



Transformative Carbon Asset Facility (TCAF)

**Supporting transformative mitigation action in developing countries
through results-based payments for verified emission reductions**

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1 Introduction

Developing countries are implementing climate strategies and mitigation actions to put their economies on a low-carbon development pathway to meet their Nationally Determined Contributions (NDCs), and, in turn, the goals of the Paris Agreement.

More and more countries are looking beyond project-to-project approaches at transformative mitigation actions aiming to decarbonize complete sectors, jurisdictions, or even the whole economy. Policies with high mitigation impacts are playing a key role in that context. Examples include energy pricing reforms, agricultural subsidy reforms, fossil fuel- and carbon pricing. Next to price-based policies there are regulatory policies such as energy efficiency standards or building codes that can incentivize low-carbon development. Besides individual policies, countries are also interested in sectoral or jurisdictional decarbonization programs including renewable energy programs, greening the financial sector, or building green cities and decarbonizing existing ones.

To support this process and help developing countries implement their plans, the Transformative Carbon Asset Facility (TCAF) was established as a trust fund by the World Bank.¹ TCAF aims to support transformative climate action through results-based payments for verified emission reductions (VERs).

Approximately half of TCAF's funds will be channeled through results-based climate finance (RBCF), used to pay for VERs that can be used by the host country to meet targets under its NDC. The other half is intended for the acquisition of emission reductions that will be transferred outside the host country as internationally transferred mitigation outcomes (ITMOs), which cannot be used by the host country to meet domestic climate targets.

This brochure provides developing countries interested in engaging with TCAF an overview of how TCAF can support their transformative mitigation actions.

Box 1. The need for financing transformative mitigation action in the context of the Paris Agreement

In November 2016, the Paris Agreement entered into force, less than eleven months after its adoption at COP21 in December 2015. By ratifying the Agreement, countries agreed to transform their development trajectories in a way that is consistent with limiting global warming to 1.5 to 2°C above pre-industrial levels, and to communicate and increase the ambition of their nationally determined contributions (NDCs) every five years.

NDCs, combined with long-term climate and development strategies that reach full decarbonization by mid-century, are an essential tool for the achievement of the Paris Agreement goals. But five years on from entry into force, it is clear that current levels of action will not create change at the scale needed. Increased national

¹ TCAF's supporters are The Canadian Department of Environment and Climate Change, The Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety of Germany (BMU), The Royal Norwegian Ministry of Climate and Environment, The Swedish Energy Agency, the Switzerland State Secretariat for Economic Affairs (SECO), The Climate Cent Foundation (CCF - Switzerland), The Department of Business, Energy and Industrial Strategy UK (BEIS), and the Ministry for the Ecological Transition and the Demographic Challenge (MITECO) of Spain.

ambition – as well as international cooperation – will be essential for meeting the ambitious targets set by the Agreement.

Globally, countries are turning more and more toward transformative mitigation actions beyond the level of individual projects to do just that. However, many countries lack the infrastructure and resources to scale mitigation activities, let alone to support the establishment of carbon markets, using only domestic public funding. International climate finance can complement domestic efforts. Results-based climate finance (RBCF) is applied ex-post and rewards the outcomes of mitigation activities. It sets incentives to maximize the effectiveness of mitigation action and to sharpen results-orientation. RBCF improves the economics and financials of low carbon technologies and contributes to mobilizing private sector mitigation activity. It helps to cover operational cost(s) of mitigation programs and recurring costs of mitigation policies. Emission reductions achieved with RBCF stay in the host country and therefore help the host country achieve its NDC.

In addition to accessing RBCF funding, host countries aiming to overachieve their NDCs might be interested in engaging in international carbon market transactions selling and transferring ITMOs to purchasing countries. Such transactions can look very similar to RBCF transactions but are fundamentally different because transferred ITMOs can no longer be used for domestic NDC compliance.

TCAF offers both RBCF support and ITMO purchases to accommodate host countries in their various needs. In TCAF's case, payments for verified emission reductions (VERs) are provided under both RBCF operations and ITMO purchases. The difference between the two is reflected in a different pricing approach and arranged through different contracts as well as different requirements on NDC reporting.

2 Overview of key transformative mitigation actions supported by TCAF

2.1 Key transformative mitigation action supported by TCAF

TCAF supports developing countries in achieving and overachieving their NDC targets through implementation of transformative mitigation actions. Table 1 provides examples of mitigation actions TCAF can support.

Table 1. Overview of key transformative mitigation actions supported by TCAF

Price-based interventions

Carbon pricing encompasses a number of policy approaches that put a price on GHG emissions. It aims to incentivize industries, companies, and consumers to reduce their emissions and to invest in more sustainable and cleaner production practices, goods and services. It can also support governments to generate local environmental benefits, incentivize low carbon development pathways, and generate government revenues. A carbon price can take different forms, and can be implemented in different ways and at different levels including national, sub-national and regional, but also at the international level. Governments do not necessarily have to select one carbon pricing instrument: a combination of complementary carbon pricing instruments might be the preferred option in certain cases. For instance, prior to implementing a carbon tax, subsidy reforms might be

necessary to eliminate conflicting incentives, thus maximizing the efficiency of the tax. As of April 2021, a total of 64 regional, national or sub-national explicit carbon pricing policies are implemented globally.²

<i>Supported action</i>	<i>Description</i>
Carbon taxes	<p>A carbon tax is a policy that places an explicit price on activities or goods based on the GHG emissions they produce.³ Regulators can decide on the scope and coverage of the carbon tax which may, depending on domestic circumstances, be applied to either all or some emissions, cover a range of sectors, and be specific to certain industries, practices or goods within that sector. A threshold for emissions can also be developed to allow governments to tax large GHG emitters only, or governments can introduce certain tax exemptions. Overall, a carbon tax with broad scope and coverage tends to be most effective in reducing emissions, as it increases the number and range of abatement opportunities. Policymakers can also enable entities to either fully or partially fulfill their carbon tax obligation by purchasing carbon credits to provide additional flexibility.</p> <p>South Africa and Colombia are two examples of developing countries with a carbon tax. South Africa imposes a carbon tax since June 2019 on direct GHG emissions from fuel combustion, industrial processes and fugitive emissions.⁴ In Colombia, a carbon tax of approximately USD 5 per ton of CO₂e has been levied since 2017.⁵</p>
Emissions Trading Systems	<p>An ETS is a carbon pricing instrument in which the government sets a quantitative cap on emissions in one or more sectors, and then distributes (grandfathers) or sells an equivalent amount of emission permits to entities covered by the system. Entities covered by the ETS need to surrender emission permits equal to their emissions at the end of each compliance period to the government. Covered entities are allowed to buy or sell emission permits in the market if they have a surplus or shortage of permits. In an ETS, the interaction between the supply and demand of permits sets the price of emitting carbon, and an entity with abatement costs which are higher than the price of an emissions permit may opt to purchase additional permits to meet its compliance obligation.⁶ Entities with a relatively low abatement cost will be incentivized to abate their own emissions first. In some cases, the system allows for the flexibility to surrender carbon credits (or “offsets”), which are generated from emission reductions or removals initiatives that occur outside the ETS, to (partially) meet the ETS obligation.</p> <p>Given the relative complexity of designing and implementing an ETS, most countries that operate an ETS to date are high-income economies. China is an example of an upper-middle-income country that implements an ETS, operating the world’s largest ETS since 2021, which covers around 40% of the country’s carbon emissions.⁷</p>

