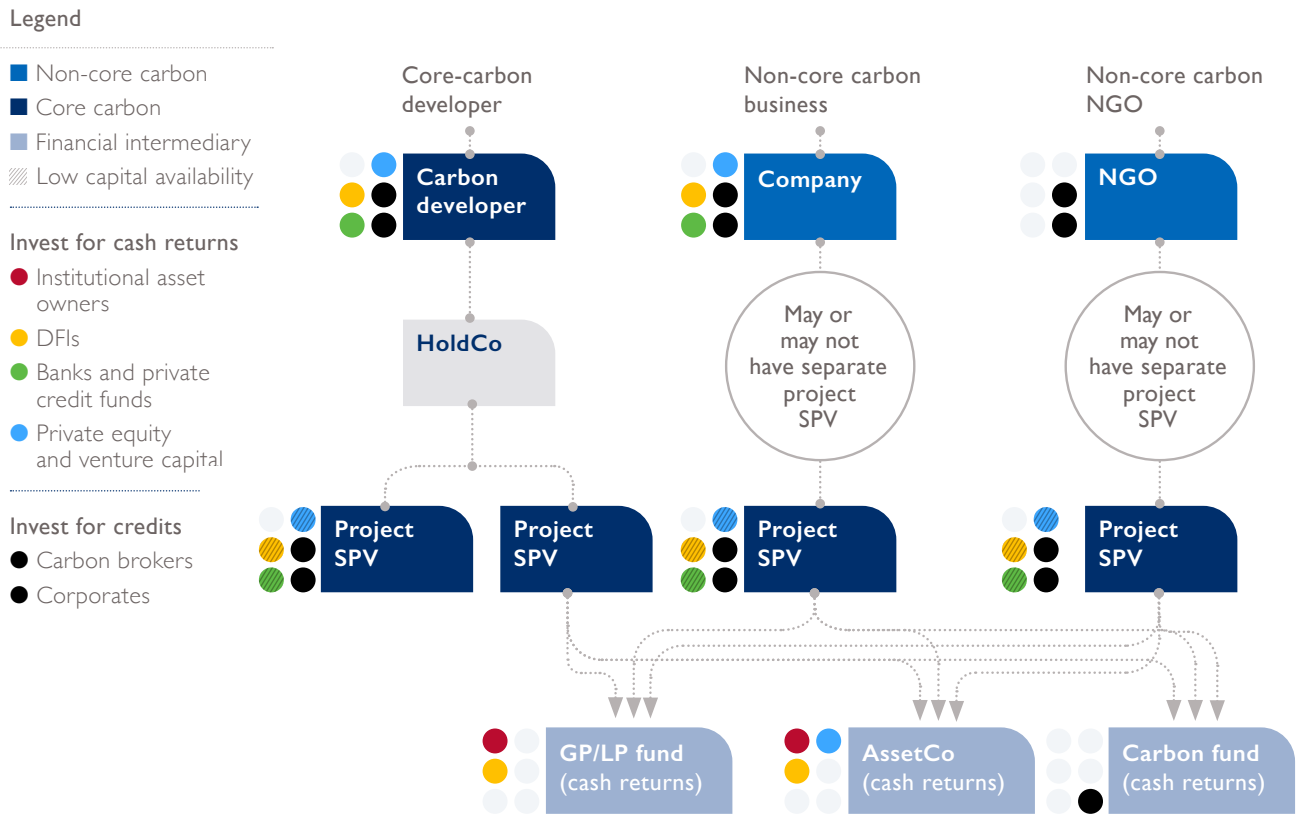
5.5 Sources of capital for carbon projects

While there are large pools of capital that could potentially be leveraged for carbon projects, in practice capital is limited by geography, risk profile, project size, and centrality of carbon to the business model.

Figure 31 shows the availability of capital from key capital sources (institutional asset owners, development finance institutions (DFIs), banks and private credit funds, private equity and venture capital, carbon brokers, and corporates) for each type of entity in the carbon project ecosystem (carbon developer, company, NGO, project SPV, and carbon funds returning cash or credits).

While this Playbook focuses on project funding, it is important to note the important role that carbon funds and asset companies play in channeling capital to projects. For example, institutional asset owners that would not be able to directly invest in a project can come into a GP/LP fund as a limited partner, or they can buy shares in an asset company (AssetCo) to achieve the necessary ticket size, aggregation, and de-risking. These financial intermediaries play an important role in aggregating projects for investment.

Figure 31. Typical sources of capital for carbon projects



There have been a number of new and promising transactions in the last two years that illustrate the increasing flow of capital in the carbon project development ecosystem in emerging markets.

A few of these are highlighted below.

In August 2022, Brazilian start-up **Mombak** raised US$100M for its investment vehicle, The Amazon Reforestation Fund, from Rockefeller Foundation, Canada Pension Plan Investment Board, and commercial investors such as Bain Capital Partnership Strategies and AXA IM Alts. Mombak aims to develop high-quality removal carbon credits through reforestation of the Amazon. Mombak's forestation strategy focuses on large-scale restoration of degraded land and generation of high-quality credits.

In early 2022, AXA IM Alts – the investment manager and subsidiary of insurer AXA – and energy group ENGIE backed agroforestry start-up **Shared Wood Company (SWC)** through US$500M of equity and carbon credit offtake agreements. SWC will combine conservation, reforestation, and agriculture across Africa and Latin America to generate 40M credits.

In 2022, **KOKO** received equity investment from Microsoft Climate Innovation Fund along with a group of venture capital and family office investors. In 2023, Japanese corporation ITOCHU Corporation signed an agreement with KOKO to finance the company's expansion and jointly market a portion of KOKO's credits. Thanks to carbon finance, the company - which employs more than 2,000 people - has delivered over $100 million in the form of discounts to its customers.

Founded in 2013, US-based climate finance provider, **Aspiration**, invested US$21M in 2023 in sustainable agroforestry projects in Western Kenya implemented by the non-profit organization **Trees for the Future (TREES)**, which trains farmers across Sub-Saharan Africa. The projects aim to create 15,000 ha of regenerative agroforestry land and generate over 4M credits. More recently, **Meta** purchased in advance 6.75M carbon removal credits from Aspiration with an expected delivery from 2027 through 2035.

Founded in 2020, **Climate Asset Management (CAM)** is a joint venture between HSBC and Pollination dedicated to investing in natural capital. In 2021, CAM announced the Restore Africa program, a US$150M program in partnership with the NGO **EverGreening Alliance** aiming to restore more than two million hectares of land and support over two million smallholder farmers over five years across six Africa countries.

Founded in 2014, **BURN Manufacturing** is an international cookstove company with a production facility in Kenya that has an annual production capacity of three million cookstoves. In 2022, BURN Manufacturing received US$4M in long-term quasi equity (mezzanine investment) from the Spark+ Africa Fund, a joint venture between the investment advisor Enabling Qapital and the Netherlands-based foundation Stitching Modern Cooking (SMC). During the same year, BURN Manufacturing also received a streaming investment from Key Carbon, structured under a joint venture. In October 2023, Burn announced a US$10M green bond with proceeds used to expand manufacturing capacity and open a new factory in Nigeria.

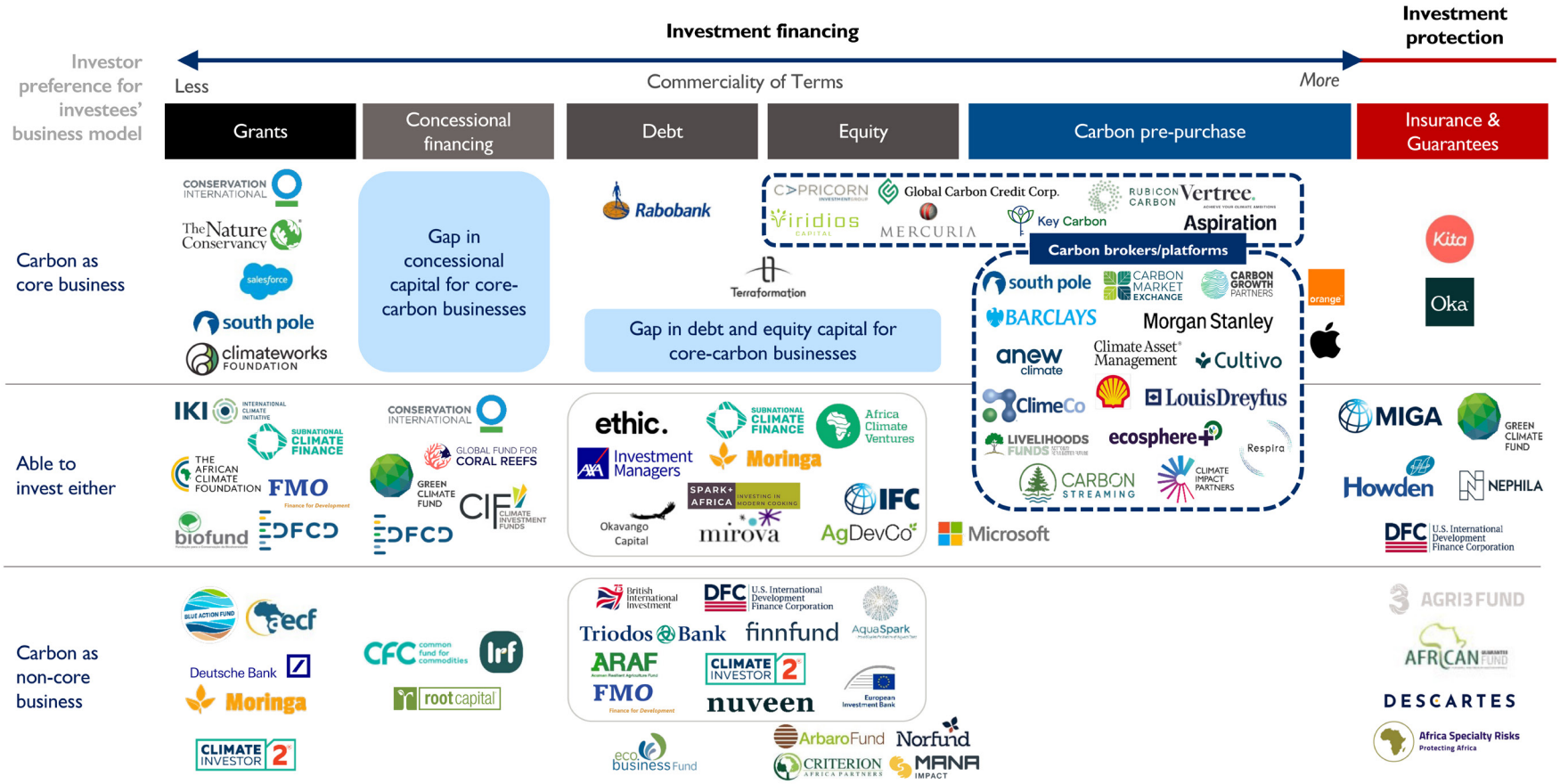
Mapping the landscape of capital providers for carbon projects in Sub-Saharan Africa reveals the dominance of carbon finance and limited concessional capital.

