



Results-Based Finance in the Paris Era

Considerations to maximise impact

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Summary

In order to reach the goals of the Paris Agreement, it is essential to rapidly move from a zero-sum offsetting approach towards rapid transitions to decarbonise all emitting sectors. Though originally developed for offsetting, using aspects of carbon market mechanisms to deliver results-based finance can have an important role in climate change mitigation and climate finance mobilisation goals. Such finance can either go towards helping host countries achieve their NDCs or in order to create an overall climate benefit. Various aspects and infrastructure built for carbon markets can be used as a vehicle to deliver such results-based finance.

A key strength of using aspects of carbon market mechanisms for results-based climate finance is their ability, when properly implemented, to provide a unit that is quantified, monitored, reported, and verified in a relatively standard comparable metric – CO₂e. Further advantages include provision of the infrastructure to “crowdfund” mitigation projects by connecting multiple small donors with projects on the ground with some measure of transparency. Under a results-based payments scheme, the metric(s) could be broadened to include, for example, sustainable development criteria.

Using carbon markets for results-based climate finance however also faces a number of challenges and limitations, which vary somewhat depending on the country, kind of project, and use of units.

These include:

- Generally, the CO₂e metric leads to a focus on the cheapest mitigation options rather than otherwise inaccessible high hanging fruit that especially developing countries need to focus on in order to drive transformative change. Selling one’s cheapest mitigation options risks undermining current climate efforts as well as future ratcheted ambition.
- The fact that risks are primarily borne by the project developers creates a bias towards activities that will reliably deliver reductions in the near future and against smaller developers, community projects, and innovative but risky early stage technologies.
- Depending on the technology and methodology, the degree of accuracy associated with measuring “results” can come at a high transaction cost for baseline development, monitoring, reporting, verifying, and issuing credits.
- Projects that need a constant stream of revenue to continue their emission abatement activity may need more than one off disbursements of finance and have not always fared well with carbon market finance and associated market volatility.
- The ex-post financial incentive nature of results-based finance does not address challenges of additionality, and perverse incentives inherent in a comparison to a baseline approach.
- A metric based on tonnes of CO₂e reduced is not particularly well suited to support action in least developed countries that have few emissions to reduce, unless problematic assumptions such as “suppressed demand” are used to inflate baselines.
- Depending on the sustainable development goal and target, there are various approaches and challenges to measuring sustainable development. Although there is some movement to change this in voluntary markets, many projects with finance mobilised through carbon markets so far have targeted emission reductions with little to no sustainable development considerations, and sometimes even detrimental impacts.

Some of these challenges can be addressed. Results based finance providers, policy makers, carbon credit standards, emission project developers, and development practitioners can work both individually and collectively to come up with new solutions. Some of these are already being undertaken by various actors, including:

- Placing an emphasis on quality over quantity – including by focussing on specific regions and specific technologies that are most likely to build capacities and foster technology transfer rather than generally just going after the cheapest possible option.
- Opportunities to streamline and reduce transaction costs should be sought out. When credits are not used for offsetting, it may make sense to review if some of the aspects associated with offsetting such as strict and exact baseline setting and MRV costs are really necessary and to what extent finance may be better spent on taking action on the ground. Such steps should however be taken with caution as downplaying stringency requirements could be a potentially dangerous precedent, especially to ensure that RBF-designated credits are not counted as offsets to claim carbon neutrality.
- Providing longer term reliable finance rather than one off disbursements can increase stability and feasibility for projects that are dependent on ongoing finance to continue their emissions abatement activity.
- Shifting from rewarding to enabling – or mixing the two can be an important way to further ambition and impact. This can be done for instance by entering into partnerships with host countries to ensure the continuation of the abatement activity after a certain period of RBCF support.
- Further, other enabling measures such as loan or grant schemes could help to support preparatory measures in cases where such upfront costs present a significant barrier to project development.

