Carbon Finance

CLIMATE POLICY INITIATIVE

Carbon finance refers to the suite of policies, financial instruments, markets, and investments designed to reduce or offset GHG emissions by establishing prices or aggregate limits on emissions. Such prices and limits, in conjunction with tradable carbon finance instruments, create incentives for businesses and individuals to reduce their carbon footprints in a cost-effective manner, as well as provide revenues for climate mitigation investments.

Carbon finance encompasses a range of policies and financial instruments, including:

- **Carbon tax**: Governments set a price that emitters must pay for each ton of greenhouse gas emissions. Carbon taxes come in two general categories: emissions taxes that are based on the quantity of GHG emissions produced, and a tax on GHG-intensive goods or services (e.g. gasoline).
- **Carbon credits**: Financial instruments that represent the removal or avoidance of one metric ton of CO_{2e} from the atmosphere, relative to a baseline or business-as-usual level of emissions.
- **Carbon trading:** Markets in which carbon credits are bought and sold. Businesses and individuals use carbon markets to compensate for their emissions footprint by purchasing carbon credits from entities that reduce or remove GHG emissions. The two major types of carbon markets include voluntary carbon markets and compliance carbon markets. In voluntary carbon markets, buyers purchase credits to help achieve corporate sustainability or net-zero goals. Compliance markets are described below.
- **Compliance carbon markets:** Also referred to as "cap-and-trade." In these markets, governments set an overall cap on the annual amount of GHG emissions for an industry or the whole economy, and distribute or sell emissions allowances to emitters. The aggregate volume of allowances distributed is equal to the overall cap, but emitters that reduce emissions more quickly can sell their excess allowances to generate revenue.
- **Carbon border adjustment mechanisms (CBAMs):** Under these mechanisms, countries with strong climate policies (such as compliance carbon markets) impose fees on imports based on the carbon content of the imported products. CBAMs can generate public revenue, provide a level playing field for low-carbon domestic producers, and avoid "leakage" of emissions to jurisdictions with weaker climate policies.

RISKS ADDRESSED

- **Regulatory and market risks:** Carbon markets help establish a price signal that can be incorporated into financial decisions, even in the absence of regulatory frameworks or mandatory policies.

APPLICATIONS AND IMPACTS

- **AFOLU/Blue carbon:** Projects that support carbon sequestration from improved land use, reforestation, mangrove restoration, and other coastal restoration projects can receive additional finance from demonstrated GHG emissions reduction.
- **Industrial decarbonization:** Carbon markets and cap-and-trade systems can help decarbonize hard-to-abate sectors like cement, steel, and shipping by supporting investments in carbon capture, utilization, and storage and clean fuel.
- **Waste management:** Methane capture from landfills and waste-to-energy projects can generate carbon credits and attract financing through carbon markets.

Each sector requires specialized methodologies for measurement, reporting, and verification (MRV) to guarantee that the emission reductions are real, permanent, and additional (i.e., they would not have happened without the project). For example, forestry projects require sophisticated remote sensing and field inventory to measure carbon stocks, while energy projects rely on metering and grid emission factors.

KEY STAKEHOLDERS

A. Commercially available instruments and providers

1. **Voluntary Carbon Markets:** Carbon markets facilitate corporate investment in emission reduction and removal projects. One-third of financial commitments to credit generating projects from 2021 to 2024 were made by global corporations, amounting to USD 5.2 billion. There are several commercially-available registries and market platforms that support the issuance, sale, and retirement of credits in the voluntary carbon market. It is important that markets maintain high integrity, adhering to Paris Agreement-aligned methodologies, such as the Verified Carbon Standard or the Gold Standard. These standards help with monitoring, reporting, and verification (MRV), certifying the climate impact of the associated investment and help prevent greenwashing or overstatement of impact.

B. Concessional or public instruments

2. **The European Union Emissions Trading System (EU ETS)** is a cap-and-trade market launched in 2005. It covers emissions from electricity and heat generation, industrial manufacturing and aviation sectors, which account for approximately 40% of total EU GHG emissions. Under the EU ETS, companies are allocated a certain level of annual emissions allowances and additional allowances are set aside for auction. The allowances are bought and sold on a market. Those companies that emit less than their allowance may sell their excess allowance, while those who emit more than their allowance must purchase additional allowances or pay penalties. By gradually decreasing the number of allowances in the market each year, the EU ETS incentivizes companies to reduce emissions gradually over time or pay additional fees. By 2023, the EU ETS had helped bring down emissions from European power and industry plants by approximately 47%, compared to 2005 levels.
3. Accompanying the ETS, the EU established the **Carbon Border Adjustment Mechanism (CBAM)**. The CBAM places a carbon price on selected imports—such as cement, iron and steel, aluminum, fertilizers, electricity, and hydrogen—to prevent carbon leakage that occurs when EU companies move carbon-intensive production abroad to countries where less stringent climate policies are in place than in the EU, or when EU products get replaced by more carbon-intensive imports. This mechanism aims to ensure

that EU-based manufacturers subject to the ETS are not disadvantaged by cheaper, high-carbon foreign goods.