² Carbon Pricing Leadership Coalition. Carbon Pricing Dashboard. Available at:

<https://carbonpricingdashboard.worldbank.org/>

³ World Bank (2017) Carbon Tax Guide. A Handbook for Policy Makers. Retrieved from <https://bit.ly/33jkCda>

⁴ Government of the Republic of South Africa (2019). Act No. 15 of 2019: Carbon Tax Act, 2019. Available at:

<https://bit.ly/3ENNY11>

⁵ Government of Colombia (2016) Ley 1918 Del 29 De Diciembre de 2016. Available at: <https://bit.ly/3k5DV2U>

⁶ Entities which can reduce emissions at a relatively low cost (i.e., they have low marginal abatement costs) will profit from investing in low-carbon technologies. This is because they will avoid buying permits and they can become sellers if they have surplus of emission allowances.

⁷ International Carbon Action Partnership (2021). China National ETS. Available at: <https://bit.ly/3do5eBs>

<p>Tax and subsidy reforms</p>	<p>Fiscal incentives that stimulate fossil fuel consumption and production are a widespread practice, especially in developing countries, to enhance energy access or use of national energy sources. However, these policies can hinder governments’ efforts to put their economy on a low-carbon development pathway, and conflict with carbon prices providing contradictory incentives. Moreover, fossil fuel subsidies typically place a large burden on public budgets. Fossil fuel tax and subsidy reforms remove financial incentives that stimulate the consumption of polluting fuels. Fuel subsidy reforms also provide governments with an opportunity to shift governmental spending from fuel subsidies to other social and/or environmental priorities. Malaysia is an example of a country that implemented a successful subsidy reform. The government in 2014 gradually reduced its support to polluting energy sources, using the savings for direct cash transfers to the poorest households and investments in other social or education development projects.⁸</p> <p>Similarly, countries may provide subsidies to the agriculture sector, such as reductions on the diesel fuel tax paid by farmers, subsidies to fertilizer production and consumption, or unsustainable biofuels. Reforming these schemes to become ‘climate smart’ can result in emission reductions.^{9, 10}</p>
<p>Feebates</p>	<p>A final example of a price-based intervention aimed at influencing consumer choices is the introduction of feebates. A feebate combines a tax and a rebate, where ‘polluting’ consumption is taxed and ‘clean’ consumption is rewarded. Feebates usually have no net impact on government revenues, as the revenues generated through the tax are returned as rebates within the same system. Feebates are applied, for instance, to vehicles, by taxing polluting vehicles and utilizing these funds to subsidize the purchase of electric cars.¹¹</p>

Regulatory Policies

Regulatory instruments are a type of environmental policy intervention using regulations to influence abatement decisions, mainly in the form of technology or performance standards-setting, or prohibitions. They are an alternative to economic instruments and can be more efficient under certain circumstances. For instance, in the case of the transport sector, large-scale transformative actions are often led by regulation because the price-elasticity of demand is low, and there are numerous externalities in addition to GHG emissions – such as congestion, accidents and noise, which are not internalized by price-based mechanisms.¹²

⁸ ESMAP (2017) Five Key Lessons from Malaysia’s 2014 Subsidy Reform Experience. Available at: <https://bit.ly/2T3yrbf>

⁹ World Bank Group (2020) Supporting Price-Based Mitigation Policies in Developing Countries through Results-Based Payments for Verified Emissions Reductions – Transformative Carbon Asset Facility. Available at: <https://bit.ly/3CbmyET>

¹⁰ World Bank Group (2021) Unlocking crediting opportunities in climate-smart agriculture – Transformative Carbon Asset Facility. Available at: <https://bit.ly/3vB7P3y>

¹¹ World Bank Group (2020) Supporting Price-Based Mitigation Policies in Developing Countries through Results-Based Payments for Verified Emissions Reductions – Transformative Carbon Asset Facility. Available at: <https://bit.ly/3CbmyET>

¹² World Bank Group (2021) Feasibility assessment and conceptualization note for the Transport Sector – Transformative Carbon Asset Facility. Available at: <https://bit.ly/3vFACE7>

Regulatory policies can be applied in all economic sectors. In the energy and building sectors, these can take the form of energy efficiency standards and norms, building construction codes and energy standards for appliances.¹³ In agriculture, for example, improvements of tenure security through legislation can be critical to incentivizing nature-based mitigation activities.¹⁴ Examples of regulations in the transport sector include fuel economy standards such as the one introduced in Mexico in 2013 and China in 2000,¹⁵ CO₂ standards for new vehicles, congestions charge zones and low emissions zones. Finally, in the solid waste sector, initiatives for collecting landfill gas and utilizing or flaring it, which are often project-based and only applied to specific landfills, could become regulations that make these practices compulsory. For instance, the European Union mandates that landfills receiving biodegradable waste must collect, treat and use landfill gas, or if its utilization is not possible, it must be flared.¹⁶

Incentive and expenditure programs

Incentive and expenditure programs can support actions that directly reduce CO₂ emissions or incentivize the uptake of low-carbon technologies. These can focus on technology installations, investment in infrastructure and equipment, and public green procurement, all of which can directly incentivize low carbon development. Examples of this type of measures include feed-in tariffs for renewables; tax credits for low carbon technology; government low-emission vehicle fleet procurement; the development of intelligent transport system infrastructure or electric vehicle charging infrastructure; direct government investment in energy-efficient equipment and processes; public investments in green financial infrastructure – such as establishing microfinance institutions; as well as large scale sectoral or jurisdictional investment programs aiming for transformative impact. Expenditure programs can be direct investments from governments or international organizations or through intermediaries, i.e., on-lending programs.¹⁷ For example, a vast number of developing countries has implemented feed-in tariffs for renewable energy,¹⁸ such as the feed-in tariff for solar power in Pakistan. This national incentive mechanism was implemented in 2015 to provide remuneration for eligible solar projects for a period of 25 years.¹⁹

