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Scaled-up crediting
approaches to deliver
climate change mitigation
results: Paying for
performance?

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Paying for performance?

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Abstract

Carbon credit markets are flexible tools that can reward greenhouse gas mitigation at different scales. Historically, most carbon credits have been generated at the project level, but crediting approaches at larger scales are emerging. Scaled-up crediting approaches can operate across entire jurisdictions, sectors, or policies, placing governments at the centre of the crediting approach and enabling a wider range of mitigation efforts, including government strategies, policies and enforcement. For scaled-up crediting to effectively support climate change mitigation, approaches must be designed and implemented with a high level of integrity. This paper examines key integrity considerations in scaled-up crediting, with a focus on environmental integrity in jurisdictional forest crediting. The analysis highlights that scaled-up crediting can help address certain integrity risks associated with project-based crediting, but considerable methodological and implementation challenges remain. The paper presents strategic considerations for donor governments to help ensure that scaled-up crediting approaches become more effective tools for climate change mitigation.

Keywords: carbon credit markets, scaled-up crediting, jurisdictional, sectoral, policy-based, REDD+, integrity, environmental integrity, social integrity, Article 6, co-operative approaches, Paris Agreement, climate change mitigation, greenhouse gas emissions

JEL Codes: F55, G14, H23, Q52, Q54

Résumé

Les marchés de crédits carbone sont des outils multifonctionnels pouvant contribuer à l'action climatique. Historiquement centrés sur des projets, ils voient aujourd'hui émerger des approches de génération de crédits à plus grande échelle, applicables à des juridictions, des secteurs ou des politiques. Ces approches placent les gouvernements au cœur du dispositif et permettent de couvrir un éventail plus large d'activités de réduction des émissions. Pour soutenir efficacement l'action climatique, elles doivent toutefois être conçues et mises en œuvre dans le respect du principe d'intégrité. Le document examine les principaux enjeux d'intégrité liés à la génération de crédits à grande échelle, en mettant l'accent sur l'intégrité environnementale des approches juridictionnelles dans le secteur de l'utilisation des terres. Il montre que ces approches peuvent réduire certains risques associés aux crédits par projet, tout en soulevant d'importants défis méthodologiques et de mise en œuvre, avant de proposer des orientations stratégiques aux gouvernements donateurs.

Mots-clés : marchés de crédits carbone, génération de crédits à grande échelle, juridictionnel, sectoriel, basé sur les politiques, REDD+, intégrité, intégrité environnementale, intégrité sociale, Article 6, approches coopératives, Accord de Paris, atténuation du changement climatique, émissions de gaz à effet de serre

Classification JEL : F55, G14, H23, Q52, Q54

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Executive summary

Scaled-up crediting approaches can provide financial support and incentives for structural climate change mitigation efforts by governments in developing countries. Carbon credit markets provide revenue to activities that reduce or remove emissions and can operate at different levels of implementation. Historically, most crediting has been at the level of projects and programmes of often small-scale activities. However, scaled-up crediting approaches, such as jurisdictional, sectoral and policy-based crediting, are evolving. In these approaches, host governments, or their delegated entities, lead higher-level mitigation efforts. In jurisdictional and sectoral crediting, governments obtain credits by outperforming an aggregate greenhouse gas (GHG) mitigation benchmark. In policy-based crediting, governments obtain credits by implementing policies that deliver measurable GHG mitigation impacts. By moving beyond individual projects and programmes, scaled-up crediting approaches can channel carbon credit revenues via governments. By leveraging government capabilities to address barriers to mitigation and accelerate reforms, such crediting approaches could potentially support climate action at scale.

While currently representing a small share of carbon credit market activity, scaled-up crediting approaches hold strategic potential for future international climate co-operation. To date, over 80 jurisdictions have participated in some form of scaled-up crediting initiative, although mostly through technical assistance and pilot activities, rather than full-scale implementation. Since 2020, 154 million units have been issued under scaled-up crediting standards, equivalent to around 6% of carbon credit supply. In the same period, donor countries and corporates have committed around USD 2 billion to scaled-up crediting, mainly jurisdictional efforts to reduce emissions from deforestation and forest degradation. As climate change accelerates in a challenging macroeconomic environment, developing country governments are looking for financial support to accelerate GHG mitigation efforts. Several initiatives are therefore exploring whether scaled-up crediting could incentivise faster, government-led, GHG mitigation efforts, mostly in the forest and electric power sectors.

Demand for credits from scaled-up approaches is expected to grow significantly before 2030, making the quality of such credits a critical and timely matter. The aviation sector's compliance market, Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), is expected to be a major driver of demand for credits from scaled-up crediting. Whether for use in CORSIA or other market segments, carbon credits should be of high quality, representing real, additional and permanent mitigation outcomes. However, while scaled-up crediting approaches can reduce some carbon credit quality risks (notably leakage), challenges remain, including baseline-setting, additionality and accounting for emission drivers beyond government control. The next few years are decisive for reviewing methodologies and building trust in scaled-up crediting as a tool to deliver effective climate change mitigation outcomes in developing countries.

Methodological improvements to enhance environmental integrity in scaled-up crediting approaches are possible but involve important trade-offs. Environmental integrity requires that carbon credit transfers lead to more GHG mitigation than would have happened in their absence. To support more GHG mitigation on the supply side of jurisdictional and sectoral crediting, methodologies could be strengthened, including (i) more sophisticated baseline approaches, (ii) stronger additionality assessments

and (iii) more systematic adjustments for exogenous emission drivers, as well as residual non-permanence and leakage risks. Further, efforts need to be made to align crediting approaches across different levels of implementation ('nesting'). Policy-based crediting is still evolving, and carbon credit quality provisions can be challenging to standardise, notably with respect to additionality assessments. In addition, scaled-up crediting approaches need to be aligned with host countries' mitigation efforts and associated reporting under the Paris Agreement. Governments could support methodology improvements in many ways, including through multilateral negotiations and direct engagement with crediting standards. However, these improvements could increase transaction costs and limit participation by host governments. Even with methodological improvements, standardised assessments of aggregate GHG impacts at the jurisdictional, sectoral or policy level, will always be uncertain. Striking a balance between rigour and feasibility will be essential to secure both credibility of, and engagement in, scaled-up crediting.

Scaled-up crediting needs to be well-implemented to support inclusive, equitable and durable climate action. Beyond methodological integrity, sufficient resources must be made available to pay for credited results, and benefits from crediting should be equitably, effectively and efficiently shared. Jurisdictional forest crediting should support inclusive forest governance and respect the rights and full involvement of indigenous peoples and local communities. Electric power sector crediting should be linked to just transition plans developed in consultation with affected stakeholders.

For scaled-up crediting approaches to succeed, donor governments and buyers need to continue supporting their implementation, in parallel with efforts to enhance their environmental integrity.

The potential benefits of scaled-up approaches are substantial: achieving mitigation in line with the Paris Agreement requires structural economic changes that depend on decisive public policy. By moving beyond project- and programme-level crediting, scaled-up approaches can help incentivise mitigation at a broader scale and leverage carbon credit revenues to support policy-driven transformations. However, these benefits will only materialise if scaled-up crediting approaches operate with environmental integrity. If payments are not effectively targeted towards mitigation performance, the credibility of scaled-up crediting could be undermined. At the same time, scaled-up crediting approaches need strong confidence from donors and buyers to sustain demand signals, and ensure that host governments perceive clear incentives to accelerate mitigation efforts, including through stable expectations on carbon credit prices. As scaled-up crediting approaches remain relatively new, there is considerable scope to improve both their implementation and environmental integrity, over time. Sustaining progress on both fronts will be key for scaled-up crediting to provide an effective instrument of international climate co-operation.

1. Introduction

Carbon credit markets¹ can support climate change mitigation and contribute to the goals of the Paris Agreement, provided they are designed and implemented with a high level of integrity (Wetterberg, Ellis and Schneider, 2024^[1]). From a climate perspective, it is particularly important that carbon credit markets operate with **environmental integrity**, i.e. that carbon credit transfers lead to more greenhouse gas (GHG) mitigation than would have happened in their absence. On the supply side, this requires that carbon credits represent **real, additional and permanent** mitigation outcomes, with one carbon credit being equivalent to 1 tonne of carbon dioxide reduced or removed (t CO₂-eq). On the demand side, **carbon credit** buyers should prioritise direct GHG mitigation in line with science-aligned pathways, while ensuring that any claims about the use of carbon credits are accurate. Furthermore, carbon credit markets require sufficient monitoring and transparency to ensure that integrity risks can be identified and managed. Beyond climate, carbon credit markets should also contribute to broader environmental and social objectives, by minimising harm and delivering positive impacts (Wetterberg, Ellis and Schneider, 2024^[1]).

A new way of generating carbon credits, scaled-up crediting represents a different model for how GHG mitigation is incentivised through carbon credit markets. Unlike project-based and programmatic crediting approaches that typically involve discrete interventions (e.g. installing clean energy technologies), scaled-up crediting approaches operate at the level of entire jurisdictions, sectors or policies. While scaled-up crediting was conceptualised more than 20 years ago, it has only begun to generate a meaningful supply of credits around five years ago. This broader scope creates distinct environmental integrity considerations, as well as opportunities to accelerate GHG mitigation. By engaging governments as key agents of change, scaled-up crediting could strengthen policy efforts, long-term planning and public investment to deliver **mitigation outcomes** beyond what individual projects and programmes could achieve in the absence of conducive policies. This could promote efforts to address the structural and systemic drivers of GHG emissions.

Despite the potential of scaled-up crediting approaches, their effectiveness in delivering climate change mitigation depends on how well environmental integrity is supported in practice. Scaled-up crediting was developed, in part, to address some environmental integrity concerns of project-based carbon crediting, notably the risk that project impacts are undermined by increased emissions elsewhere. By accounting for GHG reductions and removals across a defined jurisdiction or sector, scaled-up approaches can better capture net mitigation outcomes at scale, specifically within-jurisdiction or within-sector leakage. As such, scaled-up crediting could complement project-based and programmatic crediting approaches. However, scaled-up crediting is also associated with considerable environmental integrity risks, which must be carefully managed given the potentially large volumes of credits that such approaches can generate.

Scaled-up crediting approaches are becoming increasingly relevant for international co-operation on climate change. Demand for credits from scaled-up approaches is expected to grow in the coming years, notably from entities covered by the aviation sector's compliance mechanism, the **Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)**. As of April 2026, the majority of credits eligible

¹ Terms in bold text are defined in Annex B.

for CORSIA's first phase (2024-2026) came from one jurisdictional forest crediting approach.² Furthermore, scaled-up crediting is increasingly relied on as a vehicle for financing forest protection. At COP30 in Belém, 34 governments launched a roadmap for forest finance, which included jurisdictional forest credits as one of six priority solutions (FCLP, 2025^[2]). Finally, as countries advance implementation of market-based co-operation under Article 6 of the Paris Agreement, scaled-up crediting is an option that merits consideration.

To inform the continued development of scaled-up crediting approaches, this paper explores strategic issues related to their effectiveness in delivering climate change mitigation results. It analyses a range of environmental integrity considerations, focusing primarily on jurisdictional crediting approaches in the land-use sector (notably forests), where implementation is relatively most advanced. It also refers, where relevant, to developments in the energy sector, including policy-based crediting and emerging sectoral approaches for power generation.

The findings in this paper should be interpreted in light of the following considerations. First, while all countries play an important role in enhancing integrity and implementing scaled-up approaches, policy considerations are mostly targeted towards potential actions by OECD Member countries, given the role of OECD countries as major **donors** and potential credit **buyers**. Second, since mitigation opportunities, crediting standards and integrity risks differ across crediting approaches and sectors, findings should be interpreted as sector- and approach-specific. Third, while environmental integrity considerations are primarily presented in the context of scaled-up crediting, many of the stated integrity challenges apply to all forms of crediting, including project-based and programmatic approaches.

This paper is structured as follows. Section 2. gives a brief background to scaled-up crediting approaches, comments on their rationales and provides an overview of the current state of scaled-up crediting. Section 3. discusses environmental integrity considerations in jurisdictional and sectoral crediting, with a focus on implemented efforts in the land use sector and complementary analysis on the electric power sector. Section 4. provides recommendations on how donor governments can support environmental integrity enhancements in jurisdictional and sectoral approaches, while Section 5. goes beyond environmental integrity considerations and comments on nesting as well as social integrity considerations in these approaches. Last, Section 6. discusses selected environmental integrity challenges in policy-based crediting and gives considerations for the implementation of such approaches.

² The currently available supply of CORSIA Eligible Emission Units could become subject to further assessments before being used for compliance, depending on how CORSIA is implemented by participating states.

2. Understanding scaled-up crediting approaches

2.1. Background to scaled-up crediting approaches

Carbon credit markets can reward GHG mitigation at different levels of implementation and provide revenue to emission reducing or removing activities. The most established approaches are project-based and programmatic crediting. In project-based crediting, mitigation outcomes are attributed to an individual project, such as a standalone renewable energy or afforestation project, while programmatic crediting aggregates several component activities under a programme, for example a programme installing clean cookstoves. In **scaled-up crediting approaches**, the generation of carbon credits occurs at a higher level of aggregation. In these approaches, **mitigation outcomes** are generated from predefined GHG sources and sinks at a jurisdictional or sectoral level, or based on a specific policy intervention (Table 2.1).

Table 2.1. Different levels of carbon crediting

Approach	Objective	Examples
Project-based	Support individual projects and technologies	Account for ~85% of credits issued since 2020 and include e.g. industrial gas, landfill methane capture, reforestation and renewable energy projects.
Programmatic	Support several, similar, small-scale component activities within a programme	Account for approximately ~9% credits issued since 2020 and include e.g. household and community-level solutions to cooking, energy, water and waste management.
Scaled-up crediting approaches (as defined in this paper)		
Policy-based	Support climate change mitigation through a specific policy intervention or policy package	1.3 million units issued, equivalent to <0.1% of carbon credit supply since 2020. The only operational approach is TCAF , supported by the World Bank, with one registered activity (energy subsidy reform in Uzbekistan). Further activities are under development.
Jurisdictional	Support climate change mitigation activities in a specific jurisdiction (national or sub-national)	154 million units issued since 2020, equivalent to around ~6% of carbon credit supply since 2020. All operational jurisdictional crediting approaches are implemented in the land use sectors. These include e.g. ART TREES , BioCF ISFL , FCPF and VCS JNR .
Sectoral	Support climate change mitigation activities in a specific sector	Sectoral crediting approaches are under development for electric power generation. This includes STEPS and work under the World Bank's trust fund SCALE .

Note: At present, jurisdictional and sectoral crediting approaches closely align, with approaches often being implemented in a specific sector within a given jurisdiction. For simplicity, this paper uses ‘jurisdictional crediting’ to refer to scaled-up approaches in land use sectors (as these typically have jurisdictional boundaries) and ‘sectoral crediting’ to refer to scaled-up approaches in the electric power sector (as these would likely be grid-level, which may or may not correspond to jurisdictional boundaries). Past work on scaled-up crediting has proposed jurisdictional approaches that span multiple sectors (Climate Action Teams, 2021^[3]) and sectoral approaches that span multiple jurisdictions (Baron and Ellis, 2006^[4]), but these proposals have not materialised. Project-based and programmatic crediting approaches can align their GHG accounting with approaches implemented at a higher level of aggregation (so called ‘nested’ accounting). Verra’s VM0048 methodology, for example, aligns projects’ GHG accounting with jurisdictional deforestation risk maps. Acronyms used in the table refer to the following initiatives and/or standards (also described in Annex B): TCAF = Transformative Carbon Asset Facility; ART TREES = Architecture for REDD+ Transactions - The REDD+ Environmental Excellence Standard; BioCF ISFL = BioCarbon Fund Initiative for Sustainable Forest Landscapes; FCPF = Forest Carbon Partnership Facility; VCS JNR = Verified Carbon Standard Jurisdictional and Nested REDD+; STEPS = Standard for the Transformation of the Electric Power Sector; SCALE = Scaling Climate Action by Lowering Emissions.

Source: Categorisation based on World Bank (2025^[5]). Data on total credit issuances across major registries (excluding governmental crediting mechanisms) was sourced from MSCI (2025^[6]), focusing on the 2020 to 31 January 2026 time period to reflect recent trends and smoothen year-on-year market volatility. Multiple sources were used to identify the share of issuances from scaled-up, programmatic and project-based approaches. The share of issuances by project-based and programmatic crediting in 2020-2025 was affected by temporary measures applied to projects in the Clean Development Mechanism, and should therefore be interpreted with caution. See Annex A for details.

Scaled-up crediting approaches (as described in Table 2.1) can put governments in the driver’s seat and support broad GHG mitigation. In scaled-up crediting approaches, GHG mitigation efforts are typically orchestrated directly by a government body at the national or sub-national level, or by another independent entity entrusted by the government. Given the government’s central role, the scaled-up activity proponent is hereafter referred to as ‘government’. Governments can generate carbon credits by mitigating climate change in a specific sector or through the implementation of a specific policy or policy package. The government supports the design of the scaled-up crediting approach and registers its intended mitigation efforts with a **carbon crediting mechanism**. To obtain carbon credits, the government needs to outperform a GHG emissions baseline, either in terms of absolute emission reductions or emission intensity reductions, in line with detailed provisions under the mechanism’s **methodological framework**. As the government is often the activity proponent in scaled-up crediting approaches, it can leverage its unique capabilities to act at scale by enhancing GHG mitigation frameworks, policies and implementation, often with support from non-governmental stakeholders. If the mitigation efforts outperform the baseline and meet other methodological requirements (e.g. related to additionality, environmental and social safeguards), carbon credits are issued.

Governments can use carbon credits from scaled-up approaches strategically to support climate objectives. The obtained carbon credits can be monetised through **results-based payments** (for which carbon credits are cancelled, rather than transferred) or carbon credit market transactions. As in project-based and programmatic approaches, carbon credits from scaled-up crediting may be contracted upfront, increasing revenue certainty and helping activity proponents secure up-front financing. Considering the available sources of finance, the **host country** government decides how carbon credits are monetised and how benefits are shared, in line with a benefit-sharing plan. Host country governments typically distribute revenues to stakeholders involved in, and affected by, the mitigation activities underlying the crediting approach. They may also use the revenues to deepen mitigation efforts. Finally, the host country government also decides whether the mitigation outcomes underlying the carbon credit can be accounted towards the host country’s **Nationally Determined Contribution (NDC)**, another country’s NDC or towards other international mitigation purposes (e.g. **CORSIA**), subject to guidance under **Article 6 of the Paris Agreement** (Section 2.4).

2.2. Rationales for scaled-up crediting approaches

Jurisdictional and sectoral crediting could enable structural climate change mitigation efforts, unlike most project-based and programmatic crediting approaches (Box 2.1). By moving beyond individual projects (and programmes) and by drawing on the power of governments as activity proponents, scaled-up crediting can drive change within whole jurisdictions and sectors. Governments have unique capabilities to address and overcome structural barriers to mitigation, including policy-making, developing and implementing long-term sectoral strategies and investing in infrastructure. In the forest sector, jurisdictional crediting can incentivise governments to tackle the underlying drivers of forest loss and to strengthen enforcement against illegal deforestation, faster than they would do in the absence of the crediting incentive. In the electric power sector, sectoral crediting can provide governments with a source of non-debt finance, which could strengthen their commitment to the energy transition and unlock catalytic investments in the sector. Given the potential scale of carbon credits that could result from jurisdictional and sectoral crediting, a strong demand signal is required to motivate host governments to participate and generate credit supply.

Box 2.1. Programmatic crediting approaches

Programmatic crediting can enable aggregate mitigation at a large scale, across multiple locations

While project-based crediting approaches typically focus on individual activities, programmatic crediting, also referred to as programmes of activities (PoAs), aggregates multiple, similar small-scale activities with certain characteristics under a single framework. These activities typically share a common characteristic, such as a specific technology for clean cooking solutions. Programmatic crediting approaches were developed under the Clean Development Mechanism as a way to implement mitigation activities that, on aggregate, could achieve mitigation at a larger scale than projects (Schmidt et al., 2006^[7]).

