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# Delivering Results-Based Funding Through Crediting Mechanisms

## Assessment of Key Design Options

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# Introductory remarks

The international carbon market under the Kyoto Protocol has – especially through the Clean Development Mechanism (CDM) – initiated several thousand mitigation projects, and helped spread the word that climate protection is a business case on the one hand and good for sustainable development on the other hand. It has also led to building impressive capacity in project development as well as monitoring, reporting and verification of concrete mitigation results.

Due to the current lack of demand in the international carbon market, few new projects are being developed at the moment. In sectors without co-benefits that create income in addition to mitigation certificates, already implemented project activities are even being stopped.

However, the capacity and experience developed through the carbon market is still very much needed. Carbon markets and pricing will have to play a decisive role as an incentive, as a means of delivering mitigation efficiently and as a way of including the private sector and making its capital and creativity available for climate protection.

In addition – and this is the focus of this study – carbon market projects and experiences gained with them can also play an important role in disbursing climate finance effectively, by providing ready-to-finance projects and offering tools for monitoring, reporting and verification.

This study is a very helpful input for the debate on how carbon market projects and experiences can be used in results-based finance. The study assesses opportunities and advantages, but also explores limitations and challenges of using carbon markets for climate finance. Finally, the study also examines these questions in the concrete context of five specific project types.

Berlin, November 2015

Silke Karcher

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# Executive Summary

Results-based funding is increasingly being used as an innovative tool to effectively disburse climate finance. Results-based funding links payments to outcomes, by disbursing funding ex-post upon the achievement of a set of pre-defined results. Results-based funding therefore provides strong incentives for the recipients of the funding to achieve the results. The recipients have autonomy in how to achieve the results, which can create ownership and encourage innovation. At the same time, the recipients face higher risks and transaction costs, and must have access to upfront capital to be able to respond to the incentives. Results-based funding contracts can be complex, so careful programme design, adapted to the features of the sector and mitigation interventions, is important to achieve the intended results. This is particularly true for questions of how progress should be measured (emission reductions and/or other indicators), who should receive the funding (governments or private entities), and at which level interventions can best achieve the programme's objectives (projects, programmes, sector-wide or economy-wide policies).

Carbon market mechanisms that credit emission reductions against a baseline – like the Clean Development Mechanism (CDM) – are a suitable vehicle to disburse results-based finance for mitigation projects or programmes. This study assesses key design options for programmes using crediting mechanisms to deliver results-based funding.

Crediting mechanisms could help achieve cost-effectiveness because of their ability to identify untapped mitigation opportunities and the competitive nature of programmes purchasing emission reduction credits. Using the capacity, knowledge and infrastructure developed under existing mechanisms could reduce costs and considerably accelerate the implementation of results-based funding initiatives. Standards for calculating emission reductions and assessing additionality at project or programme level are available for a broad range of technologies and sectors, though they are not necessarily suitable for programmes targeting reductions at sectoral level, reductions from policy interventions, or reductions from capacity building or awareness raising.

To achieve a high mitigation impact, it is crucial to ensure that emission reductions are additional, while quantifying emission reductions conservatively is less important, as long as the emission reduction credits are cancelled. We recommend that results-based funding programmes focus first on mitigation projects that have already been implemented but are now at risk of stopping greenhouse gas (GHG) abatement, and then move on to new projects that have not yet been implemented. Results-based funding programmes should not support already implemented projects that are not at risk of stopping GHG abatement. We further recommend purchasing only credits issued for emission reductions that occur after the date of contracting. In the case of new projects, results-based funding programmes should focus on project types with the highest likelihood of additionality. For project types with different technical lifetimes we recommend establishing specific funding windows with specific programme design. This is because a mismatch between the duration of payments and the technical lifetime of mitigation projects could have adverse impacts, such as projects stopping mitigation once results-based payments end.

Many institutions funding climate change mitigation aim to achieve transformational change towards sustainable, low-carbon development. Results-based funding programmes using crediting mechanisms could foster or impede transformational change. They could foster innovation because they provide the recipients with autonomy in how to achieve the emission reductions. However, they could impede transformational change if they lock-in carbon-intensive technologies, if continued funding creates disincentives for policy makers to change the underlying policy framework, or if they support technologies that are not in line with the priorities and vision of the implementing country.

To support transformational change, results-based funding programmes could require government endorsement of the interventions to ensure country ownership and alignment with national priorities. They could also support the development of an enabling policy and regulatory framework to ensure continued change beyond the results-based funding programme, or require that the recipient country commits to introducing a policy framework that ensures long-term mitigation. Alternatively, they could require that the emission source be included within the scope of mitigation targets by the country under the United Nations Framework Convention on Climate Change (UNFCCC). In terms of technology choices, the results-based funding programme could exclude technologies with a high risk of carbon lock-in, and consider prioritizing technologies with a high potential for replication and innovation, by means of positive lists, performance benchmarks, or qualitative criteria.

Results-based funding programmes should adopt strong environmental and social safeguards, and tools to evaluate, monitor and enforce them. We recommend that programmes require ex-post monitoring and third-party verification of compliance with safeguards and withhold results-based payments if safeguards criteria are not met. We also recommend considering a risk-based approach, focusing on safeguards issues that are most relevant for different technologies and project types.

To avoid double counting of efforts with regard to mitigation outcomes and financial contributions, results-based funding programmes should cancel the emission reduction credits on behalf of the programme, and not use them for compliance purposes. Programmes should also proactively manage the risk of double issuance of emission reduction credits by seeking formal declarations from project owners that they have not and will not seek credits for the same emission reductions under another or the same crediting mechanism.

We tested the criteria for evaluating the suitability of technologies for programmes using crediting mechanisms to deliver results-based funding by applying them to five diverse project types: $N_2O$ from nitric acid, energy efficient lighting, large-scale wind power, landfill gas flaring, and leak detection and repair from oil and gas infrastructure. This analysis reveals important differences, including the likelihood of additionality, the incentives for project owners to continue abatement beyond the duration of the programme, the regulatory framework and incentives for policy makers to introduce policies that ensure continued abatement, the potential for replication and innovation, and the risks of carbon lock-in. For results-based funding programmes to deliver on their intended goals, therefore, they must carefully evaluate the specific features of the funded activities and adapt the programme design accordingly. We recommend that using crediting mechanisms for results-based funding is explored further by piloting credit purchases from a broader range of project types and sectors, as well as through further in-depth analysis of programme design options for specific sectors and project types.

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# 1 Introduction

To limit global warming to 1.5°C or 2°C, current mitigation efforts need to be strengthened significantly, both in the period up to 2020 and beyond. The current climate actions pledged by Parties, including Intended Nationally Determined Contributions (INDCs) submitted by September 2015, will leave a mitigation gap of around 6-10 Gt $CO_2$e by 2020, 12-15 Gt $CO_2$e by 2025, and 17-21 Gt CO2e by 2030 (Jeffery et al. 2015). To further facilitate mitigation and adaptation in developing countries, developed countries also pledged to mobilize USD 100 billion per year by 2020 for climate finance. At the same time, an estimated USD 90 trillion in investment is likely to be invested in infrastructure in the world's urban, land use and energy systems by 2030 (New Climate Economy 2014). Infrastructure choices made over the next 15 years will determine the future of the world's climate system. They will also determine how much of this investment, in the face of the need to dramatically reduce emissions, will become stranded. Discussions are underway on how to best disburse and leverage funds for maximum effectiveness and efficiency, in which results-based funding is increasingly viewed as one of the potential tools to achieve these aspirations.

Results-based funding links payments to performance or outcomes. The concept has been employed and tested in a number of sectors, including health, education and energy, and is increasingly considered for financing climate change mitigation. Carbon market mechanisms that credit emission reductions against a baseline – like the Clean Development Mechanism (CDM) – could be considered as a form of results-based funding. They typically involve pay-for-performance contracts. Emission reduction credits are awarded ex-post upon achievement and third party verification of mitigation outcomes. However, emission reduction credits have mostly been used for meeting mitigation commitments so far, as opposed to using them as a vehicle to deliver climate finance.

Carbon market crediting mechanisms could support the application of results-based funding for climate mitigation, including through the purchase and cancellation of credits or by using their tools for monitoring, reporting and verification (MRV) of mitigation outcomes. In recent years, several initiatives have begun using results-based approaches for financing climate mitigation, including the Carbon Initiative for Development (Ci-Dev) and the Pilot Auction Facility for Methane and Climate Change Mitigation (PAF), which are both operated by the World Bank and use the CDM as a vehicle to monitor and verify mitigation outcomes. The Warsaw Framework for reducing emissions from deforestation and degradation (REDD+) also provides for results-based funding elements. Similar approaches could be employed by other institutions. When launching the Green Climate Fund (GCF), Parties agreed that the fund may „employ results-based financing approaches, including, in particular for incentivizing mitigation actions, payment for verified results, where appropriate."[1]

Results-based funding provides interesting opportunities, but also poses a number of challenges. The study aims to explore how results-based funding could be delivered effectively by using tools and processes of crediting mechanisms and how the challenges could be addressed. The study focuses on the following five areas:

1. **Suitability of using crediting mechanisms to deliver results-based funding:** Existing crediting mechanisms can provide a strong base of human and institutional capacity, recognized protocols for assessing GHG impacts, and experience with monitoring and verification. At the same time, there are potential limitations, significant transaction costs, and gaps that may need to be addressed by funders using results-based funding. The study explores the conditions under which crediting mechanisms are an effective tool for delivering results-based funding.

2. **Achieving a high mitigation impact:** A key objective of results-based funding for climate mitigation is to achieve a high mitigation impact. The environmental effectiveness of results-based funding depends on which mitigation actions are funded as well as the structure and duration of payments, and how the indicators for payments are chosen. The study explores how crediting mechanisms can most effectively be used to achieve a high mitigation impact.

3. **Fostering transformational change:** There is an increasing trend toward funders using climate finance to facilitate transformational change towards a low carbon economy. Using crediting me-

1 *Decision 3/CP.17, paragraph 55.*

chanisms to disburse results-based funding could potentially foster or impede such change, or may have no effect. For example, using results-based approaches could provide greater incentives to actually achieve emission reductions because payments are linked to results and not only actions; if payments are limited to measurable short-term results, however, it could also deter long-term transformation. For example, temporary financing of specific projects or activities does not necessarily lead to long-term emission reductions: funded projects could cease operation once the climate funding stops, or new installations could use more GHG-intensive technologies if no new funding is available. The study explores whether and how programmes using crediting mechanisms to deliver results-based funding could be set up in ways that foster, and not impede, transformational change towards a low carbon development.

4. **Ensuring environmental and social safeguards:** Mitigation activities can have co-benefits with other policy objectives or affect them adversely. Financial institutions often use environmental and social safeguard criteria and stakeholder participation to prevent and manage social and environmental risks of projects. Linking payments only to emission reductions without other safeguards poses the risk that the overall benefits and risks of investment options are not adequately considered. The study explores how environmental and social safeguards could be considered in the context of programmes using crediting mechanisms to deliver results-based funding.

5. **Avoiding double counting of efforts:** Global action to mitigate climate change can be undermined if efforts are double counted. Double counting can occur in various forms, including two countries accounting for the same emission reductions towards meeting a mitigation pledge or several countries or institutions accounting for the same reductions as contributions to climate finance. The study highlights how double counting could occur in the context of programmes using crediting mechanisms to deliver results-based funding and how it could be addressed.

The study approaches these questions from the perspective of how programmes using crediting mechanisms for delivering results-based funding could be designed to effectively achieve these objectives. The study aims to identify and assess concrete design options for such programmes and discusses their benefits, challenges and risks. We identify and assess options from the perspective of a public climate fund that intends to use crediting mechanisms to deliver results-based funding for specific mitigation actions in multiple countries. The results could inform bilateral and multilateral financial institutions when implementing such programmes.

Chapter 2 provides an overview of results-based funding. Chapters 3 to 7 explore the five thematic areas highlighted above. Chapter 8 assesses the suitability of different project types for using crediting mechanisms to deliver results-based funding. Chapter 9 draws conclusions and provides recommendations.

# 2 Overview of results-based funding

## 2.1 What is results-based funding?

Results-based funding links financial support to the achievement of results. Financial means are disbursed ex-post upon the achievement of a set of predefined results. This distinguishes it from conventional international development cooperation, where support is provided largely upfront before any results are achieved, whether this support be through grants, concessional loans or technical assistance.

A variety of terms and definitions are used to describe results-based funding approaches in the literature (Clist 2014; ESMAP 2013; ESMAP 2015; Warnecke et al. 2015b). We define results-based funding broadly as a modality under which incentives are dispersed by a funder (also called the „principal") to a recipient (also called the „agent") upon the achievement and independent verification of results using pre-defined methods and indicators. Following the convention generally used in this field, we distinguish two forms of results-based funding: we use the term results-based finance (RBF) when the recipient is a private sector or non-governmental entity implementing projects or actions, as opposed to results-based aid (RBA) when the recipient of the funding is a national or regional government. Several results-based programmes channel funds through a government programme (e.g. national energy or climate funds), but the scheme is designed to deliver the funds ultimately to private sector or non-government entities. For simplicity, we use the term results-based finance throughout to cover any programme that ultimately engages actors outside of the government.[2] Finally, we discuss results-based funding in the context of programmes that fund mitigation actions. In chapters 3 to 9 we focus on programmes using crediting mechanisms to disburse funding to private sector and non-governmental entities (i.e. results-based finance), while this chapter discusses general issues of results-based funding.

Results-based funding aims to increase the effectiveness of development aid by creating incentives for and enhancing the certainty of delivering the programme objectives. It provides strong incentives for the recipients of the funding to achieve the results. Another key characteristic is that how the results are achieved is usually at the discretion of the recipient of the funding. The incentives and autonomy of the recipient can create ownership and encourage innovation to identify barriers and experiment with alternative interventions. This could lead to more efficient results compared to funding geared to milestones or the disbursement of upfront loans and grants without any reference to the outcomes achieved. A second benefit is that funders have more certainty that results will be delivered with the funding provided, which may allow them to increase the availability of funding. A third benefit is an overall greater transparency because results are more visible and are independently verified. This may also allow increased learning about which development approaches are most effective and in which context. At the same time, the level of monitoring and verification involved in results-based funding increases transaction costs and can increase the risks that the recipients face. Results-based funding also cannot address the need for upfront financing by the recipients, so either they must have access to capital on their own, or funders much create parallel financial mechanisms to provide upfront financing.

Establishing a results-based funding programme for climate change mitigation requires the funder to define ex-ante key design features, and the recipients to agree to these features if they wish to participate in the programme. Such features include, among others:

- the objectives and intended results of the programme;
- the eligibility of countries or regions to participate in the programme;
- the eligibility or prioritization of mitigation actions where appropriate;[3]
- the (type of) entities which should receive the funding;
- the indicators used to measure progress towards the objectives and results;
- the baseline for the indicators against which progress is measured;
- the methodology used to monitor the progress;
- the modalities of independent verification;
- the modalities for issuance, transfer, cancellation of verified/certified mitigation units, where applicable;
- the contractual terms and level of incentive;

2 *Other terms used for results-based approaches include payments by results (PBR), performance-based financing (PBF), payment for performance (P4P), performance-based contracting (PBC), conditional cash transfers, or output-based aid (OBA).*

3 *In principle, results-based funding aims to provide discretion to the recipients in terms of which activities they implement to achieve the results. However, some programmes may define which mitigation action activities are eligible.*

- the modalities for adhering to any social and environmental safeguards;
- any provisions for dispute settlement and conditions under which the agreement is open to renegotiation;
- other (enabling) measures which the programme should pursue to achieve its objectives.

This list suggests that results-based contracts can be complex and that establishing an effective programme can be challenging and costly in practice. For this reason, most existing results-based funding programmes or frameworks include components, such as readiness funds, to build the necessary capacity and establish institutional frameworks, and some would provide some support to cover the incremental costs of monitoring, verification and reporting of outcomes.

## 2.2 Prerequisites and challenges of results-based funding

A number of prerequisites need to be in place for results-based funding programmes to be effective and feasible. The available research indicates that results-based funding programmes could deliver the intended results but could also perform worse than traditional funding approaches, such as grants (Clist 2014; Oxman and Fretheim 2009). Two overarching lessons can be learned from the available experience. Firstly, an effective programme design, adapted to the policy objectives and specific circumstances of the country and sector, is key for success. And secondly, results-based funding should not be regarded as a "silver bullet", particularly if used in isolation of other financing instruments; depending on the circumstances, other traditional upfront finance approaches might deliver better results.

Several factors are important for the success of a results-based funding programme. Key factors include the suitability of the indicators to measure progress towards the objectives, the ability of the recipients to respond to the incentives, and the ability of the funders to commit to a results-based approach. These factors are further explored below.

### 2.2.1 Selecting suitable indicators to measure progress

Selecting suitable indicators to measure progress towards the objectives is a key prerequisite for a results-based funding programme to deliver the intended outcomes. Selecting poor indicators could lead to adverse outcomes. Identifying, monitoring and verifying the indicators can pose considerable challenges, such as the following:

- **Indicators measuring progress must be reasonable proxies for the intended results and policy objectives**: Indicators need to be closely linked to the policy objectives. This could be difficult if the policy objectives encompass several (qualitative) aspects. For example, for a programme promoting household electricity access, using only the percentage of households with an electrical grid connection may not be an appropriate indicator because it „does not consider whether the electrical grid provides high quality, reliable electrical supply. It also ignores the possibility that off-grid electricity solutions might provide a similar or better level of quality and reliability" (ESMAP 2015). Clist (2014) highlights that it is not sufficient for an indicator to be correlated with the objective ex-ante, but that it must also remain so ex-post. For example, indoor air quality may be correlated ex-ante to the number of efficient cook stoves distributed, but might not be correlated ex-post if the cleaner cook stoves were distributed but did not entirely displace traditional stoves, if the type of cook stoves distributed or the modalities of distribution were different from those prior to the programme, or if new technologies emerge during programme operation. Kreibich (2014) observes for several existing results-based initiatives that the indicators do not match their overarching goals. Initiatives may often also use climate mitigation impacts as indicators while a key goal is to achieve economic and social development. Instead of using indicators that are more closely aligned to the goals, the initiatives establish eligibility criteria or safeguards to achieve the programme objectives. Kreibich (2014) concludes that this poses considerable risks, as experienced with the CDM where payments for CERs are usually not made contingent upon achievement of sustainable development co-benefits. While the projects would need to comply with the safeguards criteria required by any other development finance that they receive, the CDM MRV process does not include safeguards evaluation. While the CDM has two main goals – achieving GHG emission reductions and fostering sustainable development – buyers of CERs mainly reward emission reductions, which in turn provides incentives for recipients to focus for reductions of GHG emissions rather than sustainable development benefits.
- **Changes in indicators must be reasonably attributable to the interventions:** The future trajectory of the indicators may be influenced not only by the interventions from the results-based funding programme, but also by other developments outside the control of the recipients. This „signal-to-noise" problem could lead to the recipients being rewarded or penalised for actions over which they

had no control. For example, the amount of electricity produced from biomass could be a problematic indicator on its own for a programme promoting biomass power, if biomass use strongly depends on international fuel prices, varying crop yields, or grid reliability.

- **Indicators must avoid gaming and distortion:** The recipient has economic incentives to design its interventions in ways that increase performance versus the indicators. This can lead to gaming or distortions. For example, under a programme promoting the capture and flaring of landfill gas, using the amount of gas flared as an indicator could lead to perverse incentives to enhance landfill gas generation by changing the design or operation of landfills or by prioritizing landfilling over recycling, composting or waste incineration.

- **Indicators measuring progress must be measurable and verifiable at reasonable costs:** Some policy objectives could be difficult to translate into indicators that are easily measurable and verifiable. For example, a key policy objective of an efficient cook stove project could be to reduce indoor air pollution. Measuring and verifying quantifiable improvements in indoor air quality could be more cumbersome and costly than just tracking the number of cook stoves distributed. Simpler indicators, such as the number of efficient cook stoves distributed, may, however, have less correlation with changes in indoor air quality.

Selecting appropriate indicators can involve some trade-offs between these requirements. When it is not possible to identify indicators which meet these requirements, the appropriateness of results-based funding may need to be reconsidered. Defining a single indicator could be particularly problematic when several policy objectives are pursued. In practice, most existing initiatives for results-based funding pursue a combination of goals (Kreibich 2014). ESMAP (2015) concludes that a multi-tier framework may be a more suitable approach when several policy objectives are pursued or when one objective includes several intended outcomes. For example, in a programme to promote household electricity access, a multi-tier framework could measure the „usability of electricity supply along multiple dimensions through representative household surveys". Alternatively, energy consumption could be considered an "intermediate impact" indicator in energy access programmes, since consumers can only utilize the source if is affordable and usable (ESMAP 2014). Indicators could also be used to assess compliance with environmental or social safeguards and payments could be made contingent upon compliance with such safeguards.

### 2.2.2 Ability of recipients to respond to incentives

The ability of recipients to respond to the incentives from results-based funding is another important prerequisite for programmes to be effective. This includes several features:

- **The recipient must have sufficient capacity and capabilities:** Recipients require considerable institutional capacity and knowledge to use the autonomy in project design and implementation provided by results-based funding. The available experiences with results-based funding programmes suggest that capacity building and technical support are often required and should be part of a results-based funding package (Oxman and Fretheim 2009).

- **The recipient must have access to upfront resources to pre-finance the intervention:** A key feature of results-based funding programmes is that payments are only disbursed ex-post upon verification of results. This requires recipients to have access to capital to pre-finance the interventions, whether those recipients are the actual project owners or intermediaries who support multiple project owners. It also requires recipients that can handle considerable time gaps from planning and implementing the interventions to receiving payments. In some cases, securing a results-based contract may assist the agent in mobilizing project financing.

- **The recipient must be able to assume risks and handle uncertainty on future performance and revenues:** Compared to the upfront grants and concession loans of traditional official development aid (ODA), results-based funding programmes shift risks from the funder to the recipient. Recipients only receive the expected funding if the interventions have the envisaged effects. Uncertainty about future performance and revenues could be significant, depending on the type of activity. Many potential recipients may not be able to handle large uncertainties. Results-based funding may thus be less suitable for more experimental interventions for which the results are highly uncertain. In addition, shifting risks from funders to recipients can increase the level of payments required under results-based funding programmes compared to conventional ODA, because the recipients must be compensated for the greater risk that they take.

- **The recipient must have reasonable control on the results:** Recipients need a large degree of control on the ability to achieve results. Achieving the results should not depend on factors outside the control of the recipients. This could present a challenge if, for example, a cook stove project imple-

menter could only receive payments after verified changes in health of the stove users, when health could be impacted by many factors outside of the improved stove project. This issue, therefore, is closely linked to the appropriate selection of indicators to measure progress and the way in which the financing is structured.

### 2.2.3 Ability of funders to commit to results-based funding programmes

Another important prerequisite is that funders are able to credibly commit to results-based funding programmes. This implies that they need to be able to withhold payments in case performance is not met. The incentive is lost if the risk of non-payment is not credible. In practice, funders often want to make sure that available funds are actually disbursed and so could face pressure to design weaker compliance frameworks.

Furthermore, funders need to commit to payments over longer time periods. In practice, funders are sometimes only able to contract over relatively short time periods (e.g. five years). This reduces the scope and incentives of results-based funding programmes. A limited time horizon of results-based funding programmes provides incentives for recipients to prioritise interventions with short-term effects over interventions with a longer-term effect. This could lead to less effective interventions and costlier outcomes, in particular if interventions that require time to deliver results are more cost-effective and beneficial. The time horizon of results-based funding programmes could be a particular concern for mitigating climate change when investments in infrastructure, such as in the energy sector, have long payback times but could deliver emission reductions over decades. A short-term programme, e.g. limited to five years, may mainly attract mitigation options with short payback times and not provide incentives to pursue investments with longer time horizons. This also highlights the importance of a clear exit strategy for the funder, and putting in place mechanisms to ensure the continued financial sustainability of the programmes under implementation.