¹³ World Bank Group (2021) Urban crediting framework: A guide for government leaders and development professionals working in urban areas – Transformative Carbon Asset Facility. Available at: <https://bit.ly/3E67sRB>

¹⁴ World Bank Group (2021) Unlocking crediting opportunities in climate-smart agriculture – Transformative Carbon Asset Facility. Available at: <https://bit.ly/2ZcLiOZ>

¹⁵ Mendoza, J.C. & Jiahan, CAO (2020) Making the Local Work for the Global Best: A Comparative Study of Vehicle Efficiency Standards Implementation in China and Mexico. In: Sustainability Standards and Global Governance – Experiences of Emerging Economies. Retrieved from: <https://bit.ly/3pp7gZH>

¹⁶ 'Council directive 1999/31/EC on the landfill of waste' (1999). Available at: <https://bit.ly/3B0Uwux>

¹⁷ The term on-lending is used when an institution borrows funds from a non-resident creditor and then lend the funds to another institution/agent within the country. See OECD (2003). On-lending of borrowed funds. Available at: <https://bit.ly/3BOrMFu>

¹⁸ REN21 (2021) Renewables 2021 – Global Status Report. Available at: <https://bit.ly/3nYUwXf>

¹⁹ International Energy Agency (2015) Pakistan feed-in tariff for solar power. Available at: <https://bit.ly/3BSYwNY>

2.2 Challenges to the implementation of transformative mitigation actions

Governments may face a number of common challenges when implementing transformative mitigation actions.

- **Political support.** Transformative mitigation actions are dependent on government intervention, hence strong political will and implementation capacity are important factors contributing to the success of the action.
- **Societal acceptability.** Transformative measures can impact industries' revenues – by banning certain technologies or making them uneconomic – and affect citizens habits. They can as well affect household incomes. For such reasons they can be unpopular if not properly communicated and if potential negative impacts on competitiveness and incomes are not addressed.
- **Knowledge gaps affect the capacity to develop strategic planning and interventions.** Technical knowledge to develop cost-effective and sustainable measures is necessary, but often limited.
- **Implementing and enforcing transformative mitigation actions require funds.** The operationalization of policy mechanisms and regulations requires an efficient enforcement mechanism to ensure compliance. Enforcement capability is often constrained by limited institutional capacity, and budget constraints.

Furthermore, specific intervention types may come with specific challenges.

Price-based mechanisms

- **Ensuring 'fairness' and creating support for pricing policies.** An effective carbon pricing instrument needs to be embedded in a supportive policy framework that contributes to the policy objectives, and mitigates any unwanted effects. Countries can consider introducing complementary policies that compensate certain actors or groups if they face disproportional impacts from a carbon price. Keeping basic goods affordable for poor households is also crucial for continuing and accelerating poverty reduction. Complementary policies can be an effective way to build support.
- **Putting in place the required technical and administrative capacities.** Carbon pricing measures require significant administrative and technical capacity during the design, implementation and operational phases – e.g., capacity and an infrastructure for the measurement, reporting and verification (MRV) of emissions, accounting, and tax collection capacity. An ETS is a relatively more complex policy intervention than a carbon tax, requiring more extensive government capacity including an infrastructure for trading emission allowances between entities covered by the system.
- **Overall economic impacts can lead to efficiency losses.** Tax and subsidies induce market distortions that reduce the level of production and consumption in the economy to some extent, resulting in efficiency losses in the economy – also called 'deadweight loss'. Countries should develop a strategy to identify and anticipate these effects.

Regulatory policies

- **Coordinating and aligning interests of various governance levels.** Setting and implementing regulations often involve several levels of government, from the national government to the local level and across different ministries. Coordination between these different entities can be

challenging, and countries may need to develop a structure for collaboration and interaction between the relevant bodies involved.

Incentive and expenditure programs

- **Various challenges might appear depending on the specific intervention.** For instance, implementation of feed-in tariffs face challenges such as finding the right tariff level that enables renewable energy production to be competitive and ensuring that grid access is guaranteed and non-discriminatory to all renewable energy producers.²⁰ Public procurement of low-emissions vehicles can be restricted by existing tendering and contract cycles, and stringent contract terms might limit competition and favor large providers.²¹

Finally, there are also a number of challenges that are specific to certain sectors. TCAF has explored these challenges in their sectoral crediting blueprint publications. Please find more detailed information [here](#).

TCAF can work with host countries to overcome these implementation and operational challenges in different ways. TCAF supports the development of MRV systems to evaluate policy performance, collect and analyze data, in turn helping to strengthen sectoral planning and the implementation of interventions. Payments for emission reductions provided by TCAF can furthermore be utilized as an effective means of attracting private sector participation. Collaboration with TCAF can also contribute to enhancing the acceptance of transformative mitigation actions by lowering compliance costs and building the capacity of the involved stakeholders, as well as facilitating the collaboration and alignment of different levels of government and political parties towards a common goal by acting as a “rallying flag”.

2.3 What can countries expect from TCAF?

The TCAF approach to results-based payments for VERs from transformative mitigation actions (in the following: “scaled-up carbon crediting”) differs from the traditional project-based crediting approaches used in carbon markets and RBCF. TCAF uses crediting approaches that are based on the level at which the activity is being implemented: at the level of jurisdiction, sector, or through policy.

Domestically, this includes supporting the implementation of sectoral mitigation policies or regulations, carbon pricing instruments and the development of MRV and accounting methodologies for mitigation outcomes and wider NDC achievement. Internationally, TCAF can support the testing of accounting, transparency and integrity parameters associated with international assets. Table 2 provides a summary of TCAF crediting approaches.

TCAF has developed a Crediting Blueprint Synthesis Report, which gives a full overview of the different conceptual approaches TCAF applies to scaled-up crediting. Please access the report [here](#).

²⁰ UN ESCAP (2012) Low Carbon Green Growth Roadmap for Asia and the Pacific – Fact Sheet: Feed-in tariff. Available at: <https://bit.ly/3wIzRvF>

²¹ Urban Foresight (2015) Local measures to encourage the uptake of low emission vehicles – Good practice guide. Available at: <https://bit.ly/31B10UQ>

Table 2. Summary of TCAF crediting approaches

Crediting approach	Baseline emissions	Program emissions	MRV
Jurisdictional	Total jurisdictional emissions in the jurisdiction, determined ex-ante and updated ex-post	Total ex-post reported jurisdictional emissions	Bottom-up jurisdiction-level GHG inventory (clear boundaries)
Sectoral aggregated	Total sectoral emissions, determined ex-ante and updated ex post	Total ex-post reported sectoral emissions	Bottom-up sectoral inventory (clear boundaries)
Policy-based	Based on economic modelling of economy-wide emissions or sectoral emissions in the absence of policy.	Based on economic modelling of economy-wide emissions or sectoral emissions with the addition of policy.	Modelling baseline and program emissions using ex-post input parameters (e.g., GDP, sectoral GDP, fuel prices).