4. **Colombian Carbon Tax:** Levied in 2016, the Colombian Carbon Tax applies to all fossil fuels, including petroleum derivatives and fossil gas used for energy, whenever they are used for combustion. The Carbon Tax covers 51.6% of GHG emissions and fuel excise taxes cover 19.9% of emissions. While these taxes effectively cover carbon, they are largely offset by substantial national fossil fuel subsidies, which brings the net effective carbon tax rate to EUR 12.18 per metric ton of CO2e. This stands in contrast to carbon tax schemes like those imposed by Sweden, which has among the highest rates and no counteracting fossil fuel – amounting to a net effective carbon rate of EUR 89.69 per ton of CO2e.

DEBT SUSTAINABILITY

- **Direct effect:** Carbon finance mechanisms do not directly reduce debt service pressures, as they do not alter debt stock, maturities, or repayment obligations.
- **Indirect effect**: Especially at the sovereign level, mechanisms like carbon taxes and compliance carbon markets can indirectly ease fiscal and external pressures by generating new public revenues (carbon taxes, credit sales), attracting private investment, and lowering long-term expenditure needs (e.g., energy imports or subsidies), thereby expanding fiscal space and improving debt sustainability.

INTERNAL CAPACITY REQUIREMENTS

A. Minimum requirements

- Ability to measure and report on carbon emissions and removals or renewable energy generation.
- Familiarity and ability to comply with monitoring, reporting, and verification standards.
- For taxation, capacity to monitor emissions, collect taxes, and manage revenues.

B. Requirements for full integration

- Ability to adapt methodologies to local market conditions, establish baselines for emissions monitoring and attribution, assess the carbon intensity of imports, and structure comprehensive MRV that facilitates standardized implementation.
- Technical expertise in GHG accounting, ability to aggregate credits, and to participate in complex market instruments (e.g., forwards).

C. Pathways

- Training on carbon accounting, MRV building and maintenance, robust partnerships with project developers, consultants, and other third-party stakeholders who can support the technical capacity and development of staff.

REGULATORY CAPACITY REQUIREMENTS

A. Minimum requirements

- Legal authority and framework to regulate emissions and tax emitters.

- National registry for tracking emissions, credits, and tax revenues.
- A designated authority or focal point that can provide a letter of approval, confirming the project aligns with national priorities. Preferably, absence of policies that would conflict with or undermine the project (e.g. contradictory subsidies)

B. Requirements for full integration

- Robust national MRV system. Ability to structure CBAMs to minimize carbon leakage.
- Coordination capacity with private sector to enforce taxation and carbon emission compliance. Potentially, a domestic compliance market like a carbon tax or an ETS.
- Modeling and implementation capacity for cap-and-trade or other aggregation-focused models for monitoring.

C. Pathways

- Establishing legal frameworks and pilot programs. Structure programs on international models and alignment with global standards.

FINANCIAL MARKET READINESS

A. Shallow markets

- **Characteristics:** Low investor markets, weak monitoring, reporting, and verification systems (MRVs), limited liquidity. Underdeveloped tax structures. Limited ability of domestic financial institutions to facilitate trading of carbon credits and lending against commitments to purchase credits.
- **Constraints:** Dearth of bankable carbon finance projects, regulatory uncertainty for carbon markets
- **Applicable solutions:** Donor-funded pilots for carbon markets, aggregator platforms for credits, technical assistance from MDBs and national finance institutions, philanthropic de-risking.
- **Readiness pathways:** Donor-funded capacity building for government and local project developers, establishing designated authority, and attracting experienced international partners for initial projects.

B. Emerging markets

- **Characteristics:** Growing private sector interest in carbon finance, including from domestic financial institutions, and improved MRVs.
- **Constraints**: Limited investor confidence, price volatility, policy uncertainty
- **Applicable solutions:** Blended finance solutions can help de-risk early-stage projects to improve pipeline
- **Readiness pathways:** Developing domestic MRV systems, creating clear rules for private sector participation, and exploring links to international carbon markets.

C. Mature markets

- **Characteristics:** High liquidity, diverse carbon trading and lending instruments available from domestic financial institutions, stable regulation and enforcement capacity.
- **Constraints:** Reputational risk related to greenwashing and overextension of credits.
- **Applicable solutions***:* Increased scrutiny/regulation of credit quality standards, improved MRVs.