The aggregation of activities allows easier implementation, management and monitoring across a larger geographic scope or group of stakeholders, with reduced transaction costs. This can enable carbon credit markets to support the implementation and financing of small-scale mitigation activities (e.g. at the household-level) that would not be commercial on a stand-alone basis (World Bank, 2025^[5]). Once a programmatic crediting approach has been established, it can accommodate a very large number of component activities, which may be added over time. As such, a programme with strong financing and implementation capacity could resemble a subsidy for mitigation activities within the programme's geographic scope. When combined with supportive policies and oversight from the host country government, some programmes may even be better categorised as policy-based crediting. For example in Zambia's proposed Carbon Feed-In Premium (CFIP) Programme grid-connected renewable energy activities are aggregated under a crediting framework that draws on both policy-based and programmatic design features (MGEE, 2026^[8]).

... but is different from scaled-up crediting, as described in this paper

While programmatic crediting is often considered among "large-scale crediting approaches", it is not included among the "scaled-up crediting approaches" discussed in this paper. Programmatic crediting remains distinct from jurisdictional, sectoral and policy-based crediting approaches in two key respects. First, under most jurisdictional, sectoral and policy-based crediting approaches, the accounting boundary is not constrained to the scope of implemented activities, but spans entire jurisdictions, sectors or the potential emissions affected by a credited policy (World Bank, 2025^[5]). Second, the scaled-up crediting approaches discussed in this paper all focus on incentivising possible government efforts to mitigate climate change in the credited jurisdiction, sector or policy area. By contrast,

programmatic approaches, even if they may be subject to government oversight and support, typically incentivise distributed implementation of mitigation activities by a wide range of stakeholders (World Bank, 2025^[5]). As such, programmatic crediting has limited ability to leverage governments' unique capabilities to mitigate climate change (e.g. through long-term planning and policy implementation), unless the programme is explicitly coupled with a higher-level crediting approach.

Policy-based crediting can unlock the implementation of GHG mitigation policies by developing country governments. Policy-based crediting, through which countries can monetise carbon credits linked to the outcomes of GHG mitigation policies, can provide a much-needed finance for developing countries to strengthen climate policies, overcome implementation barriers and deliver lasting results (World Bank, 2023^[9]). While developing country governments are advancing mitigation policy efforts (OECD, 2024^[10]), policy development and implementation often encounter barriers. Such barriers can include insufficient financial resources, weak institutional context and political resistance from vested interests (Hallegatte et al., 2024^[11]). Furthermore, many developing countries have limited capacity to monitor and evaluate the effectiveness of policies in delivering on objectives such as GHG mitigation (Hudson, Hunter and Peckham, 2019^[12]).

Scaled-up crediting emerged, in part, as a response to shortcomings of project-based crediting. Importantly, scaled-up crediting can address the concern of within-jurisdiction and within-sector **leakage** under project-based and programmatic crediting (Section 3.7) (Schwartzman et al., 2021^[13]). Under project-based forest crediting, for example, protecting one forest area could increase the risk that other forest areas outside the project are cleared (Streck, 2021^[14]), whereas a jurisdictional forest crediting approach could capture any emissions shifts within the jurisdiction. Scaled-up crediting can also overcome the limited impact of project-based crediting by leveraging broader, policy-driven transformation. The GHG impact of project-based crediting may be constrained by factors beyond the control of project proponents. For example, project-based crediting for renewable energy sources may have a relatively limited impact on electric power sector emissions, unless the government also improves conditions for sector-wide decarbonisation by unlocking investment, managing electricity demand and improving energy system planning, infrastructure and governance (World Bank, 2023^[15]).

Scaled-up crediting also faces practical limitations, so project-based and programmatic crediting approaches can provide a useful complement, provided that crediting at different levels of implementation are co-ordinated. For example, many governments lack the institutional strength and co-ordination to accelerate GHG mitigation in response to a crediting incentive. Furthermore, estimating aggregate GHG mitigation impacts and attributing these to government efforts can be very challenging (Section 3.7). Importantly, standardised assessments of jurisdictional, sectoral or policy-level GHG impacts are likely to require the use of aggregated data with considerable uncertainty as well as methodologies that cannot fully account for country-specific conditions. In jurisdictions where scaled-up crediting is too challenging to implement (due to e.g. weak government institutions), project-based and programmatic crediting may provide a simpler route for carbon credit markets to stimulate GHG mitigation (Renard et al., 2020^[16]). Market- and community-led projects can be more flexible, innovative and context-sensitive than government policies (van Bergen, 2020^[17]; Sylvera, 2023^[18]). For example, in the forest sector, project-based crediting can empower communities in halting forest loss and develop tailored solutions to local circumstances (Hamrick, Webb and Ellis, 2021^[19]). In the electric power sector, project-based and programmatic crediting can accelerate renewable energy deployment and improve energy efficiency (ICVCM, 2024^[20]). For scaled-up, project-based and programmatic crediting to act synergistically, potential overlaps between crediting approaches must be managed, for example through nesting (Section 5.1).

2.3. Current state of scaled-up crediting

Scaled-up crediting remains limited due to its relatively recent implementation, but is expected to grow over time. Between January 2020 and January 2026, scaled-up crediting approaches issued over 154 million **units**³ (equivalent to around 6% of all carbon credit supply), most of which were cancelled for results-based payments (Annex A). Credit supply from scaled-up approaches could grow rapidly, due to a large pipeline of registered crediting approaches and growing demand. Notably, total demand from the aviation sector's compliance market, **CORSIA**, could exceed 100 million credits and USD 1 billion per annum before 2030, if the scheme is implemented in full by participating states (ICAO, 2025^[21]). As of April 2026, the majority of credits available for CORSIA's first phase came from one jurisdictional forest crediting approach in Guyana.⁴ Overall, four standards for jurisdictional forest crediting meet the emissions unit eligibility criteria of CORSIA's first Phase under specific conditions, namely ART TREES, FCPF, BioCF ISFL and VCS JNR (ICAO, 2026^[22]). In addition, carbon credit demand is expected to increase from buyers that intend to use Article 6 co-operation to support the achievement of climate goals (TNC, 2025^[23]; European Commission, 2025^[24]). As of April 2026, Norway and Singapore were the only sovereign buyers under Article 6 that had signalled interest in using credits from scaled-up approaches towards their NDC (NOGER, 2025^[25]; SCMC, 2026^[26]). If demand from CORSIA and Article 6 buyers increases rapidly, scaled-up crediting approaches may be a way to contribute to credit supply, depending on how Article 6 and CORSIA rules are interpreted and implemented in practice.

While implementation of scaled-up crediting is relatively new, concepts for scaled-up crediting approaches in a wide range of sectors emerged in the early 2000s (Samaniego and Figueres, 2002^[27]; Baron and Ellis, 2006^[4]). However, scaled-up crediting approaches were not included under the Kyoto Protocol's carbon markets and low demand for carbon credits throughout most of the 2010s further constrained their development. As a result, scaled-up crediting has only seen a handful of real-life applications (Table 2.2). Notably the land use sector, and more recently the energy sector, have seen tangible scaled-up crediting efforts in recent years. Expanding scaled-up crediting to further sectors could become challenging and time-consuming. Evidence from the aluminium sector suggests that industrial activities, particularly energy-intensive trade-exposed sectors, may be less suited to jurisdictional crediting due to competitiveness concerns and leakage risks (Baron and Ellis, 2006^[4]). Furthermore, scaled-up crediting in the buildings and transport sectors could face substantial implementation challenges, including complex **measurement, reporting and verification (MRV)** requirements.

³ This refers to the volume of emission reduction units and carbon credits reported as issued under scaled-up crediting standards in the Carbon Assets Tracking System (CATS) (World Bank, 2025^[31]) and ART Registry (2026^[30]). While CATS issued over 90 million emission reduction units since 2020, only around 9 million of these were tradable.

⁴ Whether jurisdictional forest credits are ultimately used by airlines for CORSIA compliance remains to be seen. Furthermore, credits eligible for CORSIA are expected to grow and diversify (Sylvera, 2026^[212]), but most projections suggest jurisdictional forest credits will continue to account for a large share of supply.

Table 2.2. Status of scaled-up crediting approaches by sector

Sector	Status	Background
Agriculture, Forestry and Other Land Use (AFOLU)	Implemented (jurisdictional crediting)	Over 99% of units issued from scaled-up crediting approaches to date are jurisdictional forest credits issued by FCPF and ART TREES.
Energy	- Implemented (policy-based crediting) - Under development (sectoral crediting for electric power generation)	- Almost 1% of units issued from scaled-up crediting approaches to date are from a policy-based approach for energy subsidy reform under TCAF. - An electric power sector crediting standard, STEPS, has been developed by the Environmental Resources Trust (ERT) and is open for global public comment until 01 July 2026.
Industry	Not implemented, no plans of further development known	Implementation challenges, including concerns over competitiveness and leakage risks (Baron and Ellis, 2006^[4]).
Buildings	Not implemented, no plans of further development known	Implementation challenges, including complex measurement, reporting and verification.
Transport	Not implemented, no plans of further development known	Implementation challenges, including complex measurement, reporting and verification.

Source: Authors' own analysis.

Jurisdictional forest crediting is the dominant form of scaled-up crediting, with over USD 2 billion⁵ committed from donors and buyers since 2020 (Annex A). Jurisdictional forest crediting has, to a large extent, co-evolved with the United Nations Framework Convention on Climate Change (UNFCCC)'s framework for reducing emissions from deforestation and forest degradation (REDD), as well as sustainable management of forests and the conservation and enhancement of forest carbon stocks (+) in developing countries, short **REDD+**. In 2013, Parties adopted the Warsaw Framework for REDD+, which included modalities on how results-based finance could be used to support REDD+ activities in developing countries (Decision 9/CP.19) (UNFCCC, 2013^[28]). To support such result-based finance, the World Bank-led **Forest Carbon Partnership Facility (FCPF)** developed the first methodological framework to generate carbon credits from **jurisdictional REDD+** efforts. The first units under the FCPF Methodological Framework were verified in 2021.⁶ Today, jurisdictional crediting approaches in the agriculture, forestry and other land use (AFOLU) sector are implemented by several standards and initiatives, beyond FCPF (Table 2.3). Over time, these standards have increased in sophistication and alignment with good practices for carbon crediting mechanisms. Efforts to advance jurisdictional REDD+ crediting continue. In 2025, in the margins of the 30th Conference of the Parties (COP30) to the UNFCCC in Belém, a broad alliance of countries, companies and civil society launched the 'Scaling J-REDD+ Coalition', to collectively accelerate jurisdictional REDD+ crediting efforts and mobilise finance for forests at scale (FCLP, 2025^[29]).

⁵ This value excludes some large commercial agreements where offtake values have not been disclosed, e.g. between Tocantins (Brazil) and Mercuria and between Grupo Perú (Peru) and Silvania.

⁶ Most units issued under FCPF have not been monetised through transfers to a buyer, as in carbon credit markets. Instead, most issued units have been non-tradable, and host jurisdictions have received a per-unit compensation of USD 5, mainly from official development assistance (ODA). Results-based payments without unit transfer still account for most finance flowing to host governments involved in scaled-up crediting. However, the monetisation of scaled-up crediting units through transfers of credits to a buyer, or credit offtake agreements, has increased in recent years (Annex A).

Table 2.3. Overview of scaled-up crediting standards

Methodological standard	Donor and buyer support	Number of (potential) host jurisdictions	Total units issued (equivalent to % of all credits issued since 2020)
FCPF Standard	Donor government contributions towards the FCPF Carbon Fund (results-based payment vehicle) worth over USD 850 million, with smaller contributions from non-governmental stakeholders.	15	94.8 million (3.8%)
ART TREES	- Commitments worth over USD 1 billion from governments and companies through the LEAF Coalition. - Several separate offtake agreements and direct purchases from the private sector, notably an agreement worth USD 750 million between Hess Corporation and Guyana.	26	58.3 million (2.3%)
TCAF Framework	Donor government contributions towards TCAF (including funds for results-based payments) worth over USD 200 million.	2	1.3 million (0.05%)
ISFL Program Requirements	Donor government contributions towards the BioCFT3 (results-based payment vehicle) worth over USD 200 million.	5	-
VCS JNR	A small number of private sector offtake agreements, for which the value has not been publicly disclosed.	4	-
Gold Standard Policy Requirements and Procedures (PRP)	Support for the development of the PRP was provided by the Global Green Growth Institute (GGGI). GGGI also supports the development of policy-based crediting approaches in several jurisdictions.	-	-
Electric power sector crediting approaches (methodological frameworks under development, including STEPS)	- Initial technical support from donor countries through the SCALE Sustainable Infrastructure Solutions (SIS) Pillar. - Interest from multiple potential corporate buyers through the Kinetic Coalition.	-	-

Note: The number of (potential) host jurisdictions also include scaled-up crediting approaches that are at an early stage. For ART TREES, 26 jurisdictions have an approach listed on the ART Registry (2026^[30]), with further jurisdictions having submitted letters of interest to the LEAF Coalition. For the FCPF Standard, 15 jurisdictions are listed on the CATS Registry (2025^[31]), with a further 30 jurisdictions having received technical assistance under the FCPF Readiness Fund (2023^[32]). For ISFL, 5 jurisdictions have active country programs (World Bank, 2025^[33]), with 2 jurisdictions listed on the CATS registry (2025^[31]). Under TCAF, 2 jurisdictions have received project information note endorsement (2025^[34]), with 1 jurisdiction listed on the CATS registry (2025^[31]). For VCS JNR, 4 jurisdictions have either requested registration, have programs under development or that are undergoing stakeholder consultation (Verra, 2026^[35]). While SCALE SIS is supporting jurisdictions to prepare for potential power sector crediting, there is not yet a methodological standard with which to register approaches (2025^[33]). While GGGI is supporting the development of policy-based crediting approaches, none have formally registered with Gold Standard. The number of units issued includes both tradable credits and non-tradable units that were not allocated to the buffer pool. A large proportion of units issued under FCPF were cancelled in connection with results-based payments. Information was last updated on 31 January 2026.

Source: Authors' own analysis based on multiple sources listed in Annex A.

To date, over 80 national and subnational jurisdictions have been involved in scaled-up crediting approaches, including early-stage approaches that have not issued credits. This includes 18 donor and 67 potential host jurisdictions (Annex A).

Donor support is typically provided through initiatives that pool resources from multiple sovereign donors (e.g. ISFL BioCF Tranche 3 (BioCFT3), TCAF) and can also include private buyers (e.g. LEAF Coalition, FCPF Carbon Fund). Some initiatives primarily focus on readiness support (e.g. FCPF Readiness Fund and ISFL BioCFplus), and others support a range of carbon crediting approaches, potentially including scaled-up crediting (e.g. GGGI's Carbon Transaction Facility (CTF) with the Norwegian Article 6 Climate

Action (NACA) Fund (CTF/NACA) and the Transition Credits Coalition (TRACTION)). Scaled-up crediting initiatives that provide payments for verified units are typically tied to a specific crediting standard (e.g. FCPF Carbon Fund - FCPF Standard), but some initiatives (e.g. LEAF Coalition) support jurisdictions registered with different standards. Some host jurisdictions (e.g. Misiones, Argentina; Acre, Brazil) have signed contracts directly with private buyers and intermediaries.

As of January 2026, 18 sovereign donors had provided financial support to scaled-up crediting initiatives (Table 2.4), some of which do not exclusively support scaled-up crediting. Norway, the United Kingdom and Germany stood out by providing more than three-quarters of donor support across all initiatives.

Table 2.4. Sovereign donors that have supported scaled-up crediting initiatives, including technical assistance

Sovereign donor	CTF/ NACA	FCPF Carbon Fund	FCPF Readiness Fund	ISFL BioCFplus	ISFL BioCFT3	Kinetic Coalition	LEAF Coalition	SCALE	TCAF	TRAC- TION
Australia		x	x							
Canada		x	x						x	
Denmark			x							
European Commission		x	x							
Finland			x							
France		x	x							
Germany		x	x	x					x	
Italy			x							
Japan			x							
Netherlands			x							
Norway	x	x	x	x	x		x	x	x	
Korea							x			
Singapore										x
Spain			x						x	
Sweden									x	
Switzerland		x	x	x	x			x		
United Kingdom		x	x	x	x		x	x	x	
United States		x	x	x	x	x	x	x		

Note: Data covers support from sovereign donors as of end 2025, including commitments and contributions. Some initiatives listed support project-based and programmatic crediting approaches, with the potential to also support scaled-up crediting approaches, e.g. TRACTION, CTF/NACA. Some initiatives primarily support countries' readiness to participate in scaled-up crediting approaches, e.g. FCPF Readiness Fund, ISFL BioCFplus. Information was last updated on 31 January 2026.

Source: Authors' own illustration based on multiple sources listed in Annex A.

At least 67 host jurisdictions had either benefitted from one of the initiatives listed in Table 2.4, or filed documents with a scaled-up crediting standard. Of these, 26 host jurisdictions had contracted units with a financing vehicle or buyer and 15 had issued units (Table 2.5). In addition, 25 jurisdictions had submitted documentation for a scaled-up crediting approach under a crediting standard. A further 16 jurisdictions had benefitted from technical assistance with a view to support scaled-up crediting, or piloted activities that could be monetised through scaled-up crediting.

Table 2.5. Host jurisdictions that have contracted or issued units with scaled-up crediting initiatives and standards

Region	Host jurisdiction	Contracted units	Units issued
Africa	Congo	FCPF Carbon Fund	Contracted units not yet issued
	Côte d'Ivoire	FCPF Carbon Fund, LEAF Coalition	FCPF Standard
	DRC	FCPF Carbon Fund	FCPF Standard
	Ethiopia	ISFL (BioCFT3)	Contracted units not yet issued
	Ghana	LEAF Coalition, FCPF Carbon Fund	FCPF Standard
	Madagascar	FCPF Carbon Fund	FCPF Standard
	Mozambique	FCPF Carbon Fund	FCPF Standard
	Zambia	ISFL (BioCFT3)	Contracted units not yet issued
Asia	Indonesia	FCPF Carbon Fund	FCPF Standard
	Lao PDR	FCPF Carbon Fund	FCPF Standard
	Nepal	FCPF Carbon Fund, LEAF Coalition	FCPF Standard
	Uzbekistan	TCAF	TCAF Framework
	Viet Nam	FCPF Carbon Fund	FCPF Standard
Latin America and the Caribbean	Chile	FCPF Carbon Fund	FCPF Standard
	Colombia	ISFL (BioCFT3)	Contracted units not yet issued
	Costa Rica	LEAF Coalition, FCPF Carbon Fund	FCPF Standard
	Dominican Republic	FCPF Carbon Fund	FCPF Standard
	Ecuador	LEAF Coalition	Contracted units not yet issued
	Guatemala	FCPF Carbon Fund	FCPF Standard
	Guyana	Private buyers	ART TREES
	Misiones (Argentina)	Private buyer(s)	Contracted units not yet issued
	Pará (Brazil)	LEAF Coalition	Contracted units not yet issued
	Piauí (Brazil)	Private buyer(s)	Contracted units not yet issued
	Peru	Private buyer(s)	Contracted units not yet issued
	Tocantins (Brazil)	Private buyer(s)	Contracted units not yet issued
Oceania	Fiji	FCPF Carbon Fund	Contracted units not yet issued

Note: Data covers host jurisdictions with scaled-up crediting approaches where units have been contracted by a buyer and / or financing vehicle, or units have been issued under a scaled-up crediting standard. Data on contracted results are limited to public announcements. Data on issuances include both tradable credits and non-tradable units and is reported with respect to the standard used for generating verified mitigation outcomes. Information was last updated on 31 January 2026.