Figure 32 illustrates a non-exhaustive mapping of potential capital providers across instruments and carbon business models in Sub-Saharan Africa. Key takeaways include:

- **Limited concessional funding:** There is a lack of grants and concessional financing available to projects and companies that rely on carbon credits as their primary revenue stream. Grants are primarily provided by foundations and international NGOs. Concessional financing is provided by foundations and DFIs but primarily to non-core carbon companies. Funding that is available is often not sufficient to bridge the gap to investment-readiness.
- **Dominance of carbon finance:** Many investors open to core-carbon business models are carbon credit buyers or brokers who will invest directly into the project, and/or into the developer in order to get preferential access to projects.
- **Limited investment in core-carbon projects:** Most investors willing to invest debt, equity, and mezzanine are DFIs, impact investors, and financial investors, but they tend to invest in non-core carbon companies and projects, or into the carbon project developer at the company level rather than project level.

These trends in Sub-Saharan Africa largely reflect those in other emerging and frontier markets, though the lack of financial investment into carbon projects is more prominent than in regions with more mature domestic financial markets and more established project developers, such as in Latin America and Asia.

Figure 32. Map of potential capital providers for carbon projects in Africa (non-exhaustive)



6

MOZAMBIQUE DEEP DIVE

Understand carbon market regulations, risks, and opportunities for projects in Mozambique

This chapter presents a deep dive into the Mozambique context. It serves as a practical guide for project developers, investors, donors, and policymakers looking to understand the regulatory landscape (6.1), state of carbon project development (6.2), and risks and mitigation (6.3) either for use themselves or as a point of comparison across geographies.

6.1 Carbon regulatory landscape in Mozambique

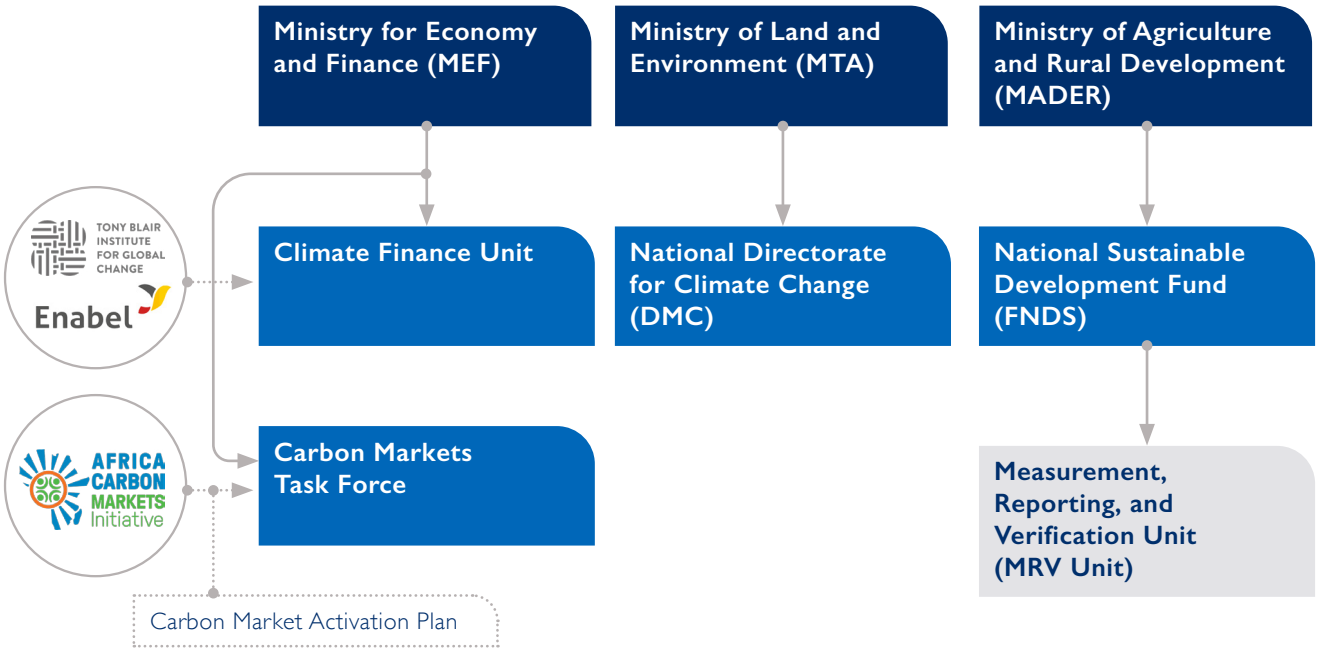
In 2018, Mozambique passed the regulatory framework that still governs carbon development in the country today.

Known as the REDD+ Decree, this regulation lays out the process through which carbon projects are licensed and registered, as well as the roles and responsibilities of various regulatory bodies with respect to carbon projects. Most countries lack any regulatory framework for the voluntary carbon market, so this Decree puts Mozambique ahead of many other African countries when it comes to carbon policy.

Regulatory institutions

Figure 33 below shows the relevant institutions within and outside the Mozambican government driving the country's carbon market policy and regulatory framework. While the list is not exhaustive, it reflects the institutions most relevant to project developers as of October 2023.

Figure 33. Governmental and non-governmental agencies involved in advancing carbon markets regulation in Mozambique[32]



Fundo Nacional de Desenvolvimento Sustentável (FNDS)

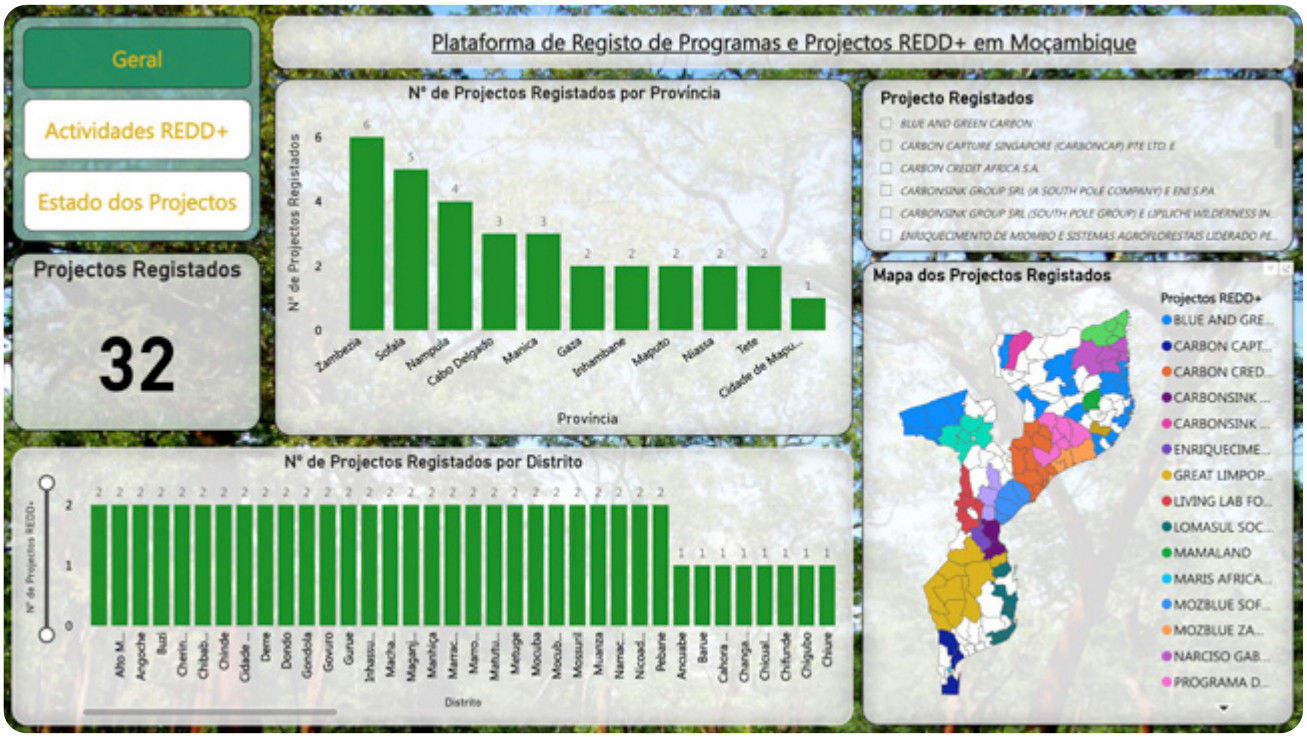
National Sustainable Development Fund

FNDS was established to support the development and financing of rural businesses in Mozambique. The entity now also has the primary authority to approve licenses for REDD+ projects applying through the REDD+ Decree process. The decision to approve an application also involves the provincial leaders responsible for environmental protection. FNDS collects the majority of the application fees paid by REDD+ project developers and, in return, provides technical support for REDD+ projects. FNDS is responsible for reviewing the MRV done by project developers, registering and tracking projects in the national emissions registry, and providing technical support for the reporting of emissions outcomes to the United Nations Framework Convention on Climate Change (UNFCCC).