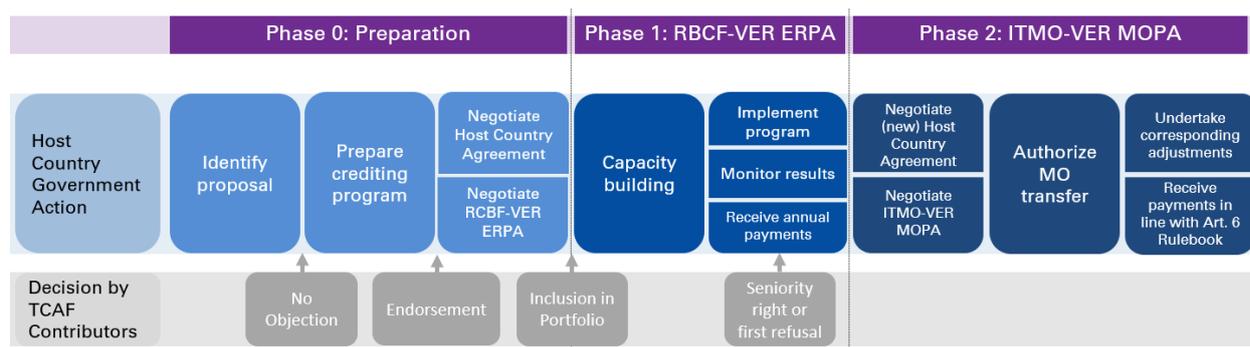
3 Operationalization of TCAF

The operationalization of TCAF support follows a number of phases. It starts by identifying a proposal and preparing the crediting program. As a next step, the implementing entity in the host country negotiates a Results-Based-Climate Finance Verified Emission Reductions Emission Reduction Payment Agreement (RBCF-VER ERPA), implements the crediting program, and receives annual results-based payments for the verified emission reductions. This will apply to a share of the emission reductions from the program. Those emission reductions will stay in the host country and can be used for the host country’s NDC compliance.

In an optional next phase, the host country negotiates an Internationally Transferred Mitigation Outcome Verified Emission Reduction Mitigation Outcome Purchase Agreement (ITMO-VER MOPA). Through this agreement, the country can authorize the international transfer of verified emission reductions generated by the crediting program and undertake a ‘corresponding adjustment’ to receive payments for the transfer in line with the modalities of the Article 6 Rulebook. This will apply to another share of the emission reductions from the program. Those emission reductions will be transferred to TCAF and cannot be used for host country NDC compliance.

Figure 1 provides an overview of the different phases of the TCAF Program Operationalization Phases.

Figure 1: TCAF Program Operationalization Phases (adapted from TCAF)



3.1 The TCAF value proposition

The two-phase structure of TCAF provides a unique approach to assist countries with achieving and surpassing the mitigation targets in their NDCs. Host countries begin their engagement with TCAF by implementing a crediting program and receiving payments for verified emission reductions as climate finance funding under Article 9 of the Paris Agreement (phase 1). As part of this first phase, the host country enters into a Host Country Agreement (HCA). This HCA includes a ‘right of first refusal requirement’ for TCAF, which applies to any market transactions into which the host country might enter in the respective NDC implementation period. The HCA also includes a robust capacity building program to help the country prepare for TCAF phase 2, and international market-based transactions in general. Emission reductions generated through the phase 1 engagement remain in the host country and can be used by the host country to fund policies and programs that help it achieve its NDC targets.

Host countries can also choose to add a next phase of collaboration with TCAF and engage in market-based transactions of emission reductions under Article 6 of the Paris Agreement (phase 2). Engaging in a TCAF Article 6 transaction enables countries to build capacities and experience to continue to leverage carbon market resources in the future. Emission reductions paid for through phase 2 of the TCAF support will generally command a higher price than phase 1 emission reductions. The difference is due to the linkage of the phase 2 emissions reductions to corresponding adjustments, meaning that they cannot be used by the host country to achieve its NDC target (see box 2).

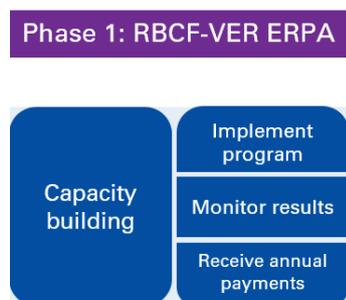
TCAF’s two-phase structure creates a number of key benefits for host countries:

- The engagement with TCAF provides **flexibility** for host countries to decide during the implementation of the crediting program how they prefer to further shape their collaboration. Engaging with TCAF in phase 1 does not create an obligation for host countries to internationally transfer mitigation outcomes through Article 6 of the Paris Agreement in phase 2.
- The hybrid support enables **no-regret engagement** for host countries. If a country is on track to achieve its NDC target, it can opt to negotiate an ITMO MOPA without the risk of overselling emission reductions.
- The support gives host countries an opportunity **to gain experience and build capacity** towards leveraging international carbon market resources, including monitoring its NDC and policy progress, the preparation of MRV systems, and inter-agency coordination and collaboration. Capacity-building will be a country-owned and country-driven process. Host country governments undertake the capacity building to be able to make the decision on participating in an Article 6 transaction and implement related reporting requirements.

The next section describes the TCAF payment structure and approach to pricing verified emission reductions. The TCAF approach uses different pricing approaches for RBCF-VERs used by the host country for meeting its NDC targets (phase 1), and for those to be transferred internationally as ITMOs (phase 2).

3.2 TCAF payment structure phase 1: RBCF-VER ERPA

3.2.1 Payments for verified emission reductions backed by results-based climate finance



As part of phase 1, TCAF disburses RBCF against verified emission reductions (VERs). These VERs can be used by the host country for domestic NDC compliance. TCAF will operationalize RBCF disbursements through Emission Reduction Payment Agreements (ERPAs) with program implementing entities. Such ERPAs are essentially a forward purchase of VERs at a fixed RBCF-VER price. As part of phase 1, the host country will first allow the VERs to be transferred to TCAF, with the aim of supporting and piloting the set-up of the host country’s approval process and infrastructure for the international transfer of ITMOs. VERs paid for will be retransferred by TCAF to the host country. This transfer process does not impact NDC accounting: the VERs will eventually remain in the host country and can be used for NDC compliance. Together with the implementation of the crediting program, the host country will be supported by the World Bank to implement a capacity building plan that aims to build and strengthen domestic capacity and the infrastructure to approve future Article 6 transactions.