Source: Authors' own illustration based on multiple sources listed in Annex A.

Jurisdictional forest crediting approaches dominate, with over 99% of units from scaled-up crediting standards having been issued by FCPF (61.4%) and the independent crediting mechanism **ART TREES** (37.8%). Beyond land use, jurisdictional and sectoral crediting has made progress in the electric power sector, however, standards for such crediting have not been finalised. **Standard for the Transformation of the Electric Power Sector (STEPS)**, an electric power sector crediting standard, has been developed by the Environmental Resources Trust (ERT) and is open for global public comment until 01 July 2026.

Less than 1% of units from scaled-up crediting to date have come from policy-based crediting under the World Bank-led **Transformative Carbon Asset Facility (TCAF)**, which has supported energy subsidy reforms in Uzbekistan. Policy crediting faces numerous challenges, such as developing robust methodologies, identifying creditable policies and building confidence among potential host governments and buyers. Already in 2004, policy-based crediting approaches were proposed under the Clean Development Mechanism (CDM), but at COP11 in Montréal 2005, such approaches were deemed incompatible with the CDM's project-based scope, which excludes local, regional, or national policies or standards as eligible CDM activities (Schmidt et al., 2006^[7]; Okubo, 2011^[36]). This was in part due to challenges in ensuring that government-driven emission reductions or removals were real, additional,

measurable and verifiable (UNFCCC, 2006^[37]; Okubo, 2011^[36]). At COP13 in Bali 2007, Parties agreed that developing countries would undertake **nationally appropriate mitigation actions (NAMAs)**, ‘in a measurable, reportable and verifiable manner’, revitalising hopes to develop policy-based crediting (Okubo, 2011^[36]). However, NAMA activities never generated carbon credits, although they were sometimes supported with results-based finance (PMR, 2017^[38]; Kreibich and Obergassel, 2018^[39]; NAMA Facility, 2022^[40]). In 2017, the World Bank operationalised the TCAF, which now hosts the only active policy-based crediting approach, an energy subsidy reform programme in Uzbekistan (TCAF, 2025^[41]). In parallel, the Global Green Growth Institute (GGGI) and Gold Standard (2024^[42]) have developed conceptual foundations for policy-based crediting under Article 6, with GGGI-supported pilot activities under development (GGGI, 2025^[43]). GGGI advances this work through its Carbon Transaction Facility (CTF), for example, through a policy-based crediting approach under development in Jordan in cooperation with the Norwegian Article 6 Climate Action (NACA) Fund (GGGI, 2025^[43]; GGGI, 2026^[44]).

Developing scaled-up crediting approaches in additional sectors would likely be both challenging and time-consuming. The potential of scaled-up crediting approaches to contribute to the goals of the Paris Agreement will depend, in part, on how quickly such approaches can be developed and implemented and if they are consistent with increasingly ambitious national mitigation efforts. Alignment with the Paris Agreement temperature goals requires increasingly ambitious national targets and progressively more stringent downward adjustments of credited mitigation outcomes over time. As countries further increase ambition, this could significantly constrain the volume of credits that can be generated from carbon credit markets, including scaled-up approaches. Before extending scaled-up crediting approaches to sectors beyond land use and energy, governments could usefully evaluate whether the potential medium- and long-term benefits of crediting are sufficient to justify the upfront investments required to develop these approaches (Section 4.).

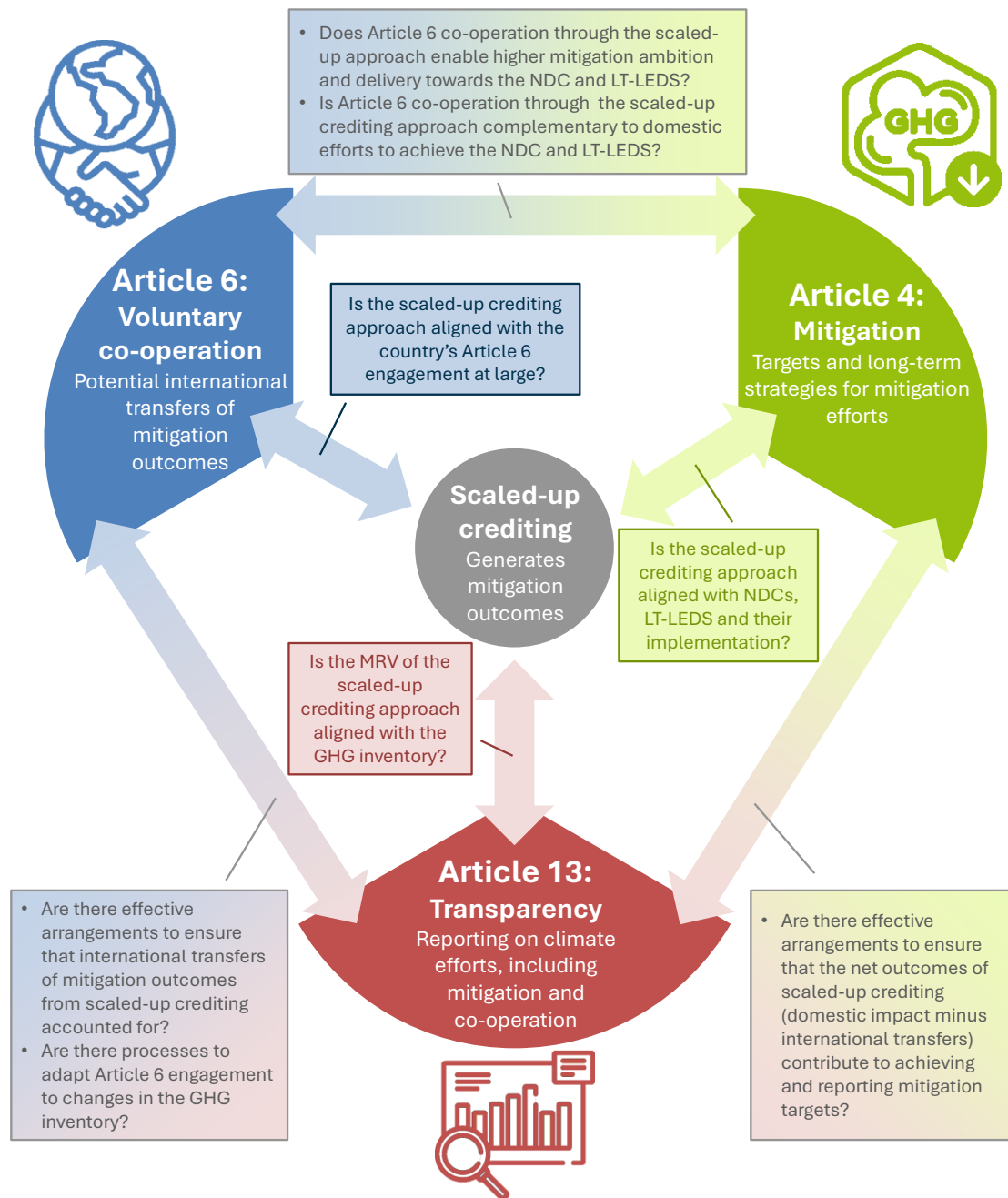
2.4. Scaled-up crediting, climate ambitions and international markets

Scaled-up crediting approaches are typically implemented at the national or sub-national level and therefore need to be carefully aligned with the host country’s climate ambitions and strategies for engaging with international carbon markets. In the case of sectoral power crediting and jurisdictional forest crediting, a scaled-up crediting approach may cover a substantial share of a country’s total GHG emissions. Participation in such an approach can therefore have significant implications for the achievement of national climate targets.

To ensure scaled-up crediting complements national climate efforts, governments should align crediting approaches with key elements of the Paris Agreement (Figure 2.1). This includes Articles 4 (mitigation), 6 (co-operation) and 13 (transparency) and their supporting decisions:

- Article 4 outlines how governments set their mitigation strategies, targets and plans. Scaled-up crediting should support both the ambition and achievement of these efforts, and remain complementary to mitigation that would occur in the absence the crediting approach.
- Article 6 enables voluntary co-operation, including through carbon markets. Participating countries must decide what mitigation outcomes to transfer internationally, in what volumes and under which conditions. As scaled-up crediting may generate a significant share of this supply, it should be integrated into the country’s overall strategy for engaging in carbon markets.
- Article 13 establishes a transparency framework for tracking and reporting climate action. National GHG inventories play a central role by reflecting emissions trends and the use of international co-operation. To ensure these systems provide a reliable feedback loop for policy, scaled-up crediting approaches should be methodologically aligned with inventory systems, and supported by procedures that allow governments to act on emerging information.

Figure 2.1. Key considerations and feedback loops related to scaled-up crediting approaches and selected Articles of the Paris Agreement



Note: Scaled-up crediting approaches may interact with other parts of the Paris Agreement, not least Article 5 (sinks and reservoirs). In this diagram, Articles are used as shorthand for both provisions in the Paris Agreement and its supporting decisions. The feedback mechanisms between Articles 4, 6 and 13 are relevant for all carbon credit generation, but particularly important for scaled-up crediting, considering the large volume of mitigation outcomes that may result from such approaches. NDC: Nationally Determined Contribution; LT-LEDS; Long-Term Low GHG Emissions Development Strategy; MRV: Measurement, Reporting and Verification.

Source: Authors' own illustration.

Nationally determined contributions (NDCs), set out under Article 4 of the Paris Agreement, provide the primary reference point for aligning carbon crediting approaches, including scaled-up crediting, with national climate ambitions. Under the Paris Agreement, Parties submit NDCs, including mitigation targets

and measures to achieve them. Over time, NDCs are expected to become more ambitious and move towards economy-wide coverage, taking into account national circumstances (UNFCCC, 2015^[45]). Collectively, NDCs are intended to contribute to the achievement of the Paris Agreement's temperature goal of limiting global warming to well below 2 °C above pre-industrial levels, while pursuing efforts to limit the temperature increase to 1.5 °C.

Scaled-up crediting approaches must be anchored in host country NDCs to support their contribution to national climate ambition and international mitigation goals. A host country's NDC provides the primary framework within which scaled-up crediting approaches should be designed and implemented. Given that scaled-up crediting approaches may contribute to a significant share of a host country's overall mitigation, it is essential that they are integrated into the development process and implementation plans for NDCs and long-term climate strategies (PMR, 2017^[38]). At the same time, it is difficult to distinguish between mitigation action that host governments undertake to meet their NDC commitments and mitigation that goes beyond these national commitments and can therefore be credited and transferred internationally. Managing the balance between mitigation outcomes transferred as ITMOs and those retained towards a host country's own NDC will therefore become particularly important as NDC ambition grows. This also requires alignment with the broader Paris Agreement rulebook, including under Article 6 and Article 13.

If well-designed, scaled-up crediting approaches can complement domestic mitigation efforts as outlined in the host country's NDC. Confidence in the complementarity of scaled-up crediting approaches may be strengthened, for example, where:

- the crediting approach targets sectors in which external support is necessary to overcome barriers to GHG mitigation;
- the crediting baseline is set well below the emissions trajectory implied by the host country's unconditional NDC.

Article 6 of the Paris Agreement allows countries to co-operate to meet their climate goals and scaled-up crediting approaches can contribute such co-operation. More specifically, **Articles 6.2** and **6.4** provide routes for Parties to use market-based co-operation (including carbon credit markets) to implement mitigation activities and transfer resulting mitigation outcomes, or otherwise account for such outcomes in relation to their NDCs. Article 6.2 provides a framework for countries to implement mitigation activities and exchange **internationally transferred mitigation outcomes (ITMOs)**, giving participating countries considerable flexibility to design and execute co-operative approaches. Article 6.4 establishes an international carbon crediting mechanism, the **Paris Agreement Crediting Mechanism (PACM)**, which includes governing bodies, standards, methodologies, a registry and **third-party** auditors. Scaled-up crediting approaches are already being implemented under Article 6.2. Notably, some of the first ITMOs transferred originated from a jurisdictional REDD+ crediting programme in Guyana under ART TREES. By contrast, scaled-up crediting is not yet an option under Article 6.4. However, ongoing work on "Large-scale crediting programmes", including a concept note expected in 2026, may open the door to future methodologies and activities of this type under the PACM. In the near term, the PACM's efforts to integrate large-scale crediting programmes are expected to focus on programmatic crediting approaches (Hoch et al., 2026^[46]).

International transfers of mitigation outcomes under Article 6 require robust accounting and careful strategic planning by participating Parties. A central feature of Article 6 is the application of **corresponding adjustments** (Box 2.2), which ensure that emission reductions or removals are counted towards only one NDC or other international mitigation purpose. When ITMOs are transferred, the host country must apply an upward adjustment to its emissions balance, reflecting the fact that the mitigation outcome is no longer available for use towards its own NDC. For countries with ambitious mitigation targets, these upward adjustments entail an opportunity cost, as additional mitigation is then required to achieve domestic climate objectives. Therefore, countries need to have robust plans to deliver mitigation actions domestically, irrespective of potential Article 6 engagement. Where host countries do engage in Article 6 co-operation, they need to manage potential trade-offs between ITMO transfers and NDC achievement through robust data on domestic mitigation opportunities, strong institutional arrangements, and clearly formulated strategies for engagement in international carbon markets. Such strategic planning is particularly important in the context of scaled-up crediting approaches, where ITMO transfers could represent a large share of national emissions or removals. In addition, the method used to account for ITMO transfers and apply corresponding adjustments must be carefully selected to avoid overstating mitigation outcomes. In particular, risks to environmental integrity may arise where a host country: (i) has a single-year NDC target (e.g. for 2030); (ii) applies an averaging approach to apply corresponding adjustments (e.g. adjusting emissions in 2030 by the average volume of ITMOs transferred in the NDC implementation period); and (iii) transfers an increasing volume of ITMOs over time. Experts have cautioned that these conditions may apply in some countries supplying ITMOs for use under CORSIA (Siemons and Schneider, 2022^[47]).

Box 2.2. Understanding corresponding adjustments

Corresponding adjustments are an accounting measure under Article 6 to prevent GHG emission reductions or removals from being counted twice. Under Article 6, corresponding adjustments effectively transfer mitigation outcomes from the seller country's emissions balance to the buyer's emissions balance (Figure 2.2). This is essential to ensure that mitigation outcomes are not claimed by several Parties and counted only once.

A seller country that transfers ITMOs will add the amount of ITMOs transferred to its emissions balance when reporting for NDC compliance. Seller countries must also apply an upwards adjustment to their emissions balance if they transfer ITMOs for use towards other international mitigation purposes, such as CORSIA. If ITMOs are used for the buyer country's NDC, the buyer country will subtract the amount of ITMOs from its emissions balance.

Figure 2.2. Simplified illustration of how corresponding adjustments work



Note: BAU = business as usual.

Source: Authors' own illustration based on Schneider et al. (2016^[48]) and Ahonen et al. (2025^[49]).

Article 13 establishes a transparency framework for how countries track and report climate action under the Paris Agreement. Countries submit regular reports on emissions and progress towards their targets, complemented by additional reporting requirements for those engaging in Article 6 co-operation (Falduto, Ellis and Simeonova, 2021^[50]). At the core of this framework are national GHG inventories, which track emissions and removals across sectors over time. These inventories provide a basis for assessing progress towards national mitigation targets and the role of international co-operation in achieving them.

The quality of GHG inventories varies across countries, but is expected to improve over time under the enhanced transparency framework. Compared to earlier arrangements under the Kyoto Protocol, reporting requirements have been strengthened, particularly for developing countries. However, inventories often rely on simplified methods, such as aggregated activity data and default emission factors, especially where capacity is limited (Cárdenas Rodríguez et al., 2024^[51]). In contrast, scaled-up crediting approaches typically require more detailed measurement, reporting and verification (MRV) within their scope. Through participation in scaled-up crediting, countries have an opportunity to strengthen national inventory systems over time, if they also enhance inventory accounting with relevant MRV elements from the crediting approach.

Misalignment between crediting MRV systems and national inventories could create risks for tracking progress towards national targets. If mitigation outcomes are captured under a scaled-up crediting approach but not fully reflected in the national GHG inventory, reported emissions trends may not accurately reflect domestic mitigation (Heras et al., 2023^[52]). This becomes particularly important when mitigation outcomes are transferred internationally under Article 6, as countries must apply corresponding adjustments to their emissions balance (Box 2.2). If the underlying inventory does not capture the mitigation achieved, such adjustments can weaken the link between reported emissions and real-world outcomes, potentially undermining progress towards the NDC. This risk is not unique to scaled-up crediting, but can apply to many situations where crediting, inventories, and Article 6 accounting are not sufficiently aligned. Countries can mitigate this risk by improving methodological alignment between

crediting and inventory systems, and by retaining a share of mitigation outcomes for domestic target achievement.

Beyond integration with national climate plans, market engagement strategies and reporting, there is a broader discussion on how to align scaled-up crediting approaches with the Paris Agreement's long-term temperature goal. In most Paris-aligned mitigation pathways, the power sector and land-use sector are among the first to reach net-zero CO₂ emissions (Pouille et al., 2023^[53]). This suggests that, in a Paris-aligned world, opportunities to reduce GHG emissions from these sectors should be exploited sooner than in other sectors. The land use sector and power sector are also most advanced with respect to scaled-up crediting. As a result, if carbon credit markets are to align with the Paris Agreement, current scaled-up crediting may face a progressively narrowing scope for credit issuance over time. This narrowing scope could result from increasingly ambitious host country NDCs, covering a wider scope of economic sectors, greenhouse gases and mitigation activities, as well as measures to align crediting provisions (e.g. baselines) with the Paris Agreement's temperature goal (Section 3.2).

3. Environmental integrity in jurisdictional and sectoral crediting approaches

3.1. Understanding environmental integrity: key conditions for effective mitigation results

Jurisdictional and sectoral crediting can bring strategic benefits for GHG mitigation in developing countries, but this requires that they meet key integrity conditions. To deliver climate change mitigation in line with the Paris Agreement temperature goal, governments will need to guide a structural transformation of the economy towards net-zero GHG emissions. While project-based and programmatic crediting mostly relies on non-governmental actors, jurisdictional and sectoral crediting strengthens the role of governments, with potential benefits for long-term GHG mitigation at scale. However, for jurisdictional and sectoral crediting to be effective in delivering mitigation action, payments to host governments must be effectively targeted to verified mitigation outcomes. In the context of carbon credit markets, **environmental integrity** typically refers to climate impacts, whereas integrity more generally also includes the consideration of social and environmental impacts.⁷ Focusing on environmental integrity, relevant conditions can be categorised into supply-side (e.g. additionality, quantification and permanence), demand-side (e.g. priority to direct mitigation, transparent and accurate claims) and market integrity (e.g. governance and transparency) (G7, 2023^[54]).