- **Readiness pathways:** Fully functional and linked registries, advanced market oversight and regulation, continuous policy innovation

PRICING CONSIDERATIONS

- **Drivers of cost**: Tech-based removal (like direct air capture) is very expensive, while avoidance projects (like renewable energy) are typically cheaper. Nature-based projects (reforestation) often fall in between. Credits from projects with strong social and biodiversity benefits (e.g., Gold Standard) command a price premium. Credits from reputable, third-party audited standards are more valuable than those from unverified schemes.
- **Role of concessional support:** Public or philanthropic funds can de-risk projects by offering a price floor or a guaranteed offtake agreement (ERPA). This provides revenue certainty, which is crucial for securing private financing for the project's upfront costs.

AVERAGE TIMEFRAME TO DEPLOY

- **Single Carbon Project (2-5 years):** This includes the project design document phase, validation by a third-party auditor, project implementation, and the first monitoring period and verification, which leads to credit issuance.
- **National/Jurisdictional Program (e.g., REDD+) (5-10+ years):** This requires extensive policy work, developing a national strategy, establishing MRV systems, creating benefit-sharing plans, and completing the readiness phase before payments can be made.
- **Establishing a National ETS (3-7 years):** This involves extensive legislative work, economic modeling, stakeholder consultations, and building the institutional and technical infrastructure for the market to operate.

KEY CHALLENGES TO UPTAKE

- **Technical Barriers:** The complexity and cost of MRV can be high, especially for smaller projects. Some methodologies can be rigid and may not exist for all innovative project types.
- **Market barriers:** Price volatility and the lack of long-term demand certainty can make it difficult to forecast revenues. There are also concerns about the integrity of some credits, with accusations of non-additionality or poor verification.
- **Legal/institutional barriers:** Lack of clear national frameworks, bureaucratic hurdles, and weak institutional capacity can cause delays. The evolving rules for international transfers under Article 6 of the Paris Agreement also creates policy uncertainty

HOW TO ADDRESS KEY CHALLENGES

Practical steps for ministries and partners:

- Develop a clear national carbon finance strategy: This should clarify rules on carbon rights, benefit sharing, and the process for project approval, providing certainty to investors.

- Define a focal point for project approvals to reduce bureaucratic delays.
- Support the development of national-level data (e.g. grid emission factors, forest inventories) to reduce costs for individual projects.
- Leverage national development banks to manage financial risk and facilitate financing mechanisms for carbon credits, as discussed by CPI here.

Role of donors/DFIs:

- Provide targeted capacity building to governments, for them to be able to develop legal frameworks and to the private sector to design high-quality projects.
- Provide grants for early-stage project development, offer guarantees to mitigate risk, or help aggregate smaller projects into larger, more cost-effective portfolios.
- Fund the development of new methodologies and digital MRV technologies to enhance transparency and reduce costs.

EXAMPLES OF ENABLING REFORMS OR PILOT INITIATIVES

- The World Bank's Forest Carbon Partnership Facility (FCPF) has successfully helped various countries prepare for large-scale REDD+ finance by building national strategies and MRV systems
- The GCF has a readiness program that provides grants to countries to build the capacity needed to access climate finance, including carbon market development, like the one in Mongolia.

RELEVANT LINKS

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KEY TERMS

AFOLU	Agriculture, Forestry, and Other Land Use; a sector category for land-based climate actions
Article 6 (Paris Agreement)	Framework allowing countries to trade emissions reductions to meet climate targets
Cap-and-trade	Market system that sets a cap on emissions and allows trading of emission allowances
Carbon border adjustment mechanism (CBAM)	Tariff on imports based on their carbon content to prevent carbon leakage
Carbon credits	Certificates representing one metric ton of CO_2-equivalent reduced or removed from the atmosphere
Carbon finance	Financial mechanisms that use carbon pricing or markets to incentivize emission reductions
Carbon leakage	Shift of carbon-intensive production to countries with weaker climate policies
Carbon market	Platform for buying and selling carbon credits or emission allowances
Carbon tax	Government-imposed price on each ton of greenhouse gas emitted
European Union Emissions Trading System (EU ETS)	EU's cap-and-trade program covering major industrial emissions
Gold Standard	Certification ensuring carbon projects deliver verified climate and sustainable development benefits
Monitoring, Reporting, and Verification (MRV)	System to ensure emission reductions are real, measurable, and additional
REDD+	UN mechanism that incentivizes reducing emissions from deforestation and forest degradation
Scope 2 emissions	Indirect GHG emissions from purchased electricity, heat, or cooling