FNDS Measurement, Reporting and Verification (MRV) Unit

The MRV Unit is the technical arm of FNDS responsible for country-wide deforestation monitoring and baselining. Technical support from the World Bank's Forest Carbon Partnership Facility (FCPF) has made Mozambique's MRV Unit particularly strong for the region. The MRV Unit monitors all land use change in the country through a combination of remote sensing and on-the-ground measurement, and it maintains a database (Figure 34 and available **here**) of all REDD+ projects under development in the country.

Figure 34. Snapshot of Mozambique REDD+ projects online database



Ministério da Economia e Finanças (MEF)
Ministry for Economy and Finance

MEF and the MEF Climate Finance Unit have the authority to impose taxes on REDD+ projects. Currently there is a two percent tax on carbon credits whereby the central government will retain two percent of the credits generated by any carbon projects governed by the Decree. Once FNDS has verified the MRV done by the project developer, MEF has the authority to issue certificates of emissions reduction. These certificates grant the holder of the certificates (i.e., the project developer) the right to transfer and trade them. MEF also has the responsibility for registering all carbon certificate transactions. It should be noted that this process has not yet been completed in practice for any private carbon projects. In addition to the carbon-specific tax, for-profit carbon project developers will also be subject to corporate income taxes and withholding taxes.

Carbon Markets Task Force

The Carbon Markets Task Force is a cross-sectoral effort established under MEF. Convened with the support of the Tony Blair Institute and the Belgian Development Agency (Enabel) the taskforce is working to establish governance and best practices for carbon market development in Mozambique.

The taskforce will soon be supported by key donors in the country through the African Carbon Markets Initiative (ACMI). ACMI will be supporting the Government of Mozambique to develop a Carbon Market Activation Plan that seeks to bring clarity to Mozambique's position and regulatory framework for supporting and fostering both VCM and Article 6 carbon markets. The taskforce was first convened in June, and the Carbon Market Activation Plan is expected to begin development in the fourth quarter of 2023.

Ministério da Terra e Ambiente (MTA)
Ministry of Land and Environment

Responsible for regulation of land-based activities including the issuance of land use permits (DUATs), MTA holds the authority to issue REDD+ project licenses after FNDS and the provincial governments have reviewed and approved the applications. This includes the one-year feasibility license and the 20-year implementation license.

Direcção de Mudanças Climáticas (DMC)
Climate Change Directorate

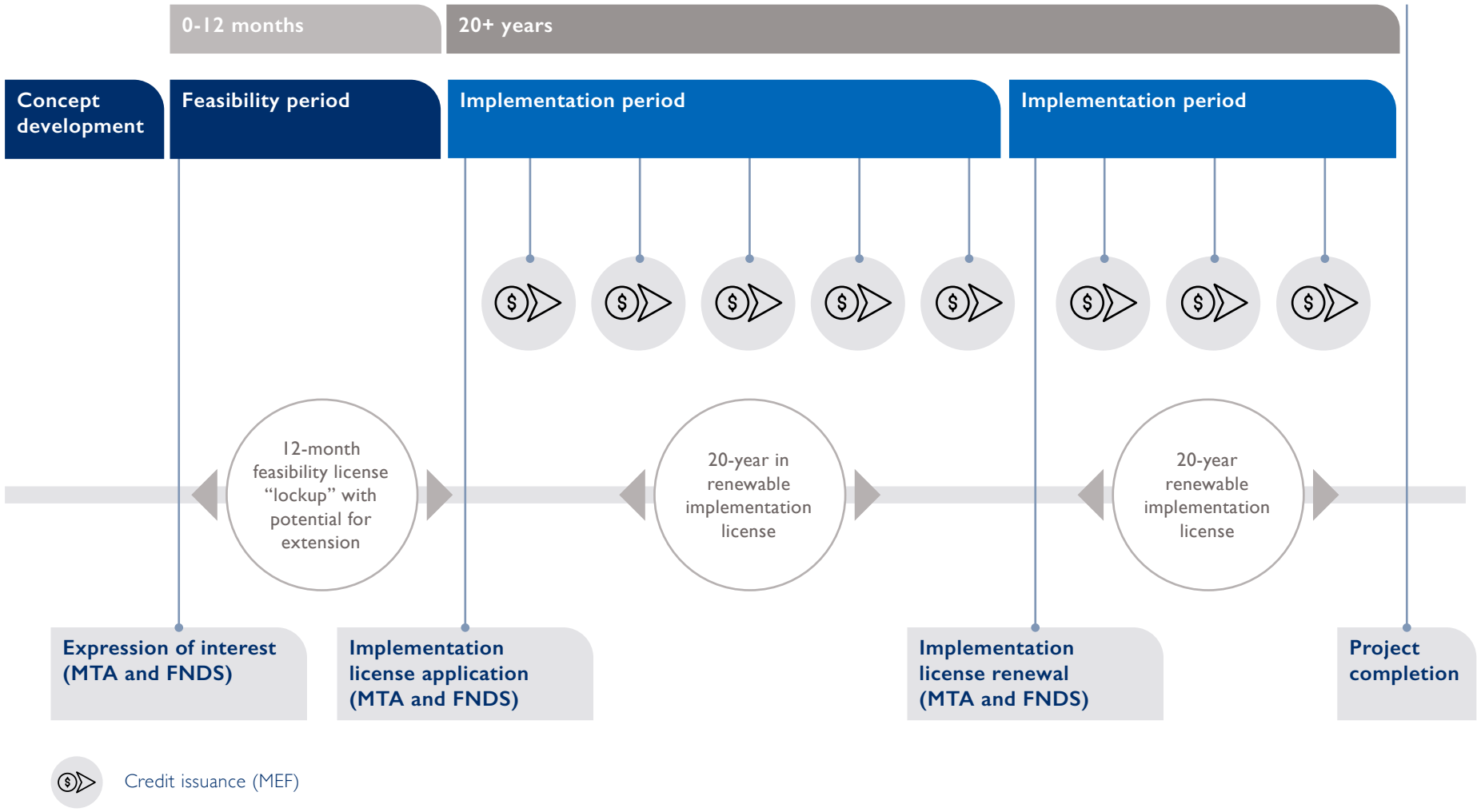
Established in 2020 under MTA to coordinate climate change activities across ministries, DMC provides technical support on environmental issues to MTA. The unit also coordinates high-level climate change reporting to the UNFCCC and for national inventories. DMC also plays a key role in the technical review of feasibility and implementation license applications under the REDD+ Decree.

Carbon Project Registration Process

Despite its progressive nature, the REDD+ Decree is not without its issues. It only applies to projects that fall under the REDD+ category, and this category is not well defined in the regulation. It is generally accepted that REDD+ in Mozambique includes all forestry-related carbon projects including afforestation, reforestation, and revegetation (ARR), improved forest management (IFM), and blue carbon, except those that deal specifically with commercial plantations. Engineered carbon projects are generally accepted to be outside of the purview of the decree, while non-forestry agricultural projects are in a grey area. There also remains ambiguity about exactly where the line for "commercial plantations" is drawn and whether forestry operations that undertake ARR projects fall under the decree. Furthermore, registration protocols mandated by the regulation are not always followed or enforced and requirements seem to evolve over time. There is also confusion as to how and when the regulation's jurisdictional (district-level) approach applies to the various project types.

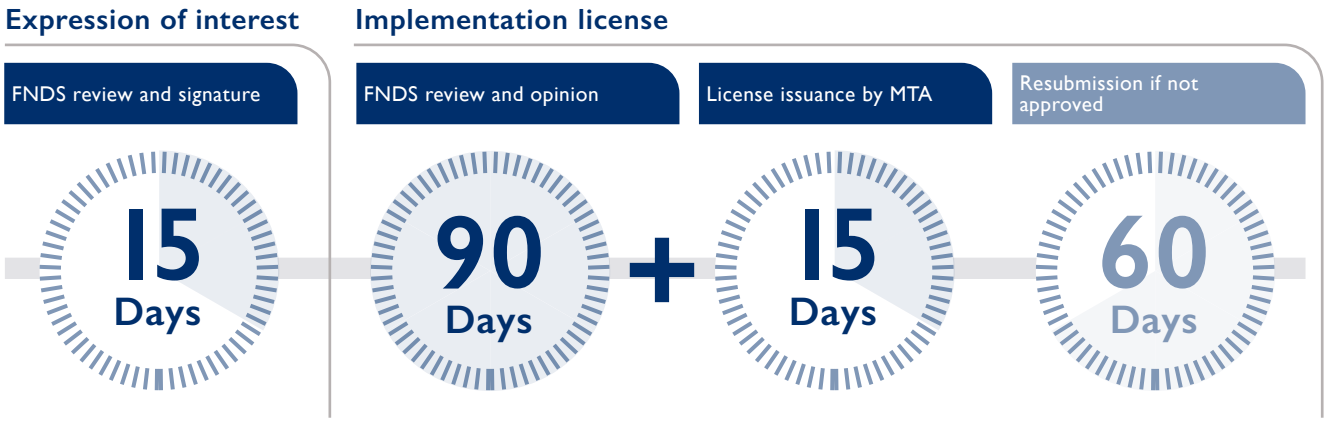
Figure 35 lays out the official process for REDD+ project registration and implementation.