At the same time, results-based finance through carbon market mechanisms is likely not the appropriate policy option for all technologies in all countries. For nascent technologies still in research and development, the risks associated with the uncertainty of a future payment is too high a barrier. For such technologies, grants are likely to be a more suitable form of finance. As technologies mature and gain market share, market rate loans or other financial instruments targeting specific barriers are more appropriate. Results based finance is best suited to a niche where a technology has been proven but is not yet mature and has not gained significant market penetration.

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Abbreviations

BMU	German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CO₂e	Carbon dioxide equivalent
ERPA	Emission Reduction Procurement Agreement
EUR	Euro
GCF	Green Climate Fund
GEF	Global Environment Facility
GHG	Greenhouse Gas Emissions
HFC	Hydrofluorocarbon
ICAO	International Civil Aviation Organization
IPCC	Intergovernmental Panel on Climate Change
ITMO	Internationally Transferred Mitigation Outcome
LDC	Least Developed Country
LTS	long-term low greenhouse gas emission development strategies
MRV	Monitoring Reporting and Verification
NAMA	Nationally Appropriate Mitigation Action
NDC	Nationally Determined Contribution
OECD	Organisation for Economic Cooperation and Development
PoA	Programme of Activity
RBCF	Results-based climate finance
RBF	Results-based finance
SDG	Sustainable Development Goal
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar

1 Introduction

Carbon market mechanisms in the context of the United Nations Framework Convention on Climate Change (UNFCCC) and specifically the Kyoto Protocol have primarily been used for offsetting or compensating. In other words, reducing in one place to allow for increased or continued emissions elsewhere. Because of the zero-sum nature of this approach, it can only play a limited and shrinking role in global climate change mitigation efforts if the temperature goals of the Paris Agreement are to be reached – a radical emission reduction of 45% carbon dioxide emissions by 2030, reaching net zero by about 2050, and reach net negative in the second half of this century. This will require rapid transitions from all emitting sectors (IPCC, 2018). However, carbon markets are not necessarily limited to zero-sum outcomes – approaches developed primarily for offsetting may still have a role to play to measure, report, verify the emission reduction impact of climate finance.

We understand results-based finance (RBF) to be a wider general term for modalities under which finance is disbursed upon achievement of predefined results often in the context of development finance. The concept dates back to at least 2005 and the Paris Declaration on Aid Effectiveness and the Accra Agenda for Action 2008 (Grittner, 2013). For example, the World Bank's Global Partnership for Results Based Approaches applies the concept to sectors as diverse as education, health, water and sanitation¹. Pereira and Villota (2012) find that political pressure on budget allocations in higher income countries has placed an increased focus on evidence that development aid has achieved results.

With regard to climate finance, the focus of international debate has primarily been on the developed countries' Copenhagen and Cancun commitments to annually mobilise at least \$100 billion USD for developing countries, including the proportions allocated to adaptation and mitigation; and how to account for various kinds of finance in the form of grants, concessional lending, guarantees or market rate lending. The issues of climate finance effectiveness and results-based climate finance (RBCF) are however clearly issues of debate on the international climate policy agenda (Nakhouda and Norman, 2014). For mitigation-related RBCF, payments are made ex-post based on ex-ante agreed results; these are often measured in terms of tonnes of emissions reduced or removed from the atmosphere, and are often verified by a third party (Warnecke *et al.*, 2015). As an ex-post measure, from the climate finance provider perspective, RBCF represents a subset of grant finance, which distinguishes it from other kinds of ex-ante finance in the form of technical assistance, grants, guarantees or concessional loans. This paper will focus primarily on RBCF channelled through carbon market mechanism(s) where emission credits are purchased to fund a project ex-post after delivery of results. While aspects of results based climate finance can be found in some concepts for supported Nationally Appropriate Mitigation Actions (NAMAs) and certain disbursements from the Green Climate Fund (GCF), methodologies to calculate baselines in these cases are generally less strict than for carbon markets where their zero sum nature makes environmental integrity more important.

This paper explores how past experience with carbon markets can inform future disbursement of RBCF. We start with a brief exploration of RBCF's potential role in the overall climate finance landscape, what limitations it faces, and what can be done to overcome these limitations with special attention paid to options to support climate finance flows to less developed countries. Further, this paper reviews a number of innovations in the voluntary carbon market that may help to address other limitations of carbon market based RBCF and at the same time contribute to the achievement of development goals with a focus on Least Developed Countries.