As the credits generated and paid for during phase 1 of the TCAF support remain in the host country, there is a scenario that these VERs could be sold by the host country through an Article 6 transaction at a later stage, once the relevant capacity and infrastructure has been set up. TCAF asks host countries to agree to not sell these VERs generated as part of the TCAF crediting program and within the RBCF-VER ERPA to any third party, but instead use them against their NDC target.

3.2.2 Pricing of verified emission reductions

RBCF-VERs are priced based on the cost of implementing the supported program. For a direct investment program, in practice this could mean that RBCF-VER pricing is based on the incremental cost of a low-carbon investment as compared to a BAU investment – thus informed by the ‘cost-gap’. For scaled-up crediting, calculations require a similar cost-gap logic, though may require additional inputs. In the case of implementing a carbon tax, for example, the implementation cost is the ‘deadweight loss’ that the new tax has on the overall economy.²² RBCF-VER pricing can be based on these losses, though would require modelling or conservative estimation and in addition potential policy costs (e.g., administrative, compensation to poorer households) may also need to be factored in. A different case of scaled-up crediting, such as subsidized loans for energy efficiency building improvements, may require a slightly different logic, centered on the ‘required reward’. In this case, the discount to the interest rate would need to be large enough to incentivize a loan offer that comes with energy efficiency requirements for

²² For more information on how results-based payments for emission reductions can support the implementation of a carbon tax, see Strand (2020) Supporting Carbon Tax Implementation in Developing Countries through Results-Based Payments for Emission reductions. Available at <https://bit.ly/3H5fpsK>

the planned rehabilitation activity. Given these variations, determining RBCF-VER pricing is highly context-specific and must be approached on a case-by-case basis.

3.3 TCAF Payment Structure Phase 2: ITMO-VER MOPA

3.3.1 Purchases of ITMOs backed by carbon market finance

Phase 2: ITMO-VER MOPA

Negotiate (new) Host Country Agreement	Authorize MO transfer	Undertake corresponding adjustments
Negotiate ITMO-VER MOPA		Receive payments in line with Art. 6 Rulebook

As part of phase 2, TCAF pays for the international transfer of verified emission reductions (ITMOs). TCAF will contract ITMOs through a Mitigation Outcome Purchase Agreement (MOPA). This MOPA will ensure that the program implementing entity will receive the payments necessary to be able to implement the program, and that the host country government will receive the needed payments to cover the administrative costs of Article 6 participation such as costs for complying with the recording requirements and the needed payments to cover the opportunity cost of transferring ITMOs out of the country and undertaking corresponding adjustments. This is ensured through the methodology applied by TCAF for pricing ITMOs (see section 3.3.2 below). Together with the MOPA, the host country will agree to make corresponding adjustments (see box 2) for the contracted ITMOs in the target year in its NDC accounting, and undertake the necessary reporting as required in the Article 6 Rulebook as well as the Enhanced Transparency Framework under Article 13.

Box 2: corresponding adjustments in the context of the Paris Agreement

What are corresponding adjustments?

The international transfer of mitigation outcomes triggers a “corresponding adjustment”. Corresponding adjustments are accounting adjustments of reported emissions in the national registries of countries that participate in an international transaction of mitigation outcomes, triggered when a mitigation outcome transfers from one country to the next. Corresponding adjustments are a requirement set out in Article 6 of the Paris Agreement, which creates the framework for international collaboration in the context of the Paris Agreement. Their application aims to safeguard the environmental integrity of collaboration, by ensuring that one and the same emission reduction is not counted towards multiple emission reduction targets. In other words, corresponding adjustments avoid ‘double counting’: the moment a mitigation outcome is transferred from one country to another, both countries reflect this in their bookkeeping (double-bookkeeping). The mitigation is ‘un-counted against NDC’ by the country that agrees to transfer it.

What are the main challenges that corresponding adjustments pose?

Corresponding adjustments are a new accounting requirement in the context of international mitigation collaboration which has not yet been applied and tested in practice. Two main challenges with the requirement for implementing corresponding adjustments are (i) the technical challenges of making and tracing corresponding adjustments due to the non-standardized nature of targets, NDCs, and accounting, and (ii) the need for significant capacities in host countries to understand the implications of implementing a corresponding adjustment, allowing them to strategically engage with Article 6.

Corresponding adjustments in the context of a decentralized system

The Paris Agreement has created a context for international collaboration that is bottom-up and decentralized, and thereby lacks a standardization and comparability of targets or accounting periods. This provides flexibility to countries in setting and realizing their emission targets, but increases the complexity of accounting for the transfer of emission reductions. Corresponding adjustments introduce technical challenges. For example, countries can apply different methods for corresponding adjustments (averaging or trajectory), with different

implications for when the corresponding adjustment is applied, and how it is reflected in a country's emissions reporting. The metric in which ITMOs are accounted for poses another challenge, as countries may have different types of targets (absolute targets versus intensity-based targets, or GHG versus non-GHG targets). Importantly, the context in which countries collaborate may change as well, for example if NDC targets of the participating countries are re-defined, reconceptualized, or new NDCs are introduced in a new reporting period. This context implies that there is no one-size-fits-all solution on how to deal with the requirement of corresponding adjustments. Harmonizing corresponding adjustments rules for ensuring NDC compliance can be challenging across different cooperative mechanisms operational under Article 6 due to their differences in nature, aims and scope. This means that host countries need to put in place a tailored accounting, reporting and verification infrastructure to be able to participate in international carbon market collaboration. Irrespective of the adopted approach to adjusting reported emissions, a lack of robust national GHG inventory or weak reporting system can pose problems to implementing corresponding adjustments.

Understanding the implications of corresponding adjustments

Where mitigation activities are supported through international carbon market collaboration, it is important to clarify which emission reductions of the supported activity will be transferred out of the host country, and thereby become linked to a corresponding adjustment. The host country can no longer count for this mitigation outcome as its own emission reduction. Rather, the transferred mitigation outcome now supports the acquiring country to meet or go beyond its emission reduction commitments. This can impair host country's ability to make progress with the realization of its NDC targets.

The TCAF program will only purchase and require corresponding adjustments through an ITMO-VER MOPA for the transfer of those emission reductions that go beyond (i) the host country's unconditional NDC targets and beyond (ii) mitigation efforts funded by international climate finance. The aim of this strategy is to avoid a situation where a host country sells emission reductions that it needs to achieve its mitigation targets.