Figure 35. Regulatory process for registering and implementing a REDD+ project in Mozambique



The REDD+ Decree defines clear timelines for review and approval or denial of expressions of interest and implementation licenses (Figure 36).

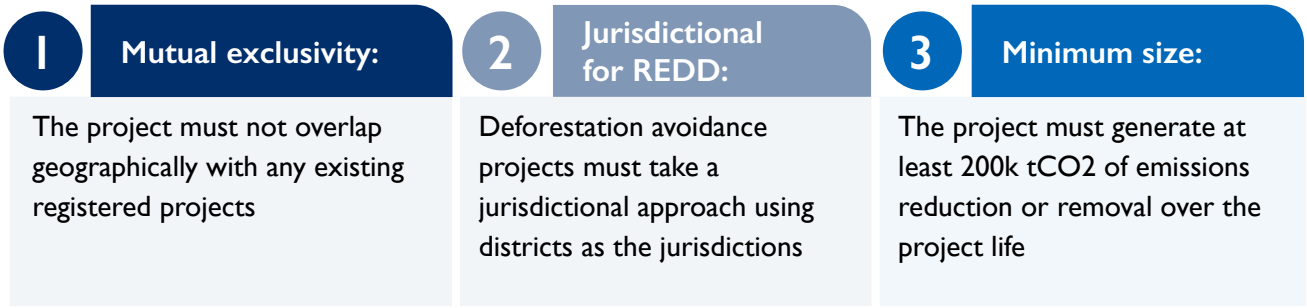
Figure 36. Review and approval timelines and durations as stipulated by the REDD+ Decree



Eligibility

To be eligible for state-issued implementation licenses under the REDD+ Decree, carbon projects must meet the three criteria shown in Figure 37 below:

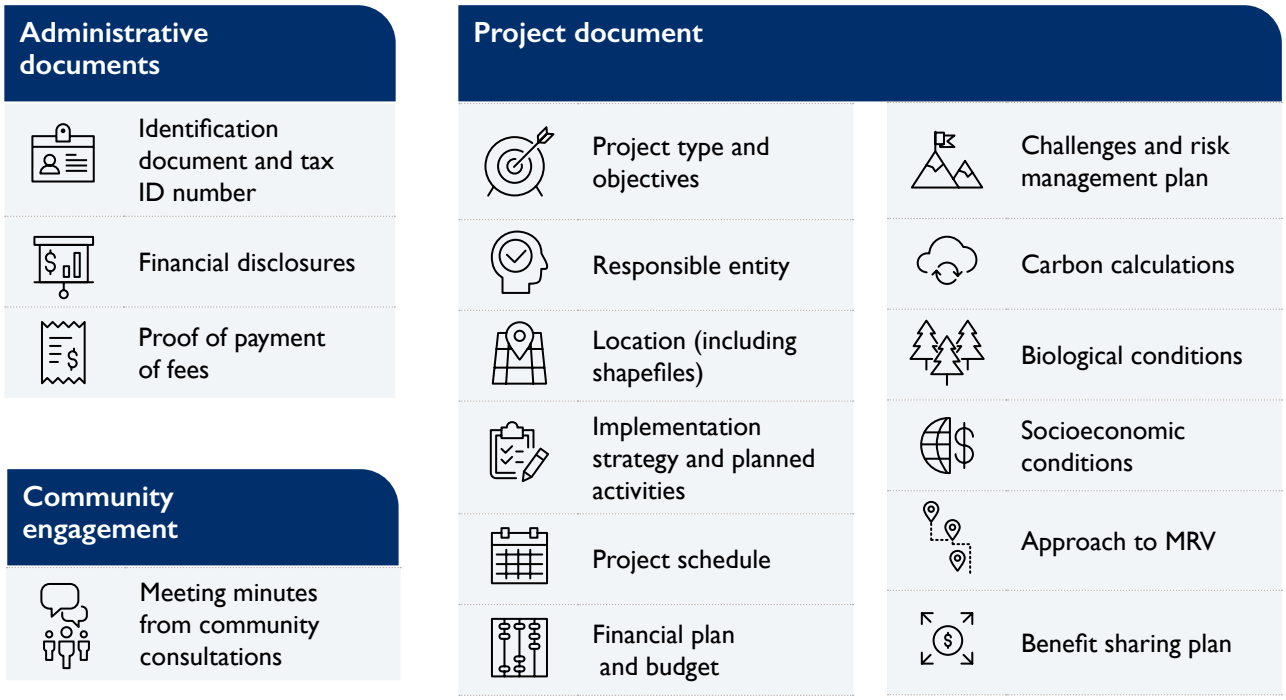
Figure 37. Eligibility requirements for projects registering under the REDD+ Decree[33]



33 Mozambique has three key administrative divisions. There is a national government that oversees the entire country. There are provincial governments that oversee each of the 11 provinces. And finally, there are district governments that oversee each of the 128 districts. These districts were selected as the jurisdictional level for use in deforestation avoidance projects under the REDD+ Decree.

Projects meeting these eligibility requirements can submit an expression of interest and receive a feasibility license, which provides an exclusive, 12-month window to conduct feasibility assessments and design the project. During this 12-month window, project developers can submit their full implementation license application. Once granted, the implementation license provides the developer with the exclusive 20-year right to implement the project. Figure 38 below provides a summary of the requirements for submitting an implementation license. For an exhaustive list of requirements and additional detail, developers should refer to the REDD+ Decree, found **here**.

Figure 38. REDD+ Decree requirements for application for 20-year implementation license

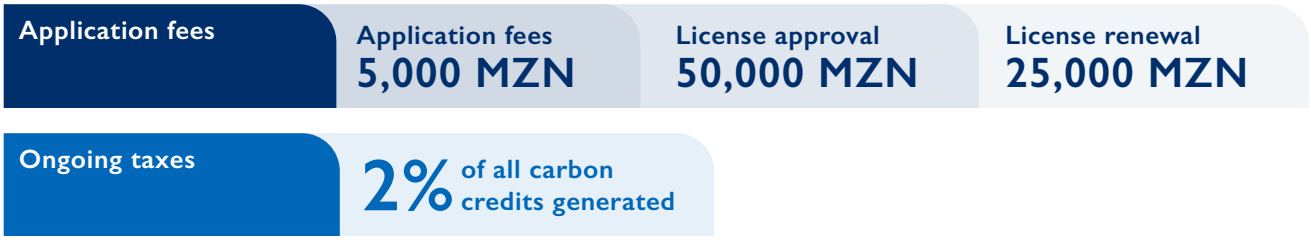


Licensing fees and taxes

Carbon projects in Mozambique are subject to several fees and taxes. By law, the government of Mozambique owns all carbon credits generated within its borders. In order to secure the rights to export these credits, carbon project developers are required to pay for REDD+ application and registration processing fees according to the schedule set out in Figure 39 below.[34]

Project developers are additionally required to pay a two percent carbon credit tax on all credits generated. This tax is unique in that it is not paid in fiat currency but in actual carbon credits. The government of Mozambique will then either sell these credits to finance the operation of the national carbon registry, or it will use the credits towards its NDC.

Figure 39. Fees associated with REDD+ project registration and licensing



Alongside laying out a process for the registration of REDD+ projects in Mozambique, the regulation also defines the roles and responsibilities of various government ministries with respect to carbon.