This paper concentrates on six supply-side integrity elements that are particularly material to scaled-up crediting, but should be met by all carbon crediting approaches. Credited mitigation outcomes should (Figure 3.1):

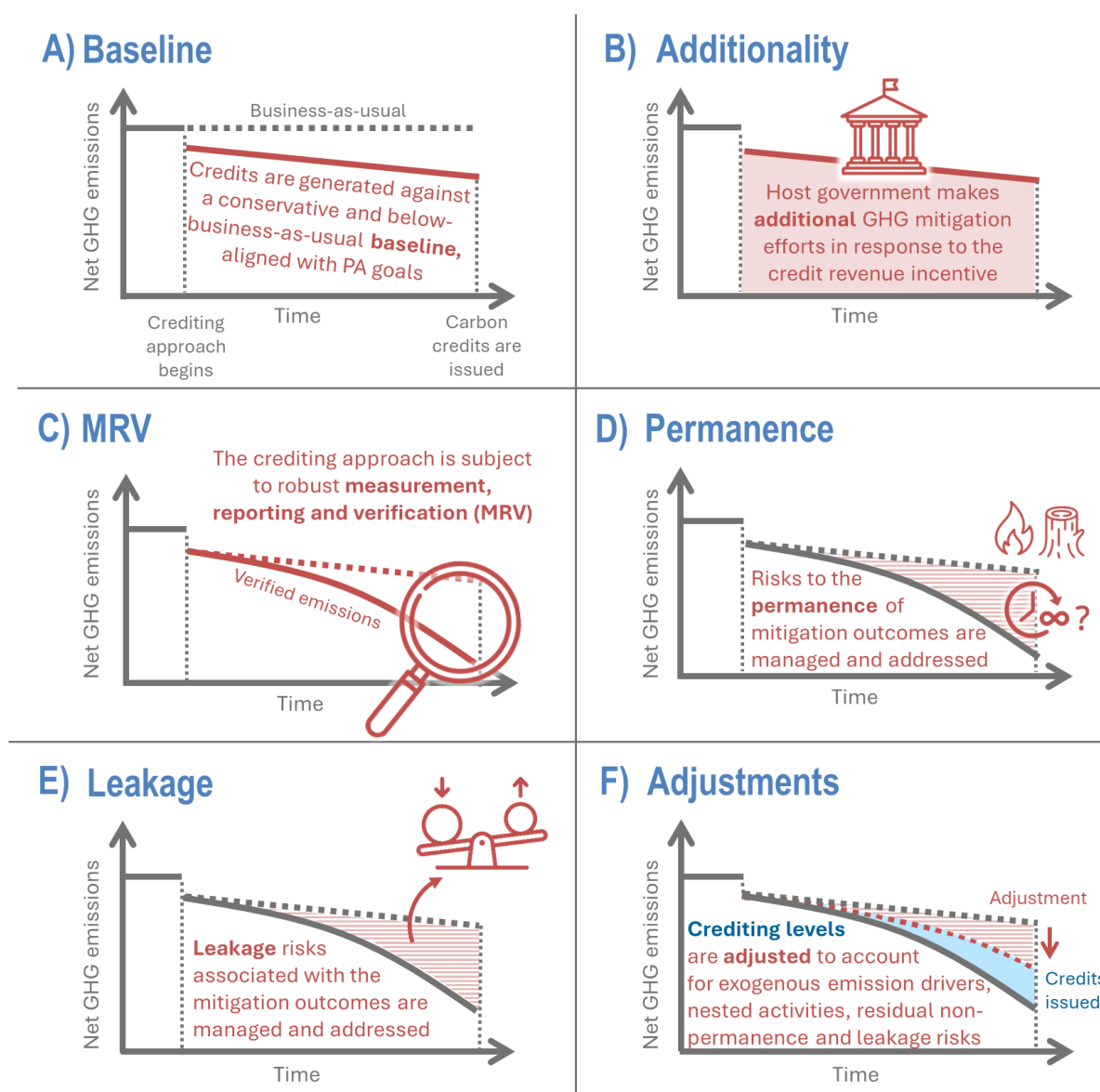
- A. Be generated against a conservative, below-business-as-usual baseline, supporting the host country's NDC and the Paris Agreement (PA) temperature goal;
- B. Reflect additional mitigation efforts by the host government;
- C. Be subject to robust measurement, reporting and verification (MRV);
- D. Be subject to systems for managing and addressing non-permanence risks;
- E. Be subject to systems for managing and addressing leakage risks; and,
- F. Be adjusted for exogenous emission drivers, nested activities, as well as residual non-permanence and leakage risks,⁸ to accurately reflect the government's mitigation efforts.

⁷ For a more comprehensive account of integrity, and specifically environmental integrity conditions, see (Wetterberg, Ellis and Schneider, 2024^[1]).

⁸ Even if non-permanence and leakage risks are managed (Sections 3.5 and 3.6), for example by addressing the underlying drivers of forest loss, some residual risk remains that credited mitigation may be reversed over time or that emissions may be displaced beyond the crediting boundary.

While these six conditions are non-exhaustive, interdependent and cannot be assessed in isolation, each is unpacked in the following sub-sections, focusing on jurisdictional crediting approaches in the land-use sector, where implementation is most advanced, and referring to developments in the energy sector, where relevant.

Figure 3.1. Illustration of key conditions for environmental integrity in scaled-up crediting approaches



Source: Authors' own illustration.

3.2. Conservative and below-business-as-usual baselines

The **baseline** is the GHG emission level against which mitigation outcomes are estimated. Baselines should represent a **conservative** and **below-business-as-usual** scenario. In this context, business-as-

usual refers to a plausible reference benchmark for GHG emissions or removals, representing how GHG emissions would have evolved in the absence of the crediting approach (Schneider and Cames, 2009^[55]).

Jurisdictional baselines in the land use sector are set in relation to historical GHG emission levels, with considerable methodological differences across jurisdictions. So called ‘**historical baselines**’ are based on past GHG emissions and removals and allow for some adjustments for e.g. jurisdictional circumstances and uncertainty. In the forest sector, jurisdictional crediting baselines are closely related to **forest reference (emission) levels (FRLs/FRELs)**, which are subject to high-level methodological guidance and reviews under the UNFCCC’s REDD+ framework. The majority of FRLs/FRELs are also derived from historical GHG emission levels. As of January 2026, 81 out of 107 reference level submissions are based on historical averages, 12 apply an upward adjustment to consider expected increased pressures on forests, seven rely on linear projections⁹ and five use zero-baselines,¹⁰ while two apply some other approaches (FAO, 2026^[56]). Compared to forest reference levels, jurisdictional REDD+ baselines have more standardised provisions and a stronger third-party audit system. However, forest carbon accounting is largely sovereign. While jurisdictional crediting standards include extensive provisions for baselines and GHG accounting, their interpretation and implementation can vary, leading to different methodological choices across jurisdictions. Such choices include what scope of sinks and sources to include in the baseline, which **emission factors** to apply and how to adjust baselines for jurisdictional circumstances (Alvarez and Stokeld, 2025^[57]).

Current approaches to setting jurisdictional baselines in the land use sector could lead to inaccurate crediting, due to uncertainty about future GHG emissions or removals. Emission levels and trends (notably depending on deforestation rates) in the land use sector are very difficult to predict, as GHG emissions vary a lot year-on-year (Neeff, 2021^[58]; Teo et al., 2023^[59]). Due to this variability over time, historical baselines entail potential risk of over- or under-crediting in jurisdictional approaches. If historical baselines overestimate future emission levels, such baselines could lead to over-crediting, rewarding host jurisdictions for GHG impacts that may not result from mitigation activities under the crediting approach (i.e. constituting an environmental integrity concern) (CCQI, 2024^[60]). Conversely, if historical baselines underestimate future emission levels, host governments struggle to outperform the baseline, discouraging potential host jurisdictions from engaging in scaled-up crediting approaches (Wang, 2025^[61]). If host jurisdictions with overestimated baselines are more likely to participate in jurisdictional forest crediting, such selection bias could lead to over-crediting becoming more common than under-crediting. However, if global deforestation pressures increase in the future, historical baselines could lead to under-crediting becoming more common than over-crediting. Experts have different perspectives on whether global forest net emissions have increased or decreased in the last 20 years (IPCC, 2024^[62]; WRI, 2025^[63]; FAO, 2025^[64]), and future trends are challenging to predict. For deforestation in specific jurisdictions, predictions based on biophysical and socioeconomic factors will typically be more accurate than predictions based on historical emission levels (Teo et al., 2023^[59]). However, while more accurate, **model-based baseline** approaches can be challenging to implement (Box 3.1). Therefore, standards for jurisdictional land use crediting typically use historical baselines, while requiring downward adjustments to account for uncertainty (Section 3.7).

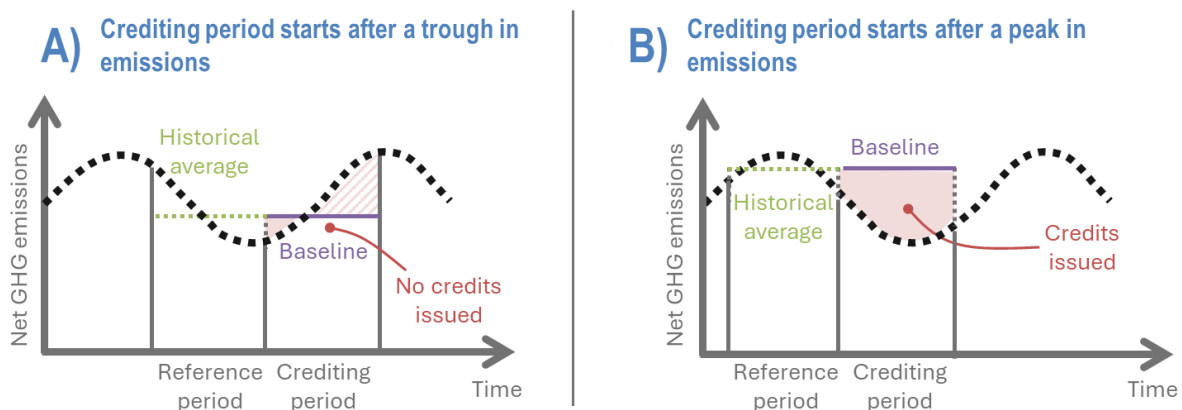
The risk of potential over-crediting in jurisdictional land use crediting may be increased by methodological flexibility in setting jurisdictional baselines. In the forest sector, baselines emissions for a **crediting period** are usually informed by average emissions in a given historical **reference period**. While jurisdictional crediting methodologies have reduced flexibility compared to FRLs/FRELs, host jurisdictions have some flexibility in choosing the timing of the first crediting period and/or reference period. Different start and end dates for crediting and reference periods can lead to significant differences in credits issued, with potential

⁹ A linear projection approach constructs a reference level by linearly extrapolating historical observations.

¹⁰ A zero-baseline constructs a reference level in which net emissions in the sector are set to zero.

over-crediting as a result (Mertz et al., 2018^[65]). Some standards (e.g. TREES) have reduced flexibility by requiring that crediting baselines decline over time if the jurisdiction outperforms the baseline (ART, 2021^[66]) but flexibility in the first crediting period remains a potential source of over-crediting risk. In addition, flexibility in the duration that jurisdictions must participate in a jurisdictional crediting approach can further increase the risk of over- or under-crediting, given the interannual variability observed in forest GHG emission levels (Figure 3.2) (Schneider et al., 2025^[67]). Furthermore, host jurisdictions are sometimes granted permission to adjust their baseline emission levels for national circumstances. For example, jurisdictions with **high forest cover and low deforestation (HFLD)** can apply upward adjustments to baseline emissions under certain standards (e.g. ART TREES), as these jurisdictions typically face increasing deforestation pressures over time (Teo et al., 2024^[68]). Whether these upward adjustments accurately reflect increasing deforestation pressures in HFLD jurisdictions remains contested and under active research (Teo et al., 2024^[68]; Schneider et al., 2025^[67]). Upward adjustments are typically more constrained under ART TREES than those used by host countries in forest reference level submissions to the UNFCCC under the Warsaw Framework for REDD+. Nonetheless, concerns over the application of upward adjustments have been raised in relation to the most lucrative scaled-up crediting approach to date, ART102 in Guyana (UNFCCC, 2025^[69]).

Figure 3.2. How crediting period start dates affect crediting levels



Note: The timing of the crediting period start can affect the level of crediting. Panels A and B demonstrate this with an illustrative net emissions curve in which GHGs fluctuate over time, rather than declining continuously (dotted curve). In Panel A, the crediting period starts immediately after a trough in net emissions, resulting in a low historical average, a low baseline and no credits being issued. In Panel B, the crediting period starts immediately after a peak in net emissions, resulting in a high historical average, a high baseline and the issuance of credits.

Source: Authors' own illustration.

Model-based baselines with ex-post adjustments could improve baseline accuracy, but these are challenging to implement and reduce investment certainty for activity proponents. Compared to baselines informed by historical emission levels, alternative approaches to baseline-setting could be considered to improve accuracy. Research on the forest sector has found that model-based baseline approaches (Teo et al., 2023^[59]) and ex-post adjustments of baselines, which are informed by trends in similar forests (Rau et al., 2025^[70]), can significantly improve baseline accuracy. However, model-based baselines (Box 3.1) and ex-post adjustments significantly increase technical complexity and require assumptions and judgements that can be disputable (Teo et al., 2023^[59]), potentially resulting in a range of plausible projections. In addition, ex-post adjustments of baselines increase uncertainty about the expected volume of credits, and delay credit issuance and payment. With reduced revenue certainty, the political support for jurisdictional REDD+ efforts in host jurisdictions could be undermined.

Box 3.1. Opportunities and risks with model-based approaches to crediting baselines

Model-based baseline approaches could substantially reduce baseline uncertainty

Model-based approaches could improve baseline accuracy for jurisdictional forest crediting, but some baseline uncertainty will always remain. Comparing different jurisdictional forest baseline approaches, (Teo et al., 2023^[59]) found that model-based baselines had a significantly lower average forecast error (~50%) than historical average baselines (~80%). While the forecast errors remain large, reflecting the high uncertainty of forest emission levels, model-based approaches could offer better accuracy. Models achieve higher precision in their projections by controlling for biophysical factors (e.g. elevation, slope, temperature and rainfall) and socioeconomic factors (e.g. population density, agricultural and mining areas). However, the models reviewed did not explicitly consider important emission drivers that could only be controlled for ex-post (e.g. agricultural commodity prices and extreme weather events, such as those induced by El Niño). This suggests model-based projections could be further improved if they included ex-post adjustments.

In the electric power sector, governments' energy planning and modelling could provide a robust basis for sectoral crediting. Modelling has been widely used to project GHG impacts with relatively low forecast errors on a 5-year time horizon in advanced economies (EIA, 2022^[71]; Shen, Wen and Trutnevyte, 2023^[72]) and in absence of disruptive events affecting energy demand (e.g. the COVID pandemic) or supply (e.g. extreme weather). Sectoral crediting approaches in the electric power sector could build on governments' energy system planning based on least-cost expansion and dispatch model, identifying how to meet electricity demand at the lowest cost.

Model-based approaches to crediting baselines requires significant resources

Model-based approaches face several barriers, including:

- **Technical and administrative requirements:** Model-based baselines impose high requirements on data quality, collection and harmonisation, as well as model maintenance (OECD, 2024^[73]). Granular data on a jurisdictional and sectoral level would need to be available over long periods of time and for multiple biophysical, socioeconomic and other variables. Establishing standards, collecting data, building technical capabilities and developing models fit for scaled-up crediting would take significant time and resources. Further, model-based baselines add complexity to third-party audits, requiring the validation of data sources, methodologies and assumptions.
- **Accessibility issues:** Existing models could accelerate the development of model-based baselines. However, their accessibility remains limited as, while many are open-source, most require data access as well as prior experience and expertise to be used effectively. Such accessibility challenges are considerable in the forest sector.
- **Trust and governance:** Strong governance arrangements and trust, for example through open-source and transparent models, will be essential to the effectiveness of implementing model-based baselines, which can be perceived as 'black boxes'. Furthermore, greater co-ordination between modelling exercises underpinning scaled-up crediting and NDCs within a jurisdiction would be important for building confidence in the approach and enabling effective policy planning. Technical capacity building for host jurisdictions and inclusive governance arrangements would be key to support uptake among host governments.

The integrity of baselines in the electric power sector depends on clearly defining the scope of the approach, with further research needed as new standards are emerging. Defining the scope of electric power sector crediting approaches (e.g. electric power sector boundaries, and governance structures) will

be critical for such approaches to stimulate sector-wide GHG mitigation efforts (Ellis and Baron, 2005^[74]). How electric power sector boundaries are defined, affects the measurement and mitigation of GHGs from e.g. captive power plants, non-CO₂ gases, as well as electricity imports and exports. In April 2026, ERT (2026^[75]) published a draft standard on an emission intensity-based crediting approach in the electric power sector for global public comment. As the details of electric power sector crediting standards emerge and are finalised, further research will be needed to assess the integrity of baseline-setting approaches. This could include insights from energy modelling to evaluate the accuracy of proposed baseline approaches (Box 3.1).

Jurisdictional crediting has mainly been proposed in sectors that can reach net-zero emissions early, so any future Paris-alignment of such crediting approaches could lead to a narrower scope for credit generation. As countries submit increasingly ambitious NDCs, covering more sectors, gases and mitigation activities through domestic action, the scope to generate credits from the power sector and land-use sectors may reduce. large credit deductions. Furthermore, for carbon credit markets to incentivise increasing ambition, in line with the Paris Agreement's temperature goal, **crediting levels** may need to reduce over time. Such credit deductions may differ across regions and sectors (Michaelowa et al., 2022^[76]). Under the recently agreed baseline standard of the Paris Agreement Crediting Mechanism (PACM),¹¹ such credit deductions are required, and these deductions may consider “established long-term pathways” (UNFCCC, 2025^[77]). In Paris-consistent mitigation pathways, net deforestation generally stops within the next decade (IPCC, 2023^[78]), and electricity sector emission levels in developing countries are expected to reach net-zero CO₂ around 2040-2045 (Jeudy-Hugo et al., 2024^[79]; IEA, 2023^[80]). If scaled-up crediting in the forest and electric power sectors are to consider established long-term pathways, increasingly stringent baselines or significant credit deductions need to be applied. Such credit deductions would require host jurisdictions to pursue particularly rapid mitigation efforts in these sectors to obtain carbon credits.

3.3. Additional mitigation efforts by the host government

For carbon credits to be high-quality, credited emission reductions or removals must represent GHG mitigation that is additional to what would have happened in the absence of the scaled-up crediting approach. **Additionality** is a key environmental integrity element in all carbon credit generating activities, including scaled-up approaches. Since additionality is defined in relation to a counterfactual scenario, it is impossible to observe and difficult to assess (Martins Barata, 2016^[81]). It is, nonetheless, possible to strengthen confidence in the additionality of scaled-up crediting if: (i) the incentive from scaled-up crediting is credible enough for host governments to participate in scaled-up crediting approaches; and (ii) credit-generating activities are robustly assessed on whether they reflect additional GHG mitigation efforts. Furthermore, an ambitious crediting baseline can strengthen confidence that observed GHG mitigation efforts are indeed a progression beyond business-as-usual and exceed efforts envisaged in a country's unconditional NDC. However, ambitious baselines are not a guarantee for additionality, as exogenous emission drivers (beyond governments' control) may also cause GHG emission levels to fall below the crediting baseline.

Market signals, domestic circumstances and international relationships influence the likelihood that host governments participate in jurisdictional and sectoral crediting approaches. In particular, host governments are more likely to engage and act if they trust that credit revenues will cover implementation and transaction costs within their jurisdiction (BeZero, 2025^[82]). For example, several experts involved in major forest carbon initiatives, interviewed for the development of this report, stated that the **LEAF Coalition's** floor

¹¹ The PACM baseline standard also specifies that historical baselines should be adjusted downwards to account for uncertainty, going well beyond the requirements of other standards (UNFCCC, 2025^[77]).

price of USD 10 per credit was a key market signal that convinced forest jurisdictions to pursue crediting with the initiative. Furthermore, a jurisdiction's economic situation and the mitigation opportunities in the credited sector also influence the likelihood that host governments participate. For example, in the forest sector, scaled-up crediting could be a powerful incentive for countries where the opportunity costs of forest-based mitigation are low.¹² In such cases, potential carbon credit revenues could represent a non-negligible share of total government income. Experiences from diverse EU climate partnerships also suggest that strong bilateral relationships (between the host and the donor government), host government buy-in and private sector interest can further enable large-scale co-operative mitigation efforts (Jackson, Kahlen and Paiva, 2024^[83]), such as scaled-up crediting approaches.