### 2.2.4 Evaluating results-based funding against other funding options

The above considerations illustrate that results-based funding could be an effective tool but also poses considerable challenges. If key prerequisites are not met, results-based funding should not be pursued. Using results-based funding for climate finance should, therefore, be carefully evaluated against other funding approaches. In summary, key questions for evaluating whether results-based funding is a suitable instrument include:

- Can appropriate indicators be identified which closely align with the policy objectives, are attributable to the intended interventions, avoid gaming and distortion, and are measurable and verifiable at reasonable costs?
- Are recipients available that have the appropriate capacity to implement and pre-finance the interventions, assume the risks and uncertainty of future payments, and have control over the results?
- Are funders able to commit to conditional payments over appropriate time horizons?
- What transaction costs are associated with a results-based funding programme compared to other funding options?

## 2.3 Existing initiatives for using results-based funding for climate mitigation

Results-based funding for climate mitigation[4] has been tested and employed in several existing initiatives. Table 1 provides an overview of nine existing initiatives. Below we describe in more detail the two initiatives that use carbon markets as a vehicle for disbursing results-based funding: the World Bank's Carbon Initiative for Development (Ci-Dev) and its Pilot Auction Facility for Methane and Climate Change Mitigation (PAF).

All nine schemes target developing countries – five select recipients in broader geographic regions, two limit recipients to participants in some initiatives (e.g. REDD+ and Energy+ partnership), and two focus only on a single country (i.e. Uganda and China). The World Bank Group and the Norwegian government are the most prominent agents using results-based funding. The overall focus is on renewables, energy efficiency, forestry, and the waste sector. Some programmes address specific greenhouse gases, such as the PAF addressing methane emission sources in its first round or the NDRC programme addressing HFC-23 emissions. The initiatives vary with regard to how they define criteria for the selection of mitigation actions and the MRV framework. Two initiatives use CDM project registration as a pre-requisite (PAF and Ci Dev), and several require compliance with sustainability safeguards or performance standards (PAF, Ci-Dev, GET FiT), financial and/or technical feasibility (GET FiT and FCPF Carbon Fund), and co-benefits (Ci-Dev and FCPF Carbon Fund). The initiatives mostly conduct upfront due diligence for project selection

*4 Although some of the programmes covered here may not have climate change mitigation as a primary objective, the implementation of all the programmes would lead to mitigation outcomes.*

based on internal processes and criteria (Ci-Dev, EnvDev, FCPF Carbon Fund, Energy+, NDRC), by independent bodies (GET FiT), or no due diligence required (PAF, NIFCI).

The result indicators for payment are mainly based on emissions reduction (i.e. CERs or t $CO_2e$) and energy availability (i.e. number of people gained access, kWh generated by low carbon energy, sales of low carbon appliances, etc.). Based on these indicators, pricing is set either based on auctions (PAF), case-by-case or bilateral negations (Ci-Dev, EnvDev, FCPF Carbon Fund, Energy+, PBC Finance in Latin America), or at a fixed rate per results (GET FiT, NIFCI, NDRC). The initiatives also use different MRV approaches for monitoring: they use CDM methodologies (PAF, Ci-Dev, NDRC), other existing methodologies (FCPF Carbon Fund and Energy +) or develop own methodologies for the entire program or each project (EnvDec, GET FiT, NIFCI, PBC Finance in Latin America). In general, all schemes share one common feature: they use quantitative results as an indicator for payment or other incentive, while other design features are more dependent on the overarching objective of the scheme.

Alongside these specific initiatives, several global instruments provide frameworks for using results-based funding for climate mitigation: Adopted at COP 19, the Warsaw Framework for REDD+ establishes principles for reducing emissions from deforestation and degradation through results-based funding, including that safeguards have to be addressed and respected before developing countries can receive payments and key elements of measuring results for results-based payments for REDD+ (e.g. institutional arrangements, modalities for MRV, safeguards, reference levels, and key mitigation efforts).[5] REDD+ is to be implemented as a capacity building and payment delivery mechanism and is divided into three phases: Phase 1 focuses on technical and institutional readiness, phase 2 on policy implementation, and phase 3 on result-based payments and MRV implementation.[6] The Warsaw Framework also recognizes the importance of sufficient technical, institutional and policy preparation to successful de-

*5 Decision 9/CP.19*
*6 Decision 1/CP.16, paragraph 73.*

Table 1 Overview of results-based funding related initiatives for climate mitigation

| Scheme | Recipient Countries | Technologies | Criteria for selection |
|---|---|---|---|
| Pilot Auction Facility for Methane and Climate Change Mitigation (PAF), World Bank | Non-Annex I countries, excluding China, Israel, South Korea | 1st round: limited to landfill gas, animal waste, wastewater | • 1st used CERs from specified CDM methodologies with specified vintage<br>• Environmental, health and social performance criteria, adapted from World Bank Performance Standard and customised for each project<br>• No contract with a third-party |
| Carbon Initiative for Development (Ci-Dev), World Bank | Africa IDA and Asia LDC | Limited to RE with new connections; and other under-represented sectors with innovation (EE, waste, other electrification)<br>Preference for RE | **Required:**<br>• Development benefits/savings at household or community level<br>• Must register as CDM<br>• Adhere to World Bank Performance Standard (Environmental and Social Safeguards)<br>• Include local community involvement<br>• Project type not already successful in region<br>• Small to medium scale<br>• CER price of less than €10<br>**Preferences:**<br>• Show how carbon finance benefits the poor<br>• Require no additional donor finance<br>• Support new methodologies that help poor countries |

livery of results-based funding. It also highlights the potential role of Green Climate Fund in delivering result-based climate finance.[5]

At COP16 in 2010, Parties decided to establish the Green Climate Fund (GCF).[7] One year later, the fund was formally launched at COP 17, with the approval of a governing instrument to guide the development of the fund.[8] The governing instrument mentions RFB as an important criterion for funds allocation and recognizes RFB as one of the potential financing approaches for incentivizing mitigation actions and payment for verified results. In accordance with Warsaw Framework for REDD+, the GCF board developed an initial logic model and performance measurement framework (PMF) for ex-post REDD+ result-based payments (RBPs) as part of the financing logic of the fund (GCF 2014b, Annexes X and XI). Both frameworks use the verified emission reductions and increased removals as a results indicator for payments, noting that REDD+ programmes supported by the fund „can identify additional indicators that are relevant and compelling in light of specific circumstances on a case-by-case basis". Interestingly, the frameworks are not only applicable to REDD+, but also include conservation of forest carbon stocks, sustainable management of forests, and increased removals through enhancement of forest carbon stocks, thereby covering all possible forest-related activities to mitigate climate change (GCF 2014b). The frameworks also mention expected results and program outcomes, and the reporting responsibility or frequency as guidance for implementing results-based funding for REDD+ initiatives through the GCF. The initial logic model and PMF for RBPs provide a first step for using results-based funding as one of the financing tools for the GCF.

Finally, crediting mechanisms, and in particular the CDM, can be seen as instruments for disbursing results-based funding, as payments are made for delivery of CERs (Neeff et al. 2014; Warnecke 2015b). The use of crediting mechanisms to deliver results-based funding is further explored in chapter 3.

*7 Decision 1/CP.16, paragraph 102.*
*8 Decision 3/CP.17.*

| Upfront evaluation | Results used for payments | Pricing approach | MRV |
|---|---|---|---|
| No upfront due diligence on project, only evaluated when put option is redeemed; bidders screen for reputational issues | 1st round used CERs; future rounds could use other MRV standards | Reverse auction of put options of CERs | 1st round: CDM MRV for CERs, plus an Environmental, Health & Safety and Social (EHS) audit, and Integrity report from a Designated Operational Entity (DOE) |
| Due diligence and qualitative assessment by Ci-DEV staff and other World Bank experts | CERs, plus additional agreed Results Indicators | Bilateral negotiations, based on financial analysis of programmes | CDM MRV for CERs; Ongoing dialogue with partners, with standard WB evaluation process, but not linked to payments and no formal MRV of non-GHG impacts |

| Scheme | Recipient Countries | Technologies | Criteria for selection |
|---|---|---|---|
| RBF facility within the Energising Development (EnDev) Programme | Africa, Asia and Latin America | Grid connections, mini-grids (solar, hydro, biogas), and off-grid technologies (stoves) | No predefined criteria for individual facility; only require recipients to be capable of marketing products and solutions |
| Global Energy Transfer Feed-in Tariffs (GET FiT) Premium Payment Mechanism, Deutsche Bank | Uganda | Small-scale RE (small hydro, cogeneration and biogas) | • Financial and economic viability<br>• Technical feasibility<br>• Compliance with IFC Performance Standards (ESG) |
| Forest Carbon Partnership Facility (FCPF) Carbon Fund, World Bank | REDD+ developing countries | REDD+ policies and measures | • Political commitment and readiness progress<br>• Potential to generate emission reductions at scale<br>• Technical soundness<br>• Stakeholder participation<br>• Non-carbon benefits |
| Norwegian International Climate and Forest Initiative (NIFCI) | Brazil, Ethiopia, Guyana, Indonesia, Mexico, Tanzania and Vietnam | MRV for REDD, capacity building, and forest conservation | • Bilateral agreements with no specific criteria<br>• Brazil: Projects are selected by the Amazon Fund based on compliance with certain national sustainable development aspects |
| International Energy and Climate Initiative Energy+, Norway | Kenya, Bhutan, Liberia, Ethiopia, Maldives, Senegal, Morocco, Tanzania, Nepal, Mali, Grenada, Mozambique | RE and EE | No particular criteria but countries have to complete Phase I (strategy development, technical and institutional capacity building ) and Phase II (institutional capacity building, policy and legal reform, MRV) in order to participate in Phase III (scale-up RE and EE implementation) |
| Facility for Performance Based Climate (PBC) Finance in Latin America | Latin America | Renewable power generation, energy efficiency, municipal solid waste management and transportation | No information |
| NDRC HFC-23 subsidy program | China | Incineration, transformation and utilization of HFC-23 | Projects are required to submit disposal status report and third party verification report to be considered |

| Upfront evaluation | Results used for payments | Pricing approach | MRV |
|---|---|---|---|
| Internal selection process among EnDev's local project offices and selected partner organisations | Sales of low carbon energy appliances or the number of people connected to low carbon mini grid | Bilateral negotiations, based on benchmark of maximum 20 EUR per person gained access to energy | Scheme-specific MRV; no programme-wide MRV requirements |
| Upfront due diligence by independent experts | kWh fed into national grid | Fixed FiT per RE technology over 20 years | Methodology developed by Uganda Energy Transmission Company Limited |
| Due diligence by World Bank on project appraisal and safeguards assessment | Tons of emission reductions | Project-specific negation; pricing criteria to be determined | Developed internally specifically for this facility |
| No upfront due diligence – bilateral agreement | $tCO_2$ reduced against a deforestation baseline | Brazil: Fixed price of 5 USD / $tCO_2$ | National MRV approaches |
| Case-by-case selection | (Phase III only) Access to sustainable energy services and emission reductions from RE and EE | Case-by-case determination | Global Tracking Framework by Sustainable Energy for All (SE4all) |
| No information | Verified $CO_2$ emission reductions | Depending on the type of technology implemented | Own MRV system |
| Expert review meeting to examine disposal status report and third party verification report | t $CO_2e$ | Investment subsidy capped at 15 and 10 million Yuan for incineration capacity of 1200 and 600 tons of HFC-23 respectively for new HCFC-22 plants that are not eligible under the CDM; annual declining operation subsidy from 4 to 1 Yuan per t $CO_2e$ | MRV methodology developed by the NDRC |

### 2.3.1 World Bank: Carbon Initiative for Development

The Carbon Initiative for Development (Ci-Dev) was established by the World Bank's Climate and Carbon Finance Unit in December 2011 and became operational in April 2014, to „build capacity and develop tools and methodologies to help the world's poorest countries access carbon finance, mainly in the area of energy access".[9] The facility disburses performance-based payments for emission reductions on the basis of an Emissions Reduction Purchase Agreement (ERPA), with a focus on household-level clean technologies in low-income countries. The objectives of Ci-Dev are shown in Box 1 below, and include not only emissions reductions but also the evolution of carbon market mechanisms, results-based finance and other climate finance mechanisms in a way that benefits the poorest countries.

To implement these objectives, Ci-Dev uses a focused country and technology strategy, as shown in Table 1. In other words, in addition to conducting a detailed, quantitative assessment of proposals to determine whether they meet the overall goals of Ci-Dev and the other criteria, the fund uses an internal, qualitative assessment process involving sectoral experts to identify business models with potentially transformative potential and impact on development. The development benefits are driven by the technology and country focus rather than being an additional outcome that must be monitored and verified. However, Ci-Dev does have a monitoring and evaluation process, which incorporates indicators beyond GHG emissions reductions, but it is part of an ongoing dialogue with the recipient of the funds and is not directly tied to the results-based payments.

The due diligence process for Ci-Dev proposals focuses on the business model of the programmatic activity, not only to understand how carbon revenues leverage private financing and drive innovation, but also to ensure that the programmes are sustainable over the long run – even beyond the expiration of the ERPA. By reducing the initial barriers to investment and promoting innovative business models, Ci-Dev aims to transform these markets so that the mitigation activities can continue beyond the life of the carbon revenue stream. Again, this is possible, in part, due to the choice of technology areas, which offer the potential for significant cost reductions over time, as well as increased efficiency of the delivery systems for energy access. Ci-Dev is also piloting innovative monitoring approaches using, for example, cellular technology and payment control systems, to track non-GHG metrics of project performance, even if they are not yet directly linked to payments.

**Box 1 Objectives of the Carbon Initiative for Development (Ci-Dev)**

To demonstrate that performance-based payments for the purchase of certified carbon emission reductions (CERs) can lead to a successful and viable business model that promotes increased private sector participation, and share lessons for replication.

To influence future carbon market mechanisms so that low income countries, and especially least developed ones, receive a greater and fairer share of carbon finance, resulting in high development benefits that avoid carbon emissions.

To support low income countries in developing standardized baselines and establishing "suppressed demand" accounting standards in key areas such as rural electrification, household energy access and energy efficiency.

To contribute proposals to further improve and extend the scope of the Clean Development Mechanism (CDM) for use by least developed countries (LDCs), in particular for Programmes of Activities (POA).

Source: Ci-Dev website

9 *http://www.ci-dev.org*

### 2.3.2 World Bank: Pilot Auction Facility for Methane and Climate Change Mitigation

The Pilot Auction Facility for Methane and Climate Change Mitigation (PAF) was launched by the World Bank in September 2014 as a pilot pay-for-performance facility that would purchase emissions reductions through auctions. The objective of the PAF is to "demonstrate a new, cost-effective climate finance mechanism that incentivizes private sector investment in climate change mitigation in developing countries." Rather than following the traditional route of calling for project proposals, conducting due diligence, and then signing ERPAs with selected mitigation projects, the PAF will use auctioning of options to provide project owners with price security while aiming that the PAF's funds are used efficiently (i.e. achieving the highest mitigation per dollar invested). Mitigation project developers must bid to have access to a price guarantee, and the PAF will select projects up to the amount of funding available for each auction.

The first round of auction, held in July 2015, was a "reverse auction" of "put options". A put option is an option for the owner to sell a product at an agreed price in the future, which they may or may not choose to exercise. In a reverse auction, the auction manager sets a fixed option premium (i.e. the cost of securing an option to sell at a fixed price in the future) in advance, which auction winners must purchase. The bidding then focuses on what the actual future guaranteed price will be, which is called the "strike price". In other words, bidders compete by reducing the strike price they will accept – hence the name "reverse auction" – so that the bidders that can still be profitable with the lowest carbon price will win the auction. The final strike price is the same for all bidders, and is the price at which the desired amount of emissions reductions for the overall round can be contracted. Future rounds of the PAF may use a "forward auction", whereby the strike price is fixed but the premium is bid up by the participants in the auction. In either case, the PAF options (i.e. the right to sell at fixed price in the future) will be denominated as a World Bank bond that is tradable, so even if a project owner decides not to use them, they can sell them to another potential project owner, who would then be guaranteed the same price and volume (assuming they could meet the eligibility criteria established in advance by the PAF for all option redemptions).

The first auction of the PAF covered three areas of methane mitigation – landfill gas, wastewater and animal waste – which were selected in large part based on an underlying study (Cantor and Quesnel 2013). In an important departure from other carbon funds, the PAF evaluation process for proposals will happen almost entirely at the time of redemption of the options, not upfront. While there are participation criteria for bidders, and participants are informed of any PAF restrictions on country, technology and project type, the due diligence for projects will only happen when the successful bidders try to redeem their options. Each project will have to comply with a customized set of environmental, health and social performance criteria, established by the PAF on a project-specific basis, and which will be evaluated by a third party auditor at the same time that the GHG emissions reductions are evaluated (and most likely by the same company). The environmental, health and safety (EHS) audit used for projects in the first round was based on an assessment of the risks of the particular project types – future rounds with different sectors might use different approaches. The performance-based payment will only be disbursed if all the agreed performance criteria are met (i.e. GHG mitigation and other criteria as well). Note that the tradability of the options means that a project owner who realises that they may not be able to meet the agreed criteria can still sell the options to a project owner who can meet them. In its first auction, bidders bought put options for 8.7 million CERs at a strike price of USD 2.40 per CER - a price well above current spot prices for CERs at around USD 0.50. The auction attracted 28 bidders from 17 countries, of which 12 companies were selected as winners.

# 3 Suitability of crediting mechanisms for delivering results-based finance

Carbon market instruments that credit emission reductions against a baseline – like the CDM – can be regarded as a form of results-based finance (RBF), because most (if not all) of the payment is made only after the verified result is achieved (Neeff et al. 2014; Warnecke 2015b). Crediting mechanisms measure and quantify emission reductions achieved from mitigation interventions ex-post and issue credits corresponding to the emission reductions expressed as $CO_2$ equivalents. They also provide for third party verification by independent auditors. In crediting mechanisms, the contracts between buyers and sellers of credits have almost always specified that most of the payment was contingent upon the delivery of the credits, though some contracts include partial upfront payments.[10] Crediting mechanisms thus provide for many of the features of RBF. Using crediting mechanisms as a vehicle for delivering results-based funding could therefore be a promising route. The High-Level Panel of the CDM Policy Dialogue recommended investigating the establishment of funds to purchase and cancel CERs and to consider cancelling CERs to support results-based financing through the GCF (CDM Policy Dialogue 2012).

A key difference between disbursing climate finance from official development aid (ODA) and using carbon markets as a tool for complying with mitigation commitments is how the mitigation units are used. To date, mitigation units have mostly been used by countries or entities to comply with GHG emission reduction targets. A much smaller amount has been used in „voluntary markets" for offsetting GHG emissions of individuals, entities or activities. Using mitigation units for compliance constitutes trading a commodity. Emission reductions achieved by one entity allow another entity to increase its emissions by the same amount. While crediting mechanisms reduce the cost for achieving a given target, they are a "zero-sum game" to the atmosphere, as long as one unit corresponds to one tonne of additional, real and measurable emission reductions. If credits are used to disburse climate finance from official development aid, the credits should not be used by the funders for complying with GHG emission reduction targets. This can be achieved if credits issued under crediting mechanisms are cancelled in respective registries and not used towards meeting any mitigation targets (see chapter 7). A further difference is that climate finance initiatives often have a broader set of objectives than carbon market instruments. Development, transformational change, building capacity, and ensuring environmental and social safeguards are usually strong priorities. While crediting mechanisms may also aim to support these objectives, generally most emphasis is put on the measured contribution to climate change mitigation. Finally, climate finance has a wider range of contractual options principal and agent with alternative payments structures (Spalding-Fecher et al. 2015).

In practice, experience with using crediting mechanisms for results-based funding is limited to date. Of the eight initiatives in Table 1 that use results-based funding for climate mitigation, only two – the PAF and Ci-Dev – use a crediting mechanism, the CDM, to monitor, report and verify emission reductions. Most existing initiatives instead develop their own MRV systems. Crediting mechanisms could be used in two ways to deliver results-based funding. Funders could:

- use the full procedures and infrastructure of the mechanism by purchasing and cancelling credits; or
- draw upon elements of the mechanism, for example, by using existing standards to calculate emission reductions or by using auditors accredited under the mechanism to verify mitigation outcomes.

Based on the overview of generic design issues for RBF, discussed in chapter 2, the remainder of this chapter explores the extent to which using existing crediting mechanisms can meet the objectives of RBF for mitigation.

## 3.1 Building on and strengthening existing capacity

A key prerequisite for RBF to be effective is that the institutional capacity to implement RBF programmes and to respond to the incentives is in place. A key lesson learned from existing RBF programmes is that an enabling environment and sufficient capacity are

*10 It is important to note that what defines a transaction as "results-based" is the contractual arrangement (i.e. payment after results are achieved) not the standard used to measure the results (in this case the crediting mechanism).*

critical for success. For this reason, most existing RBF initiatives spend considerable resources and – perhaps more importantly – time for readiness activities that create an enabling framework for RBF, including the development of MRV approaches and establishing institutional capacity. Experience has shown that such measures can take many years before the actual RBF activity can start. Existing crediting mechanisms have already undergone this process and could deliver verified outcomes in relatively short time periods. Under the CDM, the largest crediting mechanism, capacity has been built in many key areas, including: the regulation of the mechanism by the CDM Executive Board and its support structure; the establishment of standards and procedures to process projects and quantify outcomes; the establishment of an accreditation system for third party auditors; the establishment of institutional capacity in host countries, project developers and implementers, auditors, and the UNFCCC secretariat; and the establishment of registry systems transparently track and cancel mitigation outcomes. Using this existing infrastructure could reduce costs and considerably accelerate the implementation of RBF initiatives. Given the urgency of dramatically reducing global GHG emissions in the coming decades, the consequences of potential delays when establishing RBF frameworks from scratch should not be underestimated.

An additional benefit of drawing upon existing schemes would be to help preserve the capacity built under crediting mechanisms. Demand for CDM and JI credits has dried up in recent years. In 2012, carbon market prices for CDM and JI credits have collapsed and severely affected both existing projects and the development of new projects. Some projects have even stopped GHG abatement or are at risk of doing so (Schneider and Cames 2014; Warnecke et al. 2015a). RBF could be an effective means to ensure in a timely manner that projects that are at risk of stopping GHG abatement have incentives to continue mitigation (see chapter 4).

Moreover, the considerable capacity that has been built, in particular under the CDM, could further erode without increases in demand. RBF schemes using the CDM could help maintain this capacity. Maintaining this capacity is important to ensure that emission reductions can continue to be delivered for potential new demand sources in the future, including countries aiming to use crediting to achieve their INDCs under the Paris Agreement, a market-based measure currently being negotiated under the International Civil Aviation Organization (ICAO), or the voluntary market.