¹ See: <https://www.gprba.org/what-we-do>

2 Can RBCF play an important role in shifting the world towards low carbon climate resiliency?

Developed countries have generally attained their standard of living by following a development pathway based on burning fossil fuels, and to a large extent, developing countries are currently still following this development model. The OECD estimates that shifting the world's infrastructure to a system that avoids the worst impacts of climate change while achieving development goals globally will cost \$6.9 trillion USD of investment per year through 2030 (OECD; World Bank; UNEP, 2018). A clean pathway is not necessarily more expensive than a fossil fuelled development pathway – especially considering the staggering cost of responding to the impacts of climate change. Recent research finds that reaching the well below 2 °C or 1.5 °C goal is of particular interest for countries with large and vulnerable populations such as India, Indonesia, Nigeria and China (Wei *et al.*, 2020). But the financing challenge is large, none the less.

It is clear that innovative ways to mobilise these financial flows need to be found and scaled up in order to achieve the goals of the Paris Agreement and the Sustainable Development Goals (SDGs), and that both public and private finance has an important role to play. RBCF approaches and engagement in voluntary carbon markets on behalf of private companies and individuals can play a role, but based on existing experience, would benefit from a review and revision of their approach.

The use of the Clean Development Mechanism (CDM) and voluntary markets have increasingly drawn attention as an option to disburse climate finance especially around the end of the Kyoto Protocol's first commitment period which experienced a crash in market demand (CDM Policy Dialogue, 2012; Ghosh *et al.*, 2012; Warnecke *et al.*, 2013). A number of examples of government facilities with the objective to distribute climate finance through this channel can be found in Table 1. In the first two cases, the credits acquired through the fund are explicitly for climate finance and the Swedish and German governments have made it clear that acquired credits will be cancelled and not used towards a mitigation target. In the other examples, the extent to which the credits have been or may still be used for climate finance rather than a mitigation target is less clear which blurs the distinction between RBCF and “carbon finance”.

Table 1: Examples of Government Credit Purchase Facilities

Examples of Government Credit Purchase Facilities
Sweden's International Climate Investment Programme built on the Swedish Energy Agency's program to procure credits started in 2002. It was originally mandated to procure up to 40 million CERs for the 2013–2020 period, with CERs intended to be used partially for compliance purposes but in its Second Biennial Report under the UNFCCC, Sweden said it would not use the procured credits to fulfil a mitigation target (Sweden, 2015).
The Nitric Acid Climate Action Group ² was launched by the German government in 2015 in order to incentivize both pre-2020 climate action and long-term emission abatement in the nitric acid sector. Credits acquired through this initiative are cancelled and counted as climate finance, but not towards a climate mitigation target.
The Community Development Carbon Fund (CDCF), launched in 2003, is a public-private partnership-based carbon fund developed by the World Bank to support disadvantaged potential climate change mitigation activities to participate in market-based approaches.
Switzerland's Climate Cent Foundation (CCF) launched in 2005 was a public-private partnership which expects to procure approximately 20 million CERs for the 2013–2020 period, partially to be used for compliance towards Switzerland's 2020 Kyoto Protocol target.
The Norwegian Carbon Credit Procurement Programme (NEFCO) ³ was authorised by the Norwegian parliament in 2007 to procure up to 60 million CERs for the 2013–2020 period. The extent to which CERs should be used for compliance purposes has not yet been determined.
The Carbon Initiative for Development (Ci-Dev) ⁴ was launched by the World Bank in 2011 to support the participation of low-income countries in market-based approaches for climate change mitigation
The Pilot Auction Facility for Methane and Climate Change Mitigation (PAF) ⁵ launched in 2014 is operated by the World Bank, with the purpose to support the development of innovative market-based approaches for climate change mitigation projects. The facility has a total capitalisation target of USD 100 million.