The implementation of scaled-up crediting approaches could create perverse incentives for host countries, although this risk is very difficult to assess and observe. In theory, host governments could take strategic decision about whether and when to enrol in a jurisdictional or sectoral crediting approach to maximise the number of credits it generates (e.g. given the flexibility in setting the first crediting period). Expectations of future participation in a crediting mechanism could incentivise a host government (and/or any other subordinate beneficiaries of a crediting mechanism) to delay or scale back mitigation actions in the near term, thereby increasing the volume of credits and associated revenues once crediting begins. However, total results-based finance flows for REDD+ have been relatively limited to date, and are dwarfed by financial flows for activities that drive forest loss (UNEP, 2023^[84]). Because the incentive from jurisdictional REDD+ is comparatively weak, the risk that this incentive has perverse effects on mitigation action is likely limited. In this regard, it is not surprising that recent literature has only found limited evidence that strategic behaviour in response to crediting incentives has occurred in jurisdictional REDD+ programmes. In some analysed jurisdictions, deforestation temporarily increases near the start of the crediting period, which may reflect anticipatory behaviour by landowners in the respective jurisdiction (Garcia and Sanford, 2024^[85]).

Several barriers can prevent developing countries from scaling up mitigation action, calling for targeted and comprehensive support packages by donors and development partners. Even if the economic incentive of scaled-up crediting is strong, host governments face several challenges when implementing scaled-up crediting activities. In both the forest and electric power sector, host governments need significant technical and administrative capacity to design and implement effective crediting activities. For the electric power sector specifically, infrastructure limitations (e.g. transmission and distribution grids may be ill-equipped to integrate renewable power sources) can present a further barrier. Beyond these technical barriers, host governments require strong political will, governance and institutions to coordinate across government institutions and to overcome political contestation about GHG mitigation efforts (Ravikumar et al., 2015^[86]; Vanheukelom, 2023^[87]). While potential credit revenues can help motivate host jurisdictions to overcome structural barriers to climate action, complementary support is needed to unlock additional GHG mitigation at scale (Ward et al., 2008^[73]). This will require comprehensive, up-front capacity building and technical support from donors and development partners, including through providing certainty for host countries over longer timeframes. Host countries need to be able to deliver on scaled-up crediting approaches consistently over multiple crediting periods that can span multiple political cycles, requiring lasting commitment (Baastel, 2024^[88]). In light of current pressures on donors' budgets, support packages may need to be targeted towards jurisdictions demonstrating high potential for additional GHG mitigation.

Compared to project-based crediting, current standards for jurisdictional forest crediting approaches take a light approach to assessing additionality. Traditional additionality testing applied in project-based crediting is considered inappropriate for jurisdictional approaches (BeZero, 2025^[82]; Michaelowa, 2024^[89]).

¹² The ability of carbon credit markets to steer resources towards low-cost mitigation opportunities is a balancing act. Countries with low opportunity costs are more likely to respond to a credit revenue incentive with further mitigation action but may also be more inclined to undertake such mitigation in the absence of the crediting approach. Some have suggested that countries should therefore avoid relying on carbon crediting for the lowest-cost mitigation options, and pursue crediting for mitigation activities that face higher costs or barriers (Day et al., 2023^[213]).

In project-based crediting, the additionality of specific activities can be assessed using a wide range (e.g. financial, technological and regulatory) of criteria. In jurisdictional and sectoral crediting approaches, governments may implement a range of measures, involving numerous stakeholders, making traditional additionality assessments unviable. Existing jurisdictional crediting standards have relatively light additionality requirements compared to project-based crediting. Standards typically rely on conservative baselines as a provision that supports additionality (Chagas et al., 2020^[90]). While stringent baselines can enhance confidence in the additionality of scaled-up crediting, further assessments may be required to assert that observed GHG impacts are the result of host government efforts. Host jurisdictions are typically asked to submit implementation plans related to REDD+, and in some cases (e.g. VCS JNR), jurisdictions should justify the start date of the crediting period with reference to policy efforts (Chagas et al., 2020^[90]). However, assessments of the de facto implementation of such plans are limited (Schneider et al., 2024^[91]). The relatively light additionality requirements, combined with considerable methodological flexibility in the first crediting period (Section 3.2), increase the risk that some credited mitigation outcomes may not be additional (Schneider et al., 2024^[91]).

Further research is required to identify strengthened, balanced and standardised approaches to additionality assessments for jurisdictional and sectoral crediting. To strengthen additionality assessments of jurisdictional and sectoral crediting approaches, third-party auditors would need clear pass-fail criteria to assess if governments' efforts exceed what would have occurred in the absence of the crediting approach (Neeff and Lee, 2018^[92]). In the forest sector, such criteria are challenging to standardise due to differences across jurisdictions in, for example, forest governance systems, pre-existing policies and economic conditions. Similarly, in the electric power sector, jurisdictions differ with regards to their electric power systems, resource endowments, projected energy demand, capital costs as well as energy market distortions and regulations, all of which complicate standardised additionality assessments. Through its Assessment Framework, the Integrity Council for the Voluntary Carbon Market (ICVCM)'s Assessment Framework has attempted to operationalise additionality in jurisdictional REDD+ by setting structured expectations around the identification and implementation of mitigation actions and the role of carbon revenues (ICVCM, 2024^[93]). However, in applying the Framework to specific methodologies, observers have questioned whether certain elements, particularly requirements related to the monitoring and verification of implemented actions, have been given sufficient attention (Schneider et al., 2024^[91]). Further research, discussion and consultation are required to develop workable additionality assessments that can enhance environmental integrity, without excessively restricting market access (ICVCM, 2024^[94]).

3.4. Robust measurement, reporting and verification (MRV) of mitigation activities and outcomes

Robust **MRV** demonstrates that mitigation activities covered by a jurisdictional or sectoral crediting approach have reliably reduced or removed GHG emissions. MRV in carbon credit markets involves the *measurement* of GHG emissions and impacts, the *reporting* of this information to relevant entities as well as the validation and *verification* of reports by third parties (OECD, 2025^[95]). Mitigation outcomes can only be issued as carbon credits if these are verified by a third party. MRV systems in carbon credit markets also include a wide range of information beyond mitigation outcomes, including on activity implementation, risk management and safeguards. The responsibility for robust MRV is shared by multiple actors, including activity proponents, carbon crediting standards, validation and verification bodies, as well as accreditation bodies (Wetterberg, Lanzi and Gómez, 2025^[96]). The MRV systems used for scaled-up crediting approaches typically overlap with, and build on, MRV systems for other purposes (e.g. national GHG inventories, reporting to the UNFCCC, domestic GHG mitigation policies). To support synergies between scaled-up crediting MRV and national GHG inventories, countries need to actively pursue increased alignment across the two systems, with robust procedures to manage potential accounting risks (Section 2.4)

For host countries, establishing jurisdictional and sectoral MRV systems can be challenging at the outset, but these systems can offer strategic benefits over time. Scaled-up crediting approaches require MRV systems to capture aggregate GHG impacts across multiple sources and sinks, which increases administrative and governance requirements compared to project-based crediting (UNFCCC, 2014^[97]; World Bank, 2025^[5]). Once in place, robust and **interoperable** jurisdictional MRV systems can support the development of carbon pricing instruments, strengthen national and international reporting (e.g., for NDCs) and provide a foundation for more effective mitigation policies (OECD, 2025^[95]). Robust MRV systems are particularly important in the power sector, as electricity is a key input across many sectors. If an emerging scaled-up crediting approach contributes to better GHG impact accounting for electricity generation, this could improve estimates of downstream product-level carbon intensity.

Jurisdictional forest crediting has seen significant MRV improvements, yet challenges in accounting for uncertainty persist. In the last 15 years, tropical forest jurisdictions significantly improved their national forest inventories and increased the use of remote sensing technologies to e.g. monitor forest cover (Nesha et al., 2021^[98]), providing a stronger basis for estimating changes in forest carbon stocks. Furthermore, according to expert interviews conducted for this study, jurisdictions that participated in scaled-up crediting further enhanced their forest carbon MRV systems to meet third-party audit requirements. Looking ahead, the continued advancement and adoption of technologies such as advanced remote sensing and artificial intelligence (AI) are expected to further enhance MRV in jurisdictional forest crediting. While MRV capacities have improved, forest MRV is inherently uncertain and costly (Köhl, Neupane and Mundhenk, 2020^[99]). Crediting standards therefore set provisions for host jurisdictions to discount crediting levels for MRV uncertainty. Crediting standards' MRV provisions align in some respects (e.g. requirements to estimate aggregate MRV uncertainty), but provisions diverge with respect to e.g. the size of discounts applied and the thresholds above which discounts apply (Verra, 2025^[100]; ART, 2021^[66]; FCPF, 2020^[101]).

Electric power sector crediting could have comparatively robust MRV of mitigation activities, provided that governance is strong. Given the comparatively low uncertainty in power GHG emission level estimates (Solazzo et al., 2021^[102]), the electric power sector is well-positioned to set up MRV systems for sectoral crediting, potentially building on and strengthening existing inventory reporting processes under the UNFCCC. However, governance and limited regulatory independence could pose challenges to robust MRV in some developing countries (Ngulube, 2022^[103]). Lack of capacity to ensure data transparency and consistency or preventing political interference can undermine the robustness of MRV systems.

3.5. Managing and addressing non-permanence risks

Non-permanence risks are particularly relevant to carbon credits that rely on preserving or increasing carbon stocks, such as forest carbon sinks, which remain vulnerable to both human-caused disturbances (e.g. harvesting and land conversion) and natural events (e.g. pests, fire and drought) (FAO, 2024^[104]). Jurisdictional forest crediting approaches must address non-permanence risks both ex-ante, through measures that reduce reversal risk across the jurisdiction, and ex-post, through credible monitoring, accountability arrangements and compensation provisions for residual risks (Ahonen and Keßler, 2025^[105]). By contrast, in sectors such as electric power, emission reductions are generally considered permanent. Replacing fossil fuel-based electricity generation with renewables reduces emissions immediately and does not rely on carbon stocks vulnerable to reversal (FAO, 2024^[104]).

Crediting at a jurisdictional scale can partially mitigate non-permanence risks, since emissions from individual disturbance events are less likely to exceed jurisdiction-wide emission reductions or removals (FAO, 2024^[104]). However, jurisdictional forest activities still carry material reversal risks. Even at a jurisdictional scale, factors such as agricultural expansion, commodity price fluctuations, insecure tenure, and weak enforcement against illegal logging can create ongoing risks that mitigation outcomes may not persist. It is therefore critical to align jurisdictional forest crediting approaches with broader policy efforts to

address the drivers of forest loss (Wetterberg, Lanzi and Watkinson, forthcoming^[106]). Experience to date illustrates non-permanence risks. In 2021 and 2022, Mozambique's jurisdictional crediting approach under FCPF, the Zambézia Integrated Landscape Management Program (ZILMP), saw an increase in slash-and-burn agriculture, reversing mitigation outcomes previously issued for 2018-2021 (FAO, 2024^[104]). The reversal event is managed in line with FCPF procedures, including a third-party verification of the reported results and adjustments via the buffer pool (FCPF, 2023^[107]).

To manage non-permanence risks ex-ante, host governments participating in scaled-up crediting approaches can target their efforts to prevent forest loss. For example, host governments could focus on forest areas where incentives to convert forest land can be managed and enforcement against forest loss is more feasible (FAO, 2024^[104]). Furthermore, host governments can assess forests' exposure to future droughts, wildfires and pest outbreaks to prioritise interventions in areas where reversal risks are comparatively lower (ibid.). Overall, it is important for host governments to align their participation in scaled-up crediting with longer-term policy frameworks, as strategies related to rural development, infrastructure and agriculture can exert a large influence on the drivers of forest loss (Wetterberg, Lanzi and Watkinson, forthcoming^[106]). Since reversal risks cannot be eliminated, jurisdictional forest crediting typically involves a range of measures to address residual risks.

To address non-permanence risks ex-post, jurisdictional crediting standards include provisions to monitor, account for and compensate reversals once they occur. Jurisdictional forest crediting standards typically require a reversal risk assessment and withhold a share of issued credits in a buffer mechanism, from which credits are cancelled to compensate for verified reversals (Hickey, Jenkins and Allen, 2025^[108]). Some frameworks also specify additional safeguards, such as replenishing the buffer after large reversals, transferring or cancelling buffer units if a programme ends, or retaining buffer contributions when a participant exits (ART, 2021^[66]; FCPF, 2025^[109]).

Risk management in current standards could be further improved. Research on project-based forest crediting suggests that non-permanence risks are often underestimated, and standards' risk management tools are insufficient (Anderegg et al., 2025^[110]). Recent insights suggest that similar issues may exist in jurisdictional forest crediting approaches (Schneider et al., 2025^[67]; Calyx Global, 2025^[111]). Furthermore, the relevance of non-permanence risks in jurisdictional forest crediting may increase as large volumes of jurisdictional forest credits may soon be used in CORSIA. Some stakeholders have expressed concerns that long-lived GHG impacts from the aviation sector may be offset with non-permanent GHG emission reductions and removals (Schneider and Wissner, 2022^[112]). Further research could usefully assess non-permanence risks at the jurisdiction-level, as well as options to introduce further innovative risk management approaches beyond **buffer pools** (e.g. insurance or host country guarantees), to address residual risks in jurisdictional forest crediting (ICVCM, 2025^[113]; UNFCCC, 2025^[114]).

3.6. Managing and addressing leakage risks

Compared to project-based crediting, scaled-up crediting can address a key environmental integrity risk: within-jurisdiction and within-sector **leakage**. Leakage occurs when GHG mitigation in one place shifts emissions elsewhere, rather than reducing them overall (Filewod and McCarney, 2023^[115]). In forest crediting, leakage may arise if reduced deforestation in one area leads to increased logging or agricultural expansion elsewhere, while in the electric power sector it may occur if closing a fossil fuel-fired plant leads to increased fossil generation elsewhere on the grid. If GHG impacts outside a crediting approach's scope are not accounted for, too many, or too few, carbon credits could be issued. By aggregating emission reductions and removals across a jurisdiction and/or sector, scaled-up crediting approaches can reduce some these risks, particularly leakage within the accounting boundary (Schwartzman et al., 2021^[13]). For example, if deforestation declines in one community but increases elsewhere within the same jurisdiction, or if fossil generation shifts between plants within a grid, these effects remain captured within the

accounting scope, provided the jurisdiction's MRV systems are sufficiently robust. Scaled-up crediting approaches therefore help reduce leakage risks, but they do not eliminate them.

As with non-permanence, leakage risks must be managed and addressed both ex-ante and ex-post. Ex-ante, governments can reduce leakage risks by designing interventions that address the underlying drivers of emissions, such as agricultural expansion (for forests) or dispatch and capacity expansion incentives (for power). Ex-post, standards typically require identifying and accounting for leakage effects when quantifying mitigation outcomes and crediting volumes, although approaches vary in scope and conservativeness (Filewod and McCarney, 2023^[115]).

However, some forms of leakage remain difficult to manage. Cross-sector leakage can occur when mitigation in one sector increases emissions in another, while international leakage could happen if domestic mitigation efforts shift fossil fuel use or land-use pressures abroad. These types of leakage are not systematically addressed under most existing scaled-up crediting standards, possibly because they are inherently difficult to quantify (Streck, 2021^[14]). The leakage standard of the Paris Agreement Crediting Mechanism (PACM) is a useful contribution in this regard, as it requires systematic identification and accounting of all forms of leakage (UNFCCC, 2025^[116]).

3.7. Adjustments for exogenous emission drivers and residual risks

Carbon credits need to represent **real**, **permanent** and **additional** mitigation that can be attributed to the host government's action. This requires that jurisdictional and sectoral crediting approaches adjust the level of carbon credits issued for **exogenous emission drivers**, over which governments have limited control. As explained above, crediting levels can also be adjusted to manage residual risks that mitigation outcomes can later be reversed (**non-permanence**) and that emission impacts can leak outside the crediting approach's emissions accounting boundary (**leakage**). Lastly, adjustments need to be considered for mitigation outcomes transferred and/or monetised by nested GHG mitigation activities (**nesting**). This section focuses on potential adjustments related to exogenous drivers, while other sections discuss non-permanence (Section 3.5), leakage (Section 3.6), and nesting (Section 5.1).

Factors that are beyond governments' control drive a lot of the variation in jurisdictional and sectoral net GHG emissions. Trends in tropical forest cover are, to a large extent driven by macroeconomic conditions, agricultural commodity prices and extreme weather (e.g. droughts), over which governments' exercise limited control (Bento De Souza, Filho and Hanusch, 2022^[117]; Staal et al., 2020^[118]). Extreme weather can also exert a large influence on electric power sector emission levels. Droughts, for example, can decrease clean electricity production (notably from hydropower), driving up emissions from fossil fuel-based power supply (IEA, 2024^[119]). Even if governments significantly increase their mitigation efforts, exogenous emission drivers could overshadow observed changes in GHG emissions during a crediting period, either by reducing emissions (e.g. through a pandemic and reduced economic activity) or by increasing emissions (e.g. through high commodity prices that induce forest clearing). To ensure carbon credits accurately reflect governments' actions, exogenous emissions should ideally be accounted for, and crediting baselines adjusted.

To robustly account for exogenous emission drivers, crediting standards would need systematic approaches to adjust baselines upwards or downwards, ex-post. Existing jurisdictional crediting standards for the land use sector typically do not allow for crediting baselines to be adjusted ex-post. Some recently published project-based crediting methodologies for Improved Forest Management (IFM) and Afforestation, Reforestation, and Revegetation (ARR), such as ACR's IFM methodology version 2.1 and Verra's VM0045, incorporate dynamic baseline-setting. Dynamic baselines (or performance benchmarks) are reassessed and updated ex-post as real-world data becomes available. To account for the effects of exogenous emission drivers, standards for jurisdictional crediting could develop methods for decomposition analyses and require that baselines are adjusted accordingly, ex-post. If standards pursue

model-based baseline approaches (Box 3.1), exogenous emission drivers could be accounted for by updating the baseline models as new data becomes available during the crediting period. However, as noted earlier, while ex-post adjustments could decrease baseline uncertainty, they reduce investment certainty for activity proponents. Furthermore, the added technical complexity as well as the identification of exogenous drivers to include (e.g. pandemics, conflicts, economic shocks), data sources and approaches to for adjust baselines could become politically contentious and challenging to verify with a reasonable level of assurance. Even if crediting standards included provisions to adjust baselines ex-post, a considerable level of uncertainty will always remain in jurisdictional and sectoral crediting approaches. Standardised protocols to adjust jurisdiction- and sector-level baselines need to rely on aggregated datasets (which may lack precision) as well as methodologies that may not fully account for country-specific conditions.

4. How donor governments can support environmental integrity enhancements in jurisdictional and sectoral crediting

Jurisdictional and sectoral crediting approaches can reduce some environmental integrity risks compared to project-based crediting. As highlighted in previous sections, these scaled-up crediting approaches have several potential strategic benefits for GHG mitigation, including strengthening host governments' institutional capacity, policy efforts and catalysing transformative investments. Compared to projects, jurisdictional and sectoral crediting can also reduce the risk of leakage (i.e. within-jurisdiction and within-sector leakage) and non-permanence as forest disturbances are less likely to lead to a reversal of mitigation outcomes at larger scales (Schwartzman et al., 2021^[13]). Furthermore, jurisdictional and sectoral baselines can provide a ceiling for project-based and programmatic crediting baselines within the same jurisdiction and sector (so called 'nested' activities). If nested activities have to align their GHG accounting with a jurisdictional or sectoral baseline, this could address one of the key reasons (i.e. inflated baselines) for over-crediting in project-based forest crediting in recent years (CCQI, 2024^[120]).