To strategically engage with carbon markets, countries need to understand how international collaboration can best contribute to achieving their NDC target. This requires modeling and planning work to know the marginal abatement cost curve of their economy, their NDC implementation strategy and their preferred long-term low carbon trajectory. In each collaboration, parties will need to create clarity on the 'attribution' of the emission reductions generated through the support. Attribution refers to determining the share of emission reductions that is attributable to different streams of climate finance and carbon market mechanisms, where emission reductions generated through climate finance usually remain in the host country, whereas emission reductions supported by carbon market mechanisms are typically transferred out of the country. Typically, large-scale mitigation projects benefit from a diverse set of financial contributions.

To ensure that in the MOPA TCAF only purchases verified emission reductions which go beyond the mitigation outcomes funded by climate finance, TCAF applies *proportional attribution* of the emission reductions generated through a TCAF program to international climate finance (constituting the emission reductions that remain in the host country) and the ITMO-VER MOPA. The aim of the proportional attribution approach is to make sure that only those emission reductions that can be directly linked to TCAF's contribution to the mitigation intervention are attributable to TCAF. Proportional attribution has the advantage enabling host countries to get insight into which portion of mitigation outcomes can be authorized for international transfer, and which share can be maintained for achieving domestic NDC targets. Moreover, proportional attribution helps ensure that mitigation outcomes paid for by climate finance are not used for offsetting, which would result in cross subsidization. Finally, proportional

attribution allows the cooperating parties to reflect the contribution of TCAF to the host country's conditional NDC target, and to increase economic efficiency of carbon market transactions.

Proportional attribution requires a three-step approach, which is explained in more detail in section 4.4.²³ The calculation of attribution is applied ex-ante, as a way to support sellers and buyers in strategizing their engagement, determining prices, and engage in upfront payments.

If a host country will be in a position to sell ITMOs, they are asked to first invite TCAF to purchase these ITMOs, or allow TCAF to match an offer of a third buyer that has expressed interest in the ITMOs. Note that the TCAF ERPA and the TCAF MOPA do not overlap and target different emission reductions.

3.3.2 Pricing of ITMOs

TCAF pays for verified emission reductions which are linked to a 'corresponding adjustment' and thereby transferred out of the host country. Upon transfer, these ITMOs are no longer available for the host country to meet its NDC target. Contributors to TCAF may use these emission reduction credits for their own compliance.

A major concern of host countries participating in cooperative approaches is that the international transfer of the mitigation outcomes generated through cooperation will compromise the ability of the host country to fulfil its domestic mitigation ambition. In such a situation of 'overselling', the host country 'loses' a part of its reduced emissions which it needed to meet its NDC target. This goes against the spirit of the Paris Agreement in general and Article 6 in particular, which was designed to enable countries to collectively meet their targets. Moreover, a situation of overselling does not only pose a risk to the seller country, but buyers risk reputational damage as well if their ITMO purchase has created a disadvantage for the seller country they are collaborating with.

One of the risk factors that may lead to overselling is agreeing an ITMO price which is too low, and which does not properly consider the impact of the purchase and transfer of the mitigation outcomes beyond the cost incurred for abating emissions. Pricing that shields the seller country from overselling considers the costs the host country will incur for replacing its collaborative mitigation intervention to still be able to meet the NDC goal in the ITMO price.

In the TCAF program, ITMOs are priced in a way that contributes to avoiding overselling of mitigation outcomes, by considering the "opportunity costs" of collaboration. This approach looks beyond the implementation costs of a program by determining the difference between the abatement cost for the particular crediting intervention, and the marginal cost of meeting the NDC. From this difference, the opportunity cost, the pricing of ITMOs and the payment to the transferring government will be derived.

Support offered by TCAF

The application of an opportunity cost pricing approach requires significant analytical work. It means that host countries need to have a good understanding of the NDC implementation strategy, the cost of various mitigation activities included in the NDC, and the marginal abatement cost of achieving their NDC target. Depending on the nature of the NDC target and the form of collaboration envisaged, this information may need a level of granularity that allows the collaborating partners to access sectoral and intervention-level information. Developing this information requires substantial technical capacities.

²³ For a detailed explanation, refer to "Core Parameters for TCAF Operations", available at <https://bit.ly/3AzM61z>

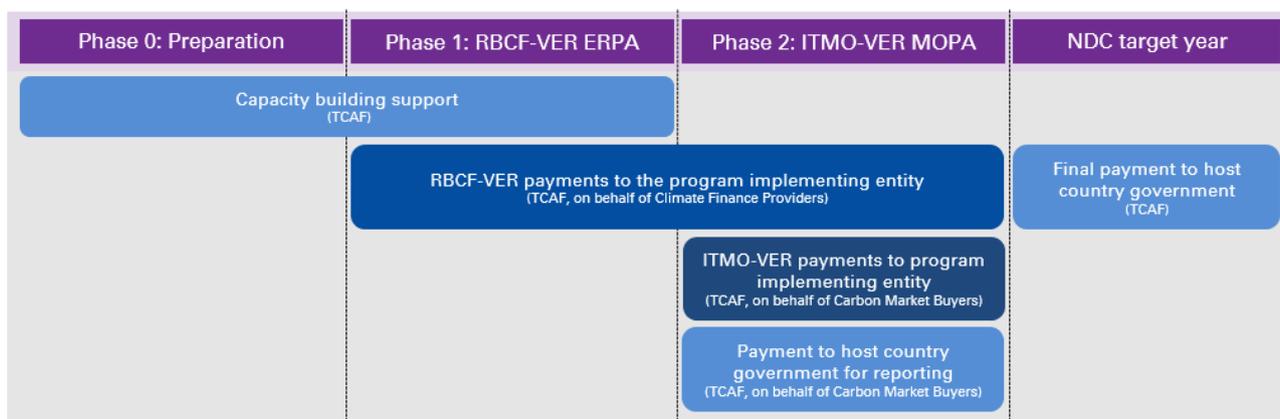
Some countries have already started this work as part of their NDC design, or for developing their NDC implementation programs. TCAF aims to build on this existing work, leveraging existing data and capacities. In cases where such capacity or information is not available, TCAF offers support to close the information gap through its own efforts.

3.4 Disbursement of payments

Payments for verified emission reductions are disbursed by TCAF in different tranches throughout the implementation of the crediting program. Figure 2 provides an overview.

- TCAF, on behalf of Climate Finance Providers, will pay for verified emission reductions as results-based finance throughout the implementation of the crediting program.
- Upon the verification, delivery and host country authorization of the ITMOs, TCAF on behalf of Carbon Market Buyers will disburse payments to the program implementing entity.
- TCAF, on behalf of carbon market buyers, will disburse annual payments to the host country for reporting the emission reductions during the timeframe of the MOPA.
- TCAF will disburse a final payment to the host country in the year when the NDC target achievement will be reported. This will constitute the completion of the host country fulfilling the obligation on corresponding adjustment for the transaction.