In order to achieve the overall goals of the Paris Agreement, many developing countries have made it clear that their Nationally Determined Contributions (NDCs) to the Paris Agreement have been enabled by and build upon the developed countries' Copenhagen and Cancun commitment to mobilise at least \$100 billion USD annually by 2020 to help developing countries with climate mitigation and adaptation. To uphold the integrity of the commitments made under the UNFCCC, it is therefore important to achieve developed country mitigation and finance goals separately and not use carbon credit purchases for both climate finance mobilisation and climate mitigation targets (Schneider, Kollmuss and Lazarus, 2014). Although because there are ongoing disagreements about how to account for mobilised climate finance which has led to a wide variety of estimates, so far, results-based carbon finance is likely to have accounted for a small percentage of the at least 100 billion USD annual climate finance mobilisation goal. The UNFCC Standing Committee on Finance did not even specifically mention carbon market mechanisms in its 2018 Biennial Assessment and Overview

² For more information see: <http://www.nitricacidaction.org/>

³ For more information see: <https://www.nefco.org/fund-mobilisation/funds-managed-by-nefco/nefco-carbon-funds/>

⁴ For more information see: <https://www.ci-dev.org/>

⁵ For more information see: <https://www.pilotauctionfacility.org/>

of Climate Finance Flows (UNFCCC, 2018), although it did in the past⁶. RBCF may however offer an innovative and important niche role moving forward under the Paris Agreement.

In addition to using carbon market mechanisms to achieve international climate mitigation targets⁷ and separately as a way to distribute public climate finance, a growing “voluntary market” has emerged where private individuals and corporate actors buy and cancel emission reduction credits without a legally mandated compliance obligation or mitigation target. Forest Trends’ Ecosystem Marketplace finds that this market value grew to \$295 Million USD in 2018 up from \$111 Million USD in 2006 (Donofrio *et al.*, 2019) although this includes traded volume where credits may change hands multiple times. By comparison after marketing, brokerage, and transaction costs, only a portion of that finance actually ends up financing projects on the ground.

There are a variety of reasons that may motivate buyers in the voluntary market, but the main reason so far has been to voluntarily offset or compensate for the climate impact of their carbon footprint. One could argue that while the purchase and cancellation of emission reduction credits in the voluntary market is generally to meet a mitigation compensation goal, it is a voluntary goal and that it could be re-framed as a voluntary contribution to climate finance efforts if the company and its products are *not* marketed as “carbon neutral”. A number of organisations including the Gold Standard, and NewClimate Institute have started to promote an alternative “contribution” claim in various iterations (Gold Standard, 2017; Net Zero Initiative, 2019; WWF, 2019; NewClimate Institute, 2020), while some of these approaches could be considered a form of results based carbon finance. Though at the same time, an approach which foregoes the carbon neutrality claim could be provided through results-based finance, or flexible climate finance, potentially taking advantage of the ability of RBCF to help crowdsource finance for projects.

To the extent that RBCF flows through carbon markets, it remains a pertinent question if claims to the mitigation outcomes should stay with the country to help it achieve its NDC, or if a corresponding adjustment should be issued and the credit cancelled. Both could represent options for the delivery of RBCF through carbon markets but have different implications for the target host country. An overview, including a comparison with an offsetting approach can be found in Table 2.

⁶ See, for examples reports from 2013 and 2014.

⁷ Such as quantified emission reduction and limitation obligations (QELROs) under the Kyoto Protocol

Table 2: Overview of modalities for Offsetting, RBCF, and OMGE

Modality	Discussion of key characteristics
RBCF with resulting mitigation counted towards host country NDC	<ul style="list-style-type: none"> • This climate finance modality would not include the use of a corresponding adjustment • If counted as climate finance, no reductions should be used towards the achievement of a donor's mitigation targets otherwise this would be considered double counting (double purpose) • Both the donor and the recipient could this financial flow as climate finance • Unclear benefit for the climate overall as this depends on how the host country reacts to the received support
RBCF with corresponding adjustment applied and not counted towards either donor mitigation target nor host country NDC	<ul style="list-style-type: none"> • If not for any UNFCCC Party, airline, or voluntary market participant's mitigation target, this could be considered climate finance • Such finance would not be included in host country received finance considering the corresponding adjustment would therefore lead to a discrepancy between donors' accounting of finance mobilised and recipients' accounting of finance received • This modality would lead to an overall benefit for the climate and stands in contrast to the zero-sum nature of offsetting
Offsetting for the purpose of use towards a mitigation target	<ul style="list-style-type: none"> • Traditional offsetting where there is a claim of "carbon neutrality" or for use towards a mitigation target either an NDC, CORSIA, or a corporate target would require a corresponding adjustment • This financial flow should not be counted as climate finance • This modality is zero sum and does not lead to an overall benefit for the climate