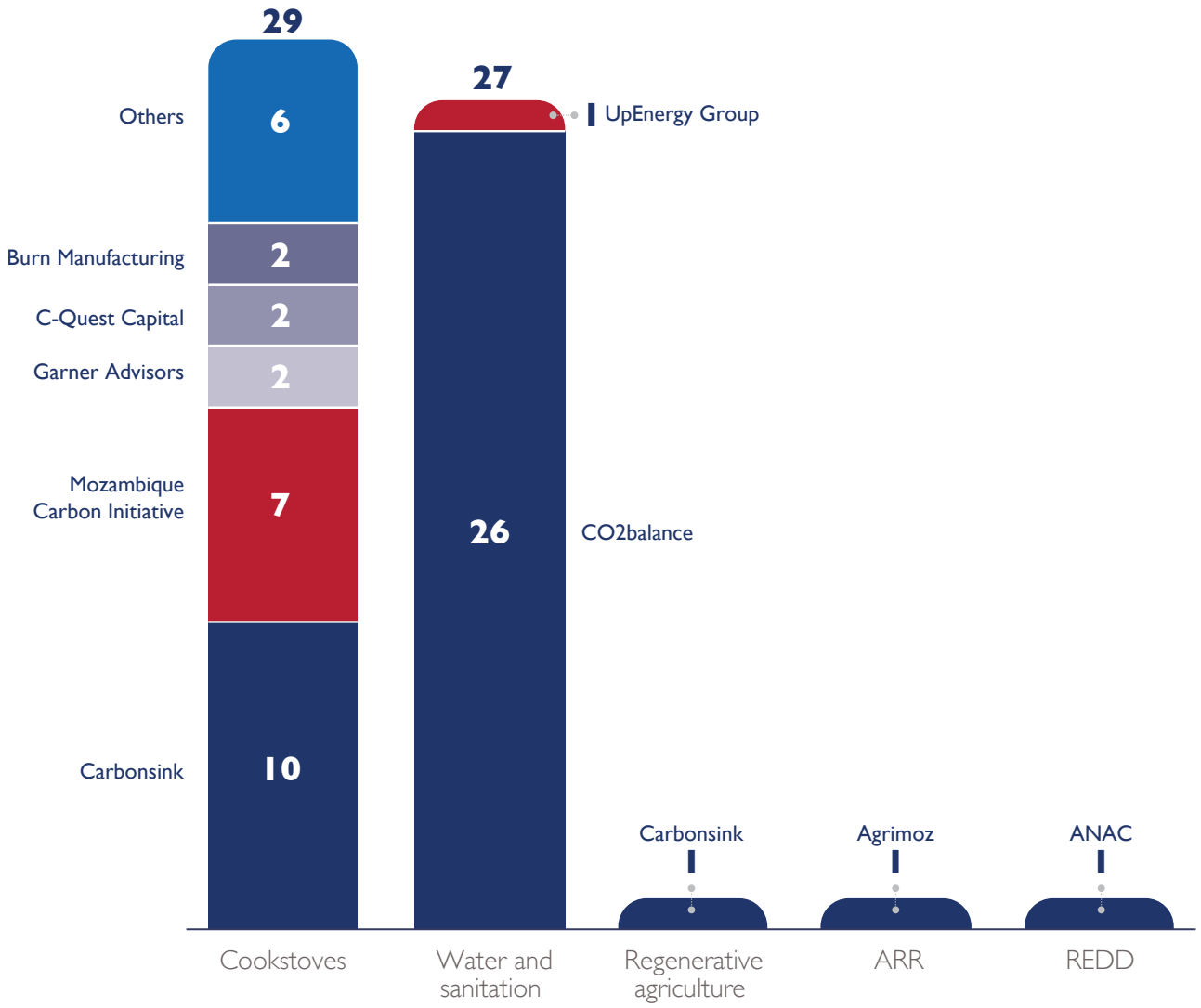
It is generally understood that nature-based project types outside of forestry (e.g., soil carbon, biochar, etc.) are not governed by the REDD+ Decree. This would leave these projects unregulated, which may seem appealing at first glance due to the lower of administrative complexity and taxation. Project developers should, however, be cautious about these unregulated spaces due to the uncertainty surrounding future regulation. Some investors are shying away from unregulated carbon markets due to the risk that future regulations may negatively impact project economics ex-post.

34 At the time of writing, on November 30, 2023, the exchange rate between the Mozambican Metical and the US Dollar was approximately 63:1

6.2 Current state of carbon project development in Mozambique

As of the writing of this report, there are currently 60 Mozambican carbon projects registered with Verra and Gold Standard. Figure 40 below provides a breakdown by project type and developer.

Figure 40. Registered Mozambican carbon projects by project type and developer (Verra and Gold Standard, as of October 2023)



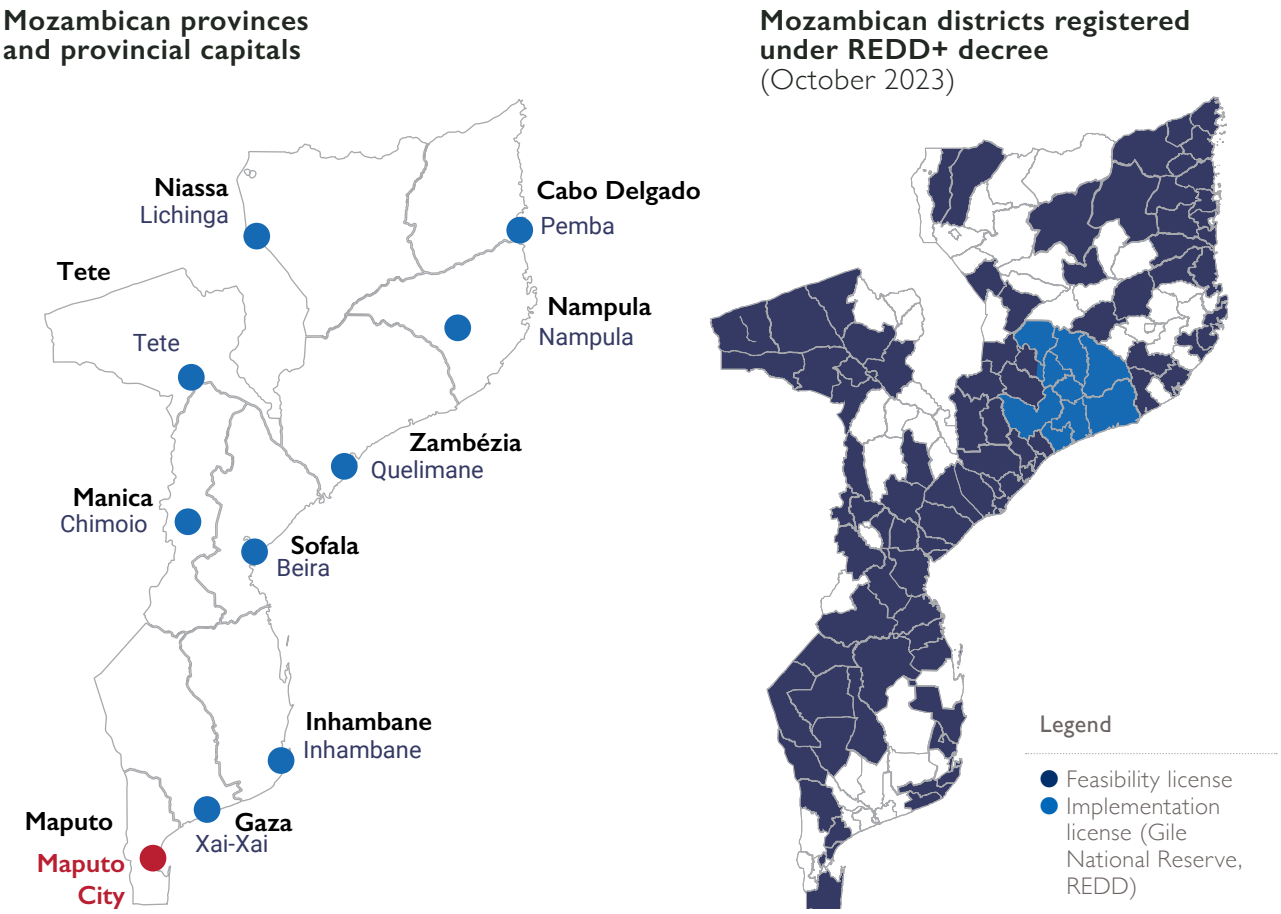
There is currently only one Verra-registered ARR project in Mozambique. It is a fruit tree agroforestry project developed by Agrimoz in Manica province generating around 30,000 tons of emissions removals per year. There is also one deforestation avoidance project registered on Verra, the Gile National Reserve project, managed by ANAC.

This project is generating around 70,000 tons of avoided emissions per year.

There is a very small climate smart agriculture project registered on Verra which was developed by South Pole (through its local entity, Carbonsink) which is expected to sequester 163 tons of carbon in the soil each year.

Despite the lack of currently operational land-based projects to date in Mozambique, the recently enacted REDD+ Decree has led to a cohort of new projects that are moving through the Government's registration process. There are currently 31 additional forest-based projects in the Mozambican project registry. Two of those projects are in the licensing phase as of October 2023, meaning they have submitted their 20-year implementation license application. These are South Pole's Lipilichi Wilderness REDD+ project in the Niassa Special Reserve, and Blue Forest's MozBlue mangrove reforestation project along the coasts of Sofala and Zambezia

Figure 41. Mozambican political boundaries as well as districts currently registered for feasibility licenses under the REDD+ decree (as of October 2023)



provinces. The remaining 29 forest-based projects have signed EOIs with the government and are in their 12-month feasibility period.

There has been significantly more activity in Mozambique with respect to clean cookstoves and WASH (water, sanitation, and hygiene) projects. There are three Verra-registered cookstove projects and 26 Gold Standard-registered cookstove projects. These projects are spread across twelve different developers and have an average size of 130,000 tCO2e avoided per year. The most active developers are South Pole (Carbonsink) and Mozambique Carbon Initiative with ten and seven projects, respectively.

There are an additional 27 registered WASH projects, 26 of them through CO2Balance and one through UpEnergy. The average project size for these WASH projects is just over 40,000 tCO2e avoided per year.

6.3 Risks and mitigation for Mozambican carbon projects

Mozambique is an attractive destination for carbon project developers for several reasons. It is rich in natural resources with the second-largest mangrove forests in Africa along the coast, extensive miombo and mopane woodland in the interior, and significant rates of deforestation. Just under 60% of Mozambique is covered in forest (as designated by IPCC standards), while grasslands are the country's second most dominant ecosystem, covering 20% of the country.

Mozambique is also on track to update the overarching regulatory framework in a way that guides and promotes development of the sector. Despite these opportunities, carbon project proponents looking to enter Mozambique should also be aware of significant risks and idiosyncrasies in the Mozambican context that can make carbon project development difficult.