Jurisdictional crediting approaches are still new, so the potential to enhance environmental integrity provisions is considerable. While jurisdictional and sectoral crediting has been discussed since the early 2000s, the first verified units were issued as late as 2021. As the first generation of approaches have come under greater scrutiny, assessments have highlighted several areas of potential improvement. Previous sections highlight that (i) methodological flexibility for baseline-setting could be further reduced; (ii) baselines could potentially be informed by more accurate models of future and counterfactual emission levels; (iii) additionality assessments could be strengthened; and (iv) exogenous emission drivers, non-permanence risks and leakage could be better accounted for. However, even with methodological improvements, some uncertainty will always remain in jurisdictional and sectoral crediting approaches.

Stricter environmental integrity provisions could negatively impact host jurisdictions' access to credit revenues. Many of the potential measures that could strengthen environmental integrity in jurisdictional and sectoral crediting are administratively and technically demanding (Box 3.1). Many host jurisdictions already struggle to participate in scaled-up crediting approaches under current standards. As of 22 July 2025, 26 jurisdictions had submitted concept notes for jurisdictional crediting under ART TREES, but only 4 had submitted registration documents and monitoring reports, which require a more detailed technical assessment against standard requirements (ART TREES, 2026^[30]). Experience from the FCPF suggests that several years of capacity building is needed for most host countries to meet essential requirements for jurisdictional crediting (Baastel, 2024^[88]). So, further complicating methodological standards could increase barriers for jurisdictions to access finance. At the same time, demand-side actors are more likely to engage with crediting approaches that generate high-quality carbon credits. A lack of environmental integrity may therefore undermine the ability to secure finance at all. Generally, predictability for jurisdictional REDD+ crediting participants is key, not least in light of multitude of finance vehicles and methodological standards that they have needed to navigate since the adoption of the Warsaw Framework (Granziera et al., 2022^[121]).

Credible demand signals and comprehensive support are key to the effectiveness and timeliness of jurisdictional and sectoral crediting approaches. In light of current macroeconomic conditions and finance needs, many developing countries find it challenging to scale up climate action. Scaled-up crediting could potentially address some of these constraints, provided that there are strong demand signals and up-front support for the host country to overcome barriers to mitigation in the credited sector (Ward et al., 2008^[122]). Carbon credit demand from CORSIA is projected to increase, but public results-based payments could become more challenging, in light of shrinking budgets for official development assistance (OECD, 2025^[123]). As the pipeline for jurisdictional forest credits grows (UN- REDD, 2025^[102]) and electric power sector crediting is emerging, further resources may be required to ensure sufficient finance is available for credited mitigation results. The challenges with resourcing existing scaled-up crediting approaches could also provide a lesson for a potential expansion to other sectors. Developing scaled-up crediting approaches in additional sectors would involve considerable time and effort to develop methodological frameworks, pilot approaches, mobilise resources, and build host government capacity, as illustrated by the almost 20 years required to go from concepts to credit issuance in the forest sector.

Governments can influence the environmental integrity provisions for jurisdictional and sectoral crediting approaches in multiple ways (Table 4.1). The negotiation and implementation of multilateral frameworks (e.g. Article 6, CORSIA) are key to set guardrails for jurisdictional and sectoral crediting in international carbon credit markets. In the near-term, governments could pay particular attention to carbon credits eligible for CORSIA, as this is projected to become the world's largest compliance market for carbon credits within 5 years (ICAO, 2025^[21]). Furthermore, governments could use the upcoming concept note on 'Large-scale crediting programmes' under the Paris Agreement Crediting Mechanism (expected in 2026) to discuss options for enhancing quality standards for jurisdictional and sectoral crediting, while recognising the associated practical challenges. Governments can also directly engage with crediting mechanisms to inform the development of new and updated jurisdictional and sectoral crediting standards. While existing evidence can inform environmental integrity enhancements for jurisdictional and sectoral crediting, further research on critical integrity elements may be required. This could include an analysis of the benefits and costs of modelled baselines, as well as potential measures to strengthen jurisdictional additionality assessments.

The environmental integrity of scaled-up crediting is not just about methodological standards, but also about effective implementation. Notably, as market-based co-operation under Article 6 is expected to gain a larger share of overall carbon credit market activity, the implementation of scaled-up crediting approaches needs to be aligned with multiple aspects of the Paris Agreement. This will require technical assistance to improve the alignment between scaled-up crediting and NDCs, national GHG inventories and strategies for Article 6 engagement (Section 2.4). Furthermore, bilateral support to host jurisdictions and support to scaled-up crediting initiatives could strengthen their motivation to take additional mitigation action and ability to engage with crediting standards. Importantly, FCPF (the largest scaled-up crediting fund to date) is coming to an end in 2028. While some FCPF jurisdictions have developed institutional capacity to continue operating their jurisdictional REDD+ programmes, others may require continued support to transition from FCPF to other crediting standards. The new fund SCALE will continue to provide targeted support to selected jurisdictions and other partners in development (e.g. UN-REDD) are supporting some of the FCPF programs to transition, but if support to current FCPF jurisdictions is reduced, this risks undermining institutional capacity, REDD+ efforts and could ultimately affect forest carbon stocks. It is also critical that benefits from scaled-up crediting are effectively, efficiently and equitably shared (World Bank, 2019^[124]).

While this paper focuses on targeting payments towards performance, the distribution of carbon credit revenues and non-monetary benefits is also key (TNC, 2024^[125]), both for power sector and forest crediting. Before crediting approaches are developed, governments need to systematically assess their mitigation opportunities and investment needs in the credited sector, to identify where credit revenues can unlock high-impact mitigation actions. These mitigation opportunities may sit across different sectors and line

ministries, calling for cross-sectoral planning and co-ordination. When mitigation outcome transactions are agreed, an important consideration is the equitable sharing of mitigation outcomes, i.e. how many of the mitigation outcomes are transferred to the buyer and how many are withheld by the host country? For mitigation outcomes that are transferred, governments can usefully target revenues so that these support lasting GHG impacts, for example by: (i) compensating stakeholders for costs incurred by the crediting approach; (ii) financing inclusive governance arrangements; and (iii) reinvesting revenues to further reduce and remove emissions (Atkins and Woser, 2025^[126]).

Table 4.1. Potential ways for governments to influence the environmental integrity of jurisdictional and sectoral crediting approaches

Pathway	Relevance for jurisdictional and sectoral crediting	Potential government influence over environmental integrity
Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)	Could become the world's largest compliance market for carbon credits within 5 years. Most of the supply available for CORSIA's first phase as of 31 January 2026 came from jurisdictional forest crediting.	• Provide input on efforts to assess CORSIA eligibility under the International Civil Aviation Organization (ICAO). This includes an ICAO Council working group that periodically amends Eligible Unit Criteria, as well as the ICAO Technical Advisory Body's efforts to interpret criteria and provide recommendations on eligible credit supply. • Explore whether the domestic implementation of CORSIA could be leveraged to influence integrity provisions.
Article 6.2	In the absence of a scaled-up crediting methodologies under Article 6.4, Article 6.2 guidance provides high-level guardrails for jurisdictional and sectoral crediting under Article 6. Article 6.2 guidance also applies to credits used for CORSIA compliance.	• Explore options to clarify Article 6.2 guidance with respect to jurisdictional and sectoral approaches from 2028 onwards. • Use Article 6.2 co-operation to demonstrate good practices for jurisdictional crediting under Article 6.
Article 6.4 / Paris Agreement Crediting Mechanism (PACM)	PACM could provide more detailed guardrails for jurisdictional crediting under Article 6 and set environmental integrity norms for other jurisdictional crediting standards.	• Set an ambitious direction for scaled-up crediting under PACM with the upcoming concept note on "Large-scale crediting programmes", and subsequent updates to methodological standards.
Crediting mechanisms with jurisdictional protocols	Jurisdictional supply comes from a handful of protocols and crediting entities, including ART, Verra, Gold Standard and World Bank vehicles. Further protocols are forthcoming, e.g. for the electric power sector.	• Respond to public consultations for new and updated jurisdictional crediting protocols.
Integrity Council for the Voluntary Carbon Market (ICVCM)	ICVCM manages a carbon credit quality framework that could incentivise crediting mechanisms to improve over time. ICVCM runs several thematic "Continuous Improvement Work Programmes" which will inform enhanced integrity provisions in the next ICVCM assessment cycle.	• Engage with Continuous Improvement Work Programmes, notably the one on Jurisdictional crediting approaches. • Provide support to potential host jurisdictions, indigenous peoples, local communities, or relevant umbrella organisations, to ensure equitable engagement with CIWPs.
International initiatives and coalitions	Government-led initiatives and coalitions could promote convergence around good practices and establish norms on jurisdictional and sectoral crediting outside of formal UNFCCC processes. Examples include the LEAF Coalition and Scaling J-REDD+ Coalition.	• Influence methodological requirements and safeguards through collective commitments.
Conditions on Official Development Assistance (ODA)	Many vehicles for scaled-up crediting are supported with ODA funds, notably those managed by the World Bank.	• Attach conditions to the release of ODA funds. For example, funds may only be released following a review of project documentation, including with respect to environmental integrity.
Research	Since jurisdictional and sectoral crediting approaches are new, independent research on several critical environmental integrity parameters is still limited.	• Leverage existing research, ratings and credit quality assessments to inform protocol updates (CCQI, 2024^[60]; Calyx Global, 2025^[127]; Brady et al., 2025^[128]). • Support further research on e.g. costs and benefits of model-based baseline approaches and stronger additionality assessments.
Implementation	Jurisdictional and sectoral crediting approaches only work if they are coupled with comprehensive	• Couple jurisdictional and sectoral crediting with political engagement, investments, and technical support for sectoral

Pathway	Relevance for jurisdictional and sectoral crediting	Potential government influence over environmental integrity
	support to (and investment in) host jurisdictions. Credit revenues and non-monetary benefits from crediting approaches must be effectively, efficiently and equitably shared, to support lasting impacts.	mitigation efforts, e.g. through country platforms. • Support host countries with aligning scaled-up crediting approaches with mitigation efforts and associated reporting under the Paris Agreement, notably Article 4, 5, 6 and 13. • Demand that benefit-sharing plans build on established good practices (World Bank, 2019^[124]).
Availability of finance	Incentives for host jurisdictions to undertake additional mitigation action depend on the finance available to pay for credited mitigation results. In the electric power sector, credit revenues must be coupled with sectoral financing strategies, to cover the high capital investments and costs of capitals facing potential host jurisdictions.	• Assess the balance between available finance and potential credit supply. The findings can inform potential further implementation of scaled-up crediting and allocation of resources. • Provide attractive offtake agreements, with floor prices, impactful benefit-sharing plans and partial advance payments (Atkins and Woser, 2025^[126]; Coalition, 2023^[129]).
Demand-side integrity guardrails	The net GHG impact of jurisdictional and sectoral crediting depends on how buyers use carbon credits.	• Require that jurisdictional and sectoral credits are used in line with established demand-side integrity principles (Wetterberg, Ellis and Schneider, 2024^[1]).

Source: Authors' own analysis.

Enhancements to the environmental integrity of scaled-up crediting approaches must be coupled with efforts to strengthen mitigation incentives for countries with limited administrative capacity. Scaled-up crediting is more likely to work if host governments have strong administrative capacities. Not all governments can effectively respond to a credit revenue incentive, deliver GHG mitigation at scale and adhere to crediting standards' procedures and requirements. For many countries (notably for low- and middle-income countries), it remains challenging to access both scaled-up crediting revenues, as well as other forms of results-based finance (Morita and Matsumoto, 2023^[130]; Yang et al., 2025^[131]; Baastel, 2024^[88]). If scaled-up crediting standards adopt more stringent environmental integrity provisions, this could further increase the thresholds for host government participation. As donors seek to strengthen the landscape of scaled-up crediting and results-based payments, they should consider a range of support mechanisms that cater to different developing countries' capacities and needs.

5. Going beyond environmental integrity: Further integrity considerations in jurisdictional and sectoral crediting

5.1. Nesting arrangements and multi-level implementation

‘Nesting arrangements’ refer to the alignment of crediting approaches at different levels of implementation. In the forest and electric power sectors, crediting approaches may operate in parallel at various levels of implementation. For example, a credit-generating project that conserves a specific area of forest can be situated inside a higher-level jurisdictional forest crediting approach. To align the implementation of GHG mitigation activities across multiple levels, governments need to develop ‘nesting arrangements’, which include elements such as (i) GHG accounting; (ii) legal and institutional arrangements; (iii) rights to mitigation outcomes and associated benefits; and (iv) the application of environmental and social safeguards (World Bank, 2021^[132]). Since most experience with scaled-up crediting to date is in the forest sector, the paragraphs below discuss nesting in the context of jurisdictional REDD+. However, considering renewable energy accounts for more than a quarter of project-based credit supply (Wetterberg, Ellis and Schneider, 2024^[1]), emerging electric power sector crediting also requires robust nesting arrangements.

Many forest jurisdictions face technical and political challenges when aligning GHG accounting across different levels of implementation. An analysis of 50 forest countries developed for this report finds 515 active forest projects, which have issued 656 million carbon credits to date (Annex A). The carbon accounting across projects varies a lot, for example with respect to methodologies used, carbon pools included in the accounting scope, as well as the reference periods used to establish baseline emission levels (Atmadja et al., 2022^[133]; Alvarez and Stokeld, 2025^[57]). As jurisdictional forest crediting has advanced, the number and diversity of projects has made it technically challenging for governments to establish nesting arrangements for projects within the jurisdictional accounting boundary (World Bank, 2021^[132]). Moreover, in many cases, the GHG mitigation impacts of forest projects have been overestimated, leading to high crediting levels (Furey, 2023^[134]; West et al., 2023^[135]). This can make the alignment of GHG accounting politically challenging, as imposing a jurisdictional baseline on projects could reduce crediting levels and expected revenues for project proponents.

Nesting arrangements can vary and should be tailored to jurisdictions’ circumstances. Host governments can make nesting arrangements more or less integrated. For example, if governments have inclusive and effective forest governance arrangements, they could fully integrate projects as part of a jurisdictional approach. Rather than issuing credits, nested projects would then report impacts to the government and receive benefits in line with an agreed benefit-sharing plan (Hamrick, Webb and Ellis, 2021^[19]). For example, in Madagascar’s jurisdictional approach under FCPF, previously existing REDD+ initiatives were integrated into the jurisdictional approach’s benefit sharing plan, with obligations for each initiative to report on REDD+ activities, GHG impacts as well as environmental and social safeguards (BNCCREDD+, 2022^[136]). However, if governments lack the institutional capacity to support multi-level implementation, it

may be useful to grant project-based crediting approaches more autonomy (Renard et al., 2020^[16]). Host governments should carefully assess the risks and opportunities with different nesting arrangements, considering their legal and institutional frameworks, existing REDD+ activities and their access to REDD+ finance (World Bank, 2021^[132]). When developing nesting arrangements, host governments should involve key REDD+ stakeholders to design context-sensitive and durable solutions (World Bank, 2021^[132]).

If REDD+ projects align their GHG accounting with jurisdictional REDD+ approaches, this can enhance environmental integrity. Over-crediting in REDD+ projects has been a major integrity concern in voluntary carbon markets, and a key motivation for jurisdictions to establish nesting arrangements (World Bank, 2021^[132]). By using the jurisdictional crediting baseline as a ceiling for project-based crediting, nesting arrangements could limit over-crediting and prevent double counting. Verra's new methodology for avoided deforestation, VM0048, imposes a ceiling on REDD+ project baselines. This ceiling is informed by jurisdictional deforestation risk maps (which may not be fully aligned with jurisdictional baselines of other standards, such as ART TREES) and will apply to most activities by 2026 (Verra, 2025^[137]). While VM0048 has large room for integrity enhancements (e.g. adjustments for uncertainty and leakage) (CCQI, 2024^[60]), it contributes towards more aligned GHG accounting.

5.2. Social integrity in jurisdictional and sectoral crediting approaches

Social integrity is essential for carbon crediting approaches to be effective and fair. Social integrity implies that carbon credit markets support the people who are affected by such markets; both by avoiding negative impacts and delivering positive impacts (IPGDCF, 2023^[138]). In jurisdictional REDD+, crediting approaches could deliver social benefits if they are inclusively designed and governed, ensuring accountability, considering gender,¹³ respecting the rights of affected populations, and sharing the benefits from crediting equitably. Forest loss is often connected to power imbalances and rights violations (Hoare and Kanashiro Uehara, 2022^[139]), so social integrity in the forest sector is not just about fairness, but also about clarifying land and resource tenure rights, supporting forest stewards and effective forest management. In terms of supporting forest stewards, carbon credit markets face some drawbacks compared to other mechanisms for valuing forest ecosystem services. For example, transaction costs can be large proportion of total payments for forest protection and carbon credit transfers may involve the transfer of some rights associated with the forest carbon sink (McLaren et al., 2025^[140]). In electric power sector crediting, crediting approaches should be coupled with sectoral just transition plans. Such plans should be developed in consultation with workers and communities, and may include measures to mitigate possible negative impacts of the energy transition (MAS, 2024^[141]).

Scaled-up crediting approaches rely on host government actions, which affect many stakeholders, making social integrity management more complicated. In project-based and programmatic crediting, activities are typically small- to medium-scale, and proponents are often non-governmental stakeholders. For such activities, existing systems like safeguards, impact monitoring systems, third-party audits as well as feedback and grievance redress mechanisms, could, if well-designed, address many social integrity risks. In scaled-up crediting, the host government is the activity proponent, and their mitigation actions are implemented at a large scale, impacting numerous stakeholders. Due to both scale and potential political challenges in the host jurisdiction, social integrity management can therefore become very complicated but potentially also more lasting. Many years of work are required to develop governance frameworks, **safeguard information systems**, accountability mechanisms, **benefit-sharing plans**, and more (Baastel, 2024^[88]). Therefore, scaled-up crediting approaches can benefit from implementation partners that have

¹³ Gender considerations are increasingly recognised in carbon markets but the degree to which gender-related considerations are operationalised (e.g. through gender action plans and monitoring strategies) across market segments has been lacking. As governments pursue efforts to enhance the social integrity of scaled-up crediting they could, for example, build on more established practices from climate finance (GGGI, 2025^[43]).

sufficient institutional capacity, trust and leverage to support the host government in developing an equitable crediting approach.

In jurisdictional forest crediting, the involvement of indigenous peoples (IPs) and local communities (LCs) are key to lasting positive impacts. At least 36% of intact forest landscapes are managed by indigenous peoples and local communities globally, and lands under their management generally show lower deforestation trends than non-indigenous lands (Fa et al., 2020^[142]). However, IPs and LCs are rarely compensated for these efforts, and jurisdictional forest crediting has been suggested as one tool to reward IPs and LCs for their forest stewardship (CIX, 2022^[143]). For such crediting approaches to be effective, they need to respect the knowledge, rights and full participation of IPs and LCs (UNFCCC, 2010^[144]; IPGDCF, 2023^[138]).

Jurisdictional forest crediting approaches are designed in contexts where existing forest governance systems may have gaps in addressing social integrity. A particular challenge for jurisdictional forest crediting is the recognition of land rights and obtaining **free, prior and informed consent (FPIC)**, as these rights are often contested and processes can be lengthy requiring clarification and mapping. In tropical forest countries, on average 55% of land is claimed by IPs and LCs, half of which is not formally recognised by the national government (LandMark, 2025^[145]). Furthermore, a recent review of 33 tropical forest countries found that land tenure rights, FPIC and rights related to carbon markets are lacking in most countries' domestic legal systems (RRI & McGill, 2024^[146]). Issues related to alleged shortcomings of FPIC have also been raised in relation to some jurisdictional forest crediting approaches, such as in Guyana and Pará (Brazil) (Padin-Dujon, 2025^[147]; Cubas-Baez et al., 2025^[148]). In the case of Guyana, a formal appeal was made to the ART Secretariat, but this was dismissed after the appellant did not agree to the terms of reference of the appeals committee (ART, 2023^[149]).