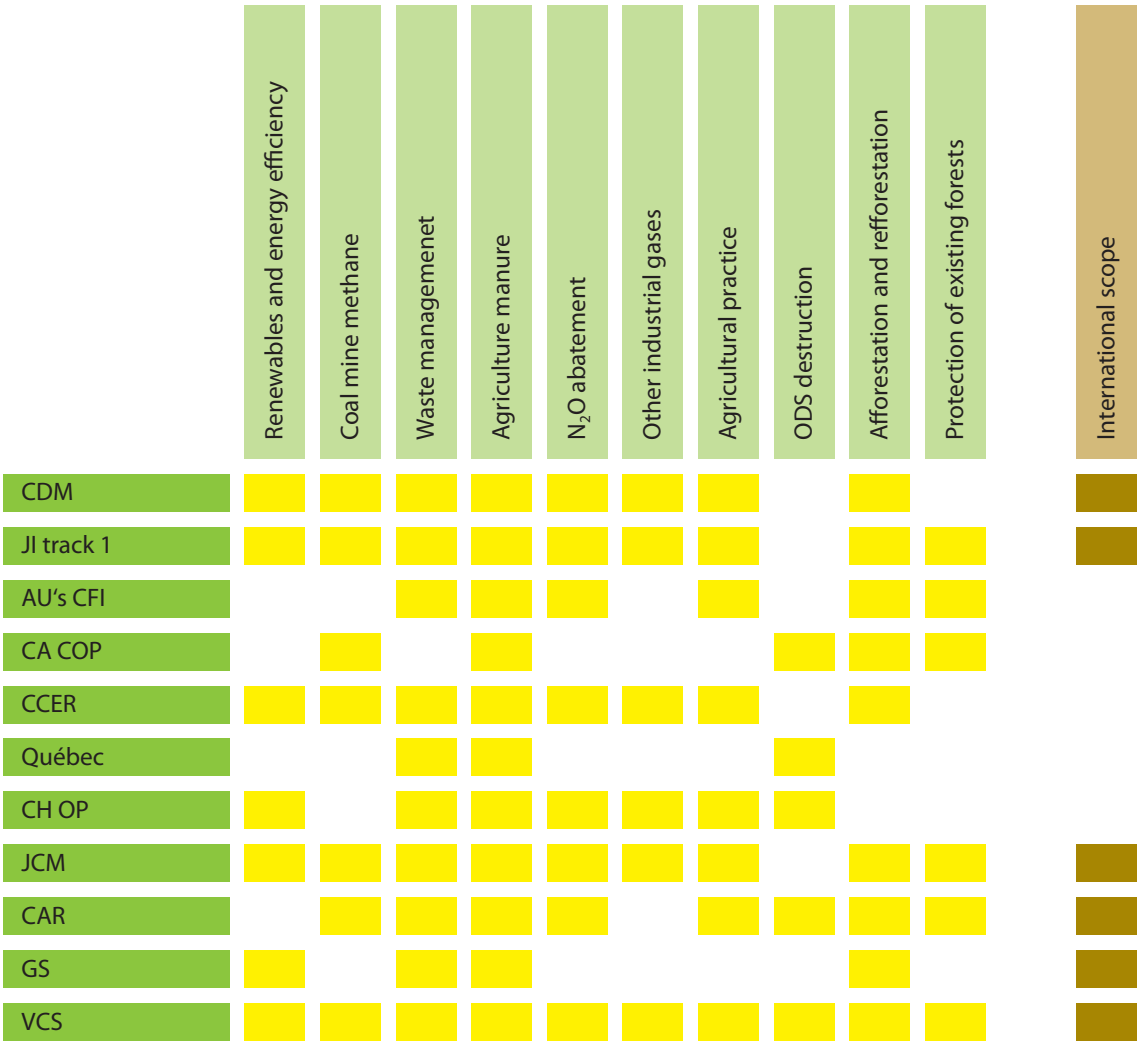
## 3.2 Suitability of established standards for quantification of emission reductions

Funders and intermediaries increasingly place value on the additionality and quantification of finance and mitigation outcomes, transparency in reporting and verifying these outcomes, thereby ensuring accountability. A key benefit of using crediting mechanisms for RBF is the knowledge developed and capacity built over time in assessing additionality and quantifying emission reductions. Creating methodologies and protocols to assess additionality and quantify emission reductions across a wide range of technologies and sectors has been a major undertaking of crediting mechanisms for almost 15 years[11]. The CDM currently has 219 approved and active methodologies, while the Verified Carbon Standard accepts all CDM methodologies and has an additional 42 specific methodologies, including ones for REDD. The Gold Standard also accepts CDM methodologies within their scope of activities, and adds another 17 methodologies beyond the CDM. Figure 1 below shows the wide range of sectors covered by 11 standards reviewed under the Partnership for Market Readiness (Kollmuss and Füssler 2015). Of the RBF facilities examined in the earlier chapter, those that focus only on impacts other than GHGs (e.g. energy access for EnDev, renewable energy capacity for GET FiT, national deforestation rates for NICFI) use their own methodologies. Facilities such as the PAF and Ci-DEV as well as other national and multi-lateral carbon funds, have generally relied on CDM methodologies, and sometimes also include scope for voluntary carbon market methodologies (e.g. from VCS, Gold Standard VER methodologies, etc.).

This means that many of the requirements for indicators discussed in section 2.2.1 above have been successfully addressed in baseline and monitoring methodologies, in particular under the CDM. A range of methodological approaches were developed under the CDM to ensure that emission reductions are attributable to the interventions, that gaming and distortion is prevented, and that monitoring and verification is feasible at reasonable costs.

*11 Early examples include the following: Baumert (1999); Ellis and Bosi (1999); Meyers (1999); Michaelowa (1999); World Bank (1998).*

Figure 1 Overview of technology scope of major crediting mechanisms




Source: Kollmuss and Füssler (2015).
Note: AU CFI = Australia's Carbon Farming Initiative; CA COP = California's Compliance Offset Program; CAR = Climate Action Reserve; CCER = China CER; CDM = Clean Development Mechanism; CH OP = Switzerland's Offset Program; GS = Gold Standard; JCM = Joint Crediting Mechanism; JI = Joint Implementation; Québec = Québec's Offset Program; VCS = Verified Carbon Standard; ODS = Ozone depleting substance

While there is clearly a wide range of methodologies that address additionality and baseline setting, whether a new RBF facility could rely on existing methodologies, and whether this would limit the scope of the scheme, depends on several factors. Firstly, there are important technology areas for which the existing methodologies have not yet created a large pipeline of projects, such as in the building, transportation and agriculture sectors, although there are some recently introduced methodologies that are innovative and could enlarge the pipeline. In the cement sector, for example, specific methodologies allow the calculation of emission reductions from specific actions, such as waste heat recovery, fuel switching, using alternative raw materials in the calcination process, or increasing the blending of clinker. Measuring the impact of a combination of these actions, however, is not always possible, and would require a methodology that determines emission reductions for the entire industrial facility rather than from each mitigation component. Moreover, interventions that can trigger emission reductions more indirectly, such as capacity building or awareness raising, are usually not eligible under crediting mechanisms. A key feature of RBF is the recipients' autonomy in how to achieve the results. In some instances, this autonomy could be reduced when using crediting mechanisms, if the available methodologies within a particular sector do not cover important mitigation actions or if their combination is not possible. Other RBF approaches, such as rewarding reductions in overall $CO_2$ emissions per cement

production, could allow the recipient to pursue a wider range of mitigation options and interventions, including capacity building or awareness raising. If an RBF programme wanted to include these areas, developing new methodologies might be warranted.

Secondly, the standards in the carbon market have focused on project- and programme-level accounting of emissions reductions, rather than sectoral level accounting (Jung et al. 2010; Ruthner et al. 2011; Schneider and Cames 2009). To monitor, report and verify mitigation outcomes at sector or even economy-wide level, other standards would need to be used, or existing crediting mechanism standards would need to be adapted. While the move from project activities under the CDM to Programmes of Activities did broaden the scope, and further reforms are being discussed for wider application of MRV protocols, there are currently no crediting mechanisms that use sectoral level data (as opposed to facility-level data) to calculate GHG emission reductions. While much of the discussion of new market mechanisms emphasises the need for broader accounting frameworks (Castro et al. 2012; Prag and Briner 2012; Wehnert et al. 2013), almost no experience has been gathered to date with sectoral crediting methodologies. This means that for an RBF programme to make payments based on sectoral performance, new methodological approaches or at least a revision of methodologies would be required in many instances. In some cases, project-specific methodologies might also be used at sectoral level, e.g. if baseline emissions are determined based on a single sectoral benchmark applicable to all facilities, if reported project emissions cover all GHG emissions from the facility, and if all facilities reported their emissions and participated in a programme. RBF programmes covering an entire sector could also potentially be linked to Nationally Appropriate Mitigation Actions (NAMAs).

Finally, existing methodologies do not credit emission reductions from the introduction of domestic policies (e.g. energy efficiency standards, carbon taxes, performance standards). Existing crediting mechanisms target public and private entities that make investments, and not national, regional or local governments mitigating climate change by means of policies and regulations. Hence, they are not suitable for results-based aid (RBA) whereby governments are the recipients of funding and implement policies and measures to target the emissions of a sector or sub-sector. However, RBA can have advantages over RBF, in particular when governments have the necessary capacity to implement a broader set of interventions to achieve the objectives.

The focus of the protocols developed under carbon market mechanisms is, understandably, the quantification of GHG emission reductions. Some protocols also include other indicators. The Gold Standard, for example, requires monitoring of sustainable development impacts, and the CDM developed a voluntary tool to report on the sustainable development benefits of projects. Many methodologies measure also other parameters as part of calculating GHG impacts (e.g. energy consumption, units distributed).

Clearly, emission reductions are a well-suited indicator for programmes focused on mitigating climate change. However, additional indicators may be necessary, in particular if programmes have multiple objectives (e.g. providing a high reliability of electricity access in rural areas).

The disadvantages of an RBF scheme developing new MRV standards are the time and cost involved. Development and approval of standards under one of the existing crediting mechanisms can take many months and require substantial expert or consultant support, while setting up an entirely new standard for accounting and verification could take several years. The approach to methodologies, therefore, will also be linked to the timeframe for the RBF funding, because creating new credible standards could substantially delay the roll-out of the programme.

## 3.3 Transaction costs and cost-effectiveness

One of the challenges with crediting mechanisms is that they involve transaction costs (e.g. fees for project registration and credit issuance, consulting costs to develop documentation to meet the standards, third party auditing costs). They may be higher or lower than for other forms of (results-based) finance. The MRV requirements for an RBF programme are necessarily much higher than for traditional development assistance or other regulatory instruments, because of the need for third party verification of mitigation results. If the emissions reductions are small compared to these transaction costs, traditional development assistance or simpler approaches towards monitoring results than in crediting mechanisms may be more appropriate. An example could be a sectoral-wide transport programme involving a combination of behavioural change, model shifts and technology improvements. The diverse sources of emissions (e.g. passenger vehicles) and large number of actors (e.g. individual passengers), as well as the other external influences on transport supply and demand (e.g. fuel prices, economic development) could lead to high transaction costs for MRV at the level necessary for an RBF programme. While

some RBF funders might be willing to cover some of these transactions costs on behalf of project owners, just the way donor-supported capacity building programmes for the CDM often covered the costs of upfront project development, it still constitutes a cost to the overall system, and could reduce the mitigation effectiveness of the funding.

At the same time, an advantage of using crediting mechanisms for RBF is that they provide a "search function" to identify the most cost-effective mitigation opportunities, which could increase the overall cost-effectiveness of delivering RBF compared to other instruments. An example of this would be $N_2O$ emissions from nitric acid production, with regard to which the CDM was more effective at identifying low cost abatement options than the regulatory frameworks implemented in Europe with the same goals (Kollmuss and Lazarus 2010).

## 3.4 Conclusions

In conclusion, using crediting mechanisms to deliver RBF for climate mitigation could provide benefits but also has limitations and poses challenges. Crediting mechanisms should, therefore, not be regarded as a "silver bullet" for RBF but their advantages and disadvantages should be carefully evaluated against alternative programme designs, including alternative ways of using RBF as well as traditional channels of funding mitigation actions. In particular, the following issues should be considered:

- At which level can interventions best achieve the programme's objectives (projects, programmes, sector-wide, economy-wide);
- Which recipient of funding is best suited to achieve the programme's objectives: private or public entities investing in concrete mitigation actions (RBF) or national, regional or local governments (RBA);
- Whether and how using crediting mechanisms could limit the scope of the interventions that can be pursued to achieve the objectives;
- whether emission reductions as the measurable result is the most appropriate approach for measuring progress and whether other indicators are needed or more suitable; and
- How transaction costs compare with other channels of (results-based) finance, both at the project level and at the level of the overall RBF scheme.

# 4 Achieving a high mitigation impact

Achieving a high mitigation impact is an important objective of RBF programmes using crediting mechanisms. Using the available financial resources effectively becomes particularly important in the light of the significant current mitigation gap to limit global warming to 1.5°C or 2°C and strained public budgets.

An important prerequisite for achieving a high mitigation impact is delivering additional emission reductions. RBF programmes aim to trigger mitigation actions that would not be implemented without the incentives from the programme. Ensuring additionality is thus equally important for RBF programmes as the use of credits for offsetting emissions in capped environments. In section 4.1 below we discuss how RBF programmes can ensure that they trigger additional emission reductions. In section 4.2 we discuss whether an accurate quantification of emission reductions is equally important in the context of RBF programmes. In section 4.3 we explore the implications of the structure, duration and timing of payments on mitigation outcomes. Other programme design features, such as the instrument for project selection (e.g. tendering or auctioning), might also impact overall mitigation outcomes but are not discussed in this study.

A straightforward way of achieving a high mitigation impact is prioritizing mitigation options with low abatement costs. Using crediting mechanisms to deliver RBF could help achieve cost-effectiveness because of the ability of carbon markets to identify untapped mitigation opportunities and the competitive nature of programmes purchasing emission reduction credits through tenders or auctions. However, focusing only on low abatement costs may involve trade-offs with other objectives, such as fostering long-term transformational change or achieving high sustainable development co-benefits. Some low cost mitigation options could achieve significant reductions in the short term but could pose risks to lock in carbon-intensive technologies in the long run. Some mitigation options might be costlier in the short term but may induce innovation and reduce technology costs in the long run. We discuss these aspects in the context of transformational change in chapter 5. When RBF programmes pursue several (conflicting) objectives, prioritizing mitigation opportunities can be a challenge for programme managers.

## 4.1 Ensuring additional emission reductions

Crediting mechanisms assess the additionality of mitigation projects when they are initially approved. Once a project is implemented and running, additionality is usually not reassessed. The rationale is that, once an investment decision has been taken, investment costs are sunk, and it becomes more unlikely that investments be reversed, e.g. due to changing economic circumstances. This rationale is plausible in some cases, but less plausible in other cases.[12]

The perspective of an RBF programme could be different. An RBF programme aims to ensure that the purchase of one credit triggers one tonne of further emission reductions. However, purchasing credits from projects that have already been implemented may not necessarily trigger further emission reductions, even if the project was clearly additional when it was approved. To achieve a high mitigation impact, we recommend that RBF programmes focus on either projects that are at risk of stopping GHG abatement or new projects that have not yet been implemented.

Prioritizing projects that are at risk of stopping GHG abatement may have several benefits: the projects have already spent investment costs and transaction costs for registration and setting up systems to monitor emission reductions and may thus deliver emission reductions at lower cost. Economically, initiating new projects while discontinuing existing projects is less efficient. Existing projects that are at risk of stopping GHG abatement may also deliver emission reductions at shorter notice than new

12 *This rationale is plausible for cases in which an alternative investment is made in the baseline scenario that would lock in more carbon-intensive technologies. For example, an industrial facility may opt between constructing a new efficient gas power plant or a new coal power plant. Without credit revenues coal power is economically more attractive, with credit revenues, the efficient gas power plant becomes more attractive. Even if coal and gas prices change after project implementation and a new gas power plant became the economically most attractive course of action, it is unlikely to be economically attractive to dismantle the existing coal power plant and replace it with a new gas power plant. For this reason, emission reductions are considered additional throughout the crediting periods of the invest-ments. The rationale is, however, less plausible, if no (significant) investment were made in the baseline scenario. For example, a project retrofitting a boiler under the project scenario but continuing to operate the existing boiler in the baseline scenario, might well retrofit the boiler at a later stage without incentives from a crediting mechanisms, due to changed economic circumstances.*

projects, which may involve considerable lead times. For these reasons, RBF programmes may first prioritize projects at risk of stopping GHG abatement, and once this potential is addressed, consider new projects.

Several factors play a role in whether projects are at risk of stopping GHG abatement without credit revenues. Key aspects include (a) whether safety aspects and regulations or policies require continued operation, (b) whether the project generates financial benefits other than emission reduction credits, such as electricity sales, that exceed operational expenditures and the costs for monitoring and verifying emission reductions, and (c) whether capital expenditures could be recovered when GHG abatement is stopped, and (d) whether investing in another alternative is more profitable than continuing GHG abatement (Schneider and Cames 2014). For example, projects abating $N_2O$ from nitric acid production may stop mitigation, because these emissions are typically not regulated in developing countries and the projects have ongoing costs for replacing catalysts but do not generate revenues other than from the carbon market (see section 8.1). An example of a project type that could likely continue mitigation is renewable power generation, which has high capital costs, but generates ongoing revenues from electricity sales that are higher than ongoing operating costs (see section 8.3). In some instances, it could be difficult to assess whether a project would stop GHG abatement. However, project types could be broadly classified according to their risk of stopping GHG abatement, taking into account the context of the country. Many implemented projects are likely to continue operation and abatement of GHG emissions, even if they cannot sell credits, while others may stop GHG abatement (Schneider and Cames 2014; Warnecke et al. 2015a).

When RBF programmes focus on projects at risk of stopping GHG abatement, the vintage of credits eligible under the programme is an important consideration for achieving a high mitigation impact. Purchasing credits from emission reductions that already have occurred in the past would not trigger any further emission reductions due to the RBF programme. We recommend that RBF programmes only purchase emission reductions that occur after the date of the finalization of the purchase agreements or date of auctioning.

When RBF programmes focus on new projects, they need to ensure that, not only the projects have not yet been implemented, but that the project owners have not yet made an irreversible decision to proceed with the project. Whether or not the project owners have already decided to proceed with the project is important for the objective of achieving a high emissions impact. Once that decision is taken, a project may be constructed, operate and reduce GHG emissions, irrespective of whether it is supported by the RBF programme. If this decision has not yet been taken, the project could be classified as „new". Crediting mechanisms usually provide information on the timeline of project implementation. However, RBF programmes need to carefully define what constitutes a „new" or an „existing" project. Projects could be already registered under a crediting mechanism but not yet be implemented, e.g. due to the low carbon prices; projects could also be already implemented but not yet registered, because the registration process has not yet been finalized. The date of registration may thus not be sufficient to distinguish between existing and new projects. Similarly, the date of starting operation could pose difficulties as the lead times between the decision to proceed with implementation and the start of operation could differ significantly between projects. We recommend defining the date to proceed with a project as the date at which the final decision is taken to procure the main equipment (e.g. the wind turbine) and not to use the date of conducting feasibility or engineering studies, as these could be undertaken without finally proceeding with the investment. This point in time has also been referred to as „start date" under the CDM.

Finally, for RBF programmes focusing on new projects, the likelihood of additionality of the relevant project types is a key consideration to achieve a high mitigation impact. The likelihood of additionality depends on the robustness of the additionality tests used by the relevant crediting mechanisms, as well as the characteristics of the technologies and the policy environments in which they are implemented. The available research on additionality suggests that the likelihood of additionality and uncertainty surrounding additionality differs greatly between different project types (Spalding-Fecher et al. 2012; Lütken 2012). RBF programmes may prioritize project types that are considered to have a higher likelihood of additionality. Several authors use the profitability of projects without credit revenues and the impact of credit revenues as indicators of the likelihood of additionality (Sutter and Parreño 2007; Spalding-Fetcher et al. 2012; Lütken 2012). These approaches could be used in prioritizing project types.

## 4.2 Quantifying emission reductions for RBF

Quantifying emission reductions conservatively is another important aspect of ensuring the environmental integrity of crediting mechanisms. In the

context of RBF programmes this aspect may, however, be less important than ensuring additional emission reductions. When using credits for compliance, over-crediting leads to an increase in global GHG emissions. When credits are cancelled, over- or under-crediting has no impact on global GHG emissions. As long as RBF programmes cancel the credits, over- or under-crediting has no direct impact on mitigation outcomes, because the protocol used to calculate the emissions reductions does not affect the actual atmospheric impact of the project. This holds for both existing projects at risk of stopping GHG abatement and new projects. However, the accuracy in quantifying emission reductions could impact the prioritization of mitigation actions: in competitive tenders or auctions over-credited projects have an advantage compared to under-credited projects. Both over- and under-crediting could thus lead to a less cost-effective selection of project types in a competitive project selection process, and may thereby indirectly lower the overall mitigation outcome of a programme with a given budget.

## 4.3 Payment structure and duration of mitigation

The structure, duration and timing of payments is another important issue that can impact the mitigation outcomes of RBF schemes, including beyond the life of the RBF scheme. Many funders of RBF schemes are exploring payment schemes that are much shorter than the technical lifetime of mitigation projects implemented under crediting mechanisms. Many RBF schemes consider payments for 3 to 7 years, whereas technical project lifetimes typically vary between 10 and 30 years.

This mismatch between the duration of payments and the technical lifetime of mitigation projects could affect the overall mitigation outcome of RBF programmes in different ways. First, it can directly impact the overall mitigation outcome from the RBF programme. For project types that are at risk of stopping GHG abatement without credit revenues it could imply that these projects terminate their mitigation activities once the RBF payments stop. In contrast, projects that would continue abatement beyond the duration of the RBF programme would generate more emission reductions than credited under the RBF programme. If the projects are additional, i.e. they were triggered through the RBF programme, the RBF programme would promote mitigation beyond the duration of the programme. In this regard, payment periods shorter than project lifetimes could be regarded as a form of „under-crediting". An analysis of the CDM project pipeline in 2012 showed that the average project lifetime of hydropower facilities, for example, was 30 years, far longer than the possible crediting period under the CDM. If the projects were truly additional, this could lead to a large potential of „under-crediting", estimated at 2.1 billion t $CO_2$e for wind power and hydropower. The challenge with estimating this net impact, however, is that it is these same projects types whose additionality has been called into question most often, so a similar magnitude of "over-crediting" of non-additional projects is also possible (Erickson et al. 2014). Thus, while short-term RBF programmes could catalyse more long-term emissions reductions by targeting technologies with non-carbon revenues and long lived capital stock, the RBF programmes still need to wrestle with the difficulty of additionality.

Secondly, a mismatch between the duration of the RBF programme and the technical lifetime of mitigation projects has implications on the prioritization and feasibility of mitigation projects. As pointed out in section 4.2, both over-crediting and under-crediting can impact the type of projects selected under a competitive project selection process. Projects with long technical lifetimes would be „under-credited" or „under-valued". They would need to offer credits at significantly higher prices than their GHG abatement costs over the technical lifetime, whereas projects with a shorter duration could offer credits at prices close to the abatement costs. This could lead to an unintended prioritization of project types with shorter technical lifetimes over project types that deliver emission reductions over longer time periods.

From a project owner's point of view, high cash flows in the first years of intervention are most beneficial, in particular for technologies with high „upfront" costs. For the project owner, paying out most of the incentive early (even if the total lifetime incentive is based on the lifetime impacts) matches best the cash flow needs and would thus provide the strongest catalyst for new projects. This is the case, for example, in the Uganda GET FiT results-based payment programme, in which the incentives for renewable energy generation are paid out in the first five years – 50% at commissioning and the other 50% spread over five years based on performance (GET FiT Uganda 2014). High RBF payments in early years could help cover the start-up costs for the concessionaires and early investments, while payments from consumers may be sufficient to keep the programme going after 4-5 years. RBF payments over a relatively short time frame could thereby reduce financial barriers to these project types, and continued mitigation action beyond the programme would be likely due other revenues. The risk of this payment structure is, of course, that it does not guarantee long-term performance. As discussed earlier, with technologies that have low operational expenditures and additional revenues other than RBF payments, the risk of discontinuing the project is lower, but is still a risk. Another challenge is a tension with

ensuring that projects are still additional. In other words, for projects that need less carbon revenue to be viable in the long term, it becomes more difficult to demonstrate that the benefits of the RBF scheme are the decisive factor in project implementation.