Figure 2. Overview TCAF payment structure



4 Parameters for TCAF support

To be eligible for TCAF funding several core parameters must be met. These include sustainable development, transformational change, baseline(s) setting, additionality, MRV, crediting periods, and pricing considerations.^{24,25} This chapter introduces the main core parameters applied in TCAF-supported mitigation activities.

²⁴ TCAF (2020) Core parameters for TCAF operations. Available at: <https://bit.ly/3IT9Sg3>

²⁵ TCAF (2021) Transformative Carbon Asset Facility (TCAF): Crediting Blueprint Synthesis Report. Available at: <https://bit.ly/3pez1Uz>

4.1 Sustainable development

The TCAF Framework establishes that programs should maintain social and environmental standards that are congruent with the World Bank's country engagement model as well as the United Nations Sustainable Development Goals (SDGs). All operations should follow the World Bank's operational policies and procedures, including environmental and social safeguard policies where appropriate. Each TCAF program should define indicators based on the SDGs, against which it will measure progress, evaluate results, and identify co-benefits.

4.2 Transformational change

Transformational change is a key criterion for the selection of TCAF programs, as well as a parameter against which to assess program performance. In this context, transformational change can be defined as the global economic and societal changes necessary for achieving the decarbonization and temperature stabilization goals set out by the Paris Agreement. The TCAF Framework identifies four criteria, which indicate an operation's ability to deliver transformative change, which it recommends be integrated into a program's theory of change – including the identification of specific indicators by which they can be measured over the program's lifetime.

Size. The program must have the ability to achieve large volumes of emission reductions over time (a minimum of 5Mt over a period of 5-7 years or approximately 1 Mt per year once the program achieves maturity).

Sustainability. The emission reductions generated by the program must be technologically, politically, and economically sustainable. A technology sustainable program will use a technology that is appropriate for both the sector and time of deployment: in practice, one which avoids the lock-in of technologies with short-term but no long-term mitigation benefits, such as technologies that lock-in the use of fossil fuels for decades. Policy sustainability can be indicated by an activity that is directly or indirectly linked to domestic policies or accepted by relevant social and political stakeholders. Financial sustainability is indicated by a mitigation activity that has long-term financial viability that includes the phase-out of public funding as a result of external market development.

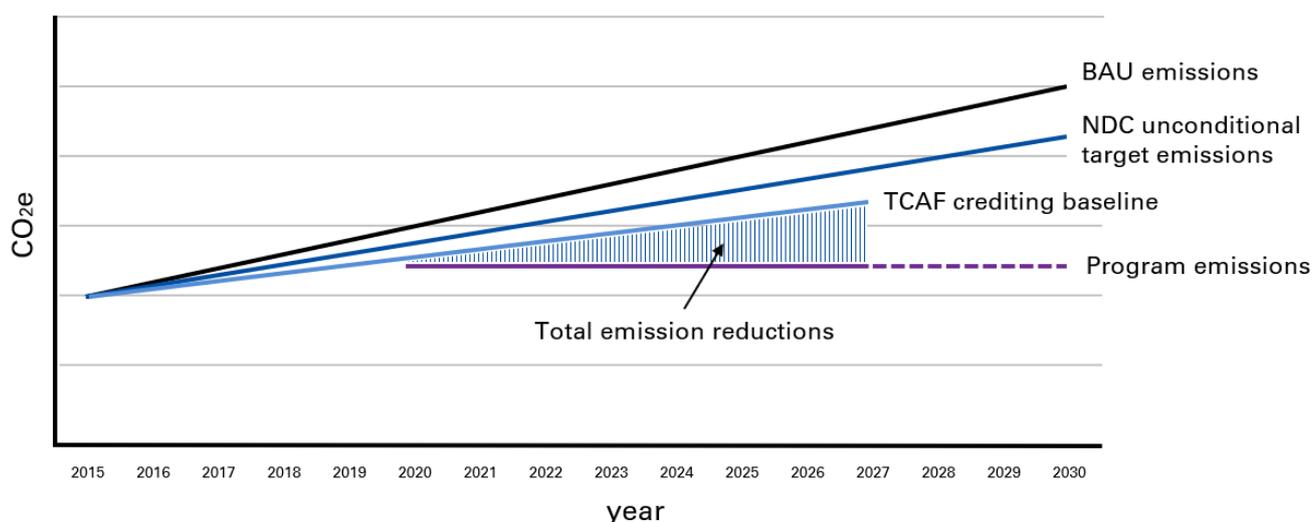
Leverage. The program must support host countries to increase their climate ambition over time, whether this is based on revenues generated by TCAF activities, or by indirectly strengthening domestic planning and MRV capacities.

Carbon pricing. The program contributes directly or indirectly to the development and implementation of implicit or explicit domestic carbon pricing.

4.3 Baseline setting

Emission reductions that form a part of countries' NDC targets cannot be credited under TCAF transactions and as such, must be incorporated into the setting of program baselines. Baseline setting under TCAF is determined through a comparison of the target emissions trajectory (using the unconditional target) with a BAU emissions trajectory (calculated by TCAF). Whichever trajectory produces the lower volume of emissions will be used as the baseline.

Figure 3. TCAF approach to baseline crediting



Source: Adapted from TCAF (2021) Core Parameters for TCAF Operations

Not all emission reductions relative to the baseline will be credited, rather, crediting parameters will be determined to reflect TCAF and the host country's objectives. In practice, this will create a crediting baseline (or "TCAF baseline") that is below both the BAU emissions trajectory and target emission trajectory, therefore ensuring that emissions reductions from the program exceed the ambition of existing decarbonization targets. This approach yields a crediting baseline that reflects (or is more conservative) than the baseline used for unconditional NDC targets, which helps to account for uncertainties arising from emission reduction calculations, as well as helping ensure environmental integrity of the generated emission reductions.

The TCAF implementation context will vary depending on country and program type, and as such the baseline setting mechanism must be flexible to account for this.

Some countries distinguish between conditional and unconditional NDC targets. If an unconditional NDC target is defined, TCAF takes this as the starting point for calculating the crediting baseline. Where an conditional NDC target applies, the BAU emission trajectory will be adjusted according to the full or partial conditional target depending on external support received for reaching the conditional target (building on the TCAF attribution approach), and an own effort component upon agreement between the host country and TCAF.