Community land use and livelihoods

Mozambique has undergone significant land-use transformation, losing forest and woodland to agricultural expansion. To illustrate, between 2001 and 2016, Mozambique lost 6.2% of its forest cover, 2.7% of its grasslands, and 5.7% of its savannah, largely due to local communities' subsistence activities such as slash and burn agriculture, fuel collection, and building material collection. In fact, most local communities are barely able to scrape out a subsistence living, a situation that is complicated by infertile soil and a long dry season. Combatting deforestation and ensuring long-term success of ecosystem restoration

necessitates behavioral shifts at the individual household level, but it also requires that project developers provide alternative livelihoods – and in doing so, address the complex drivers and symptoms of rural poverty.

The costs and operational complexities inherent in finding a solution to these drivers of deforestation should not be overlooked. Project developers entering the country with a "developed world" mindset on project development will quickly find that carbon project development tactics that work in places like the United States can be impractical, unjust, and ineffective in Mozambique. Local communities are typically the stewards of the land, and as will be discussed in the land tenure section below, have a legal, customary right to use the land. Put simply, it is illegal for a carbon project developer to come into an area and prevent communities from using land for agriculture, fuel collection, or building material collection regardless of the authorizations that the developer has secured from the Mozambican central or provincial governments.

Legality aside, it would be entirely impractical from an operational and cost perspective to enforce any policy against community use of their traditional resources. Furthermore, there are significant equity and climate justice implications with respect to the involvement of local communities in project design and operation. Beyond the clear moral implications of these considerations, there is also a practical consideration stemming from the increased oversight of projects by verification bodies and the press that can effectively blacklist inequitable projects and freeze them out of carbon markets.

Weather and climate

Mozambique is prone to experiencing a variety of natural disasters, primarily droughts, floods, tropical storms, and cyclones. There have been a series of devastating cyclones in recent years including Gombe in March 2022 and Freddy in February and March 2023. Cyclone Freddy affected every province in Mozambique and destroyed over 132,000 homes, leaving more than 640,000 people homeless.[35] It also damaged over 1,017 schools and over 5,000 kilometres of roads. The extensive flooding caused by these storms is exacerbated by deforestation and soil erosion.

Mozambique is expected to see fewer but more extreme rainfall days in the near term as a result of climate change, which will exacerbate both flooding and drought. However, rainfall in Mozambique is projected to decrease over the next 100 years, which will have significant impacts for a country that is heavily dependent on subsistence agriculture.

These impacts have significant implications for land-based carbon projects both over the short and long term. Over the short term, extreme weather events can cause extensive

35 Mozambique Response Plan: Cyclone Freddy, Floods & Cholera (March-September 2023), OCHA ReliefWeb, March 2023. https://reliefweb.int/report/mozambique/mozambique-response-plan-cyclone-freddy-floods-cholera-march-september-2023

damage to projects and impact their ability to issue credits or significantly increase costs. Over the long term, droughts may make some project types entirely unviable, at least in certain areas. Project developers in high-risk areas should strongly consider purchasing insurance to protect against the most devastating extreme weather events.

Land tenure & carbon rights

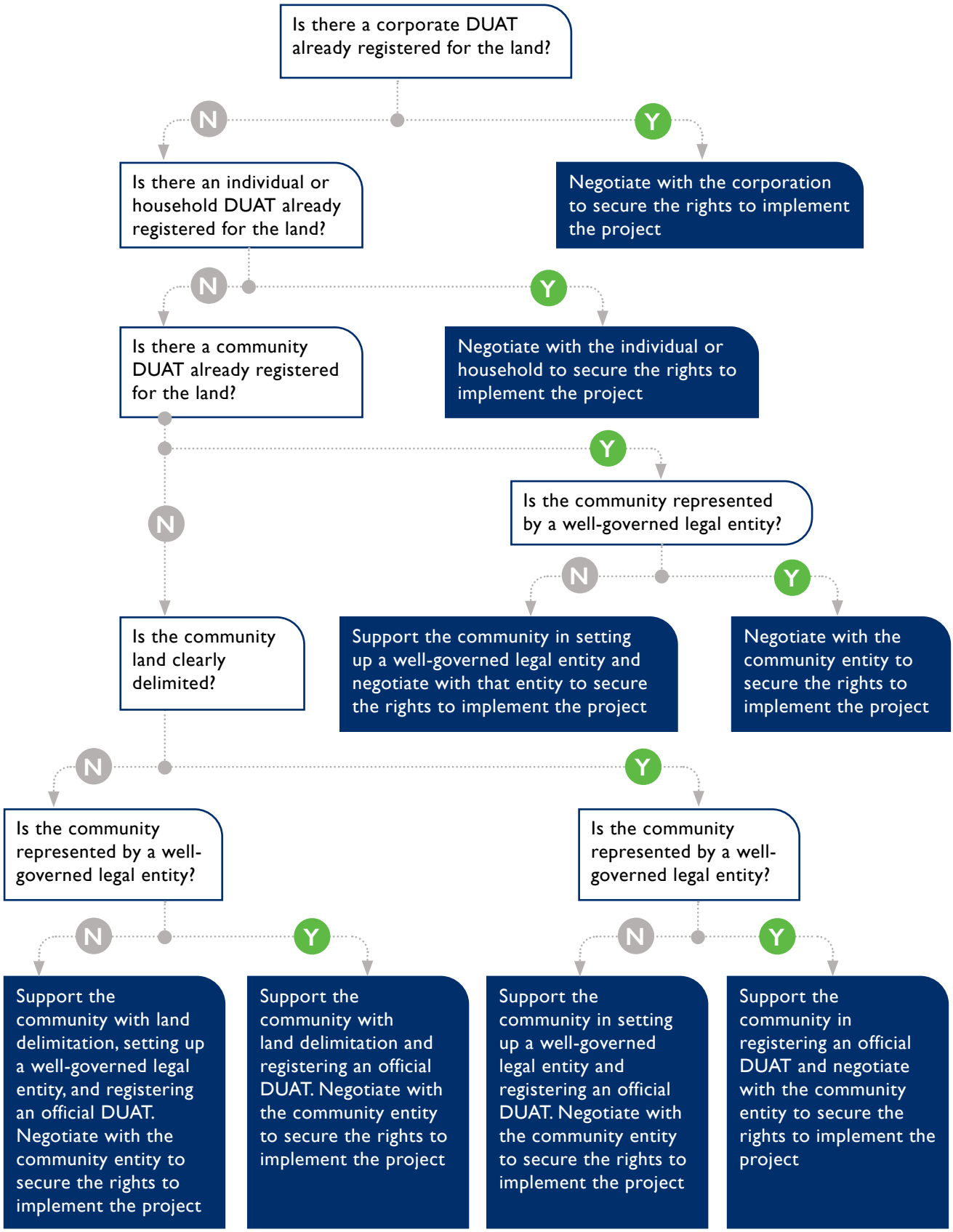
In Mozambique, all land and maritime space is owned by the Government of Mozambique and cannot be sold, leased, or mortgaged. While there is no private land ownership, there are two different licenses that entities can secure that grant legal use rights:

1. **DUAT (Direito de Uso e Aproveitamento de Terra):** This translates to the Right to Use and Benefit from Land, and grants the license holder the right to conduct economic activities and derive economic benefits from the land covered by the license. DUATs are issued by the national and local authorities that regulate land (e.g., MTA at the national level).

2. **TUPEM (Título de Utilização Privativa do Espaço Marítimo):** This translates to the Title for Private Use of Maritime Space and grants the license holder the right to conduct economic activities and derive economic benefits from the maritime space covered by the license. TUPEMs are issued by the national and local authorities that regulate maritime space (e.g., MIMAIP at the national level).

Despite the existence of these legal land licenses, most land in Mozambique is unadjudicated and is not under official license. Despite the lack of adjudication and licensing, most land in Mozambique is being used in one form or another, generally by communities for subsistence purposes. Under Mozambican land law communities that have occupied and used land in good faith for ten years have customary land use rights. Even if these rights are not officially adjudicated and registered, these rights are equally valid as officially registered DUATs. This means that the legal right to use most of the land in Mozambique is held by the communities that reside on and make their living from the land.

Figure 42. Decision tree of land tenure options for carbon project developers in Mozambique



Carbon project developers looking to implement land-based projects should take care to fully understand the existing land tenure status of the land required for the project. The following decision tree (Figure 43) may help guide decisions as to which avenue of securing land tenure is most appropriate.

While it is not possible to own land in Mozambique, it is possible to sign agreements with DUAT-holding entities as described in Figure 43 above. It is also possible to secure corporate DUATs as a project developer if there are no communities or registered DUAT holders in the area. However, corporate DUATs can be expensive, as they have associated annual fees based on the land area, economic activity conducted, and jurisdiction. Communities are exempted from these DUAT fees.

Regardless of how they are attained, DUATs provide similar protections as land ownership including the right to exclude other uses of the land that conflict with project activities. It is important to note that eminent domain exists in Mozambique and the government retains the right to revoke DUATs for any projects or activities deemed to be in the public good. There is precedent for this to extend beyond public projects to private mining projects that are deemed to be in the public interest.

Blue carbon projects such as mangrove protection or restoration projects may also need to secure TUPEMs for maritime space, which includes land within 100 meters of the high tide mark. These rights are not granted to communities for customary use in the same way as DUATs. However, it is generally accepted that coastal communities do not need to secure TUPEMs to conduct activities that protect or restore mangroves. Therefore, signing agreements with coastal communities gives the project developer the de facto right to operate in the mangrove areas.