Shorter payment time frames usually also match the needs of funders, so both parties are likely to prefer early payments. The risk of this payment structure is, of course, that it does not guarantee long-term performance. As discussed earlier, with technologies that have low operational expenditures and additional revenues other than RBF payments, the risk of discontinuing the project is lower, but is still a risk. Another challenge is a tension with ensuring that projects are still additional. In other words, for projects that need less carbon revenue to be viable in the long term, it becomes more difficult to demonstrate that the benefits of the RBF scheme are the decisive factor in project implementation. The question is then how to manage these risks associated with mismatches between the duration of the RBF programme and the technical lifetime of projects.

One option could be to consider extending the duration of RBF payments. This option would reduce the potential for distortions in the selection of projects. It would also be a reliable way of ensuring continued performance. The limitations would likely be on the funder's side, because donors from national governments or multilateral funds might have shorter-term budgetary constraints.

Another option could be dedicated funding windows for projects with similar technical lifetimes and cost structures. For example, different funding windows may be opened for renewable power technologies and project types that require ongoing revenues to continue abatement, such as industrial gas project types. If all projects under a dedicated funding window have a much longer technical lifetime than the duration of RBF payments, they would be equally „under-credited". This would implicitly lead to higher payments per credit compared to a longer payment programme. Dedicated funding windows could thereby avoid a distortion towards selection of projects with shorter technical lifetimes, but not provide incentives for performing beyond the duration of the RBF programme.

A further option could be increased short-term payments covering the emission reductions over the entire project lifetime. In this case, the emission reductions over the entire technical lifetime of the project would be rewarded over a shorter time period. Implicitly, the „under-crediting" of projects with long technical lifetimes would be compensated by „over-crediting" during a shorter payment period. This option would reduce the distortion between projects with different technical lifetimes, but not provide incentives for performing beyond the duration of the RBF programme.

An RBF funder might also seek to secure longer-term mitigation benefits through contractual obligations for project owners. This option would include a contractual obligation to the RBF scheme that would extend beyond the period of performance payments. In other words, the agreement could include 5 years of payments for the mitigation benefits achieved, followed by additional years in which the project owner must continue the action without an RBF payment. The longer contract period could present a challenge for the RBF scheme, because it requires ongoing monitoring and might prevent financial closure of activities by the funder. Moreover, there would need to be agreement upfront on the consequences for project owners if they breached the agreement years after the last payment had been made. As under dedicated funding windows, the project owners would offer, for some project types, the credits at higher prices due to the costs associated with continued abatement beyond the duration of the RBF programme.

# 5 Fostering transformational change

Institutions funding climate mitigation are increasingly focusing their climate finance on actions that facilitate transformational change towards a low carbon economy. For example, the GCF seeks to "promote a paradigm shift towards low-emission and climate-resilient development pathways", the United Kingdom's International Climate Fund (ICF) expects that supported actions should achieve "change which catalyses further changes, enabling either a shift from one state to another […] or faster change" (ICAI 2014), the NAMA facility's overall objective is to achieve "transformation towards a low carbon society in line with the 2°C limit" (NAMA Facility 2015). The Climate Investment Fund (CIF) aims at „delivering investment to stimulate transformation" (CIF 2015a), and the Clean Technology Fund (CTF), which is one funding window of the CIF, aims at catalysing „transformative change that can be replicated elsewhere" (CIF 2015b). Facilitating transformational change is thus an important objective in climate finance.

This raises the question of whether and how programmes using crediting mechanisms to deliver RBF could contribute to achieving transformational change towards a low carbon economy. We argue that, depending on their design, such programmes could potentially either foster or impede transformational change, or have no effect. RBF programmes may support transformational change by catalysing the uptake and innovation of low carbon technologies or triggering lasting behavioural change or policy interventions. RBF programmes may stimulate innovation and change because they provide the recipient with autonomy in how to achieve the results. Crediting mechanisms, in particular, enable searching and identifying untapped mitigation potential and finding innovative solutions to reduce emission reductions.

RBF programmes could impede transformational change in different ways. They could „lock-in" technologies that are less carbon-intensive than currently available technologies but that are not compatible with the low carbon development in a longer-term perspective. This could lead to stranded investments and actually increase the costs of addressing climate change (Bertram et al. 2015; Clark et al. 2014; Luderer et al. 2013; Riahi et al. 2015). The concept of carbon „lock-in" refers to "the dynamic whereby prior decisions relating to GHG-emitting technologies, infrastructure, practices, and their supporting networks constrain future paths, making it more challenging, even impossible, to subsequently pursue more optimal paths toward low-carbon objectives through these investments" (Erickson et al. 2015a). For example, subsidizing efficient coal power plants could reduce emissions compared to less efficient coal power plants, but investment in and continued operation of coal power plants might not be compatible with achieving the envisaged emissions pathways. Another way in which RBF programmes might impede transformational change is by providing incentives for governments not to change the underlying policy framework. For example, continued international support for capturing and using landfill gas could provide disincentives for policy makers to introduce regulations requiring the capture (and use) of landfill gas. RBF programmes could also impede transformational change by supporting technologies that are not in line with the priorities and vision of the country. For example, supporting landfill gas flaring could undermine efforts by a country wishing to shift to composting of organic waste.

A general challenge of climate funds targeting multiple countries is that transformational change is a nationally driven process that may vary from country to country. Countries may have different priorities with regard to which actions and technologies are best suited to achieve their own desired transformational change. A specific challenge of programmes using crediting mechanisms to deliver RBF is that transformational change is a process that is driven by policy makers and stakeholders in the country and which requires actions at many levels, including legislative changes, capacity building, awareness raising, and stakeholder participation. Programmes using crediting mechanisms to deliver RBF, however, primarily fund-specific mitigation investments implemented by private or public entities. Supporting specific mitigation investments can, however, only be one piece in a much larger puzzle of actions to achieve transformational change.

In this chapter we explore how RBF programmes using crediting mechanisms could be designed in order to support, rather than impede, transformational change. We first introduce the concept of transformational change in the context of climate finance (section 5.1). We then discuss two broad approaches for how RBF programmes using crediting mechanisms could support transformational change. Firstly, we explore how such programmes could engage with governments of the implementing countries to ensure compatibility with their priorities and vision, and to ensure continued change beyond the duration of the RBF programme (section 5.2), followed by a discussion on prioritizing mitigation technologies in the light of transformational change (section 5.3).

## 5.1 Transformational change in climate finance

As shown above, the notion of achieving far-reaching, structural change towards sustainable, low-carbon development has become a widely applied target of climate finance. However, there is no agreed, generally applicable definition of transformational change or paradigm shift to date. This has led to the introduction of a variety of approaches to implementing the concept in practice, some of which are quite rudimentary and will be revised in the near future. This section takes a closer look at existing definitions, or rather descriptions, of what transformational change is in general and in climate finance as well as possible ways of operationalizing the concept in climate finance.

In publications on the topic, transformational change is often described as being change that is fundamental, structural, complete, radical, deep, irreversible, or as a change which occurs in the long term and at system level or societal level (e.g. University of Oslo 2013; WBGU 2011; Mersmann et al. 2014). Mersmann et al. (2014) define transformational change (in general) as „a structural change that alters the interplay of institutional, cultural, technological, economic and ecological dimensions of a given system. It will unlock new development paths, including social practices and worldviews." In this sense, the term "transformation" is also used to refer to significant shifts that have taken place in the past, e.g. from nomadic hunting and gathering to localized agriculture, or from agriculture to industry (WBGU 2011; Raskin 2002). This use of the term illustrates how fundamental these changes can be because, in contrast to other change processes, transformational change alters widespread patterns of thought and action.

In view of persistently high levels of GHG emissions and the urgent need to reduce them to near zero by the end of the century, the global community has recognized that such a far-reaching change, encompassing entire economies and societies and fundamentally altering the way in which we do things, is necessary to achieve the global target of limiting global warming to no more than 1.5°C or 2°C. This is why transformational change has been introduced in a number of climate funds as one of the main objectives.

In the past, however, such changes have mostly been observed and described ex-post. With climate change imminent, humanity needs to find ways to trigger such change and make sure it occurs at sufficient speed and in the right direction. As of now, there is no comprehensive and agreed understanding of how this can be achieved (O'Brian et al. 2013). For this reason, existing climate funds have opted for descriptions of transformational change that focus on different aspects and, taken together, reveal a more complete picture of transformational change, as illustrated by three examples below.

While lacking a definition of transformational change, the UK's International Climate Fund (ICF) has developed a „theory of transformational change", in which it identifies four mechanisms that indicate whether transformational change is likely to occur: scale, replication, innovation, and leverage (ICAI 2014). Scale refers to the scope and coverage of the measures, which should be national, sectoral or economy-wide and include institutional and policy reform and reach a critical mass of deploying new technologies. Replication and leverage are inextricably linked to scale: Replication refers to measures that others can copy, leading to larger scale or faster roll-out, while leverage refers to additional public and private sector finance being mobilized for the purpose of low-carbon development, again increasing the scale – and with it the impact – of supported measures. Innovation refers to the support of measures that pilot new ways of achieving objectives that could lead to wider and sustained change (ICAI 2014). In this description of transformational change, the ICF thus focuses on how this change can possibly be triggered and what the measures are that the fund can support to achieve transformational change.

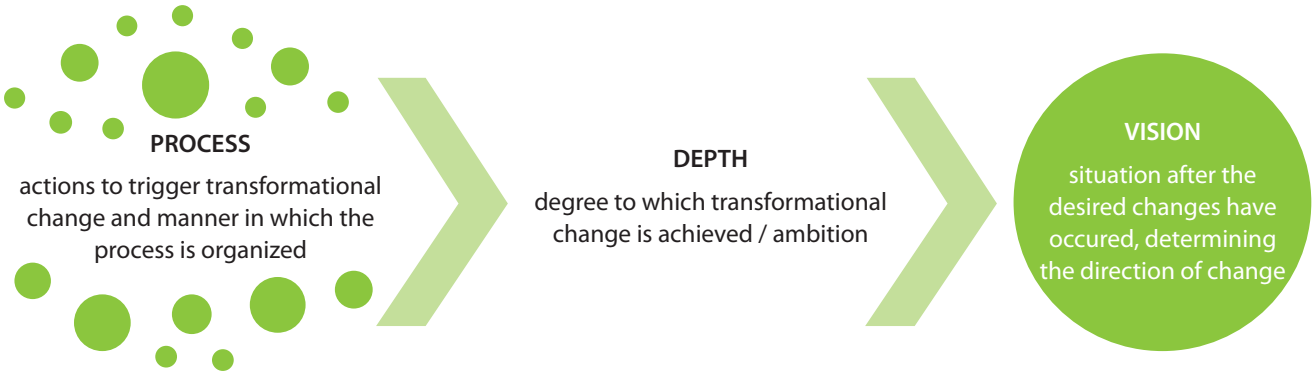
The NAMA Facility pragmatically describes transformational change as "the degree to which the supported activities catalyze impact beyond the NAMA support project" (NAMA Facility 2014). The definition itself does not reveal what kind of impact (direction of change) it targets, or how this impact can be achieved by the projects and sustained after the end of the project. Instead, it puts the focus on how much each project does to promote transformational change – its ambition, or the depth dimension of transformational change. The potential to achieve transformational change is one criterion in the evaluation of proposals for NAMA support projects. Accordingly, the Facility estimates a project's potential to trigger transformational change, based on a qualitative evaluation by the Facility's staff, and favours projects with a higher potential to achieve transformational change. In other words, if project proposals are submitted that are unlikely to trigger emission reductions after the end of the project, they are not considered ambitious enough for the NAMA Facility to support them.

A third approach has been chosen by the GCF. The fund uses the „paradigm shift" potential as one of its high-level investment criteria. In its 'Initial Results Management Framework' (GCF 2014c) it describes

paradigm shift as changes achieved towards a situation in which "all facets of society are demanding and integrating low-emission and climate-resilient approaches to sustainable development." This description focuses on the direction of change that is pursued, describing the situation after a complete transformation has been achieved, but omits what and how much the projects can do to achieve this situation or trigger changes towards this direction. However, starting from this definition, it is relatively easy to deduce that supported measures should contribute to creating an environment in which actors will implement necessary changes out of their own self-interest (on a large scale), e.g. by establishing incentives, overcoming barriers, spreading knowledge or doing anything else that anchors low-emission and climate-resilient, sustainable approaches in society.

Each of the three above-mentioned descriptions of transformational change focuses on a distinct aspect of transformational change, as can be seen in the figure below. While the UK's ICF concentrates on the measures to be taken to achieve transformational change (part of the process dimension of transformational change), the NAMA Facility focuses on the depth of change, and the GCF describes the situation after the change has occurred (the vision used as a compass to determine the direction of the change process). These three aspects can be thought of as elements of transformational change and will be further explained below.

Figure 2 Three dimensions of transformational change




Source: Authors' own illustration

The vision, which determines the direction of change, is usually expressed in quite general terms in the sense that it describes a broad objective (e.g. an energy system solely based on renewable resources) but it is not known which (social and technical) innovations will materialize during the change process and which specific technologies will prevail once the vision has been achieved. For example, in 2015, it is difficult to anticipate what the transport or energy sector in a specific country will look like in 2050 or beyond. Different innovations will likely be tested before a set of solutions become established. It is therefore all the more important when elaborating and implementing actions to double check whether the proposed changes go in the right direction, including not only GHG emissions but also sustainable development in general (i.e. all impacts the actions are expected to have), as the vision will most likely be multi-dimensional. This vision should also be based on a broad social consensus, not on particular interests of individual groups.

The depth dimension relates to the degree to which transformational change is achieved and the pace of change. Just like the vision itself, the required speed of change towards the vision needs to be defined upfront (i.e. there should be a consensus on when the vision is to be achieved). Actions must lead to impacts that are strong enough to comply with the required change path. They should not jeopardize the timely achievement of any element of the vision, especially in the long run (e.g. by "locking in" second best options). In other words, the achieved depth of change needs to be consistent with the path towards the timely achievement of the vision.

The process dimension relates to the identification, prioritization and implementation of actions that potentially trigger transformational change, as well as the approaches pursued to achieve and sustain the change. This includes the way actions are prioritized, implemented and combined with other actions, and the way learning is organized to be able to value and draw lessons from mistakes. Continuous

evaluation and adaptation of the implemented actions play an important role, as does stakeholder involvement, which is needed to ensure support and ownership, to secure necessary expertise, and to reduce the risks of adverse outcomes. In addition, the process dimension also comprises safeguard provisions and measures to avert any environmental and social risks. And last, but not least, this dimension includes ensuring that all actions comply with high ethical standards.

These three dimensions illustrate what aspects should be considered when operationalizing transformational change in climate funds. All three dimensions are important when identifying, designing, implementing and monitoring actions to trigger transformational change.

In existing climate funds, however, operationalization of the transformational change concept has proven to be challenging because the concept is so complex, and because its implementation has such a long time horizon and involves so many players and activities in society. An evaluation of the operationalization of transformational change in the World Bank Group comes to the conclusion that "there are gaps in how the Bank Group defines, operationalizes, achieves, and measures transformational impact" (IEG 2015). The independent evaluation of the Climate Investment Fund (CIF) recommends that the fund should, "continue to define and better pursue transformation" (Wagner and Chomitz 2014). Likewise, the Clean Technology Fund (CTF) calls for the CIF Administrative Unit "to provide clarification on how issues such as [...] transformational impact should be understood and measured," because, "other analytical or evaluative approaches will be needed to help us gain better insights into how, why and what kind of transformation has been achieved or not."

Indeed, most climate funds have chosen simplified approaches to operationalizing the transformational change concept, which may not reflect the complexity of transformational change processes. The CTF, for example, has introduced a results framework that consists of two results levels: the "outcome" level with five core indicators, and an "impact" level with a single objective of a "transformed low carbon economy". Since no indicators have been formulated for this objective, the approach thus seems to assume that transformational impact is achieved automatically when progress is made on the five core indicators on the outcome level. Two of the five core indicators are to be used by all projects (i.e. avoided GHG emissions and finance leveraged), while the remaining three are used for the project types for which they are relevant (i.e. renewable energy, transport and energy efficiency) (CIF 2013). The indicator for transformational change is country-level GHG emissions per unit of GDP. While progress on the core indicators is to be reported annually for each project and program and the entire country portfolio by the implementing Multilateral Development Bank (MDB) in consultation with other counterparts, assessing progress on achieving transformation lies with the CTF country focal point or the agency designated by the government, together with the MDBs, and is to be reported for the entire country. Monitoring and reporting on transformational change is thus not linked to the performance and impacts of the funded projects.

Similar to the CTF, the GCF does not require individual projects to report on progress towards triggering transformational change because it regards achieving a paradigm shift as a long-term change of more than 15 years that, in its logic model, goes beyond the impact level. Accordingly, the impact of the GCF on the aspired paradigm shift will be evaluated by the GCF Secretariat by using three indicators: (a) the development of GHG emissions in the country which received funding, (b) the cost of GHG emission reductions per tonne in all GCF projects, as well as (c) the volume of public and private funds catalysed by the fund. The first two are to be assessed every five years by the Fund Secretariat, while the third is taken from the projects' proposals and reports at the beginning and end of each project (GCF 2014a).

In conclusion, both the concept of transformational change and its operationalization are still under discussion in climate finance. Different solutions are being tested and most will certainly be revised in the future as the discussion is carried to the next level and experiences are evaluated. However, as the different dimensions of transformational change become clearer, this concept can be better integrated into selecting and evaluating projects proposed for climate finance.

## 5.2 Ensuring alignment with the transformational change agenda of implementing countries

Transformational change is a process that is largely driven by the implementing countries themselves. To achieve transformational change, it is important that the actions taken to trigger such change support the country's process and long-term vision for a sustainable, low-carbon economy, and achieve the necessary depth. A specific action could support one aspect of the countries' vision but impede achievement of another. A mitigation action which

leads to significant emission reductions but does so at the expense of other objectives of the vision, such as employment, biodiversity or clean air, may not be compatible with the vision of transformational change. The same might be true for mitigation actions that demand far-reaching behavioural changes or culturally unacceptable practices. Support by governments and broad society is thus important.
Moreover, ownership and actions by the government of the implementing countries are needed to sustain and broaden the change process over time. The national regulatory and policy framework plays a decisive role in triggering, sustaining and adapting the change process, in particular to achieve momentum beyond a specific RBF programme. In addition, many of the critical interventions in policy and regulation necessary to create an enabling environment for mitigation are most effective when they are in place prior to the RBF interventions. RBF programmes should be designed to provide an avenue for engaging governments and supporting them in developing and implementing the policy and regulatory framework needed to achieve transformational change.

RBF programmes using crediting mechanisms could pursue three broad approaches to engage governments in the implementing countries. They could:

1. Require government endorsement of the RBF interventions;

2. Require government commitments or actions that facilitate transformational change;

3. Help countries achieve transformational change by supporting the development of an enabling framework through complementary funding windows.

### 5.2.1 Government endorsement

Requiring formal government endorsement of the implementing country could be a simple way of engaging governments, similar to the CDM requirement for a Letter of Approval issued by the CDM Designated National Authority (DNA) of the host country. While voluntary carbon standards typically do not require country endorsement, official development aid is usually provided based on agreements with and strong involvement of policy makers in the implementing country. Requiring formal government endorsement would have two benefits. Firstly, it could promote compatibility with country priorities by seeking a written confirmation by governments that the project or programme is regarded as compatible with national priorities and, where available, the national vision and process of transformational change. Secondly, government endorsement could be used to ensure that the RBF projects provide benefits to the country beyond climate change mitigation. It could thereby strengthen government ownership of the RBF initiative, and the links with existing programmes and strategies across the relevant sectors. The government of the implementing country could be required to simply confirm endorsement (as in the CDM), or it could be requested to specify the country's vision and process regarding transformational change, including social, economic and environmental aspects, as well as a brief explanation or more detailed assessment of the projects' compatibility with that vision and process. A disadvantage of requiring government endorsement is that it could delay the implementation of RBF programmes, as such endorsements could require considerable time in some countries. Moreover, experience with the CDM shows that, in practice, a simple endorsement did not lead to a strong country ownership or prioritization of mitigation actions. Very few cases have been reported in which project endorsement was not provided by the host country.

### 5.2.2 Government commitments or actions

Requiring government commitments or actions to facilitate transformational change could be a stronger form of engaging governments of implementing countries. Different types of commitments or actions could be required, including having a low carbon development strategy for the sector, committing to enforce mitigation actions beyond the duration of the RBF intervention, having the emission source included in the INDC, or making a financial contribution to the intervention.

RBF funders could, for example, require that implementing countries have a „low carbon development strategy" for the sector in question. Such strategies usually include a political process and vision for achieving transformational change in the sector. In other words, the RBF funding would only be provided if the country is committed to putting an enabling environment in place for transformational change in the sector. While this idea may be attractive in principle, implementing it could be challenging for several reasons. Firstly, even if an official "low carbon development strategy" is available, the depth, quality and actual implementation of those strategies will vary widely across sectors and countries. Judging whether the process laid out in this strategy is likely to lead to transformational change would also be difficult from outside of the country, and could be seen as imposing external standards. Secondly, having a strategy in place does not guarantee that the RBF initiative will be linked to the

strategy or compatible with it, without the endorsement highlighted in the first option above. Finally, a drawback of both this option and government endorsement is that they are passive, in the sense that they do not directly catalyse an improved enabling environment for the RBF interventions.

A more stringent option for the RBF funder could be requiring that implementing countries enforce mitigation actions beyond the duration of the RBF intervention. A country commitment to regulate the sector or to enforce specific mitigation actions over time, or at least to initiate this policy development process, could be part of the requirements of RBF funding. For example, a regulation that introduced a requirement for abatement of $N_2O$ emissions from nitric acid production over a 5- to 10-year period could be part of an overarching commitment by the country, but still allow for a period during which $N_2O$ abatement would be supported through an RBF programme. The commitment could take different forms, such as a NAMA submitted for the sector or sub-sector, a MoU with the RBF programme, or an ODA project to evaluate options for regulation. Presumably, this commitment would be needed at the start of the RBF programme, and potentially linked to the actual funding decision,[13] but the exact form of the commitment could vary, and would likely depend on the national legal frameworks (e.g. the authority of relevant ministries, the legislative approval process). In most cases, the commitment would most likely only be relevant for the particular sub-sector or technology targeted by the RBF programme (as in the example above with nitric acid), but some commitments could extend across multiple sectors (e.g. GHG emission taxes, energy taxes, cap and trade schemes, domestic offset schemes). A variation on this option would be to increase the country requirements to participate in the RBF scheme over time. For example, there might be no requirements for RBF-funded projects starting in 2015-2017, but for contracts initiated in 2018 and beyond a country would need to demonstrate that regulatory development was underway. A programme could also be phased, so that after 5 years the results-based payments would only continue if a certain milestone had been reached in regulatory development.

A simpler option could be to require that implementing countries include the emission sources in the mitigation contribution under their INDC. If the emission sources are included within the scope of mitigation contributions, policy makers have incentives to ensure the successful continued implementation of abatement beyond the duration of the RBF programme. An advantage of this option is that it is more objective and more easily verifiable than the requirements of having a low carbon development strategy or a commitment to adopt policies or regulations for the sector in place. A possible drawback is that the ambition of mitigation contributions in INDCs varies and INDCs are mostly expressed as single year targets for 2025 and 2030. With low ambition or a target far in the future, countries may have less urgency to put a policy framework in place that ensures long-term mitigation.

A further option for securing government commitment could be to require that implementing countries make a financial contribution to the mitigation action. This could happen in several ways, including covering part of the upfront investment costs, contributing to performance-based payments over the life of the project, or taking over the performance-based payments after the end of the RBF scheme contract. This assistance could be structured to provide sufficient incentive for private sector investment and continued mitigation action, while still reducing the overall costs for the implementing country compared to unilateral mitigation action. Of course, this country contribution could also be linked to the policy changes discussed earlier in this section, since these changes are also a contribution to the enabling environment for the mitigation actions. Measuring the country contribution could be difficult unless there were explicit agreements about payments (as opposed to in-kind support or policy/institutional support).