Jurisdictional forest crediting could strengthen social outcomes if good practices for social integrity are mainstreamed across crediting approaches. Several governments have already led the way in recognising land and carbon rights, establishing legally binding protocols for FPIC and benefit sharing (RRI & McGill, 2024^[146]). For example, Peru has developed legal protocols for engaging with IPs and LCs, clarifying rights, principles for consultation as well as decision-making and monitoring processes (Congreso de la República, 2011^[150]). Peru also co-designed a jurisdictional crediting approach with IPs, which was submitted to ART in 2024. Between 2013 and 2019, Costa Rica carried out extensive consultations to establish a legally-binding benefit-sharing plan, which distributes carbon credit revenues across conservation efforts, indigenous peoples and sustainable development (MINAE, 2022^[151]). On the subnational level, the GCF Task Force (2020^[132]) has developed guiding principles for collaboration between subnational governments, IPs and LCs, with respect to inclusive forest conservation. Jurisdictional crediting standards could support the uptake of good practices with more comprehensive social integrity provisions and stronger accountability mechanisms (Lauer et al., 2024^[152]). For example, the PACM's sustainable development (SD) tool (UNFCCC, 2024^[153]) and appeal and grievance procedure (UNFCCC, 2024^[154]) could inform standard enhancements. The PACM SD tool sets a 'new benchmark' by introducing several new approaches (e.g. assessing both positive and negative potential SDG impacts, providing an analysis of the total net impact on SDGs), while remaining aligned with common practices (Schell and Arens, 2025^[155]). However, piloting is required to see how PACM's social integrity provisions work in practice (SDI, 2024^[156]) and how the SD tool can reflect an appropriate balance between robustness and feasibility (in terms of transaction costs) (Schell and Arens, 2025^[155]). More generally, jurisdictional forest crediting could build on lessons and inclusive governance foundations in other areas of forest value creation, such as timber production and trade (FCDO, 2024^[157]).

In the electric power sector, sectoral crediting approaches should be accompanied by transition planning and carefully designed benefit-sharing arrangements. As sectoral crediting approaches in the electric power sector are emerging, lessons can be drawn from a transition credit pilot in the Philippines, a pioneering initiative by the Monetary Authority of Singapore (MAS), the Coal to Clean Credit Initiative (CCCI) as the methodological framework provider and ACEN as the project proponent. First observations

from the pilot indicate that just transition considerations should be incorporated from the start of a crediting approach, including the early identification of impacts on workers and the local community and associated financing needs as well as the importance of stakeholder engagement (Lone, Buescher and Matsuo, 2025^[158]). Benefit-sharing arrangements form an integral part of a broader system for managing social and environmental impacts and engaging affected stakeholders (IFC, 2019^[159]), as experience from hydropower and renewable energy projects suggests that costs and benefits are often unevenly distributed, with host communities often bearing a disproportionate share of negative impacts (World Bank, 2025^[160]). Designing effective benefit-sharing arrangements is challenging and requires context-specific work on the ground to determine its scope and benefit allocations, as there is no one-size-fits-all approach (World Bank, 2025^[160]).

6. Policy-based crediting approaches

6.1. Selected environmental integrity challenges for policy-based crediting approaches

Determining whether a policy would have been implemented in the absence of policy-based crediting approaches is a difficult endeavour. While policy-based crediting is subject to many of the same environmental integrity elements as project-based, programmatic, jurisdictional and sectoral crediting approaches (Section 3.), additionality is the most debated element (Schneider et al., 2014^[161]; Kreibich and Obergassel, 2018^[39]; Michaelowa and Keßler, 2024^[162]). The additionality of policy-based crediting relies on two conditions:

- a) Would the policy have been implemented to the same degree in the absence of the crediting incentive?
- b) Would the mitigation impacts have happened in the absence of the policy?

Condition (a) is particularly challenging, as a government's decision to implement a policy depends on many factors that are difficult to assess with a standardised protocol. Policy decisions depend on, e.g. (i) the type of policy proposed; (ii) the government's pre-existing interest and ability to implement the policy; and (iii) how significant barriers are to implement the policy. Existing methodological frameworks assess additionality differently. Gold Standard requires a combination of methods, including an analysis of existing policies, the country's NDC, policy costs and benefits, as well as barriers to policy implementation (Gold Standard, 2024^[163]). TCAF assesses additionality more indirectly, by requiring an ambitious crediting baseline, adjusting crediting levels for overlapping sources of climate finance, and requiring that the policy delivers transformational change (TCAF, 2022^[164]). In both frameworks, policy additionality assessments will be very dependent on expert judgement, since it is highly speculative what a government would do in the absence of a crediting incentive. Because of challenges with standardising the assessment of whether policies are additional, there is a risk that environmental integrity provisions for policy-based crediting could be inconsistently implemented across jurisdictions.

The effects of specific policies on GHG emissions and removals are uncertain, and such uncertainty should be accounted for. There is a wide literature, with many studies performed by governments, that has attempted to quantify the effect of climate policies on emission levels or drivers of emission levels (e.g. energy use), following policy implementation. A recent comprehensive review of this literature finds that the effects of policies on GHG emissions and removals varies a lot by instruments, sectors, and regions, reflecting differences in policy design, implementation, and contextual factors (OECD, 2025^[165]). Over two thirds of the studies reviewed focused on North America and Europe, suggesting experience with evaluating policy effectiveness is more limited in developing countries. As highlighted by the OECD's Inclusive Forum on Carbon Mitigation Approaches (IFCMA) project, estimating the effects of specific policies is difficult, and requires advanced expertise and modelling tools. Various sources of uncertainty complicate the evaluation of policy effects, e.g. (i) how other policies and market conditions mediate policy effects; (ii) how regulated agents respond to the policy; (iii) what spillover effects are induced by the policy (OECD, 2024^[73]). TCAF and Gold Standard have adopted different approaches to address such uncertainty. TCAF use a model-based approach to estimate policy impacts, and only a small share of

verified emission reductions (~10% to date) are issued as credits (TCAF, 2025^[166]). Gold Standard proposes a programmatic approach to estimating policy impacts. This includes identifying activities that are likely to have been induced by a policy and estimating the emissions impact delivered by these activities (Gold Standard, 2024^[42]). Given that policies have different characteristics, tailored methodological approaches will be required to estimate policy impacts (Michaelowa et al., 2025^[167]).

6.2. Considerations for the implementation of policy-based crediting approaches

Some policies are more suited than others for policy-based crediting (Table 6.1). The World Bank (2025^[5]; 2023^[9]) suggests that policy-based crediting is suitable for policies with small upfront costs and considerable operational expenditure (e.g. energy efficiency standards), as well as policies that negatively impact households (e.g. energy subsidy reform). Michaelowa and Keßler (2024^[162]) suggest that the ease of quantifying and attributing GHG impacts to policies should be a primary consideration for identifying suitable policies. They further highlight that mandates, financial incentives and the elimination of restrictions may be suited to policy crediting, while e.g. information instruments are not. Gold Standard's (2024^[42]) programmatic impact measurement means that creditable policies must directly lead to physical implementation and actions, for which mitigation impacts can be estimated. Therefore, policies with diffuse impacts (e.g. carbon taxes) are not eligible in the pilot phase, whereas more targeted sectoral policies (e.g. removing restrictions for clean technologies) are. By contrast, Michaelowa and Keßler (2024^[162]) suggest that carbon pricing policies may be among the more suitable for crediting. This is because a carbon pricing instrument could be evaluated against a threshold price level, informed by the country's marginal abatement costs, above which higher levels of carbon pricing could be deemed additional. The lack of consensus on which policies can be credited reflects that policy-based crediting is still experimental, with further experience required to arrive at mature crediting frameworks.

If policy-based crediting approaches grow further, their governance could be strengthened to prevent potential conflicts of interest. To date, policy-based crediting has been spearheaded by international organisations (notably the World Bank and GGGI), as they have unique technical capabilities and host government connections. These implementation partners have supported e.g. the origination of policy-based crediting activities, the development of transaction structures and the design of methodological frameworks. While policy-based crediting activities are subject to third-party audits, the multiple functions performed by implementation partners could present conflicts of interest. Therefore, if policy-based crediting approaches become more common, crediting standards may need to strengthen the segregation of duties between quality assurance functions and activity proponents.

While policy-based crediting can provide a targeted incentive for effective climate policies, other tools to incentivise climate policymaking could also be considered. Policy-based crediting requires rigorous methodologies and MRV to promote confidence in the quality of carbon credits issued. While this can support host governments in developing effective mitigation policies, carbon credit generation can be time- and resource-intensive. Other, less precise and outcome-oriented, mechanisms could also support GHG mitigation policies in developing countries. This can include budget support for sectoral reforms, policy-based loans and results-based finance without the transfer of title to mitigation outcomes. Alternatively, jurisdictional and sectoral crediting approaches can also incentivise GHG mitigation policies. Such approaches provide a less targeted incentive than policy-based crediting, but more flexibility for host governments to identify a policy mix that can drive net GHG emissions below the jurisdictional or sectoral crediting baseline. However, jurisdictional and sectoral crediting approaches may also be subject to a wider range of exogenous GHG emission drivers, as they do not attempt to isolate the GHG impact of specific policies.

Table 6.1. Strategic considerations for governments in relation to policy-based crediting approaches

Strategic considerations	Relevance	Detailed considerations
Select suitable policies for crediting	Not all policies are equally suitable for policy-based carbon crediting, as there needs to be a high level of confidence that carbon credits represent real, additional and permanent mitigation outcomes. Depending on a policy's target and operating mechanism, they may be more or less suited to crediting.	Features that could make policies more suitable to crediting include: • Ease of quantification and attribution of policy-related GHG emission impacts (Michaelowa and Keßler, 2024^[162]); • Targeted sectoral focus (Gold Standard, 2024^[42]); • Small upfront costs and high operational costs (World Bank, 2025^[5]); • Potential for carbon credit revenues to address distributional concerns of the credited policy, which in turn could support policy implementation (World Bank, 2025^[5]).
Select suitable host countries for crediting	Similarly, the host country itself matters. Depending on a country's pre-existing interest in climate change mitigation and its political system, it may be more or less difficult to assert whether policy-based carbon credits represent mitigation outcomes beyond business-as-usual efforts.	Assessing the suitability of a country with respect to policy crediting is more politically sensitive. Nonetheless, crediting standards and implementing partners need to give due consideration to the political context of the host country, and whether policy-based crediting is an appropriate vehicle to incentivise additional GHG mitigation efforts.
Recognise that environmental integrity requirements cannot be fully standardised in the context of policy-based crediting	Due to policies having very different operational mechanisms and targets, the environmental integrity of policy-based crediting approaches cannot be uniformly assessed.	Develop methodological standards that describe how environmental integrity elements could apply to policy-based crediting in as much detail as possible, while leaving sufficient flexibility for policy- and context-sensitive methodological approaches. Since policy-based crediting approaches may require more methodological flexibility compared to projects and programmes, the selection of methodological approaches needs to be robustly governed and reviewed by independent bodies with significant knowledge of the host country, and the assessment of policies' effectiveness with respect to GHG mitigation.
Strengthen governance of policy crediting approaches	If policy-based crediting grows from its current, relatively limited, pilot scale to a more significant revenue opportunity for host countries and implementation partners, it will become increasingly important to avoid potential conflicts of interest.	Strengthen the segregation of duties between implementing, standard-setting and auditing functions in policy-based crediting approaches and associated standards.
Compare policy-based crediting to potential alternative support mechanisms	Policy-based crediting is one of many ways in which host countries can be supported in their GHG mitigation policy efforts.	Compare the costs and benefits of policy-based crediting approaches against other potential mechanisms to promote GHG mitigation policy efforts (e.g. technical assistance, budget support for sectoral reforms, policy-based loans).

Source: Authors' own analysis.

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Annex A. Description of data analyses

Preliminary analysis of issuances from project-based, programmatic, and scaled-up crediting

To provide a rough estimate of the shares of units issued under different levels of crediting from 2020 up until 31 January 2026, data from multiple sources were combined.

For total issuances, MSCI's (2025^[2]) data on carbon projects and transactions was used. MSCI captures issuances from ACR, ART TREES, BioCF, CAR, EcoRegistry, GCC, Gold Standard, Plan Vivo, Puro Earth and Verra. MSCI's publicly available database has limited coverage of governmental crediting mechanisms. To complement MSCI's data gaps, issuances from the CDM (UNFCCC, 2026^[168]), as well as FCPF and TCAF (World Bank, 2025^[31]) were added. This generated a total volume of 2.49 billion units issued between 2020 and January 2026.

Data on scaled-up crediting approaches were retrieved from the World Bank's CATS (2025^[31]) and ART Registry (2026^[30]). Between 2020 and 31 January 2026, around 154 million units were issued, most of which were cancelled for results-based payments. This is equivalent to around 6% of all carbon credit supply in the same period. While CATS reports 96 million emission reduction units as "net issued" (gross issuances minus buffer pool contributions), only 9 million of these units were tradable credits.

Issuances from programmatic crediting were estimated using data from the Berkeley Voluntary Registry Offsets Database (version 2026-02) (Haya et al., 2026^[169]) and the CDM registry (2026^[168]). The Berkeley database provides data on issuances from VCS, Gold Standard, ACR, and CAR, which account for most programmatic crediting beyond the CDM. Programmatic crediting approaches in the Berkeley database were estimated by filtering for methodologies that are typically used for programmatic crediting (e.g. containing "small-scale", "clean cooking", "AMS-"), recognising that some methodologies may be applied for different applications. The issuances for such methodologies between 2020 and February 2026 were approximately 222 million credits. Data from the CDM registry was combined with information from IGES (2025^[170]), which identifies small-scale bundled (programmatic) activities. The CDM registry issued around 3 million credits from programmatic activities between 2020 and February 2025. In total, programmatic crediting accounted for around 225 million credits (~9% of all supply). Post-2020 CDM issuance data should be interpreted with caution, as issuances after 31 December 2020 were processed only provisionally under the CDM Executive Board's temporary measures pending transition decisions. These figures therefore reflect claimed and verified mitigation outcomes, but not necessarily finalised credit issuance. As a result, CDM issuance figures are indicative only (CDM Executive Board, 2022^[171]).

Units that were not identified as scaled-up or programmatic were assumed to be project-based crediting. In sum, between 2020 and January 2026, approximately 85% of units originated from project-based approaches, 9% from programmatic crediting, and 6% from scaled-up crediting.

Mapping of the current state of scaled-up crediting approaches

The information on participation in scaled-up crediting approaches was compiled from multiple sources, including FCPF (2023^[32]), (2024^[172]) and (2025^[173]), BioCF (2024^[174]) and (2025^[175]), TRACTION (2024^[176]), LEAF Coalition (2022^[177]) and (2025^[178]), Emergent (2023^[179]) and (2024^[180]), World Bank

(2024^[181]) and (2025^[33]) and (2025^[31]), Kinetic Coalition (2025^[182]), Government of Guyana (2022^[183]), ART (2026^[30]), UK Government (2024^[184]) and (2025^[34]). Information was collected on scaled-up crediting initiatives, methodological standards, participants (donors/buyers and host jurisdictions) as well as publicly available information on contracted mitigation outcomes, commitments and disbursements. Information was last updated on 31 January 2026.

Eight scaled-up crediting initiatives with jurisdictional participants were identified: **BioCF**, **NACA**, **FCPF**, **LEAF Coalition**, **Kinetic Coalition** (formerly ETA Coalition), **SCALE**, **TCAF** and **TRACTION**. Four initiatives had already resulted in agreements to transact credits (BioCFT3, FCPF Carbon Fund, LEAF Coalition and TCAF), with further agreements made directly between host jurisdictions and buyers (e.g. Guyana and Hess Corporation). The mapping included early-stage approaches that had not yet issued credits and nor resulted in purchase agreements (e.g. SCALE, Kinetic Coalition, NACA). The mapping also covered capacity building programmes aimed at supporting future results-based payments and/or scaled-up crediting (e.g. FCPF Readiness Fund, BioCFplus), as well as initiatives for which scaled-up crediting approaches were under consideration (e.g. TRACTION).

The mapping shows that, to date, scaled-up crediting approaches have involved over 80 jurisdictions, including 18 sovereign donors (e.g. Norway, United Kingdom, Germany) and 67 (potential) host jurisdictions (both national e.g. Guyana, and sub-national, e.g. Pará (Brazil)). Over 90% of funds committed to scaled-up crediting initiatives relate to jurisdictional approaches in the AFOLU sector.

In terms of resource flows, around USD 3 billion were committed to scaled-up crediting approaches between 2008 and January 2026, with around USD 2 billion committed after 2020. In terms of actual payments, around USD 0.5 billion were paid for mitigation outcomes from scaled-up crediting initiatives between 2020 and January 2026.

Preliminary mapping of project-based forest crediting in forest jurisdictions

To estimate the potential scale of nesting challenges for jurisdictional forest crediting, data on carbon credit-generating projects and issuances from AlliedOffsets (2024^[185]) was analysed.

A list of 2548 carbon credit generating-activities was exported from AlliedOffsets on 20 February 2025. This list was filtered for projects categorised as being in the “Forestry and Land Use” sector, as well as being located in one of the 50 countries that has either (i) participated in the FCPF’s Readiness Fund, or (ii) reported results to the UNFCCC’s Lima REDD+ Information Hub. This returned a list of 515 projects, mostly activities focused on avoided deforestation, improved forest management as well as afforestation, reforestation and revegetation. The cumulative issuances from these projects on the 20 February 2025 was around 656 million carbon credits. While the 50 countries selected have made efforts to monetise REDD+ efforts at the national or subnational level, all forest-related projects within these jurisdictions will not be subject to nesting arrangements for several reasons. First, many of the countries have not advanced their jurisdictional REDD+ implementation to the point where projects would need to align their GHG accounting with a jurisdictional approach. Second, the location, duration and scope of emissions or removals covered by a jurisdictional REDD+ approaches may not overlap with all project-based activities in the country. Therefore, to understand the scale of nesting challenges for a given country, a detailed analysis of the degree to which jurisdictional and project-based crediting approaches overlap is needed.