This avenue does not, however, give project developers the right to exclude other corporations from securing TUPEMs to conduct economic activities within those same mangrove areas. If project developers or investors require the exclusionary rights provided by the TUPEM, they can secure these at the corporate level, but the annual fees associated with TUPEMs are extremely high. These TUPEM fees are levied on a per square meter basis and were primarily designed for mining use rather than carbon projects.

NDC and corresponding adjustments

Mozambique has made a nationally determined contribution (NDC) under the Paris Agreement to reduce cumulative emissions over the period 2020-2025 by 40 million tons of CO2 equivalent relative to a business-as-usual scenario. The last inventory of Mozambican emissions was conducted for 2016 and indicates that the country is not on track to meet this target.

Article 6 of the Paris Agreement provides a mechanism for the trading of emissions reductions between countries (once traded, these reductions are known as "internationally traded mitigation outcomes or ITMOs).. In essence, countries that are not able to economically meet their NDCs can opt to purchase emissions reductions from other countries that have a lower marginal cost of abatement. Any emissions reductions traded under this mechanism will count toward the purchasing country's NDC and will be "correspondingly adjusted" on the selling countries NDC so that they are not double counted.

The voluntary carbon market (VCM) exists outside of the Paris Agreement's formal mechanisms, allowing companies, individuals, and other entities to purchase carbon credits voluntarily. Offsets purchased by corporations through the VCM are not required to have a corresponding adjustment from the issuing country. In fact, there is currently no mechanism or infrastructure for issuing and tracking corresponding adjustments within the voluntary markets. Despite this fact, there is a growing perception among investors, brokers, and buyers that corresponding adjustments are a marker of quality for credits, or that they may serve as protection against expropriation of credits from the host government. Corresponding adjustments may also allow buyers to retire credits within compliance schemes that require corresponding adjustments, or to otherwise count these credits towards another country's NDCs. As a result, an increasing number of buyers are requesting that host countries issue corresponding adjustments even for credits sold into the VCM.

This presents a challenge for project developers in Mozambique as the government has yet to provide clarity on its policy regarding corresponding adjustments. If corresponding adjustments are widely adopted in the voluntary markets globally, this could lead to a competitive disadvantage of Mozambican carbon credits and could cause them to trade at a discount relative to correspondingly adjusted credits of the same type and quality from other countries.

Security

Mozambique was immersed in a civil war from 1977-1992 between FRELIMO – the ruling Marxist government that won independence from the Portuguese – and RENAMO – the anti-communist group supported by South Africa and what was at the time Rhodesia (now Zimbabwe). Tensions between the two groups flared again from 2013-2021 when RENAMO began targeted attacks over accusations of unfair elections. As of June 2023, RENAMO is fully demilitarized.

The overall security situation in Mozambique has improved since 2021, but security concerns remain in the Northern province of Cabo Delgado due to the presence of the Islamist militant group al-Sunnah wa Jummah. The military's presence has increased since the group's attack on the northern town of Palma in 2021, which caused Total Energies

to pause LNG activity in the region. The Rwandan military and the Southern African Development Community have both provided troops to the region to aid Mozambican security forces. Private companies have also hired private military forces to secure assets in the region. Despite the increased security presence in the region, militant activity persists and over one million people have been internally displaced due to the conflict.

The insurgency in Cabo Delgado continues to worry investors, especially those unaccustomed to investing in fragile states. These investors may perceive the threat to be country-wide, when in reality it is largely confined to the coastal portion of Cabo Delgado province in the north. While the implementation risks will be higher in Cabo Delgado, there is strong potential for climate and community impact in the province.

Lack of investor awareness and experience in Mozambique

Carbon investors generally have mixed views on Mozambique. On the one hand, they view it as a country with great carbon mitigation opportunities and with opportunity for high-impact carbon project development. They also view it as a market with little competition and where they may be able to get attractively priced deals as a result.

On the other hand, investors are fully aware of the risks discussed earlier in this chapter and generally feel that they lack the experience and on-the-ground perspective to effectively evaluate these risks – particularly those without previous experience in emerging markets. There is a risk that the real or perceived information asymmetry in

favor of the project developer will make investors more risk averse and may lead them to turn down an otherwise attractive deal or to under-price it. To mitigate this risk, project developers should be extremely attentive to investor needs and devote the necessary time to educate the investors on the local context, risks, and opportunities.

A key component of educating investors and streamlining the diligence process for them is to create a detailed data room that covers the categories and topics in Table 6 with clear, concise, and easy to digest documents.

Table 6. Summary of categories of documents to be included in the project's investor-facing data room

Marketing materials

- Teaser (summary version of pitch deck to be shared pre-NDA)
- Full pitch deck or investment memorandum
- One-pagers for each key risk facing the project explaining the risk and providing an overview of the risk mitigation strategy

Legal

- Documents of incorporation
- Corporate structure
- Summary of any past or ongoing litigation
- Prior investor term sheets or agreements

Social

- Documentation of community engagement work including minutes of meetings with communities
- Benefit sharing plan

Environmental

- Pre-feasibility or feasibility studies
- Environmental impact studies
- Overview of biodiversity co-benefits, if applicable

Geographic

- Shapefiles for project area
- Shapefiles for delimited communities within project area

Human resources

- Organizational chart showing key employees, titles, and salaries
- Resumes/profiles for key employees
- Copies of employment agreements for key employees

Commercial

- List of top customers and revenue for each
- Existing customer or carbon offtake contracts
- List of primary products and revenue for each
- Any market analyses or competitive analyses that have been completed

Financial

- Historical financials (Income statement, Cash flow statement, Balance sheet) for the past three years, preferably audited
- Cap table
- Financial projections/financial model
- List of assets (property, plant, equipment, etc.)

CONCLUSION

Carbon revenues have the potential to unlock significant volumes of investment for nature-based solutions and emissions-reducing products in emerging markets, yet raising investment against these revenues remains challenging.

The voluntary carbon market is promising but still in its infancy, with all the growing pains that come along with this early stage. Foremost among these challenges are lack of alignment on supply-side and demand-side integrity, uncertainty about future price and demand for carbon credits, low understanding of the carbon market opportunity from traditional financial investors, and a limited capital stack accessible to projects today. These challenges are above and beyond the country risk already faced by companies and projects operating in emerging markets.

Still, carbon projects have unique advantages including revenues in hard currency, less reliance on physical infrastructure to export what is essentially a digital good, strong alignment with local social and economic development priorities, and most fundamentally: real and measurable climate impact.

Blended finance, including investment facilitation, has an important role to play in scaling private finance for high-impact carbon projects.

While many carbon projects are commercially investible, and the risk/return profile for others can be improved through blended finance approaches, there are often still firm-level barriers to investment in underserved markets that can keep otherwise mutually beneficial deals from closing. In particular, high transaction costs and information asymmetry can create an intermediation gap between capital providers and viable investment opportunities.

Investment facilitation is an approach to addressing these firm-level barriers to investment. Neutral intermediation between capital providers and capital seekers can lower search costs on both sides, fill information gaps, and provide hands-on support to manage the

investment process from initial interest through to financial close. The investment advisor also helps to mitigate adverse selection by conducting independent screening and analysis of investment opportunities, and to ensure that parties are able to negotiate on equal footing and agree on terms that set the stage for a successful project.

Closing good deals is critical for building trust in the voluntary carbon market, and for signaling the attractiveness of the market for other credible investors, developers, and local stakeholders.

PLANETA is a first-of-its-kind investment facilitation platform for carbon projects in Mozambique, funded by USAID.

Launched in May 2023, PLANETA provides Mozambican carbon project developers and carbon investors with transaction advisory services to help break down barriers to investment and mobilize capital into the emerging Mozambican carbon ecosystem. Over the next three years, PLANETA will support carbon projects as they raise capital for implementation. Specifically, PLANETA will provide financial modeling assistance, develop investor-facing marketing materials, facilitate access to global carbon markets and investors, and support negotiations and structuring of transactions. The program supports projects that have strong climate mitigation and resiliency benefits as well as co-benefits for biodiversity and local communities.

Project developers and investors interested in receiving transaction advisory assistance in Mozambique should reach out to the PLANETA team at PLANETA@crossboundary.com.

GLOSSARY

Additionality: Mitigation achieved by a project must be additional to what would have happened if the project, and its financially supportive credits, had not been realized.

Afforestation, Reforestation, and Revegetation (ARR) projects: Projects focused on planting trees and other vegetation to remove carbon from the atmosphere.

Agriculture, Forestry and Other Land Use (AFOLU) Projects: Projects involving land use changes or forestry activities, often requiring local community engagement and behavior change.

Article 6: An article of the Paris Agreement that provides mechanisms for international trade of carbon credits, supporting countries in achieving their Nationally Determined Contributions (NDCs).

Avoided Emissions Projects: Projects that generate certified emissions reductions by implementing activities that help reduce emissions compared with a business-as-usual scenario.

Baseline Deforestation Rate: The estimated rate of deforestation that would occur without the intervention of a carbon project.

Benefit Sharing Agreements (BSAs): Agreements that define the financial relationship between local communities and carbon projects, ensuring fair distribution of benefits.

Brokerage Agreement: An agreement where a broker sells carbon credits for a commission, providing efficient sale to a range of buyers but not guaranteeing revenues.

Capital Stack: A hierarchical structure of various types of financing sources, ranging from senior debt to equity, used to fund a project or investment, with each layer representing a different level of risk and priority in terms of repayment.

Carbon Credit Production Curve: The pattern of carbon credit generation over time for a project, which is a key driver of revenue.