An overarching issue for the options for securing government commitments or actions is whether and how these commitments would be included in the MRV for the RBF scheme. If the scheme had already paid all of the incentives, and the country did not carry through with its commitments, some mitigation activities might cease.

### 5.2.3 Supporting the development of an enabling framework

RBF programmes could also help countries to achieve transformational change by supporting the development of an enabling framework through complementary funding windows. Such complementary funding could be used to build capacity and support governments beyond the scope of the RBF payments. RBF programmes often provide for such complementary funding prior to the start of results-based incentives to ensure readiness for RBF activities. An RBF funder could also use a "readiness fund"

*13 A scheme such as the Pilot Auction Facility might be a case in which this commitment could come later, because project eligibility is only evaluated in detail at the time of redemption. This would provide more time for the policies to be put in place, and also provide an incentive for the host country to make this commitment so that actors within their country could redeem their options.*

to support policy and regulatory development. Such a programme would fit well within the current description of Nationally Appropriate Mitigation Actions (NAMA) for developing countries under the UNFCCC, because the policies would facilitate the success of the RBF mitigation scheme. Such funding could facilitate continued change and mitigation action beyond the duration of the RBF programme.
This type of capacity building can be a cost-effective way to use scarce public funds for the supporting of market development in some cases. The Global Lighting Initiative, for example, focused on standards and testing protocols rather than direct financial incentives for lighting, and was able to catalyse the distribution of millions of efficient solar lanterns (Lighting Global, 2015). Such funding could also be partly results-based, so promulgation of new regulations or the establishment of a testing centre for energy efficiency standards would be required before the final part of the financing was released. This would be a form of results-based aid.

## 5.3 Eligibility or prioritization of technologies

In addition to engaging with the governments of implementing countries to ensure ownership and compatibility with their agenda for transformative change, funders could also pursue transformational change at the fund level by either excluding technologies that could impede transformational change or by prioritizing technologies that especially support transformational change. Both approaches – excluding and prioritizing technologies – could, however, potentially conflict with national priorities. Funders should therefore carefully assess the extent to which exclusion or prioritization should be pursued at the fund level, without considering the specific circumstances of the implementing country and its agenda on transformational change.

### 5.3.1 Excluding technologies

Funders could exclude technologies with a view to avoiding locking in carbon-intensive technologies that are deemed incompatible with a low carbon economy in a longer-term perspective. Technologies with high risk of carbon lock-in could be part of a "negative list" for RBF funding. This may be simpler than developing a "positive list" of technologies for two reasons: First, many technologies whose relevance to a low carbon future may depend on the particular pathway towards the goal and the transformational change agenda of the implementing countries. Second, some technologies for a low carbon future may not be known yet (see examples in Clark et al. 2014). Excluding technologies with a high risk of lock-in could increase the cost-effectiveness of long-term emission reductions.

Recent research has started to develop frameworks to assess not only the quantitative potential and costs of carbon lock-in, but also to assess risks of specific technology areas. For example, Erickson et al. (2015a) use several metrics, including equipment life, financial barriers to changing technology in the future, and techno-institutional inertia, to identify energy technologies that pose high risks of lock-in. The three technologies with the highest risks are coal fired power generation, gas-fired power generation, and conventional internal combustion vehicles. In addition, other investments in transportation (e.g. ships, airplanes, freight vehicles) have very high barriers for switching to cleaner technologies in the future, as do gas and coal heating. Another analysis of fossil fuel supply infrastructure (Erickson et al. 2015b) emphasizes the particularly high risks of lock-in from investment in oil production, because of the capital intensity and the high economic "rents" (i.e. market price less production cost) of this supply source, while also noting the significant risks from investments in gas and coal production.

The vision of full decarbonisation of economies could be used to guide the prioritization of mitigation projects. This would imply that projects supporting less GHG-intensive fossil fuel use, such as efficient fossil fuel power plants, switching from coal or oil to natural gas, would not be eligible. As reservoirs to capture and store $CO_2$ are limited, CCS is a technology that is not applicable in the long term and should therefore not be eligible for support. CCS also locks in existing fossil fuel infrastructure.

The exclusion of technologies could also be pursued based on their risk of non-additionality (see chapter 4). Some technologies clearly require financial support to be viable, due to their poor economic performance or barriers that impede their implementation, while for other technologies the need for support is less certain, or they are already supported by domestic incentives (e.g. feed-in tariffs for renewable energy). For example, proposals have been made to exclude large scale wind power and other renewable technologies from crediting mechanisms, on the grounds that carbon revenue has limited impact compared to other financial parameters and that they are driven largely by domestic incentives (Lazarus et al. 2012).

Negative lists could cover broad technology areas (e.g. fossil fuel based energy generation) or specific technologies (e.g. excluding landfill gas flaring but allowing projects that use the landfill gas), depending on the risks of carbon lock-in and the available information on the likelihood of additionality.

### 5.3.2 Prioritizing technologies

Another approach to fostering transformational change could be prioritizing technologies that have a high potential for replication and for triggering innovation or change, which could lead to a sustained uptake of the technology. This would mainly target the depth dimension of transformational change. For example, interventions that help to drive down the capital costs of new technologies or otherwise shift the economics of the sector, can lead to longer-term change. This could also entail prioritizing measures that aim for much deeper, systemic cuts in emissions rather than incremental improvements or measures that cover a minimum percentage of emission sources in the sector (i.e. a critical mass), which might impact the remaining emission sources. Funders could also consider prioritizing actions that leverage a large amount of additional finance.

Prioritization of technologies could be implemented practically using different tools. RBF programmes could either only support technologies that qualify using one the following approaches, or they could provide additional incentives to such technologies, e.g. by rewarding a „bonus" or higher credit prices to account for the innovation potential of the technology:

- **Positive lists:** The RBF funder could develop and publish a positive list of technologies that qualify for the programme. A potential risk of positive lists is that they could inadvertently become a barrier to innovation, because very new and innovative technologies may not be included or technologies may simply be overlooked by the RBF funder. Positive lists could therefore be defined in relatively broad terms (e.g. „efficient lighting") so that they do not unnecessarily narrow the scope of technologies that are eligible. If defined more narrowly, they could also be updated regularly to address technological and economic changes – e.g. to take into account that a technology may have become common practice and viable without support – and to screen for emerging technologies that may not yet have been included in the list (e.g. by excluding CFL technology but retaining LED technology in the positive list).

- **Project performance benchmarks:** RBF funders could define minimum performance standards for classes of projects or technologies (e.g. $tCO_2$ per unit of industrial output or kilowatt hours of electricity per lumen). Performance benchmarks could „push the envelope" for using more innovative technologies (see examples in chapter 8). In developing performance standards, funders could draw upon the IPCC Working Group III technology assessments (Appendix III to WG3 report) as well as similar sectoral studies, including the data gathered for developing standardised baselines under the CDM.[14] A challenge with performance benchmarks can be selecting the most appropriate level of aggregation: if the benchmark is defined very broadly (e.g. the entire power sector), many technologies may qualify (e.g. all renewable energy), some of which may not be highly innovative, such as large-scale hydro power. But setting benchmarks narrowly for each technology (e.g. different power generation technologies) could miss innovative mitigation opportunities.

- **Qualitative project selection criteria:** Funders could also use qualitative criteria, such as the use and dissemination of best practices by the project owner, the potential for replicability, scalability and innovation, or the alignment with the respective country's vision for a low-carbon development. The Ci-DEV requirements for project innovation and replicability are an example of this.

When implementing these tools, it might be helpful to categorize mitigation projects on three different levels of aggregation:

- **Broad technology area:** Prioritization could be defined using broad technology areas (e.g. renewable energy).

- **Measures within technology area:** Within a broad technology area, specific technologies or project types could be considered eligible (e.g. wind power generation) based on positive lists (e.g. wind power generation) or performance benchmarks (e.g. buildings with less than X tons of GHG emissions per square metre) and by demonstrating viability of best available technology (e.g. enclosed rather than open flaring).

- **Project characteristics:** Even within a given technology or project type, projects can have widely different impacts depending on their design. If dissemination of new technologies and approaches, capacity building, and sectoral transformation is built into the project or programme from the start, it could increase diffusion of clean technologies beyond the specific project that is funded. This relates to the earlier discussion of the depth

*14 See, for example, the analysis of the Ethiopian cement sector for a standardized baseline proposal here: https://cdm.unfccc.int/methodologies/standard_base/new/sb8_index.html*

of transformation. Here, the requirement would be to design a specific project in a way that catalyzes broader change.

For the first two levels of aggregation, the decisions on which technologies to prioritize are complex, but, once agreed, they could be implemented transparently and simply by incorporating them in the participation requirements of the RBF programme. Using the third level of aggregation could be more subjective, and may require a case-by-case evaluation of project proposals, although this is already part of some RBF schemes (e.g. Ci-Dev).

# 6 Ensuring environmental and social safeguards

## 6.1 Approaches for environmental and social safeguards in multilateral processes

Environmental and social safeguards are a well-established practice in bilateral and multilateral development cooperation.[15] There are a number of tools that multilateral funding mechanisms and facilities can use to reduce the risks of negative social and environmental impacts:

- **Safeguards criteria:** Almost all development and financing institutions have a list of specific environmental and social criteria (e.g. adherence to international labour standards, respect for human rights) that projects must meet, although they may vary in how these criteria are evaluated and how compliance is ensured. Some institutions only evaluate the criteria at the start of the programmes; others also assess their adherence after project implementation.

- **Monitoring and verification of compliance with safeguards:** Compliance with safeguards or other criteria may be evaluated by the two parties involved (i.e. the funder and the recipient), or it may involve verification by a third party, often with accreditation required specific to that mechanism.

- **Stakeholder consultation:** Although most mechanisms and institutions require consultation with interested and affected stakeholders, the exact scope, process and content of this consultation varies, and may or may not be specified.

- **Mechanisms for conflict resolution:** Several institutions provide for different type of mechanisms to address conflicts. This could include an ombudsman, who would investigate complaints and attempt to resolve them, usually through recommendations or mediation, or an appeals process that would give stakeholders a formal process to request a change to a decision.

- **Mechanisms to facilitate redress:** Few institutions have established mechanisms for redress. Such mechanisms could include a reserve (either in monetary terms or emission reduction credits) that is set aside to compensate negatively affected local stakeholders, or liability provisions that specify which parties are liable for any unintended negative impacts.

- **Environmental and Social Impact Assessments (EIA/ESIA):** Programmes may simply rely on national law for EIAs and ESIAs, or impose additional requirements beyond national law (e.g. requiring an EIA for an activity that does not require it under national law, or providing guidance on the content of the EIA).

Table 2 below illustrates the application of these tools by some of the financing mechanisms presented earlier in Table 1. In addition, the GCF is included, because of its importance in the field of climate finance, and REDD+ has also been included, because of important steps taken under this mechanism to address environmental and social issues. Interestingly, while the CDM as a mechanism does not have safeguards criteria (except for CCS projects), funding facilities applying an RBF approach using CDM (e.g. Ci-DEV, PAF) do apply safeguard criteria. Third party verification of safeguards and conflict resolution mechanisms is the exception and not the rule, as are requirements to go beyond any national EIA or ESIA regulations. The Green Climate Fund may constitute an extension of these trends, given that it will have mechanisms for redress and appeals, as well as safeguards (initially from the IFC but eventually customised to the GCF). However, it is not yet clear whether any third party verification will be required, or how the safeguards may be assessed on an ongoing basis. Given that the GCF will work largely through intermediaries, the GCF Board will only address these issues when accrediting an entity to the GCF – in other words, by assessing the institution's capacity to implement the safeguards policies. It is unlikely that the GCF will directly review the safeguards compliance of individual projects.

Table 3 provides an overview of what safeguards criteria different mechanisms apply, and how that is related to results-based payments. The IFC Performance Standard has become the de facto global standard for financing in the private sector (GCF 2014d). The World Bank, and therefore funds or facilities based at the World Bank, use the World Bank

15 *Environmental and social safeguards in this context covers all of the relevant environmental, health, economic, social, safety, and human rights issues that could be affected by development projects. The precise scope of safeguards depends on the policies of the funding agency or mechanism. The safeguards may be codified in organizational policies, procedures or standards.*

Table 2 Tools for managing environmental and social risks in climate finance

| Instrument | Safeguards criteria | | Third party verification of safeguards | | Stakeholder consultation | Mechanisms for redress | Conflict resolution mechanisms | EIA/ESIA by national law | EIA/ESIA beyond national law |
|---|---|---|---|---|---|---|---|---|---|
| | Ex-ante | Ex-post | Ex-ante | Ex-post | | | | | |
| PAF | ✓ | ✓ | | ✓? | ✓ | | | ✓ | ? |
| Ci-DEV | ✓ | ✓ | | | ✓ | | | ✓ | |
| EnDEV (RBF) | ✓ | | | | ✓ | | | ✓ | |
| GET FiT | ✓ | | | | | | | ✓ | |
| FCPF | ✓ | ✓ | | | ✓ | ✓ | | ✓ | ✓* |
| NIFCI | ✓ | | | | ✓ | | | ✓ | |
| Green Climate Fund | ✓ | ? | *** | | ✓ | | ✓** | ✓ | ? |
| REDD+ | ✓ | ✓ | ? | ? | ✓ | | ? | ✓ | ? |

Note: Ex-ante means that criteria are evaluated at the inception (or prior to the inception) of a project, while ex-post means that ongoing evaluation is conducted after implementation. *A Strategic Environmental and Social Assessment is required, beyond a project-level EIA or ESIA. **The GCF is using the IFC compliance mechanism in the interim, but plans to have its own compliance mechanism and ombudsman. ***GCF assesses the implementing entities' capacity to evaluate the safeguards, but there is no third party verification outside of the implementing entity.

Performance Standard for all funding to the private sector, which is the same as the IFC Performance Standard. However, for lending to public sector entities, the World Bank uses the World Bank Safeguards Policies (Himberg 2015). The World Bank Safeguards Policies largely cover the same areas as the Performance Standards, although do not have dedicated provisions on labour or "community health, safety and security". These issues are mentioned in the overall framework for environmental assessment (i.e. Operational Policy 4.01 on Environmental Assessment), but do not have the level of detail that the Performance Standard does.[16] Table 3 shows that a number of mechanisms use the World Bank Group performance standards for funding to the private sector, including programmes not based at the World Bank, but some others use their own criteria.

Measurement is generally qualitative and carried out internally. The PAF links compliance with environmental and social criteria to payments, as do the REDD+ mechanisms. The GCF Board decisions do not yet state how violation of safeguards could affect payments or liability, although this is presumably part of the development of the compliance mechanism.

Protecting human rights has gained particular importance and attention in both development cooperation and addressing climate change. At COP16 in Cancún, Parties to the UNFCCC emphasized that they "should, in all climate change related actions, fully respect human rights".[17] A recent review of safeguards at all the major multilateral development banks noted that none of these institutions (other than the European Investment Bank) have a "cross-cutting policy requiring 'human rights' compliance. Most of the other MDBs refer to 'human rights' in supportive aspirational terms while recognizing the responsibility of clients to respect human rights"

*16 The World Bank safeguards policies have been under review since 2012, and are currently entering their third round of consultation. See http://www.worldbank.org/en/news/feature/2015/08/11/the-long-road-toward-consensus-on-safeguards.*

*17 Decision 1/CP.16, paragraph 8*

Table 3 Safeguards criteria and link to payments for selected mechanisms

| Instrument | Safeguard criteria | Measurement | Linked to payments[18] |
|---|---|---|---|
| PAF | Customised for each project, but derived from World Bank Performance Standard | Qualitative assessment by special WB staff | Yes |
| Ci-DEV | World Bank Performance Standard | Qualitative assessment by special WB staff | No |
| EnDev | Qualitative assessment of environmental risks conducted by implementation agency (GIZ) | Qualitative assessment | No |
| GET FiT | IFC Performance Standard | Not known | No |
| Forest Climate Partnership | World Bank Performance Standard | Qualitative assessment by special WB staff | Yes |
| NIFCI | Customized for each bilateral agreement, but based on international standards, including fiduciary, governance, environmental, and social safeguards – may include additional criteria beyond these standards | Not known | No |
| GCF | Implementing entities must ensure compliance of funded activities with environmental and social safeguards (interim use of the IFC performance standard, which is the same as the World Bank Performance Standard) | GCF checks the implementing entities' capacity to ensure compliance with this standard | To be decided |
| REDD+ | A range of criteria including: compliance with national and international agreements, respect for indigenous knowledge, conservation, as well as typical international safeguards | No process defined yet Upfront as well as ongoing reporting | Yes |

(Himberg 2015).[19] The UNFCCC secretariat recently proposed to address human rights concerns in CDM rules, which was been supported by a broad range of NGOs and the UN Special Rapporteur on Human Rights and the Environment.[20] This follows a move by 18 countries[21] during the February 2015 climate change negotiations to sign the "Geneva Pledge on Human Rights and Climate Action" to "facilitate the sharing of best practice and knowledge between human rights and climate experts at a national level".[22]

Another main challenge with safeguards across the multilateral development banks – and implicitly, for the facilities that utilize these tools - however, is not related to the scope and definition of the criteria, but their practical application by the implementing agencies and the assessment of compliance by the

*18 In other words, for an approved project, could the results-based payment be withheld because of non-compliance with safeguards after the start of implementation (as opposed to an ex-ante evaluation of whether the safeguards are met)?*

*19 Himberg adds that, "The World Bank only refers to 'human rights' in OP 4.10, Indigenous Peoples".*

*20 http://carbonmarketwatch.us3.list-manage1.com/track/click?u=2da01ffed1cef841636213017&id=2c0495fb1c&e=033d94fb04*

*21 Costa Rica, Chile, Guatemala, France, Ireland, Marshall Islands, Kiribati, Maldives, Micronesia, Mexico, Palau, Panama, Peru, Philippines, Samoa, Sweden, Uganda and Uruguay.*

*22 http://www.mrfcj.org/news/geneva-pledge-human-rights.html*

staff of funding institutions. For example, the Office of the Compliance Advisor Ombudsman (CAO), which serves the International Finance Corporation (IFC) and Multilateral Investment Guarantee Agency (MIGA), has conducted audits of IFC investments in Indonesia and Honduras that found that the IFC staff did not adequately address safeguards issues, systematically underestimated risks, and were under pressure to move loans rather than to ensure that safeguards were met (CAO 2009, 2013). NGO comments on the revision of the World Bank safeguards have also highlighted insufficient enforcement of these safeguards in practice, as well as shortcoming in their scope.[23] Another example are concerns that have been raised by journalists regarding more than 3.3 million people displaced between 2013 and 2014 allegedly as a result of World Bank funded programmes, despite safeguard policies on involuntary resettlement.[24]

With regard to stakeholder consultation, the experience of the CDM shows the importance of allowing for stakeholder consultation and providing clear guidance on the process for stakeholder consultation. Discussions at the CDM EB in recent years, and extensive input from stakeholders and analysis by the Secretariat, have led to several improvements in the stakeholder consultations and proposals for further improvements.[25] The proposals include guidance on which stakeholder should be involved at which stage of project approval, how their comments should be invited and addressed, and how to address comments outside of the formal stakeholder consultation period prior to project registration. Currently there is no procedure to address stakeholder concerns raised after registration, which also means that there is no process to follow up on commitments made during project development or in the project design documents that do not relate directly to GHG emissions reductions.

## 6.2 Environmental and social safeguards for results-based financing for mitigation

As highlighted above, the available experience with environmental and social safeguards suggests that the main deficits do not lay with the definition and criteria used, but how, when and by whom these criteria should be evaluated. The main feature distinguishing RBF from other forms of climate finance is the ex-post payment upon achievement of agreed objectives. This feature provides an opportunity to increase the effectiveness of environmental and social safeguards by making results-based payments contingent to the compliance with such safeguards. We recommend specifically the following:

**Safeguards criteria:** We recommend that RBF programmes using crediting mechanisms draw upon existing standards. There are several robust performance standards available, and GCF is currently looking at developing one specifically for that entity. We also recommend that the safeguards should include explicit provisions for protecting human rights as part of the overall safeguards policies.

**Monitoring and verification of compliance with safeguards:** RBF programmes should have third-party ex-post verification of safeguards as part of their monitoring programme. If safeguard criteria are only evaluated internally, and possibly by multiple implementing entities in the case of large scale funding mechanisms, and not verified, it may limit the effectiveness and transparency of the process. In fact, the larger funding mechanisms grow, the more important third-party verification by accredited entities becomes. Verification can only be carried out effectively after project implementation and would need to be repeated regularly, together with the verification of mitigation outcomes. Verification of safeguards could be conducted by existing Designated Operational Entities (DOEs) accredited under the UNFCCC for CDM projects, or by other specialized auditors, as long as there is a recognized accreditation process for the latter.

A mechanism may be needed to clarify how to address deviations from the project plans or what the consequences could be for contravening one of the criteria after implementation. This would include who could raise an objection, how potential violations of criteria would be assessed, and what remedies would be applied in the case of violations. This could also include withholding results-based payments until the criteria were again fully met. If safeguards are to be included in RBF payment contracts, they will require clear "triggers" that can be objectively evaluated and included in the legal and contractual agreements.

*23 http://www.safeguardcomments.org/*

*24 http://projects.huffingtonpost.com/worldbank-evicted-abandoned*

*25 In 2015, the CDM Executive Board adopted a revised Project Standard, which provides further specification as to how and when stakeholder consultation should be conducted. Further proposals for improvement are under consideration. See: http://cdm.unfccc.int/UserManagement/FileStorage/BHW3PT5CDO24YF9SJ70ER6UZIAKL1Q*

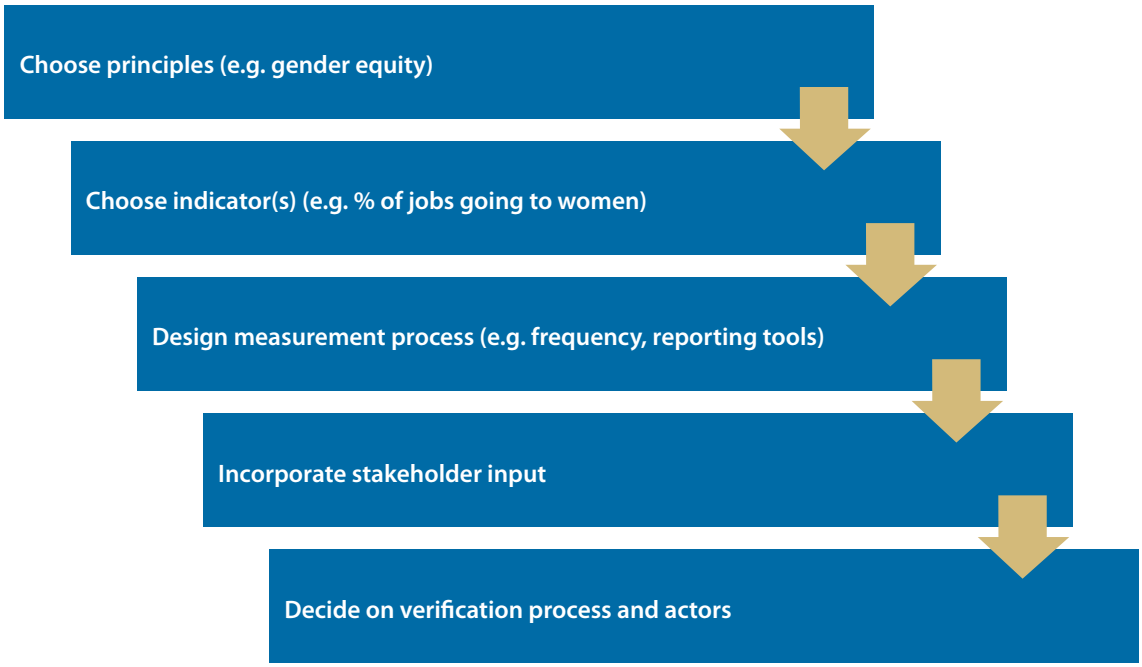
While the same general safeguards criteria would presumably apply across all sectors and technologies, the process and specific criteria for assessing safeguards could vary by technology or project type. Such a "risk-based approach" would consider what types of impacts were more or less likely for certain project types. For example, a technology such as $N_2O$ reduction in nitric acid production does not involve changes in land use, or additional discharges of water or air, so it may not be necessary to evaluate these safeguards criteria for such projects. Taking the IFC Performance Standards as an example, all projects would need to consider the social and environmental assessment system (PS1), labour and working conditions (PS2), and community health, safety and security (PS4), but other standards such as pollution prevention and abatement (PS3), land acquisition and involuntary resettlement (PS5), biodiversity conservation and natural resource management (PS6) and indigenous peoples (PS7) might only have indicators and monitoring for project types that could negatively affect these areas. Land use projects, waste management projects, and hydropower projects, for example, are project types that would need to consider all of the performance standard areas, while some energy efficiency projects and industrial gas projects might not pose risks in these areas. The process of developing such a customised approach is illustrated in Figure 3.