4.4 Additionality

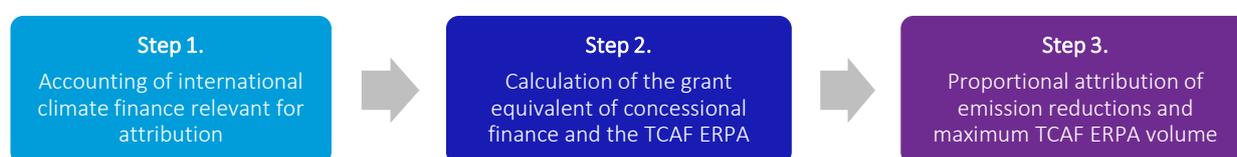
TCAF only purchases emission reductions that go beyond host countries' NDC targets and mitigation activities funded by international climate finance. As such, TCAF uses a two-layer approach to determine

additionality, which accounts for the role of both market mechanisms and climate finance in its operations: market mechanisms, in the purchase of VERs for future compliance under Article 6, and climate finance, in the provision of results-based climate finance.

Layer one, which follows the market mechanism logic, relates to the difference in emission volumes between the crediting threshold (“TCAF baseline”), and actual emissions.²⁶ Rather than assuming that NDC targets will generate emission reductions below BAU, TCAF establishes BAU trajectories (and thresholds) at the level of TCAF operations, and relates them to NDC targets. TCAF only credits emission reductions relative to emission trajectories that are below the baseline, and baselines are adjusted to reflect any increases in ambition – changes in NDC target and scope – that occur during TCAF crediting periods. All baselines and crediting thresholds will be validated by independent experts and all emission reductions will be verified by independent third parties.

Layer two, which accounts for the climate finance component, follows a three-step attribution approach.

Figure 4. Three-step approach to proportional attribution applied by TCAF



All international support provided to a TCAF operation is mapped, and those channels that are relevant for attribution are identified.²⁷ Finance relevant for attribution under TCAF includes:

1. Finance provided directly within the program boundary – *direct investment in the program activity, but not budget support or technical assistance.*
2. Finance reported as climate finance – *finance explicitly defined as climate finance, but not development finance that is unrelated to mitigation.*
3. Positive concessionally – *only concessional finance, not commercial finance.*

Grant equivalents (“subsidy values”), are calculated for relevant finance flows, and subsequently the share of this subsidy in the total aggregated support provided to the TCAF operation is calculated.²⁸ The emission reductions attributable to the TCAF operation are determined on the basis of this share using a proportional attribution method, an approach that ensures only reductions relative to the support that TCAF delivered are attributed to them.

²⁶ This method reflects the Article 6 additionality approach proposed in A. Michaelowa, S. Butzengeiger (2017) Ensuring additionality under Art. 6 of the Paris Agreement.

²⁷ Under current practice, climate finance is typically not restricted to the achievement of emission reductions beyond NDC targets (as required under TCAF). A conservative assumption, therefore, is that climate finance supports the full mitigation effort relative to BAU emissions – and therefore a small share can always be attributed to emission reductions beyond the NDC target.

²⁸ Grant equivalents are calculated (where possible) using the IDA grant element calculator. Available at: <https://bit.ly/2OQhyLL>. If this calculator cannot be used, a custom spreadsheet will be developed using the IDA grant element using a calculator default discount rate (5%). In cases where financial parameter data is lacking, conservative assumptions will be used. All grant equivalents will be ex-ante values only.

To complete the approach, the outcome of additional emission volumes of both layers is compared, and the lower of the two is used to define the maximum volume of the TCAF emission reduction purchase agreement (ERPA).²⁹ In requiring compliance with two layers of additionality, the TCAF approach allows high environmental integrity to be maintained.

4.5 MRV

The Paris Agreement established a universal framework for MRV that promotes the gradual strengthening of MRV systems, from the national down to sectoral level. The framework requires all parties (allowing flexibility for LDCs and SIDS) to report on a biennial basis on i) progress toward the implementation of NDCs; ii) progress on the provision/receipt of support; and iii) identification of capacity building needs. To ensure that TCAF supports rather than hinders this process, TCAF MRV systems are designed to align with host countries' national MRV systems, using a flexible approach that can be tailored to each case.

For TCAF operations that are implemented at sectoral level, MRV systems can build on elements of either existing methodologies developed for the Clean Development Mechanism (CDM) and Joint Implementation (JI) operations, or elements of existing methodologies used for other program-based crediting, if simplifications can yield reduced transaction costs. The latter is exemplified in the MRV component of the Standardized Crediting Framework (SCF) developed by the World Bank under the Carbon Initiative for Development (Ci-Dev).³⁰

For TCAF operations implemented at the policy level, MRV systems require modelling. Such an approach – though more labor intensive to implement – offers cheaper operational costs in addition to enabling better informed policy design above and beyond the scope of the TCAF operation.

4.6 Crediting period

TCAF crediting parameters consider two factors. Firstly, the length of TCAF payment periods, which are defined as a span between five and seven years and end in 2027. Secondly, the share of emission reductions to be purchased by TCAF, which is informed by the crediting threshold and should exceed 5MtCO₂e over the entire operation period. Consistent with the other parameters, the crediting framework is designed with a flexibility that allows for a bottom-up, operation-specific approach.

The crediting period is the period in which a mitigation activity can generate emission reductions eligible for use for NDC target achievement. It is defined by its start date and length, and is distinct from both the lifetime of the specific mitigation activities under the program, as well as the TCAF-payment period. The latter can be shorter than the program's crediting period.

For TCAF operations, the crediting period will span at most, from the start to end date of the host country's NDC implementation period. The earliest is the date the country submitted its first NDC, which for most countries means a crediting period that commenced well before 2020. The end date must fall

²⁹ The grant equivalent of the ERPA is the net present value (NPV) of the promised payments against the delivery of actual emission reductions. The NPV is calculated using the same discount rate as used for calculating the grant equivalent of climate finance (5%).

³⁰ World Bank (2016) Carbon Initiative for Development, A standardized crediting framework for scaling-up energy access programs. Available at <https://bit.ly/303jwoA>

within or at the end of the NDC target period, given the role that the NDC target has in defining the operational baseline. While some countries have adopted 2025 as target year, most NDCs extend until 2030.

The crediting period does not need to coincide with either the lifetime of the program mitigation activity or with the TCAF-ERPA payment period. By contrast to CDM crediting regulations, which required demonstration of prior consideration of the CDM, the mitigation activities used by a TCAF operation may have been implemented earlier than the start of its crediting period and as such, will not correspond to the crediting period. This includes historic policy crediting in which purchases are made against a previously existing policy, and in which case program validation would happen after the start of the payment period.

The TCAF methodological approach ensures that such crediting of historic policies - which is important in a piloting phase as policy crediting was never done before - can be undertaken while safeguarding environmental integrity: emission reductions still need to be achieved in the NDC implementation period beyond the unconditional NDC target.