Carbon Credits: Represent the avoidance or removal of one metric ton of carbon dioxide or its equivalent. Used in carbon markets for trading greenhouse gas emissions.

Carbon Finance: Investments made by corporates or intermediaries in carbon projects, typically seeking returns in carbon credits rather than cash.

Carbon Integrity: The commitment of a carbon project to providing well-evidenced carbon impact data.

Carbon Markets: A trading system where carbon credits are bought and sold. They are mechanisms for investing in climate action and can channel finance to climate-vulnerable communities.

Carbon Pricing: The process of setting a price for carbon credits, which varies based on factors like project type, geography, and quality of co-benefits.

Carbon Projects: Initiatives that generate carbon credits through emissions removal or avoidance.

Carbon Removal: The process of extracting carbon from the atmosphere using biological, geological, or engineered methods.

Catalytic Capital: Investment capital that is risk-tolerant and patient, often used to unlock additional private sector investment and support innovative solutions.

CCB (Climate, Community and Biodiversity) Verification: A Verra-managed standard used to indicate overall project quality and permanence, often leading to a price premium for carbon credits.

Climate Finance: Financial investments and funding dedicated to supporting mitigation and adaptation activities to combat climate change.

Co-benefits: Additional environmental and social benefits that a project creates such as poverty alleviation, biodiversity protection, job creation, and enhancing water and soil quality.

Compliance Carbon Markets: Regulated markets where participants are legally obligated to offset their emissions, often seen in industrialized economies.

Core Carbon Business Model: A business model where selling carbon credits is the sole revenue stream of the company or project.

CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation): A compliance market for the aviation industry, focusing on offsetting and reducing carbon emissions.

DMC (Climate Change Directorate): An organization within the Mozambican Ministry of Land and Environment responsible for coordinating climate initiatives in Mozambique.

DUAT (Right to Use and Benefit from Land): The government issued license to use land for economic activities in Mozambique.

Dynamic Baselining: Adjusting the baseline for carbon credit calculation based on current conditions rather than fixed historical data.

Ecosystem Restoration Projects: Projects focused on restoring ecosystems to enhance their ability to absorb carbon dioxide.

Emissions Trading Systems (ETS) and Carbon Taxes: Mechanisms used in compliance markets to regulate carbon emissions.

FNDS (National Sustainable Development Fund): The Mozambican government entity within the Ministry of Agriculture that oversees the technical aspects of carbon project licensing, registration, and MRV.

Gold Standard: A global non-profit carbon registry focused primarily on renewable energy and community services activities.

Green Jobs: Employment opportunities created in sectors focused on producing goods or providing services that benefit the environment.

Greenhushing: The practice of not publicly disclosing climate actions taken by organizations, often due to uncertainty or fear of criticism.

Hard-to-Abate Sectors: Industries where reducing emissions is particularly challenging and costly.

ICROA (International Carbon Reduction Offset Alliance): An industry trade group endorsing carbon standards and providing accreditation for carbon credit organizations.

Indigenous Peoples and Local Communities (IPLCs): Native groups and local communities that are often stakeholders in carbon projects.

Integrity Council on Voluntary Carbon Markets (ICVCM): An organization setting guidelines for the integrity of carbon credits and the claims made by buyers.

Internationally Traded Mitigation Outcomes (ITMOs): Carbon credits traded under Article 6 of the Paris Agreement, subject to corresponding adjustments to ensure they count towards only one country's NDC.

MEF (Ministry for Economy and Finance): The Mozambican Ministry responsible for carbon project taxation and for the issuance of certificates of emission reduction in Mozambique.

Monitoring, Reporting, and Verification (MRV): Processes to provide rigorous assessment of a project's outcomes through accurate and transparent data collection.

MTA (Ministry of Land and Environment): The Mozambican Ministry responsible for issuing carbon project implementation licenses in Mozambique.

Non-Core Carbon Business Model: A business model where selling carbon credits is one of several revenue streams.

Non-leakage: Project activities must reduce or remove emissions on a global scale rather than merely shifting emissions from within the project area to outside of the project area.

Offtake Agreements: Contracts for the future purchase of carbon credits, which can have various pricing structures.

Paris Agreement: An international treaty on climate change aiming to limit global warming. It sets targets for reducing greenhouse gas emissions.

Permanence: The assurance that carbon avoidance or sequestration outcomes of a project endure for a significant period, typically at least 100 years.

Physical Risks to Projects: The risk of damage to a project from human-caused or natural disasters like deforestation, fires, or typhoons, potentially reversing carbon emissions.

Plan Vivo: A carbon registry focusing on smallholder farmer and community-driven carbon sequestration projects.

Political Risk Insurance (PRI): Insurance coverage against non-commercial risks like currency inconvertibility, war, civil disturbance, expropriation, and breach of contract.

Pre-Purchase Agreement: An agreement where the buyer provides upfront capital for carbon credits that will be delivered at a future date upon issuance.

Project Validation: Process by which a third-party carbon project meets the rules and requirements of a standard and/or methodology.

Project Verification: The process of assessing and confirming the carbon emissions reductions or removals achieved by a project.

Puro.earth: An entity focusing on engineered carbon removal approaches, specifically biochar.

REDD+ Decree: A regulatory framework governing carbon project development in Mozambique.

Reducing Emissions from Deforestation and Forest Degradation (REDD+): A framework to encourage developing countries to reduce deforestation and forest degradation through conservation and sustainable management of forests, enhancing forest carbon stocks.

Spot Market Price: The current market price at which carbon credits can be sold.

Sustainable Development Goals (SDGs): A collection of 17 global goals set by the United Nations General Assembly in 2015 for the year 2030. These goals are designed to be a "blueprint to achieve a better and more sustainable future for all."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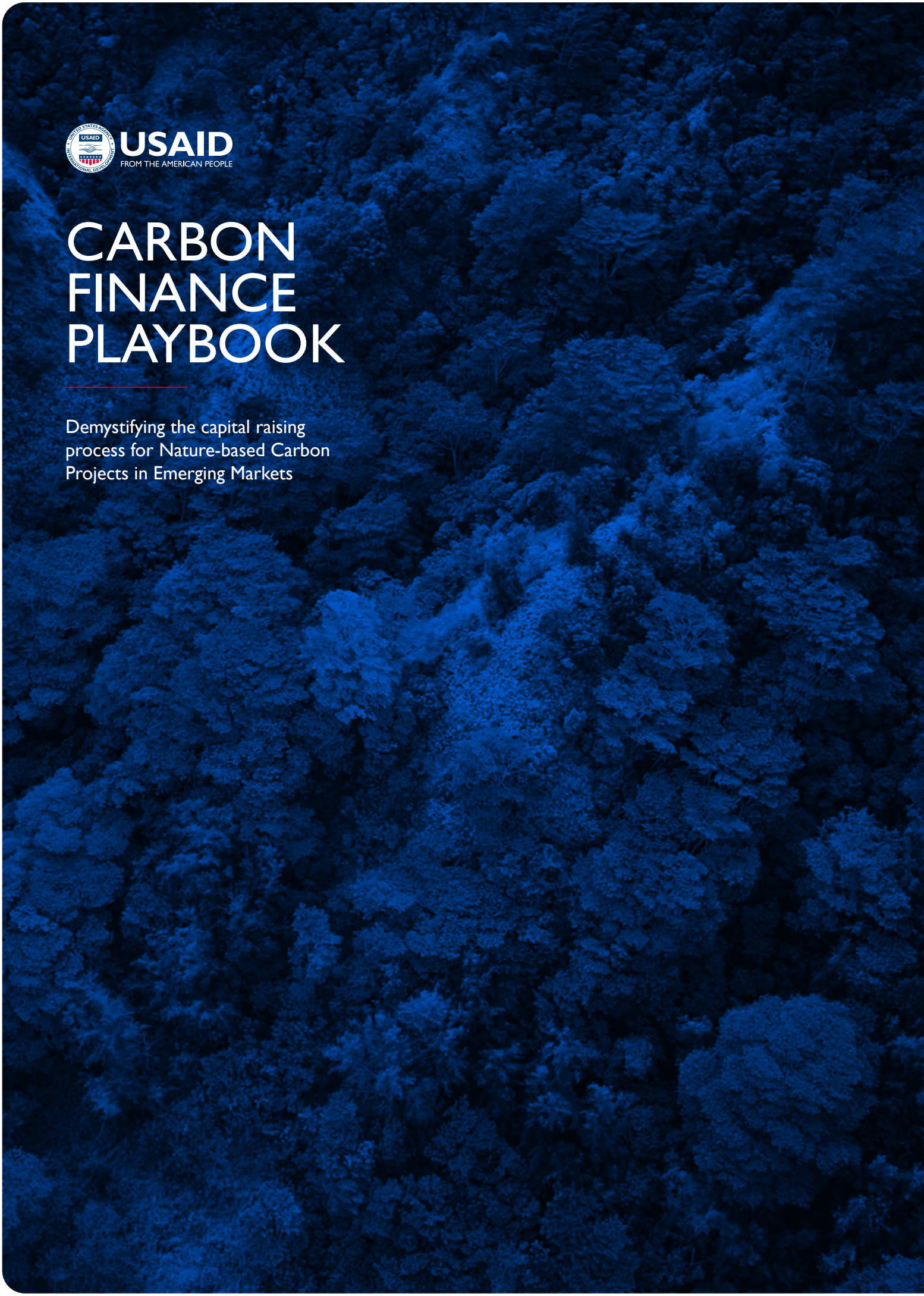
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