**Stakeholder consultation:** We recommend that RBF programmes ensure that stakeholders have the opportunity to provide comments both prior to the implemented of the funded activities and during their operation. The crediting mechanisms used to deliver RBF may partially provide for such stakeholder consultation. RBF programmes may need to develop additional rules when the scope, process and content of stakeholder consultation under the crediting mechanisms is not deemed sufficient in context of the project type.

**Mechanisms for conflict resolution and to facilitate redress:** In case safeguards are not met, or unanticipated conflicts occur after implementation, RBF mechanisms should have mechanisms to resolve conflicts and, where necessary, compensate those who have been negatively impacted by the programme.

**Environmental and Social Impact Assessments (EIA/ESIA):** Going beyond replying solely on national law for social and environmental impact assessments may be considered for RBF mechanisms, depending on the type of activities funded, for two reasons. Firstly, the broad scope of RBF interventions may lend itself more to a strategic environmental and social assessment (SESS), which would not normally be required by national law. In addition, because of the international nature of the funding and the overall commitment in the UNFCCC to human rights and other issues, it is important to ensure that the necessary and comprehensive evaluation of impacts is conducted regardless of whether it would be required under national law.

Figure 3 Key steps in developing a safeguards system



# 7 Avoiding double counting of efforts

Global action to mitigate climate change can be undermined if efforts are double counted. Double counting of efforts is a complex and controversial topic at UNFCCC negotiations. It could occur with regard to mitigation outcomes and/or finance climate, as follows:

- **Double counting of mitigation outcomes:** Double counting of mitigation efforts can occur when a single greenhouse gas emission reduction or removal is counted more than once towards attaining INDCs. If emission reductions are double counted, actual global GHG emissions could be higher than the sum of what individual countries report. As a result, countries could appear to meet their INDCs, while total emissions exceed these combined levels. Double counting of mitigation is particularly relevant in the context of mechanisms in which units representing emissions or emission reductions are issued and transferred between countries or other entities (Schneider et al. 2015).

- **Double counting of climate finance:** At COP16 in Cancún, developed countries committed to mobilizing jointly USD 100 billion per year by 2020 for developing countries to address climate change. Double counting of climate finance occurs if the same financial flow is counted more than once towards achieving climate finance pledges.

- **Double counting between mitigation and climate finance goals:** A donor could finance mitigation actions and both account for its climate finance goals and use credits issued for the mitigation action to comply with its mitigation targets.

This chapter provides an overview of how these forms of double counting could occur and how they could be addressed in the context of programmes using crediting mechanisms to deliver RBF. To illustrate the accounting issues that may arise from such programmes, we first introduce a plausible way of accounting for mitigation outcomes and climate finance (Figure 4). We then discuss several accounting issues that could arise and lead to double counting of efforts, either under this accounting approach or when deviating from it. These are discussed in the following sections.

In Figure 4, the blue boxes illustrate the accounting of emission reductions, the green boxes the accounting of financial flows. The investment costs for the mitigation action are financed through equity and, where applicable, debt (e.g. concessional or non-concessional loans). After implementation, the mitigation outcomes are verified and issued as emission reduction credits. The donor purchases and cancels the emission reduction credits. The sale of emission reduction credits allows the investor to refinance (part of) the initial costs of implementing the mitigation action. If the mitigation action is truly additional (i.e. it is implemented due to the incentives from credits revenues), the purchase of emission reduction credits (partially) leverages private finance in the form of equity or debt. If the mitigation action were not additional (i.e. it would also be implemented without credit revenues), the private financial flows would happen anyhow and are thus not caused by the purchase of the emission reduction credits.

The mitigation action – if truly additional – supports the recipient country in achieving emission reductions. The donor may account for climate finance provided to achieve these reductions, taking into account the value of the emission reduction purchase and the value of mobilized private finance as well as other sources of public funding.

## 7.1 Accounting for mitigation action

### 7.1.1 Addressing double counting of mitigation efforts

Avoiding double counting of mitigation efforts is a key objective pursued by Parties. Double counting of mitigation efforts could occur in several ways (Hood et al. 2014; Prag et al. 2011, 2013; Schneider et al. 2015; UNFCCC 2012; WRI 2014a, 2014b):

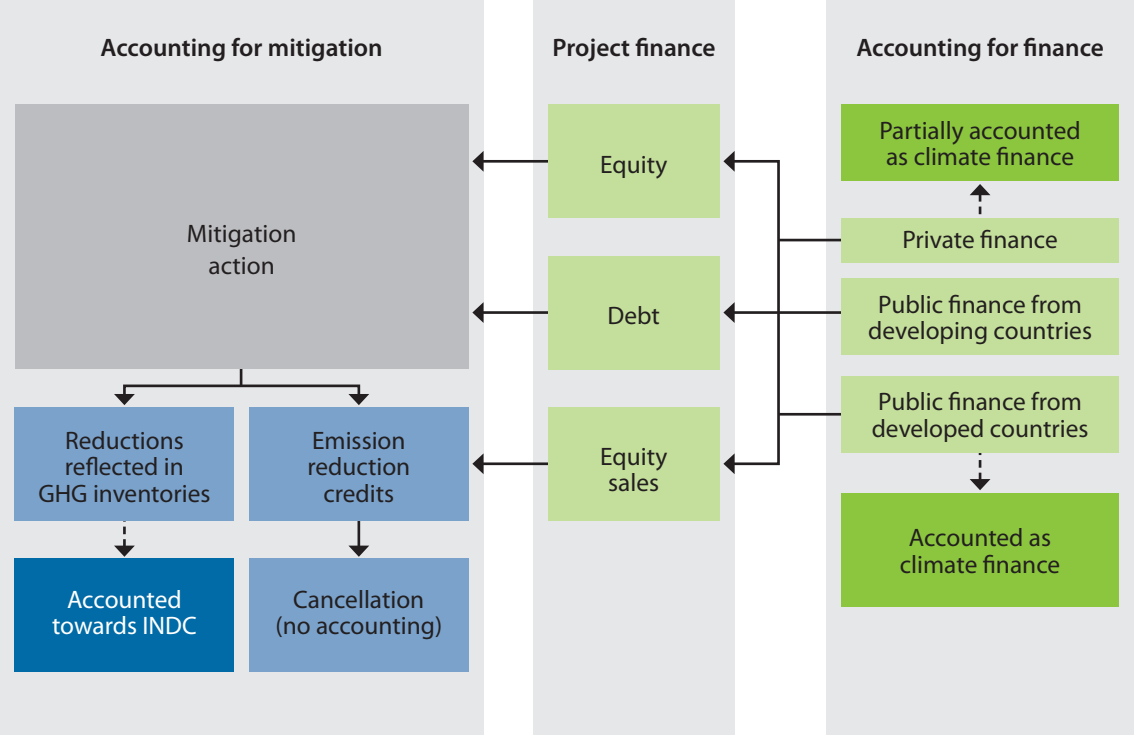
1. **Double issuance:** More than one unit is issued for the same emission or emission reduction.

2. **Double claiming:** The same emission reduction is counted twice towards attaining mitigation pledges: once through a GHG inventory by the country where the reduction occurs and once again by the country using a corresponding emission reduction credit.

3. **Double coverage:** The same emission reduction is accounted under two different types of targets, such as a GHG goal in one country and a non-GHG goal in the other (Hood et al. 2014).

4. **Double use:** The same issued unit is used twice to attain a mitigation pledge.

Figure 4 Accounting for mitigation outcomes and climate finance




Double claiming, double coverage and double use are all addressed, as long as RBF programmes cancel the emission reduction credits and appropriate systems to track unit flows are in place. With appropriate registry systems and tracking of credits in place, cancellation ensures that the credits cannot be used by any entity. This avoids double claiming and double coverage. Appropriate registry systems can avoid double use. However, RBF programmes may wish to ensure that the credits are cancelled on their behalf, so that no other entity could claim the benefits from cancellations.[26]

Double issuance is a general challenge to all crediting mechanisms. It could occur in several forms, involve one or two mechanisms, and one or two entities, for example, if both consumers or producers could claim credits for the same reductions. Double issuance is thus not a specific issue to RBF. However, RBF programmes could actively manage the risk through a number of measures (Schneider et al. 2015), including:

- **Declarations by the entities participating in the programme:** RBF programmes could require that any entity surrendering credits under the programme sign a declaration that it has not and will not seek credits for the same emission reductions under another or the same crediting mechanism. Such declarations are required under some but not all crediting mechanisms.
- **Government approval:** RBF programmes could require approval by the government for issuing credits where such approval is not required under a crediting mechanism. When governments have oversight on the issuance of credits within their jurisdiction, they could ensure that no double issuance occurs. Requiring government approval could, however, also delay the implementation of projects and may require sufficient capacity with government authorities.
- **Verification of no double counting through third-party auditors:** Auditors could be required to check for each issuance request whether the same reductions have already been issued as credits in the same or another crediting mechanism. The scope of the check could depend on the material risk of double counting, implementing a risk-based approach.
- **Limitation to activities with clear ownership of credits:** The scope of an RBF programme could

26 *Under the Kyoto Protocol, for example, mandatory cancellations have to be undertaken to „compensate" for earlier excess issuance of credits or to compensate for any emissions from carbon capture and storage projects.*

be limited to activities with clear ownership of credits. Project types with different possible ownerships, such as biofuel projects in which both the producer and the consumer could potentially claim credits, could be excluded from an RBF programme.

### 7.1.2 Accounting for mitigation outcomes by the recipient country and global mitigation impacts

In principle, the recipient country could use the emission reductions enabled through the RBF programme to achieve its INDC. In practice, however, whether the recipient country can account for the reductions and how this affects global emissions depends on several circumstances, as shown in the flow diagram in Figure 5:

1. **Additionality of the emission reductions:** If the mitigation action would also occur without the incentives from credit revenues, the funding of the project does not lead to additional reductions and does not help the country to deviate from its BAU emissions. In other words, the reductions are already reflected in the countries' BAU emissions. There is no mitigation impact due to the RBF programme.

2. **Geographical emissions impact:** Some mitigation actions could (partially) lead to emission reductions in another country. This typically occurs where commodities, such as electricity or biofuels, are internationally transferred. For example, in the case of the South African Power Pool – an electricity grid covering 12 countries in the South African region – renewable power generation in one country could affect fossil fuel-fired power generation in other countries. The country hosting the mitigation project can only account for the emission reductions if they occur within its geographical boundaries. If the reductions occur in other countries, these might account for them, depending on whether they are within the scope of INDCs and whether they are reflected in their GHG inventories.

3. **Scope of the INDC:** If the emission reductions do not fall within the scope of the INDC, the country cannot count them towards its INDC. Some INDCs do not cover economy-wide emissions or all greenhouse gases, but only specific sectors or gases. Many INDCs also refer to 2030. A renewable power plant constructed in 2020 is likely to operate until 2030 and beyond, and consequently its emission reductions would help the country achieving its 2030 emissions target. However, other project types may have a shorter lifetime or may be abandoned once an RBF scheme has been phased out. In such case, the country may not be able to use the reductions for meeting its INDC.

4. **Reflection of the emission reductions in the GHG inventory:** Capturing the effect of mitigation actions in GHG inventories may, in some instances, require more advanced methods for estimating GHG emissions. For example, the Tier 1 method in the 2006 IPCC Guidelines for estimating $N_2O$ emissions from nitric acid production does not capture the effect of projects reducing these emissions. The country can only account for the reductions towards meeting any INDC if they are reflected in the GHG inventory. This issue is also referred to as „GHG inventory visibility" (Prag et al. 2013).

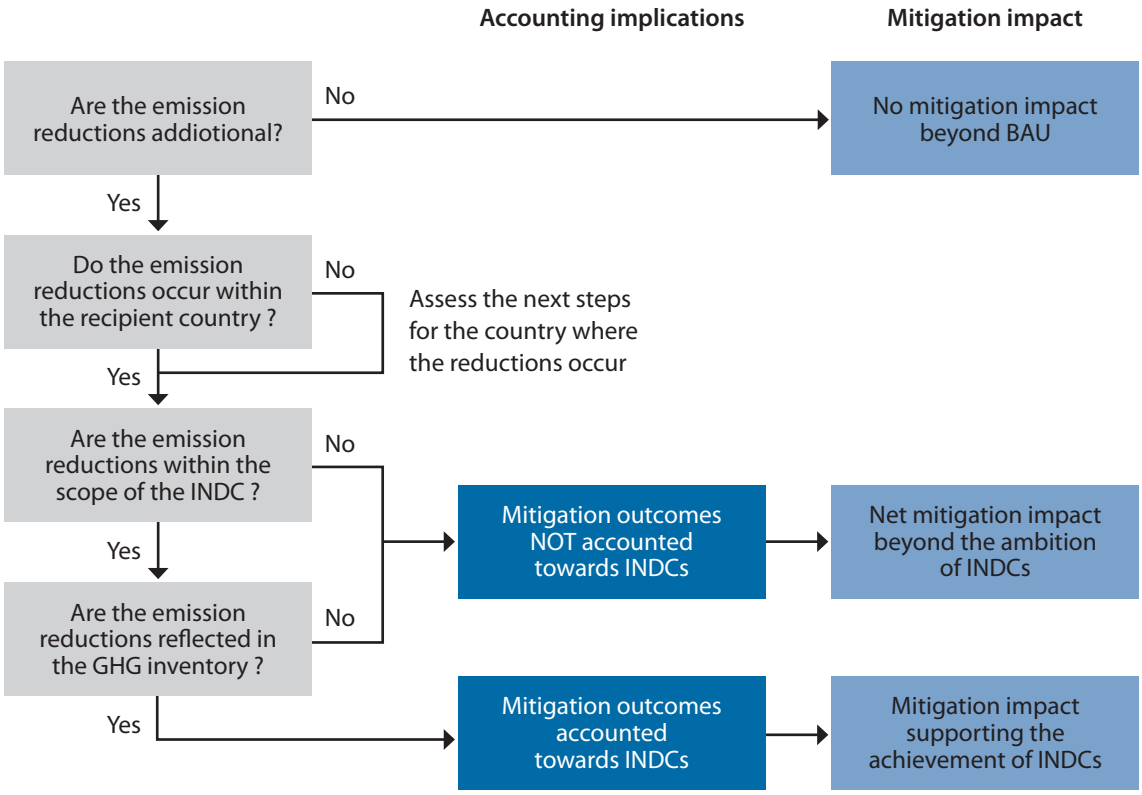
The mitigation outcomes can only be accounted towards the recipient countries' INDC if all these four conditions are met: the emission reductions are additional, occur within the recipient country, fall within the scope of its INDC, and are reflected in the GHG inventory. In this case, the climate finance provided by the funder supports the recipient country in achieving its INDC. If the reductions do not fall within the scope of the INDC or are not reflected in the GHG inventory, the mitigation outcomes are not accounted towards the INDC, which leads to a global net mitigation impact beyond the ambition of INDCs. In all cases, it does not matter whether the emission reductions are over- or under-estimated when issuing credits. As the credits are cancelled, any over- or under-crediting does not have implications for accounting or mitigation outcomes (see chapter 4.2).

## 7.2 Accounting for climate finance

Accounting for climate finance is mainly discussed in the context of the Cancún goal of mobilising USD 100 billion per year to address the needs of developing countries. The UNFCCC does not have a definition of climate finance. Parties have also not agreed on what type of activities and flows may be counted towards this goal, or how financial flows should be monitored, reported and verified.

At COP16 in Cancún, Parties decided to establish the Standing Committee on Climate Finance (SCF) to, inter alia, improve coherence and coordination in the delivery of climate finance and facilitate measurement, reporting and verification of support provided. The SCF prepares biannual reports providing an overview of climate finance flows. In its first biannual report, the SCF concludes that data collectors and aggregators use different operational definitions

Figure 5 Accounting for mitigation outcomes by the recipient country and global mitigation impacts




Note: It is assumed that the RBF programme cancels the emission reduction credits

but with common elements. The review of the climate finance definitions adopted by data collectors and aggregators points to a convergence that can be framed as: "Climate finance aims at reducing emissions, and enhancing sinks of greenhouse gases and aims at reducing vulnerability of, and maintaining and increasing the resilience of, human and ecological systems to negative climate change impacts" (SCF 2014). Initiatives to establish frameworks for accounting of climate finance and tracking progress have also been set up at various other levels, including by the Development Assistance Committee of the Organization for Economic Development (OECD DAC), multilateral development banks (MDBs), the International Development Finance Club (IDFC), and the Climate Policy Initiative (CPI).

Reporting of and accounting for climate finance poses a number of general challenges, including lack of a common definition of public and private climate finance, lack of data on climate-related financial flows – in particular for private finance, accounting for private flows and intertwined private/public and international/domestic flows, double counting across different data sets, accounting for the timing of financial flows, and accounting for financial flows from instruments other than grants, such as concessional and non-concessional loans, risk guarantees, insurances, results-based finance schemes, or export credits (Clapp et al. 2012; SCF 2014; OECD 2015). Below we explore two issues that are particularly relevant for programmes using crediting mechanisms to deliver RBF.

### 7.2.1 Accounting for mobilized private finance

The funder of an RBF programme using crediting mechanisms could, in principle, either only claim the value of the credit transactions (and possibly other support through grants or concessional loans) as climate finance or also the value of the leveraged private finance. The Cancún Agreements specify that funds provided to developing country Parties may come from „public and private" sources.[27] Many institutions have interpreted the Cancún Agreements

*27 Decision 1/CP.16, paragraph 99.*

in the way that publicly mobilized private finance could be counted as climate finance towards the USD 100 billion goal. In September 2015, 18 donor countries and the European Commission issued a „Joint Statement on Tracking Progress Towards the $100 billion Goal"[28] which sets out their common understanding of the scope of mobilized climate finance and a common methodology for tracking and reporting towards this goal, based on input by a technical working group that draws upon discussions within the OECD Research Collaborative on Tracking Private Climate Finance (TWG 2015). The Joint Statement considers that mobilized climate finance includes „private finance for climate-relevant activities that has been mobilized by public finance or by a public policy intervention, including technical assistance to enable policy or regulatory reform." This approach was drawn upon by an OECD report tracking progress towards the USD 100 billion goal (OECD 2015).

This approach pursued by donor governments would imply that in principle the value of private finance leveraged through the RBF programme could be counted as climate finance towards the USD 100 billion goal. If mobilized private finance is considered, several principles for accounting for private flows are emerging (OECD 2015; TWG 2015), including:

1. **Public finance:** Public finance (or supported policy interventions) must be part of the overall financing package to include mobilized private finance as part of the goal. Private finance invested without the involvement of public finance (or supported policy interventions) cannot be counted.

2. **Transfer to developing countries:** The public funding needs to come from developed countries and be transferred to developing countries. Public funding from developing countries is not counted. However, any private finance mobilized by public funding from developed countries may come from domestic or international sources.

3. **Causality:** A clear causal link is required between the public finance and the mobilization of private finance. The public funding should trigger or cause the private finance to happen. This issue is directly linked to the demonstration of additionality under crediting mechanisms. If a project is truly additional (i.e. implemented due to incentives from credit revenues), the purchase of emission reduction credits triggers the implementation of the project and thereby mobilizes the private finance invested into the project. If a project would also be implemented without incentives from emission reduction credits, the private finance invested into the project would flow anyhow and is not triggered by the purchase of the emission reduction credits. Whether private finance is mobilized by an RBF programme is therefore directly linked to the likelihood that the funded projects are truly additional. Demonstrating additionality is thus not only important for ensuring additional mitigation outcomes but also for appropriate accounting for climate finance.

4. **Attribution:** Mitigation projects are often financed from various sources, including international and domestic sources, as well as public and private sources. In such cases, the mobilized private finance needs to be attributed to the sources of public funding, in order to avoid double counting of efforts and to ensure that only the share of private finance mobilized through finance from developed countries is counted towards the USD 100 billion goal. The TWG (2015) recommends a volume-based, pro-rata attribution approach. For example, if a mitigation project involves an investment of one million USD and is financed by 60% private finance, 30% public finance by developed countries, and 10% public finance by the recipient country, the developed country donors could account their 300,000 USD public finance, as well as three-quarters of the private finance mobilized, i.e. 450,000 USD of „publicly mobilized private finance". While this approach is relatively simple to implement, it does not consider differences in the risk taken by funders.

The amount of private finance that may be mobilized through public RBF programmes using crediting mechanisms is uncertain. The World Bank estimates that CER transfers in the first commitment period had an overall value USD 28 billion, while the overall investment in CDM projects over the same period is estimated at USD 130 billion (World Bank 2014). However, there could be a trade-off between achieving a large leverage of private finance and ensuring additionality: the larger the leverage rate, the lower is the impact of the emission reduction credits on the economic performance of a project, and hence the less likely it becomes that the private finance is truly mobilized by the intervention of the RBF programme.

To ensure that any „publicly mobilized private finance" attributable to the RBF programme is accurately determined, RBF programmes could require projects to report on their financial structure, including the sources and conditions of funding. This

*28 http://www.news.admin.ch/NSBSubscriber/message/attachments/40866.pdf*

would allow quantifying – rather than estimating – the leverage rates and private finance mobilized through the programme and identifying the share of mobilized private finance that is attributable to the RBF programme. Such information could be verified by auditors that also verify emission reductions. Verified information could also help inform international work to develop methodologies for estimating private climate finance flows.

### 7.2.2 Timing of payments

A further practical challenge is the timing of payments under RBF programmes. Most private and public finance is provided before the start of the project whereas RBF payments are disbursed during project operation. Thus, RBF payments do not match the timing of other financial flows and are rather returns on investment. This could potentially pose risks of double counting of financial flows and requires careful consideration when accounting for climate finance, in particular when accounting for private finance mobilized by RBF programmes. Accounting should be accounted only at one point in time, (i) when the funding is approved, (ii) when it is disbursed to the RBF programme, or (iii) when the RBF programmes disburses payments to the recipients of the programme. If projects are supported by different types of public finance at different points in time (e.g. an upfront grant and RBF payments) by different funders, there could be a risk that more than one funder claims the private finance mobilized through projects.

The value of credit transactions could, in principle, be considered as an ex-post grant. To compare RBF payments with other forms of finance, the face value (i.e. the net present value of credit transactions) or the cumulated value (i.e. the sum of the value of credit transactions) could be considered as the public climate finance delivered through the RBF scheme.