Annex B. Key terms and definitions

Table A B.1. Key terms and definitions

Term	Definition used in this paper	Reference
Additional / additionality	Emission reductions or removals from a mitigation activity are additional if the mitigation activity would not have taken place in the absence of the added incentive created by the mechanism or carbon credit market.	(Schneider et al., 2022 ^[186])
ART TREES	The Architecture for REDD+ Transactions (ART) is a global initiative that seeks to incentivize governments to reduce emissions from deforestation and forest degradation (REDD), as well as restore forests and protect intact forests (+). The REDD+ Environmental Excellence Standard (TREES) is ART's standard for the quantification, monitoring, reporting and verification of GHG emission reductions and removals from REDD+ activities at a jurisdictional and national scale.	(ART, 2026 ^[187])
Article 6 of the Paris Agreement	Article 6 of the Paris Agreement recognises that some Parties choose to pursue voluntary cooperation in the implementation of their NDCs, including through market-based approaches. Article 6 outlines different approaches for countries to co-operate in Articles 6.2, 6.4 and 6.8. Article 6.2 provides a framework for Parties to the Paris Agreement to engage on a voluntary basis in co-operative approaches that involve the use of internationally transferred mitigation outcomes (ITMOs) towards nationally determined contributions. Parties engaged in such co-operation must apply robust accounting to ensure the avoidance of double counting, consistent with Article 6.2 guidance adopted by the Paris Agreement's governing body (decisions 2/CMA.3, 6/CMA.4 and 4/CMA.6). Article 6.2 gives participating Parties considerable flexibility to design and execute co-operative approaches. Article 6.4 establishes a centralised mechanism guiding the design and validation of GHG mitigation activities, as well as the verification and issuance of their resulting GHG outcomes (as Article 6.4 emission reductions), under the authority and guidance of the Paris Agreement's governing body. For further details, also see the definition of the Paris Agreement Crediting Mechanism (PACM).	Based on (Hamrick and Granziera, 2023 ^[188] ; UNDP and UNFCCC, 2023 ^[189])
Baseline	The GHG emissions and / or storage level against which emission reductions or removals of a mitigation activity are determined. Baseline scenarios can be generated in many ways. Baselines can be based on conditions in a specific sector and location, using historical, actual or projected GHG emissions and removals as a reference point. Baselines are most often determined ex-ante, but can also be adjusted ex-post, based on specific parameters and methodologies (see definition of ex-post adjustments). Some carbon dioxide removal activities refer to a baseline scenario of no GHG emissions or removals, i.e. a baseline where future net GHG emissions are assumed to be 0 t CO ₂ -eq. Baselines can also be based on a subset of historical or actual emissions, for example by referring to the GHG performance of a best available technology, or a specific percentile of GHG performance among technologies that provide the same goods or services as the proposed activity.	Based on (Schneider et al., 2022 ^[186] ; Perspectives Climate Research, 2024 ^[190])
Below-business-as-usual baseline	In the context of baseline-setting, business-as-usual refers to a plausible reference benchmark or scenario for GHG emissions or removals prior to or in the absence of the implementation of a crediting activity. It may take the form of a scenario, an emission or removal level, or an emissions or removals intensity. A below-business-as-usual baseline is therefore set at a level lower than this reference benchmark, increasing confidence that credited reductions and removals go beyond what would be expected under business-as-usual.	(UNFCCC, 2025 ^[77])

Term	Definition used in this paper	Reference
Benefit-sharing / Benefit-sharing plan	Benefit sharing is the intentional transfer of monetary and non-monetary incentives (goods, services or other benefits) to stakeholders for the generation of environmental results (such as GHG emission reductions) funded by revenues derived from those results. A benefit-sharing plan is developed by the host jurisdiction and describes how the monetary benefits (i.e. revenue from carbon credits sold) and non-monetary benefits generated by the jurisdictional or sector crediting approach will be distributed and shared with beneficiaries.	(Atkins and Woser, 2025 ^[126] ; World Bank, 2019 ^[124])
BioCarbon Fund (BioCF) Initiative for Sustainable Forest Landscapes (ISFL)	The BioCarbon Fund (BioCF) Initiative for Sustainable Forest Landscapes (ISFL) is a multilateral fund, supported by donor governments and managed by the World Bank. It promotes reducing GHG emissions from the land sector, including efforts to reduce deforestation and forest degradation in developing countries (REDD+), sustainable agriculture, as well as smarter land-use planning, policies and practices. BioCFplus provides grant-based technical assistance and capacity-building support to help jurisdictions create enabling conditions for sustainable land use. BioCF Tranche 3 (T3) provides results-based payments for verified GHG emission reductions through Emission Reductions Purchase Agreements (ERPAs).	(BioCarbon Fund, 2025 ^[191])
Buffer pool	To manage non-permanence risks in carbon crediting, buffer pools are used by many standards. A portion of issued credits are contributed to a buffer pool that serves as an insurance mechanism for potential reversal events, often across a portfolio of projects. These credits are retired or cancelled after a reversal of GHG emission reductions or removals occurs, if this is independently verified and required by the crediting standard's procedures.	Based on (Anderegg et al., 2025 ^[110])
Buyer	An entity that purchases (a) carbon credit(s), together with the title to the associated mitigation outcome(s).	
Carbon credit	A tradable intangible instrument that is issued by a carbon crediting mechanism, representing a verified GHG emission reduction to, or removal from, the atmosphere equivalent to one metric tonne of carbon dioxide equivalent (t CO ₂ -eq).	(ICVCM, 2024 ^[192])
Carbon credit markets	Markets involving the trade in carbon credits, such as the California Compliance Offset Program. These markets reward reductions or removals in emissions, in contrast to allowance markets (e.g. EU ETS), where emissions are priced.	
Carbon crediting mechanism / standard	A carbon crediting mechanism (sometimes referred to as standard) creates a supply of tradable credits for each unit of verified emission reduction or removal from a mitigation activity. Carbon crediting mechanisms typically include an overarching standard that guides the development and use of methodologies for quantifying impacts and a body with procedures for administering and governing their use, as well as for accrediting and overseeing validation and verification bodies.	(Wetterberg, Lanzi and Gómez, 2025 ^[96] ; PMR, 2021 ^[193])
Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)	CORSIA is the International Civil Aviation Organization's market-based regulatory measure to address international aviation emissions. For flights between ICAO member states who participate in CORSIA, airline operators need to offset GHG emissions that exceed a defined emissions baseline, using eligible emission units that meet criteria related to governance, transparency, additionality and more.	(ICAO, 2025 ^[194])
Conservative baseline / conservativeness	In the context of baseline-setting, conservativeness is the use of data, parameters, assumptions, and methodologies that prevent the overestimation of emission reductions and the underestimation of removals, relying exclusively on credible and context-appropriate sources. This requires the use of credible sources that are appropriate to the context of the activity type.	(UNFCCC, 2025 ^[77])
Corresponding adjustment	Corresponding adjustments provide a double-entry bookkeeping system which ensures that internationally transferred mitigation outcomes (ITMOs) cannot be double counted (i.e. by both buyer country and host country). This becomes a single-entry bookkeeping system in the case of mitigation outcomes authorised for use towards other international mitigation purposes, where the adjustment is only done by the host country.	(Lo Re, Ellis and Greiner, 2022 ^[195])

Term	Definition used in this paper	Reference
Crediting level	The quantity of credits generated by a specific activity compared to the GHG emission reductions or removals actually achieved.	(Lo Re et al., 2019 ^[196])
Crediting period	The crediting period is a timeframe in which a specific emission reduction or removal activity can result in the issuance of carbon credits.	(PMR, 2021 ^[193])
Donor country	In the context of this paper, a donor country refers to a country that provides concessional support to activities related to scaled-up crediting, or for verified mitigation outcomes from scaled-up crediting, without the transfer of mitigation outcomes. This is different from a potential buyer country, which purchases (a) carbon credit(s), together with the title to the associated mitigation outcome(s).	
Emission factor	A unique value for scaling emissions to activity data in terms of a standard rate of emissions per unit of activity (e.g., grams of carbon dioxide emitted per barrel of fossil fuel consumed).	(UNFCCC, 2025 ^[197])
Environmental integrity	A commonly used definition for this is: <i>Environmental integrity would be ensured if the engagement in the transfer of carbon credits leads to aggregate global GHG emissions that are not higher than if such transfers had not taken place.</i> However, this paper also considers environmental integrity aspects beyond this definition, such as whether carbon credit markets support mitigation in line with net-zero pathways and interact effectively with other policy instruments for climate mitigation.	(Schneider and La Hoz Theuer, 2018 ^[198])
Exogenous emission driver	An exogenous emission driver is a variable that affects GHG emissions or removals in a carbon crediting approach, but it lies outside the influence or control of the activity proponent. For example, in a jurisdictional crediting approach, the host jurisdiction cannot directly control weather- and climate-related impacts, such as droughts, which may lead to forest loss and result in increased GHG impacts.	
Ex-post adjustments	Baselines for a carbon crediting approach can be adjusted (upward or downward) at the end of a crediting period based on data gathered during or after the crediting period.	Based on (Rau et al., 2025 ^[70])
Forest Carbon Partnership Facility (FCPF)	The Forest Carbon Partnership Facility (FCPF) is a global partnership of governments, businesses, civil society, and Indigenous Peoples organisations focused on reducing emissions from deforestation and forest degradation, forest carbon stock conservation, the sustainable management of forests, and the enhancement of forest carbon stocks in developing countries, activities commonly referred to as REDD+. The FCPF was launched in 2008 and has supported 47 developing countries across Africa, Asia, and Latin America and the Caribbean.	(FCPF, 2025 ^[199])
Forest reference level / forest reference emission level (FRL/FREL)	Countries implementing REDD+ activities need to develop national forest reference (emission) levels (FRLs/FRELs) which are to be submitted to the UNFCCC. The reference levels are expressed as tonnes of CO ₂ equivalent per year for a reference period against which the emissions and removals from a results period will be compared. FRLs/FRELs serve as benchmarks for assessing each country's performance in implementing REDD+ activities and need to maintain consistency with the country's GHG inventory estimates.	(UNFCCC, 2025 ^[200])
Free, prior and informed consent (FPIC)	The concept of free, prior and informed consent (FPIC) ensures that Indigenous Peoples and Local Communities can give or withhold consent on projects impacting their land, here in the context of scaled-up crediting schemes, particularly jurisdictional forest crediting. To avoid community conflicts and legal challenges, FPIC must be transparent and culturally appropriate to ensure the full and effective participation of all community members.	(Cubas-Baez et al., 2025 ^[148])
High forest, low deforestation (HFLD)	High forest low deforestation (HFLDs) jurisdictions or countries are typically defined as jurisdictions with forest extents that cover more than 50% of their land area and have a historical deforestation rate lower than the global average. HFLDs contain many of the world's last ecologically intact and stable forests which harbor exceptional biodiversity and high carbon stocks as well as substantial areas of Indigenous territories.	(Teo et al., 2024 ^[68])
Historical baselines	In carbon crediting, baselines can be set based on different methodologies. A historical baseline is a baseline that is informed by a subset of historical emission levels in a reference period of a certain duration.	Based on (Teo et al., 2023 ^[59])
Host country (host jurisdiction)	A country or jurisdiction where a carbon crediting approach is located.	
Internationally transferred mitigation outcomes (ITMOs)	Internationally transferred mitigation outcomes (ITMOs) are amounts of GHG emission reductions or removals which can be transferred under the Paris	Full definition: Paragraph 1 of the Annex I of

Term	Definition used in this paper	Reference
	Agreement's Article 6. They represent real, additional and verified mitigation outcomes that have been authorised for use towards an NDC or other international mitigation purposes.	Decision 2/CMA.3 (UNFCCC, 2022 ^[201])
Interoperable/interoperability	Interoperability, here in MRV systems, allows data collected for one purpose to be transformed and used for others. If host jurisdictions develop interoperable jurisdictional MRV systems, the same data can be used for other purposes, e.g. for carbon pricing instruments.	(OECD, 2025 ^[95])
Jurisdictional REDD+ (JREDD+)	Jurisdictional REDD+ approaches support efforts to protect and enhance forest carbon stocks at the jurisdictional level, rather than for individual projects. The geographic extent of JREDD+ approaches typically includes all forests in a national or subnational jurisdiction, although the scope of forest types, activities and carbon pools can vary. Jurisdictional approaches are often extending across several million hectares and usually carried out by governments as the activity proponent and as part of wider national and sectoral policies.	Based on (FCPF, 2025 ^[202])
Kinetic Coalition	The Kinetic Coalition is an independent, non-profit initiative led by the Center for Climate and Energy Solutions (C2ES) that seeks to mobilise catalytic capital to support the transition to clean energy systems in emerging economies through the use of energy transition credits. The Kinetic Coalition buyers' alliance brings together companies and countries that purchase these credits and accelerate the transition to clean energy, with the goal of benefiting communities in emerging economies with affordable, reliable, clean energy and a just transition. As of October 2025, Kinetic is working on three pilot projects in the Philippines, Dominican Republic, and Chile. The Energy Transition Accelerator (ETA) laid the foundation for this work.	(Kinetic Coalition, 2025 ^[182])
LEAF Coalition	The LEAF Coalition is a public-private partnership, convened and co-ordinated by the non-profit organisation Emergent. The LEAF Coalition aims to channel funds to host governments through jurisdictional REDD+ credits generated under ART TREES.	(LEAF Coalition, 2025 ^[203])
Leakage	The net change of GHG emissions or removals that are attributable to the mitigation activity but occur outside the boundary of that activity. These include, for example, indirect emission changes upstream or downstream of the mitigation activity or rebound effects.	(Schneider et al., 2022 ^[186])
Measurement, reporting and verification (MRV) system	The system for monitoring the emissions and removals of a credit-generating activity, reporting these to an accredited third party and ultimately verifying mitigation outcomes. This can include measurements of emission levels ex-ante to inform the baseline, measurements of emission levels ex-post to estimate impact, reporting to meet standards' requirements, including accounting for emissions or removals uncertainty, as well as validation (ex-ante) and verification (ex-post) by a third-party auditor. Beyond GHG impacts, third-party auditors also examine information relevant to e.g. additionality as well as environmental and social safeguards.	Based on (OECD, 2025 ^[95] ; Streck, Dyck and Trouwloon, 2021 ^[204])
Methodological framework	A methodological framework documents the set-up and rules to quantify a project's net emission reductions or removals by a carbon crediting mechanism. These documents often include baseline and monitoring methodologies, tools, and protocols.	(Schneider et al., 2022 ^[186])
Mitigation outcomes	In this paper, mitigation outcome is used as a common term for GHG emission reduction and removal.	
Model-based approaches (to baseline setting)	In carbon crediting, baselines can be set based on different methodologies. Model-based approaches, such as linear or logistic regression models, use explanatory variables (e.g. biophysical and socioeconomic variables) to project a baseline (e.g. future deforestation in a jurisdiction).	(Teo et al., 2023 ^[59])
Nationally appropriate mitigation actions (NAMAs)	Nationally appropriate mitigation actions (NAMAs) were an instrument under the UNFCCC, referring to any action that reduces emission levels and that simultaneously fosters sustainable development in emerging markets and developing countries. NAMAs were aimed at achieving reductions in emission levels relative to 'business as usual' emission levels in 2020.	(UNFCCC, 2014 ^[97])
Nationally Determined Contribution (NDC)	Nationally determined contributions (NDCs) are national climate action plans by Parties to the Paris Agreement. NDCs embody efforts by each Party to reduce national emissions to help meet the global goal of limiting temperature rise to 1.5°C and adapt to the impacts of climate change. The Paris Agreement (Article 4, paragraph 2) requires each Party to prepare, communicate and maintain successive NDCs that it intends to achieve every 5 years. New NDCs were due	(UNFCCC, 2025 ^[205])

Term	Definition used in this paper	Reference
	in 2025.	
Nested / nesting	Nesting refers to the alignment of GHG mitigation activities across multiple levels. This is achieved through arrangements that address key elements, including GHG accounting, legal and institutional arrangements, rights to mitigation outcomes and associated benefits and the application of environmental and social safeguards.	Based on (World Bank, 2021 ^[132])
Paris Agreement Crediting Mechanism (PACM)	Article 6.4 of the Paris Agreement establishes a centralised mechanism guiding the design and validation of GHG mitigation projects and verification and issuance of their resulting GHG outcomes (as Article 6.4 emission reductions), under the authority and guidance of the Paris Agreement's governing body. The Paris Agreement Crediting Mechanism will effectively replace the Clean Development Mechanism (CDM). It has many similarities to the CDM but is subject to several new requirements, including those outlined in the Article 6.4 rules, modalities and procedures (RMP) (Annex to decision 3/CMA.3) as well as subsequent decisions adopted by the CMA as the Paris Agreement's governing body (decisions 7/CMA.4 as well as decisions 5 and 6/CMA.6) and the Article 6.4 Supervisory Body.	Based on (UNDP and UNFCCC, 2023 ^[189])
Permanence / permanent (Non-permanence / non-permanent)	Emission reductions or removals that have a lasting climate effect, with a minimal risk of reversal. Many carbon removal activities that generate carbon credits rely on short-term storage of carbon, with varying durations of storage and risks of reversal. Reversal risks can be managed and compensated with various measures to address non-permanence. Therefore, in practice, permanence is usually ensured through administrative and accounting procedures that can increase the likelihood that activities with non-permanent storage of carbon results in equivalent climate outcomes to activities with permanent storage. Cf. Non-permanence: A situation wherein the emission reductions or removals generated by a mitigation activity are later reversed, for example, due to a natural disaster, project mismanagement or changes in local conditions that make carbon storage no longer viable.	(Wetterberg, Ellis and Schneider, 2024 ^[11])
Real	In the context of carbon credit markets, "real" can encompass aspects such as GHG mitigation outcomes being unique, measurable, verifiable and not undermined by e.g. leakage.	
REDD+	REDD+ stands for reducing emissions from deforestation and forest degradation (REDD), as well as sustainable management of forests and the conservation and enhancement of forest carbon stocks (+) in developing countries.	Based on (FCPF, 2025 ^[202]) (UNFCCC, 2025 ^[206])
Reference period	In REDD+ baseline-setting, the reference period refers to the time period for which historical emissions and removals from forest carbon stocks are estimated to inform the baseline against which carbon credits are issued.	(FCPF, 2020 ^[101])
Results-based payments	Results-based payments are an approach under which a donor or buyer provides funds to a seller only after the achievement and independent verification of pre-agreed results. In the context of scaled-up crediting, results-based payments have been the main way to monetise jurisdictional REDD+ credits to date.	(World Bank, 2025 ^[5])
Safeguard information system (SIS)	As a prerequisite for obtaining results-based payments, countries participating in REDD+ activities need develop a safeguard information system (SIS) to explain how safeguards are being addressed and respected through the implementation of REDD+ activities. A safeguard information system (SIS) is required as a key piece of national REDD+ architecture under the UNFCCC.	Based on (UN-REDD Programme, 2025 ^[207] ; FAO, 2025 ^[208])
SCALE	The Scaling Climate Action by Lowering Emissions (SCALE) is a multi-donor fund managed by the World Bank which seeks to catalyse climate action by deploying results-based climate finance by supporting countries to access international carbon markets. This includes support for jurisdictional and sectoral crediting approaches.	(World Bank, 2025 ^[209])
Scaled-up crediting approaches	Scaled-up crediting approaches are a collective noun for crediting approaches that occur at a higher level of aggregation than project-based and programmatic crediting approaches. At the time of this publication, scaled-up' crediting is often associated with jurisdictional, sectoral and policy-based approaches. Common features of scaled-up crediting approaches include: Baseline emission levels are established collectively for a predefined group of GHG sources (for example, all sources within the scope of a GHG mitigation policy, or within a particular sector or subsector of the economy) Actions that mitigate or remove GHG emissions can be diverse and may be	Based on (PMR, 2017 ^[38])

Term	Definition used in this paper	Reference
	undertaken by multiple entities responding to incentives, rather than a single implementing entity.	
Standard for the Transformation of the Electric Power Sector (STEPS)	The Standard for the Transformation of the Electric Power Sector (STEPS) is a forthcoming sectoral crediting standard for emission reduction in the power sector, developed by the Environmental Resources Trust (ERT).	(ERT, 2026 ^[75])
Third-party audit	An independent third-party entity that is accredited for performing validation and/or verification audits. Validation is the process of independent, third-party evaluation of a mitigation activity requesting registration under a carbon crediting mechanism. Verification is the process of periodic independent, third-party ex-post evaluation of requests by a registered mitigation activity to issue carbon credits against the provisions of the applicable carbon crediting mechanism. Verification and validation bodies are often also referred to as auditors.	Based on (ICVCM, 2024 ^[192])
Transformative Carbon Asset Facility (TCAF)	The Transformative Carbon Asset Facility (TCAF) is a trust fund managed by the World Bank. It supports countries in raising their climate ambitions through implementing their NDCs, including through policy-based crediting. Also, it supports countries in creating the conditions needed for private sector investments in low-carbon technologies, bridge financial gaps and access carbon markets. TCAF has been operational since 2017.	(TCAF, 2025 ^[210])
Unit	The term units encompasses both tradable and non-tradable instruments representing a verified GHG emission reduction to, or removal from, the atmosphere equivalent to one metric tonne of carbon dioxide equivalent (t CO ₂ -eq). Under many scaled-up crediting standards, a large share of issuances has been non-tradable units, as opposed to tradable carbon credits.	
Verified Carbon Standard: Jurisdictional and Nested REDD+ (VCS JNR)	Jurisdictional and Nested REDD+ (JNR) is a framework under Verra's Verified Carbon Standard (VCS) and is an accounting and verification framework for jurisdictional REDD+ programs and nested projects.	(Verra, 2025 ^[100])