The actual climate impact - whether the RBCF is considered as assistance to the host country's achievement of its NDC, or if a corresponding adjustment is made and the finance leads to a general benefit for the climate - may depend on a wide number of factors, many of which are likely to be out of the direct control of key stakeholders involved in the RBCF activity. These include the coverage of the host country's NDC, visibility of the RBCF project in the host country inventory, the ambition of the host country's NDC, the future ambition of the host country's NDC, and the host country's intention and effort to achieve its NDC (Fearneough *et al.*, 2020). Generally however, from the host country perspective, if the mobilised RBCF is to count as "climate finance" and towards the Copenhagen and Cancun commitment of developed countries of providing at least \$100 billion USD from 2020 to developing countries, the claim to the emission reduction should remain with the host country, no corresponding adjustment should be made. This may represent a slightly different administrative procedure than standard internationally transferred mitigation outcomes (ITMOs) from the perspective of the host country, which would normally otherwise make a corresponding adjustment.

Purchasing and cancelling credits with a corresponding adjustment and not using them towards any climate target could be considered climate finance and would lead to an overall benefit to the climate. However, because the project host country would not count either the finance nor the reduction towards its NDC, this would lead to a discrepancy between finance mobilised by developed countries and finance received by developing countries – an issue of some debate in the UNFCCC finance negotiations.

3 RBCF: advantages, challenges, solutions

Regardless of the source of the finance, be it either public RBCF or corporate or individual engagement through the voluntary market, it is important that the finance provider clarifies their rationale for why they want to provide the finance and make sure that the climate finance tool selected is the best tool to accomplish that goal. Depending on the finance provider, common motivations include: the general interest in reducing emissions and having those reductions quantified; or to contribute to transformative change in emission patterns. Still others are interested in mitigation action but are particularly interested in highlighting the other sustainable development co-benefits that an activity may be associated with – this is often highlighted in corporate reporting of the kinds of projects being supported.

Carbon markets and the delivery of RBCF and voluntary carbon market financial flows are often portrayed as something that can help achieve all of these objectives – while they can play an important role in the fight against climate change, they are not necessarily *the best* climate finance tool for each of these objectives in all circumstances. Depending on the main objective and the local context and development needs of the recipient of the climate finance, other climate finance delivery modes may have advantages, but past experience with carbon markets can still provide insight in how to inform design options to disburse finance.

In this section we discuss the advantages of using RBCF as a delivery modality for climate finance, what limitations it faces, and potential measures to overcome those limitations with a view to informing conclusions on a suitable role for RBF.

3.1 RBCF strengths

The main advantage of disbursing climate finance as RBCF is to have the climate impact of the finance quantified, monitored, reported, and verified in a standard comparable metric – tonnes of carbon dioxide equivalent (CO_{2e}) (Warnecke et al., 2015). To the extent that RBCF flows through the purchase and cancellation of emission reduction certificates from offset projects, this also provides an existing readily deployable international infrastructure of standards and methodologies, project developers, reporting procedures, verifiers, and registries to keep track of deployed RBCF. Such infrastructure providing an estimate of impact is likely particularly well suited to the interests of certain kinds of climate finance donors. Importantly this infrastructure can further help “crowdfund” mitigation projects by connecting multiple potential small donors of climate finance to projects on the ground with some measure of transparency. Without such infrastructure, there would likely be significant challenges for such small donors to collectively mobilise and fund larger mitigation projects internationally in other countries.