## 7.3 Double counting between mitigation and climate finance goals

In Figure 4 above we assumed that the emission reduction credits will be cancelled and are not used for compliance. Using emission reductions for compliance to meet emission reduction targets and accounting associated financial flows towards financial pledges could be regarded as a form of double counting of efforts (UNFCCC 2012; Schneider et al. 2014).

Firstly, the international transfer of credits for compliance purposes implies that the funder receives a return for its payment. In this regard, using emission reduction credits for compliance has been ruled out to be accounted as ODA: in Marrakech at COP7, Parties to the Kyoto Protocol agreed that, "public funding for clean development mechanism projects from parties in Annex 1 is not to result in the diversion of official development assistance and is to be separate from and not counted towards the financial obligations of Parties included in Annex I." In the light of this international agreement, the OECD DAC agreed in 2004 that the value of any CERs received in connection with an ODA-financed CDM project should be deducted from the ODA and that ODA funds should not be used to purchase CERs (OECD DAC 2004). Hence, the purchase and use of credits for compliance cannot be counted as ODA. However, the value of credits that were cancelled does not have to be deducted from ODA. Hence, finance provided for purchase and cancellation of credits can be accounted as ODA (OECD DAC 2015).

Secondly, accounting for climate finance and using emission reduction credits for compliance is indeed even more problematic in the light of the Paris agreement, under which most countries are expected to have mitigation targets. International transfer of credits for compliance can, therefore, rather be regarded a „trade" between two countries than a support to developing countries. To prevent double claiming of mitigation actions (see section 7.1.1), the developing country would need to add any internationally transferred credits to its reported emissions. This reduces the benefits for the developing country; it could not use the emission reductions to meet its mitigation target as they are transferred to another country. If the developing country has an emission reductions target below its BAU emissions, it would thus need to engage in other mitigation actions to achieve its target. A key feature of climate finance in the development context is, however, that it should assist the recipient country in mitigation of or adaptation to climate change. Moreover, many developing country emission reduction pledges in INDCs are conditional upon financial support by developed countries. If developing countries would need to „give away" parts of their emission budget to receive financial support, it would not help them in achieving their pledges. For these reasons, we recommend that any international transfer of credits for compliance not be counted as climate finance provided to developing countries.

# 8 Analysis of selected project types

This chapter explores the suitability of different project types for RBF programmes using crediting mechanisms, based on the various considerations outlined in previous chapters. We selected five project types with a view to covering a broad range of sectors and project types with diverse characteristics: they may or may not have revenue sources or savings other than revenue from emission reductions, and their technical project life may shorter or longer than the RBF incentive (see Table 4).

As discussed in chapters 2.2 and 3, there are specific pre-requisites for RBF to be an effective tool for disbursing climate finance. Most importantly, RBF will only work for those interventions or technologies for which the recipients are able to respond to the incentives, and where the results can be reliably measured and verified through appropriate indicators. And secondly, crediting mechanisms are only a suitable vehicle to deliver RBF if they allow for a variety of mitigation actions to be undertaken, if the most suitable recipients are entities investing in specific mitigation actions, if the most effective focus is supporting specific projects and programmes rather than action at sectoral or policy levels, and if the transaction costs are reasonable. This means that, when considering a sector or mitigation actions for a possible RBF programme using crediting mechanisms, it is important to understand the characteristics of the sector, technology and the typical actors, and how this may vary by country.

Each of the selected project types is therefore evaluated based on our considerations on the suitability of using crediting mechanisms to deliver RBF (chapters 2 and 3), delivering real and additional emission reductions (chapter 4), fostering transformational change (chapter 5), and ensuring environmental and social safeguards (chapter 6). The analysis focuses on differences between project types and does not consider issues that a country-specific. We also do not consider accounting issues (chapter 7), as they equally apply to all project types.
Specifically, we evaluate the suitability of these project types based on the following criteria discussed in the previous chapters:

- suitability of the project type for crediting mechanisms (chapter 3);
- ability of agents to respond to RBF incentives (chapter 3);
- ability to select suitable indicators (chapter 3);
- mitigation potential (chapter 3);
- likelihood of additionality (chapter 4);
- incentives to continue operation beyond the duration of the RBF scheme (chapter 4);
- country ownership and risks of perverse incentives not to introduce policies to address the emission source (chapter 5);
- potential for replication and innovation (chapter 5);
- compatibility with long-term global climate goals and long-term global transformational change and risks of locking in carbon intensive technologies (chapter 5); and
- social and environmental safeguards (chapter 6).

Table 4 Project types assessed for RBF programmes using crediting mechanisms

| | | Non-carbon revenue or savings | |
|---|---|---|---|
| | | **No** | **Yes** |
| **Technical project lifetime typically longer than RBF incentive** | **No** | Nitric acid | Energy efficient lighting<br>Leakage emissions from oil and gas infrastructure |
| | **Yes** | Landfill methane flaring | Large scale wind power |

## 8.1 $N_2O$ from nitric acid production

Nitric acid is an important chemical which is mainly used for the production of synthetic fertilizers. $N_2O$ is an unwanted by-product of nitric acid production. $N_2O$ is formed at the primary catalyst in the oxidation reactor; the better the primary catalyst functions, the lower the $N_2O$ formation. $N_2O$ emissions from nitric acid production can be abated in three ways:

- Primary abatement reduces the formation of $N_2O$ at the primary catalyst;
- Secondary abatement removes $N_2O$ through the installation of a secondary $N_2O$ destruction catalyst in the oxidation reactor;
- Tertiary abatement removes $N_2O$ from the tail gas through either thermal or catalytic decomposition.

Under the CDM, 97 projects were registered and another four projects were submitted for validation. Among the 97 registered CDM projects, only 51 have issued CERs; it is likely that most of the remaining projects have not been implemented due to low CER prices (Schneider and Cames 2014).

**Suitability of the project type for crediting mechanisms:** Kollmuss and Lazarus (2010) concluded that „the carbon market was very effective in fostering abatement in an industry that had not been abating $N_2O$ emissions previously." Schneider and Cames (2014) also point out that carbon markets could be more effective than regulations „when it comes to providing incentives to abate emissions to the extent that this is cost-effective." In other words, under crediting mechanisms plant operators have economic incentives to innovate and reduce emissions in cost-effective ways.[29] More recent CDM methodologies also allow combining different ways of abating $N_2O$ emissions. Both secondary and tertiary abatement are eligible and may be combined with primary abatement; only projects implementing only primary abatement are not eligible under the CDM. Overall, recent versions of CDM methodologies appear effective for delivering RBF through a crediting mechanism in this sector. The Voluntary Carbon Standard (VCS) also uses CDM methodologies.

**Ability of agents to respond to RBF incentives:** Nitric acid projects are implemented by medium- to large-size chemical plants. Most projects were developed by project developers specialized in the industry and with detailed knowledge on both nitric acid production and crediting mechanisms. Most chemical companies have sufficient access to capital and the capacity to assume the risks associated with such projects. They also have full control over the level of nitric acid emissions.

**Ability to select suitable indicators:** Emission reductions are a suitable indicator, as for this project type the key objective is climate mitigation, while development co-benefits are relatively low. For this reason, no other indicators seem to be needed for this project type. The emission reductions are clearly attributable to the intervention. More recent CDM methodologies use a standardized emission benchmark to calculate baseline emissions. This fully avoids any gaming and distortion and also ensures low transaction costs, as no baseline measurement campaign is needed, as in previous versions of CDM methodologies.

**Mitigation potential:** The mitigation potential for $N_2O$ abatement from nitric acid production is about 60-70 $MtCO_2$ per year and thus smaller compared to other sectors (Schneider and Cames 2014).

**Likelihood of additionality:** Nitric acid projects have a very high likelihood of additionality, as plant operators do not have economic incentives to abate $N_2O$ in the absence of regulations. Developing countries usually do not have regulations in place yet.

**Incentives to continue operation beyond the duration of the RBF scheme:** Nitric acid plant operators in developing countries do not have revenues related to $N_2O$ abatement other than carbon market revenues, while the continued $N_2O$ abatement involves costs for replacing catalysts or purchasing fuels for thermal decomposition. Abatement is only ensured as long as plant operators receive economic incentives or abatement is regulated. For this reason, many CDM projects are at risk of stopping $N_2O$ abatement or have already done so (Schneider and Cames 2014; Warnecke et al. 2015a). An RBF programme supporting $N_2O$ projects could help to avoid existing projects stopping $N_2O$ abatement; however, abatement may only be ensured as long as the RBF programme exists. Without additional elements, an RBF programme would thus not provide incentives that emissions are addressed beyond the duration of the RBF programme or in even longer time frames.

**Country ownership and risks of perverse incentives not to introduce policies to address the emission**

*29 This same would be true, of course, for an RBF scheme that provides financial incentives but cancels the resulting credits.*

**source:** $N_2O$ emissions from nitric acid plants are generally not regulated in developing countries. While some countries have INDCs that cover this emission source, initiatives to address these emissions, such as unilateral or multilateral NAMAs, are not known. A further particularity of this project type is that abating $N_2O$ emissions from nitric acid production does not provide significant co-benefits, compared to other project types. Countries have therefore little incentive to introduce policies or regulations, other than for addressing climate change. In the worst case, the continued support of projects through an RBF programme could provide disincentives for policy makers to adopt policies or regulations addressing this emission source. Country ownership and engagement in addressing $N_2O$ emissions from nitric acid production thus seems an important prerequisite for a programme that should be successful in the long run. This is a common challenge with project types with limited co-benefits and limited incentives for continued mitigation. Box 2 presents options for an RBF scheme to promote longer term action in these types of project areas.

## Box 2 Domestic policies and project types with limited incentives for continuing mitigation: the case of $N_2O$ abatement

The abatement of $N_2O$ from nitric acid generation does not save costs or generate revenues other than from emission reduction credit sales. In the absence of crediting mechanisms, subsidies or regulations, plant operators do not have incentives to continue abatement beyond the duration of an RBF scheme.

To provide incentives for continued abatement beyond the duration of the RBF scheme, RBF programmes could limit eligibility to countries that have included $N_2O$ emissions from nitric acid within the scope of their INDCs. This would ensure that the countries have some incentives to ensure continuation of abatement beyond the RBF programme. Nitric acid is mainly produced in emerging economies, most of which are including this emission source within the scope of their INDCs. Prioritizing countries that have included $N_2O$ emissions from nitric acid production within the scope of their INDC would probably allow most developing countries with nitric acid production to participate in the programme, while a few may be excluded.

RBF programme operators could also require countries to introduce policies or regulations to ensure long-term abatement of $N_2O$ emissions. Developing countries currently do not have policies or regulations addressing $N_2O$ emissions from nitric acid production. Requiring such policies to be in place to participate in an RBF programme would practically exclude all countries. However, RBF programmes could require governments to commit to a process for implementing policies or regulations. This could be implemented by a phased approach in which the funding of emission reductions is unconditional in a first phase (e.g., up to 2020) and contingent upon the implementation of regulations or policies in a second phase (e.g., as of 2021). In the first phase, the recipients of the funding would be the nitric acid plant operators, as they require financial incentives to continue or initiate $N_2O$ abatement and have the best control over the emission source. In the second phase, the government of the country could be considered as recipient, as a form of results-based aid (RBA). The government has the most control over their adoption and enforcement of policies and regulations. RBA would provide the government direct financial incentives to introduce policies or regulations and to ensure their enforcement. The government could then either provide financial incentives to nitric plant operators to abate the emissions (e.g., by establishing a domestic RBF scheme similar to the scheme for HFC-23 emissions in new HCFC-22 installations in China (see section 2.3)) or adopt relevant regulations on emissions. Such approaches could also be considered for other similar project types (i.e. abatement technologies where the agent has limited incentive to continue beyond the RBF programme).

Among the options for domestic approaches, regulations and long-term policies, such as inclusion in a national emissions trading scheme, provide the advantage that the emissions would be addressed beyond the duration of any national or international RBF scheme, whereas a domestic RBF without additional elements would not ensure reductions beyond its duration. RBA, however, requires sufficient capacity within governments. Most nitric acid production is located in middle- to high-income developing countries which may have better capacity to implement and enforce regulations than low-income or least developed countries. In the latter group, plant operators as recipients could be considered as an alternative.

**Potential for replication and innovation:** Within the sector, replication of projects is straightforward. To achieve a high ambition in terms of the degree of $N_2O$ reduction and to promote innovation, performance benchmarks could be considered for the level of $N_2O$ emissions per nitric acid production after project implementation. If chosen in an ambitious manner, such benchmarks would prioritize plants that achieve a strong emissions performance. A strong emissions performance can, for example, be achieved by employing primary abatement measures that prevent the formation of $N_2O$, such as improved primary catalysts. Performance benchmarks could thereby contribute to an enhanced uptake of advanced primary catalysts and other innovative measures to avoid $N_2O$ formation, which are widespread in Europe, where plant operators have strong incentives to employ such technology due to the inclusion in the EU ETS, but used to a lesser extent in other regions. At the same time, performance benchmarks could exclude plants from participation in the scheme, in particular more purely managed plants in less developed regions. It may therefore also lead to less cost-efficient abatement.

**Compatibility with long-term global climate goals and long-term global transformational change and risks of locking in carbon-intensive technologies:** Nitric acid is produced for different purposes. Its main use is as a feedstock for production of synthetic N-fertilizer. Demand could be reduced by replacing synthetic by organic fertilizer or more efficient use of fertilizer. This not only decreases emissions from fertilizer production but also $N_2O$ emissions from fertilizer application (IPCC 2014). Other uses of nitric acid include use as feedstock in the production of explosives and adipic acid, which is mainly used for nylon production. Overall, it seems that nitric acid demand may be reduced but it appears unlikely that it can be fully phased out.

**Social and environmental safeguards:** Nitric acid projects have limited risks of adverse social or environmental impacts. Projects may only need to consider the following aspects of the IFC Performance Standards: the social and environmental assessment system (PS1), labour and working conditions (PS2), and community health, safety and security (PS4).

## 8.2 Energy efficient lighting

Energy efficient lighting has a very large, cost-effective potential for mitigation potential, but its role in crediting mechanisms has been rather limited so far. In mid-2010 there were only half a dozen registered CDM projects and 3 registered PoAs focusing on energy efficient electrical lighting. Recent growth in PoAs, particularly with larger PoAs, indicates a higher potential – even beyond the current project activity and PoA pipeline. Twenty-seven PoAs for energy efficiency lighting have been registered as of April 2015. Just from the CPAs already included in these registered PoAs as of April 2015, the volume of CERs is estimated by the project developers at 3.4 million per year, or two and a half times greater than for project activities. For CDM project activities, the 40 projects registered as of April 2015 state that they will generate 1.4 million CERs per year.

**Suitability of crediting mechanisms:** Although initial activity in this field was slow, the newer methodologies and the use of programmatic approaches have resolved the key barriers to this project type under crediting mechanisms. The methodologies also include standardized parameters, which make emissions reduction calculations straightforward. Crediting mechanisms may also be suitable, because they can involve third party entities, such as energy service companies, which are able to overcome the information barriers and split incentives often observed between lighting users and those purchasing lighting equipment. A key challenge is how to assess the level of regulatory support for different types of lighting equipment, so that projects that would happen anyway due to regulatory requirements or other national incentives are excluded.

**Ability of agents to respond to RBF incentives:** Energy efficient lighting programmes are typically implemented by electric power utilities or energy service companies (ESCOs), with skills in managing and promoting this type of programme. One of the main barriers to energy efficient lighting is that consumers, particularly those in poorer countries, are not able to pay the higher upfront cost of more efficient lighting equipment (Spalding-Fecher et al. 2004). The intermediaries such as the ESCOs do, however, have access to capital and the capacity necessary to manage an energy efficient lighting programme, with the result that most successful programmes have used this strategy.

**Ability to select suitable indicators:** The approved methodologies measure both energy savings and emission reductions, which are the relevant indicators. The methodologies also ensure that emission reductions are attributable to the project interventions.

**Mitigation potential:** The UNEP en.lighten initiative[30] notes that, "electricity for lighting accounts for

*30 http://www.enlighten-initiative.org/*

approximately 15% of global power consumption and 5% of worldwide greenhouse gas emissions. A switch to efficient on-grid and off-grid lighting globally would save more than $140 billion and reduce $CO_2$ emissions by 580 million tonnes every year." An earlier study estimated that 70% of the savings from lighting was from more efficient electric lighting, while 30% was from switching from fuel-based lighting to electricity (Mills 2002). Most of this potential would be in countries that could be eligible under RBF programmes.

**Likelihood of additionality:** According to the UNEP en.lighten initiative's Global Lighting Map[29], regulatory support for efficient lighting is widespread, but varies greatly by country and, in some cases, technology as well. Projects should only be able to claim additionality in countries with no or limited policy or regulatory support for efficient lighting. Under the CDM, this approach has been implemented in a recent large scale CDM methodology designed specifically for energy efficient lighting (AM0113), and has been introduced but not made mandatory for the small-scale methodologies that are used by PoAs.[31] We therefore recommend that RBF schemes limit eligibility to countries where regulatory support is not yet implemented.

**Incentives to continue operation beyond the duration of the RBF scheme:** The ongoing energy savings provide strong incentives for continued use of lamps that were introduced under an RBF programme. However, the equipment life of efficient lamps may only be 6-7 years (possibly longer for LED technology), and the institutions that implement energy efficient lighting programmes do not necessary benefit from those savings, making it potentially difficult to sustain such programmes.

**Country ownership and risks of perverse incentives not to introduce policies to address the emission source:** Many countries have already mandated the switch to CFLs, and soon to LEDs. Policy makers have incentives to introduce such regulations because using efficient lighting appliances has considerable economic, social and environmental benefits. It increases economic efficiency, reduces air pollution, saves costs to consumers and strongly promotes development, in particular in rural areas. This raises the question of whether financial support is needed for projects distributing efficient lamps. An important criterion for an RBF scheme is to assess the extent to which external support is needed to catalyse mitigation, based on the regulatory and economic environment of the country. Energy efficient lighting is likely to be part of national climate strategies and efforts to meet INDCs (or at least residential electricity use will be covered), but the pace of implementation may vary by country. For countries that do yet mandate high efficiency lighting, the RBF programme could develop a more specific agreement with the country to support development of energy efficient lighting regulations by the time that the RBF incentives stop.

**Potential for replication and innovation:** Since the technology unit size is very small, a programme would need to be sufficiently broad (e.g. national in scope) for it to support transformational change. To drive innovation, RBF programmes could limit eligibility to the highest efficiency lamps, e.g. by using project performance benchmarks. Highly efficient lamps could also be a technology area for which regulations may only be introduced at later stages.

**Compatibility with long-term global climate goals and long-term global transformational change and risks of locking in carbon-intensive technologies:** Highly efficient end-use devices are a critical component of any low carbon sustainable economy. Many countries consider these technologies an important part of their national vision. In the countries with the largest share of CDM projects to date, regulatory support is generally strong, making the use of compact fluorescent lamps (CFLs) increasingly common practice. Light emitting diode (LED) lamps have much lower market penetration and are rarely required by national policy. The choice of CFLs versus LEDs is an example of distinguishing among "measures within technology area". Due to the limited equipment life of lamps, the risk of „lock-in" is low.

**Social and environmental safeguards:** Energy efficient lighting projects have limited risks of adverse social or environmental impacts. Projects may only need to consider the following aspects of the IFC Performance Standards: the social and environmental assessment system (PS1), labour and working conditions (PS2), and community health, safety and security (PS4).

31 *Currently, while the small scale methodology also says that CFL projects in countries with significant support for energy efficient lighting are not considered additional automatically based on this regulatory standard, the tool for additionality for all SSC activities has allowed automatic additionality based on a "unit threshold" described as, "project activities solely composed of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale CDM thresholds." For energy efficiency, this threshold of 3000 MWh is roughly 46,000 CFLs.*

## 8.3 Large scale wind power

Wind power has been one of the most successful categories of projects under the CDM. Wind power comprises 32% of all registered CDM projects and 23% of expected CERs, at over 225 million t $CO_2$e per year. From registered PoAs, wind power so far constitutes 10% of expected CERs, at 3.5 million t$CO_2$ per year.

**Suitability of crediting mechanisms:** The methodologies for this project type are well developed and widely used across many crediting mechanisms, although many stakeholders and experts have questioned whether they adequately address additionality (Bogner and Schneider 2011; He and Morse 2013; Lema and Ruby 2007; Wara and Victor 2008).

**Ability of agents to respond to RBF incentives:** The technology has many highly skilled national and multi-national power plant project developers with access to international capital markets. When national utilities control the sector and are capital constrained, they can allow independent power producers (IPPs) to develop new plants, assuming the right regulatory environment is in place. Many of these companies have already participated in results-based schemes for renewable energy procurement, including through auctions.

**Ability to select suitable indicators:** Measuring wind electricity generation is simple and inexpensive. Emission reductions or electricity generation are suitable indicators to measure progress; other indicators do not seem necessary.

**Mitigation potential:** According to the McKinsey Global Greenhouse Gas Abatement Cost Curve, in 2030 the expansion of wind power could reduce global emissions by up to 2,300 Mt$CO_2$, depending on assumptions about market share, cost decreases and the costs of grid integration (McKinsey & Company 2009). Currently, non-OECD power sectors emissions are about two thirds of the global total, while this share is expected to be higher in 2030 (IEA 2015).

**Likelihood of additionality:** Wind power has been one of the technology types that has been most criticised under the CDM for risks of non-additionality. The arguments relate to the limited impact of carbon revenue on financial returns, the widespread national incentives for wind power in major CDM countries (incentives with much larger value than carbon revenue), and even some incidents of apparent adjustment of feed-in tariffs to ensure the wind projects would pass an additionality test (see sections on wind power in Lazarus et al. 2012; Schneider 2009; Spalding-Fecher et al. 2012). While national incentives have played a major role in wind power expansion in many emerging markets, there may be smaller markets – particularly in least developed countries – in which wind power would not be driven by national policies.

**Incentives to continue operation beyond the duration of the RBF scheme:** The ongoing electricity sales provide a strong incentive for continued operation of plants beyond the duration of the RBF scheme. The value of the electricity sales will most likely be considerably higher than the operational expenditures value of the emission reductions, while the capital investment is a sunk cost.

**Country ownership and risks of perverse incentives not to introduce policies to address the emission source:** This varies by country, but many emerging markets have renewable energy promotion incentives that are likely to be the main driver in renewable energy development, which is why additionality demonstration is challenging. In poorer countries (e.g. LDCs), there may still be a gap in the enabling environment and regulations. Renewable power (including targets) is likely to be part of national climate strategies and INDCs. RBF programmes could have specific agreements with countries to support development of renewable energy policies when these are not strong yet.

**Potential for replication and innovation:** The power sector is one of the most important in terms of GHG emissions and long-term mitigation potential. Wind power plants have a high potential for replication. An RBF programme using crediting mechanisms could promote innovative business models by monetizing the GHG emissions benefits of wind power in competitive markets. This is essential to transformation in the power sector, and the RBF programme could explore the various instruments through which this could be accomplished (e.g. auctions, forward contracts, other procurement models). Supporting wind power has a high potential for innovation through both cost reductions and further technological development.

**Compatibility with long-term global climate goals and long-term global transformational change and risks of locking in carbon-intensive technologies:** Both international studies, such as the 5th assessment report of the IPCC, and national polices in many countries strongly support renewable energy deployment, particularly in the major emerging markets in the developing world (IRENA 2015). As wind power has no ongoing emissions, there is no risk of locking in carbon-intensive technologies. There could be short- to medium-term conflicts, however, in countries with inexpensive fossil fuel resources,

for which expanding energy access and productive use of energy for economic development is a top priority.

**Social and environmental safeguards:** In addition to the FC Performance Standards for the social and environmental assessment system (PS1), labour and working conditions (PS2), and community health, safety and security (PS4), wind power projects could have additional impacts on wildlife and noise pollution. Resource efficiency and pollution (PS3) and biodiversity conservation and sustainable management of natural resources (PS6) would also need to be evaluated, as would land ownership and tenure issues.

## 8.4 Landfill gas flaring

The capture of landfill gas, and its destruction or use for energy generation, has been an important part of carbon markets for more than a decade. Approx. 5% of the projects and CERs in the current CDM pipeline are from landfill gas projects. Of these, about a third of the projects simply flare the gas and do not utilize it for energy. This is an interesting project type for RBF programmes focussing on projects that are at risk of stopping GHG abatement because, unlike landfill gas to power projects, there are no revenues other than from credit sales. In addition, when regulations are in place for LFG management, they generally only specify flaring for safety reasons, and not the utilization of the gas for energy.

**Suitability of crediting mechanisms:** The methodologies for this project type are well-developed and widely used across many crediting mechanisms.

**Ability of agents to respond to RBF incentives:** Landfills are generally managed by municipalities. When there are no safety issues with methane emissions from the landfill, the municipality may not have the technical and managerial skills to capture the methane. In addition, municipalities do not generally have good access to capital. However, in carbon markets the landfill gas mitigation programmes have usually been implemented by intermediaries who are highly skilled in developing and managing mitigation projects. As a result, skills may not be a barrier, but access to capital could be.

**Ability to select suitable indicators:** Emission reductions are a suitable indicator for the objective, as for this project type the key objective is climate mitigation, while development co-benefits are relatively low. For this reason, no other indicators seem to be needed for this project type. The emission reductions are clearly attributable to the intervention, as long as the methodology takes into consideration any enforced regulations on landfill gas capture and utilisation.

**Mitigation potential:** According to a UNEP report on short-lived climate pollutants (UNEP 2011), the 2030 mitigation potential for "Waste treatment and landfill gas utilization", which excludes wastewater treatment, in Africa, Latin America and Asia is 19.4 Mt CH4, or 490 Mt $CO_2$e. In that study, this technology area includes "separation and treatment of biodegradable municipal waste through recycling, composting and anaerobic digestion as well as landfill gas collection with combustion/utilization." Even if only 10% of the potential stems from LFG utilisation, this would constitute a very substantial mitigation potential.

**Likelihood of additionality:** Flaring projects have no other source of revenue other than carbon revenue, so the likelihood of additionality is high, as long as the capture of the gas is not required by regulations. The available methodologies adequately address this issue.

**Incentives to continue operation beyond the duration of the RBF scheme:** Projects that only flare landfill gas do not have revenues other than carbon revenues, and yet have ongoing maintenance and operational costs. Abatement is therefore only ensured as long as plant operators receive economic incentives or abatement is regulated. Warnecke et al. (2015a) found that, "end users of mitigation equipment and intended mitigation practices were often poorly trained, and that – in the absence of intervening government legislation – project activities were often quickly abandoned as CER prices dropped." In addition, they found that, "[l]andfill gas power projects demonstrate a significantly higher implementation and operational status than flaring projects…[and] some larger landfill gas flaring projects reported that they continued mitigation activities without further considering the CDM, whilst installing electricity generation equipment and selling energy."

**Country ownership and risks of perverse incentives not to introduce policies to address the emission source:** The regulation of landfill gas varies widely, not only across countries but even across different municipalities within a country. Many jurisdictions do not have mandatory requirements for flaring, unless there are site-specific safety issues. This is because the local impacts of landfill gas emissions are very limited, as long as concentrations remain relatively low. Continued support of landfill gas projects through RBF schemes could therefore create disincentives for policies to introduce landfill gas policies or regulations. To address this risk, a transition

towards mandatory flaring or use of landfill gas for energy generation could potentially be part of the discussions between an RBF funder and the governments of the countries hosting projects.

**Potential for replication and innovation:** While there is a significant pipeline of landfill gas flaring projects in the CDM and other crediting mechanisms, the majority of landfill gas projects under the CDM use the gas for energy generation. This provides two mitigation impacts – both the destruction of methane and the reduction of $CO_2$ emissions due to the displacement of other (fossil) fuels. Use of the methane is therefore more ambitious than simply flaring it. In addition, there is a limited potential for innovation in flaring since highly efficient closed flares are already commercially available. RBF programmes targeting existing landfill projects could be set up in ways to provide incentives for conversion to energy projects, for example, by offering separate windows, with higher prices, for projects that install equipment to utilize the energy. They could also require use of enclosed flares.

**Compatibility with long-term global climate goals and long-term global transformational change and risks of locking in carbon-intensive technologies:** Managing waste is a broader question than simply managing methane at landfill sites. The decarbonization of the global economy necessarily also requires a "dematerialization" of many systems (Edenhofer et al. 2014). For waste management, reducing the use of materials in products, reusing products, recycling materials, waste incineration, as well as removing organic material from the waste streams (e.g. for composting), are all alternatives to landfill gas flaring in terms of the impact on GHG emissions. In addition, if landfill gas is only flared and not utilized for energy production, it is also an inefficient use of available renewable energy sources (bearing in mind, however, that the economics of utilizing landfill gas at smaller sites may present a major barrier). An important disadvantage of landfilling is that only part of the methane can be collected. This could imply that the overall GHG emissions from landfilling, including capture and use of landfill gas, are higher compared to other waste treatment practices, such as compositing, biogas generation or waste incineration. Continued support of landfill gas projects could thus provide perverse incentives for municipalities not to move to less GHG intensive waste handling practices. RBF programmes could possibly manage this risk by limiting eligibility to closed landfills.

**Social and environmental safeguards:** Landfill gas projects have been accused of violating environmental and social safeguards for two main reasons: through the continuation of local health and safety risks by operating at the landfill site, and by displacing "waste pickers" whose livelihood depends on access to the landfill site (TERI 2012). This means that the projects should be assessed against the IFC Performance Standards for social and environmental assessment system (PS1), labour and working conditions (PS2), resource efficiency and pollution (PS3), community health, safety and security (PS4), and possible land acquisition and involuntary resettlement (PS5) (although the livelihoods issue could be addressed under PS2).

## 8.5 Leak detection and repair in oil and gas infrastructure

Fugitive releases of methane from oil and gas infrastructure are a major source of GHG emissions. They include both leaks from equipment and venting of unused gas streams. Emissions from equipment leaks are attributable to a very large number (i.e. millions) of individual sources and global emission estimates are uncertain. The US Environmental Protection Agency (EPA) considers fugitive emissions from the oil and gas sector to be one of the major sources of anthropogenic methane, constituting more than 20% of the global methane emissions (EPA 2013). In some countries (e.g. Russia, Uzbekistan, Turkmenistan, Azerbaijan), total fugitive emissions constitute more than 20% of the total national GHG emissions (Rhodium 2015).

Numerous practices and technologies for reducing methane emissions in the oil and gas sector have been documented. One important sub-category of fugitive emissions reduction is leak detection and repair (LDAR). Empirical studies indicate that LDAR has an important abatement potential that can be achieved at low or negative economic abatement costs (e.g. < USD 10 / t $CO_2$e) (Saunier et al. 2014). There are a variety of measures which differ in technological approaches and abatement costs, but with no major or fundamental problems in the determination of baseline emissions and calculation of emission reduction results. Most programmes use infrared cameras for identifying the leaks.

**Suitability of crediting mechanisms:** Standards to quantify emission reductions from LDAR technologies are already available in crediting mechanisms. The implementation of the abatement measures is quite straightforward, although MRV requirements need to balance cost with environmental integrity. LDAR projects require limited upfront investment, and the main expenditures are staff costs. Projects can be implemented with short lead times, and scaled up or down over time. The short lead time in project implementation and limited requirements for

upfront finance could be an advantage in use with crediting mechanisms.

**Ability of agents to respond to RBF incentives:** Within some sub-segments of the gas value chain, the number of industrial actors is small and/or dominated by state-owned enterprises. The number of players that can conduct LDAR programs in the upstream segment of the industry (oil and gas exploration, processing and transmission) is significantly larger than in the downstream segment (oil and gas distribution). Since the owners of the upstream segment are typically multi-national companies or large state-owned companies, these organizations would have both access to capital and also the technical and institutional capacity to implement these measures.

**Ability to select suitable indicators:** In LDAR projects, the methane leakage rate is measured at each identified lead before it is repaired. This is a reasonably good indicator of the volume of methane that would have been emitted into the atmosphere. However, there have been questions raised about how leakage rates might vary over time, and whether using the leakage rate at a given point in time is appropriate for the crediting of longer-term emission reductions. Generally, however, emission reductions are a suitable indicator and no other indicators would be necessary. A number of gas distribution LDAR projects have been developed under CDM and JI using CDM methodology AM0023, although this methodology is controversial due to potential problems with baseline determination.

**Mitigation potential:** According to a UNEP report on short-lived climate pollutants (UNEP 2011), the 2030 mitigation potential for leak reduction in Africa, Latin America and Asia is 306 kt CH4, or 7.6 Mt $CO_2$e. The potential for North America and Europe is an order of magnitude higher, at 6,360 kt CH4, but very few of these countries would be eligible for RBF funding.[32]

**Likelihood of additionality:** Almost no developing countries have any enforced regulation to reduce these sources of emissions. Many measures are potentially economically viable to implement, with negative abatement costs in principle, but are still not being implemented due to barriers. Key barriers include (i) lack of awareness among both management and technical staff, (ii) implementation challenges, and (iii) low return on investment compared to alternative projects. In addition, in many countries transmission and distributions systems are owned by national/regional companies with incentive structures that may not be directly related to total actual throughput. Economic attractiveness on a project basis is therefore not necessarily a good indicator of whether projects would be implemented in a business-as-usual scenario for these types of entities.

**Incentives to continue operation beyond the duration of the RBF scheme:** The reduction of infrastructure leaks increases the throughput of natural gas, and could therefore result in increased revenue for some owners of the infrastructure, depending on the incentive structure for gas suppliers in the particular country or region.

**Country ownership and risks of perverse incentives not to introduce policies to address the emission source:** The modest capital costs of LDAR could make it easier for governments to enforce regulations after the incentive payments end, or to assume part of the financial responsibility for incentive payments. However, governments may have limited incentives to address these emissions as they do not pose significant health risks, and reducing emissions does not create large economic or social co-benefits. Moreover, given the difficulty that many countries have had in enforcing regulations on flaring of associated gas and oil fields, there might also be gaps between country policies on LDAR and actual implementation.

**Potential for replication and innovation:** Given the large mitigation potential, LDAR pilot programmes at individual facilities could have a significant potential for replication. LDAR programmes could potentially reduce almost all fugitive emissions from oil and gas infrastructure, if implemented on a large enough scale. Using successful LDAR projects to create awareness in the industry of the mitigation potential and modest costs would promote replication across the sector. There is also significant scope for technological innovation in leak detection to reduce the costs of LDAR programmes.

**Compatibility with long-term global climate goals and long-term global transformational change and risks of locking in carbon-intensive technologies:** Establishing new fossil fuel infrastructure, even those that improve the efficiency of the energy supply system, may not be compatible with the long-term low carbon development pathway. Whether natural gas infrastructure poses a risk of carbon "lock-in" is only beginning to be understood. Some recent studies have shown that, although gas plants reduce emissions relative to coal in the short term,

*32 The regional definition for "North American and Europe" in this report includes Russia, Ukraine, Moldova, Turkey, Georgia, Armenia, Azerbaijan and the Baltic states.*

the achievement of ambitious long-term climate targets requires a quick move away from gas to renewable power (McJeon et al. 2014; Shearer et al. 2014). LDAR projects, however, are very unlikely to impact whether new fossil fuel infrastructure is established or how long existing fossil fuel infrastructure is used, as long as the pricing mechanisms for emission reduction credits ensure that credit revenues do not lead to significant profits that could impact the economic feasibility of the fossil fuel infrastructure. In this regard, LDAR projects are unlikely to lead to a lock in fossil fuel infrastructure. However, given that fossil fuel infrastructure will not be part of a low carbon long term pathway, one could question whether limited public funds for climate finance should not focus on technologies that are both part of the long-term pathway and where near term investment could drive down costs and spur innovation.[33]

**Social and environmental safeguards:** Brownfield LDAR projects would not be expected to have negative environmental or social impacts. Nevertheless, IFC Performance Standards for the social and environmental assessment system (PS1), labour and working conditions (PS2), and community health, safety and security (PS4) would be applied.

## 8.6 Summary of project analysis

Table 5 summarizes the evaluation of the selected project types in this chapter, while Table 6 and Table 7 provide more detail on the likelihood of additionality of these project types and the incentives for continuation of mitigation beyond the life of the RBF scheme.

Table 5 Assessment of selected project types against objectives of RBF programmes using crediting mechanisms

| | $N_2O$ from nitric acid | Energy efficient lighting | Large-scale wind power | Landfill gas flaring | LDAR |
|---|---|---|---|---|---|
| **Suitability for crediting mechanisms** | H | H | H | H | H |
| **Agents can respond to incentives** | H | H (through intermediaries) | H | H (through intermediaries) | H |
| **Suitable indicators** | H | H | H | H | H |
| **Mitigation potential ($MtCO_2$/yr)** | 60-70 | >200 | >1000 | >50? | ~10 |
| **Likelihood of additionality** | H | L-H* | L | H | M |
| **Incentives for project owners to continue abatement** | L | L** (beyond installed lamps) | H | L | M |
| **Incentives for policy makers to introduce policies to address the emissions** | L | H | H | M | M |
| **Potential for replication** | M | H | H | M | M |
| **Potential for innovation** | M | H | H | L | H |
| **Risks of carbon lock-in** | L | L | L | M | L |

Source: Authors' own analysis. Note: *Likelihood of additionality depends on level of regulatory support in each country **Low incentive to continue beyond the initial installation of energy efficient lamps since they must be periodically replaced

33 *This is a complex question because it depends on the potential for cost reductions, the role of investment in driving those cost reductions, and the net effect of reducing costs for some technologies while possible foregoing other short to medium term low cost mitigation opportunities.*

Table 6 Likelihood of additionality for the selected project types

| Project type | Likelihood of additionality | Explanations |
|---|---|---|
| $N_2O$ from nitric acid production | High | No revenues other than credits |
| Energy efficient lighting | Country-specific | Regulations in many, but not all, developing countries |
| Large-scale wind power | Questionable | Incentive schemes in place in many countries; limited impact from carbon revenue |
| Landfill gas flaring | High | No revenues other than credits |
| Leak detection and repair | Medium | Site-specific economics may include savings from reduced losses, but barriers also exist |

Source: Authors' own analysis

Table 7 Risk of stopping GHG abatement for selected project types

| Project type | Risk of stopping abatement | Explanations |
|---|---|---|
| $N_2O$ from nitric acid production | High | • No revenues other than credits<br>• Costs for continued abatement<br>• Usually no regulations in developing countries |
| Energy efficient lighting | Low | • Regulations in many developing countries<br>• Significant cost savings<br>• No costs for continued abatement |
| Large-scale wind power | Low | • Significant revenues from electricity sales<br>• Low OPEX for continued abatement |
| Landfill gas flaring | High | • No revenues other than credits<br>• Costs for continued abatement |
| LDAR | Low | • Modest ongoing savings due to higher gas throughput |

Source: Schneider and Cames (2014), authors' own analysis

# 9 Conclusions and recommendations

Results-based funding is increasingly being used as an innovative tool to effectively disburse climate finance. Crediting mechanisms are a ready-made vehicle to deliver results-based funding, either by purchasing and cancelling emission reduction credits or by using their tools for monitoring and verifying emission reductions. Results-based funding creates strong incentives to achieve the intended results and could foster innovation because the recipient has autonomy in how to achieve the results. At the same time, results-based funding contracts can be complex. Results-based funding increases the risks that the recipients face, and requires the recipients to have access to upfront financing. It is thus important to carefully evaluate whether results-based finance (RBF), results-based aid (RBA) or other forms of (traditional) funding are the most effective to achieve the policy objectives pursued. Moreover, programme design, in particular careful selection of the indicators to measure progress, such as renewable electricity generated, the number of efficient lamps distributed or emission reductions achieved, is key to achieving the intended results.

## Suitability of crediting mechanisms for delivering results-based finance

A key prerequisite for RBF to be effective is that the institutional capacity to implement RBF programmes is in place and that recipients are able to respond to those incentives. Existing crediting mechanisms, in particular the CDM, have already built that capacity, including with regard to project developers, third-party auditors, international regulatory oversight and capacities in host countries. Using this existing infrastructure could reduce costs and considerably accelerate the implementation of RBF initiatives. It would also help preserve the capacity built. Existing standards to calculate emission reductions and assess additionality are available for a broad range of technologies and sectors, though they may not necessarily be suitable for RBF programmes targeting reductions at sectoral level, reductions from policy interventions, or reductions from capacity building or awareness raising. Programmes intending to use crediting mechanisms to deliver RBF should:

- consider at which level interventions can best achieve the programme's objectives (i.e. projects, programmes, sector-wide, or economy-wide);
- assess whether and how using crediting mechanisms could limit the scope of the interventions that can be pursued to achieve the objectives;
- assess whether emission reductions is the most appropriate indicator for measuring progress and whether other indicators are needed or more suitable; and
- consider the transaction costs of using crediting mechanisms compared to other channels of (results-based) finance.

## Achieving a high mitigation impact

RBF programmes using crediting mechanisms should be designed to achieve a high mitigation impact. Crediting mechanisms could help achieve cost-effectiveness because of their ability to identify untapped mitigation opportunities and the competitive nature of programmes purchasing emission reduction credits. However, focusing only on low abatement costs may involve trade-offs. Ensuring additional emission reductions is crucial to achieving this objective, while quantifying emission reductions conservatively is less important, as long as the emission reduction credits are cancelled. The structure, duration and timing of payments could also impact the overall mitigation outcomes. A mismatch between the duration of payments and the technical lifetime of mitigation projects could imply that some projects stop mitigation once the RBF payments end. It could also lead to unintended distortions in a competitive selection of projects, because the reductions from projects with a longer lifetime would only partially be valued. To ensure a high mitigation impact, we recommend that RBF programmes:

- focus first on mitigation projects that have been implemented but are now at risk of stopping GHG abatement, and then move on to new projects that have not yet been implemented;
- do not support existing projects that are already operating (or for which project owners have already decided to proceed with implementation) and that are not at risk of stopping GHG abatement;
- purchase only credits issued for emission reductions that occur after the date of contracting;
- in the case of new projects:
    - assess the likelihood of additionality of the relevant project types and focus on those with the highest likelihood;

- use different funding windows for project types with strongly differing technical lifetimes, to avoid distortions in the selection of projects.

## Fostering transformational change

Many institutions funding climate change mitigation aim to achieve transformational change. Transformational change is a country-driven process that involves far-reaching, structural changes towards sustainable, low-carbon development. Achieving such change requires actions at multiple levels, and strong ownership and involvement of domestic policy makers and stakeholders. RBF programmes using crediting mechanisms could foster or impede transformational change. They could foster innovation because they provide the recipient with autonomy in how to achieve the emission reductions. They could impede transformational change if they lock-in carbon-intensive technologies, if continued funding creates disincentives for policy makers to change the underlying policy framework, or if they support technologies that are not in line with the priorities and vision of the implementing country. To support transformational change, we recommend that RBF programmes:

- require government endorsement of the RBF interventions to ensure country ownership and alignment with national priorities and the national agenda towards transformational change;
- support the development of an enabling policy and regulatory framework to ensure continued change beyond the RBF programme, through additional funding windows operating in parallel to the RBF scheme;
- for middle and high income countries: require that the emission source be included within the scope of mitigation contributions by the country under UNFCCC;
- for mitigation actions for which sustained change is not ensured by the economics of the project: require that the recipient country commits to introducing a policy framework that ensures long-term mitigation;
- exclude technologies with a high risk of carbon lock-in, such as projects supporting less GHG-intensive fossil fuel use; and
- consider prioritizing technologies with a high potential for replication and innovation, by means of positive lists, performance benchmarks, or qualitative criteria.

Since RBF programmes using crediting mechanisms target specific mitigation projects implemented by private entities, rather than broad policy or societal change, they cannot be the only or main instrument to promote transformational change. They could rather be one piece in a much larger puzzle to achieve transformational change. Policy approaches that aim to trigger long-term transformation do not necessarily lead to significant emission reductions in the time frame of RBF programmes. To successfully address climate change both long-term transformation and capturing the short- and medium-term mitigation potential are necessary. RBF programmes using crediting mechanisms may be particularly effective to tap the short- and medium-term mitigation potential in a cost-effective manner and with relatively short implementation times. Different funding windows could be established in parallel or in a phased approach. RBF programmes using crediting mechanisms could target short-term reductions for a certain period of time, under the condition that the government of the implementing country establishes a policy framework and implements measures to address the emissions in a long-term perspective. RBA or other forms of funding could be used in later phases to support countries in establishing and implementing this policy framework.

## Ensuring environmental and social safeguards

RBF schemes should adopt strong environmental and social safeguards, and tools to evaluate, monitor and enforce them. To provide for such safeguards effectively, we recommend that RBF programmes:

- draw upon existing standards for safeguards criteria, including explicit provisions for protecting human rights;
- require ex-post monitoring and third-party verification of compliance with safeguards by Designated Operational Entities (DOEs) accredited under the UNFCCC for CDM projects, or by other specialized auditors;
- withhold results-based payments if safeguards criteria are not met;
- apply a „risk-based" approach to safeguards criteria, focusing on the safeguards issues that are most relevant for different technologies and project types;
- allow for stakeholder consultation both prior to the implementation of the funded activities and during their operation;

- provide for mechanisms to resolve conflicts and facilitate redress; and
- ensure appropriate environmental and social impact assessments, where necessary.

## Avoiding double counting of efforts

RBF programmes using crediting mechanisms should ensure proper accounting of both mitigation outcomes and financial contributions, in order to avoid double counting of efforts. We recommend that RBF programmes:

- cancel the emission reduction credits, transparently documenting that the cancellation occurred on behalf of the programme, and not use the credits for compliance purposes;
- require the participating entities to report on the financial structure of the project and auditors to verify this information, to identify any other sources of public finance used to fund the project and to quantify rather than estimate the private finance mobilized through and attributable to the RBF programme; and
- proactively manage the risk of double issuance of emission reduction credits by seeking declarations from project owners.

## Lessons learned from application to projects

To test the practicality and implications of many of the recommendations from this study, the various criteria for evaluating RBF priorities were applied to five diverse project types: $N_2O$ from nitric acid, energy efficient lighting, large-scale wind power, landfill gas flaring, and leak detection and repair from oil and gas infrastructure. The analysis of the projects supports the conclusions from our previous analysis. The standards of existing crediting mechanisms are generally suitable for RBF programmes targeting projects or programmes. Project owners in these sectors would be able to respond to the incentives from an RBF scheme, and emission reductions are a suitable indicator to measure progress for all of the selected project types. However, there are key differences between project types with regard to the likelihood of additionality, the incentives for project owners to continue abatement beyond the duration of the RBF programme, the regulatory framework and incentives for policy makers to introduce policies that ensure continued abatement, the potential for replication and innovation, and the risks for carbon lock-in.

## Further research needs

Both further practical experience and further research are needed to use RBF concepts for climate mitigation. We recommend that using crediting mechanisms is explored further by piloting credit purchases from a broader range of project types and sectors. This requires in-depth analysis of the characteristics of the sector and project types, and adaption of the programme design to these characteristics in order to achieve the intended results. We recommend further sector-specific research and road-testing on how RBF programmes could be designed to achieve their objectives and avoid unintended, adverse outcomes. In this context, an important aspect is to conduct further research on the level (projects, sectors, policies) at which mitigation action is most effectively pursued and quantified and the type of recipients (governments, intermediaries, plant operators) that are best able to respond to the incentives and achieve the long-term goals of the programme.

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