For mitigation project implementers, RBCF provides a strong incentive to deliver on a project’s mitigation objectives, as otherwise upfront capital invested in project development may not be recouped. This monitoring function of carbon market approaches can help foster enduring interventions when compared to one-off grants where initial results may peter out once the finance has been distributed and monitoring stopped (Warnecke *et al.*, 2015). For example, under the CDM, projects raised finance through the sale of credits based on monitoring for one period of ten years or two periods of seven years, with credits only issued ex-post.

3.2 RBCF limitations

RBCF has been identified in section 3.1 as a pragmatic approach that builds on existing processes and frameworks. However, RBCF entails a number of potential limitations, that may restrict its suitability for some types of activities:

Not originally optimised for high hanging fruit

Crediting mechanisms were originally designed with the overall rationale of targeting the cheapest emission reductions, with the assumption that it was most economically efficient to go after these emission reductions first. RBF more generally emphasises quantity over quality of results (Pearson, 2011). Since credited emission outcomes assume that a reduction of a tonne of GHG is the same as any other reduction of a tonne of GHG regardless of the technology and context, this represents a challenge for crediting mechanisms in targeting more expensive technologies – *the high-hanging fruit* – since these projects are likely to be more expensive on a per tonne basis.

Similarly, RBCF alone may not be able to reach potentially transformational “moon shot” technologies and activities that are in an early stage of development since investment in such activities is unlikely to result in immediately quantifiable emission reductions. RCBF entails a risk outsourcing to a third-party project developer that must invest their own money with the expectation of being reimbursed in the future. This means that especially smaller developers, community projects, etc. as well as innovative but risky early stage technologies will have important disadvantages compared to activities that will more reliably deliver reductions in the near future. Some of the most transformational and inaccessible technologies – which may be in the greatest need of support though not historically well financed due to high costs and uncertainty – may be at less mature stage of development and might not necessarily be able to immediately result in quantifiable emission reductions for credit issuance. Such technologies that remain unproven or immature today but may have high potential in the future are especially relevant for upscaled financial support, but these activities carry a risk of not reaching an implementation phase in the near future, or even not at all, and are therefore not necessarily able to generate the results that RBCF would require. Figure 1 in Section 3.4 shows that RBCF may have a role only in the later stages of research and development for new technologies and could continue as a climate finance tool while the technology is not yet common practice. Once common practice, the technology can be considered mature and support delivered through RBCF would no longer be additional.

High transaction costs

Significant transaction costs can be associated with the process of generating quantitative results in the form of carbon credits. Processes for baseline development, monitoring, reporting and verifying emission reduction activities and then issuing credits can add significant transaction costs to those emission reduction activities. This is common to both RBCF as well as RBF in other sectors (Pearson, 2011). These costs represent a significant upfront barrier for smaller projects in poorer countries (Spalding-Fecher and Michaelowa, 2013).

Through the evolution of carbon crediting mechanisms in the past decades, experiences gained, along with increasing economies of scale and a degree of competition between mechanisms, have helped to reduce the transaction costs associated with these processes. The average CER sale price on the open market between 2013 and 2019 has been well below EUR 1; those costs are likely to roughly reflect the costs of verification and issuance rather than abatement costs, since many of these credits are known to come from activities that are already running and do not need continued financial support to continue abatement (Warnecke, Day and Klein, 2015; Warnecke *et al.*, 2017; Fearnough *et al.*, 2018). The extent to which such transaction costs represent a significant disadvantage depends partially on the marginal abatement cost of the activity. For relatively low-cost mitigation activities, such transaction costs may be proportionally larger than for higher-cost mitigation activities, assuming

that the administrative efforts for MRV and issuance are less variable between mitigation activities than the costs of implementing those activities. This indicates that, unless such transaction costs can be overcome – which is highly dependent on the mitigation activity, RBCF may not necessarily be the most cost-effective option for scaling up low-cost activities.

Not always a sustainable financing model

A detailed survey analysis of the status of CDM projects found that depending on project type, finance delivered in return for credits did not always provide a model on which the activities could be sustained over the long-term, e.g. when due to the market link credit prices drop as a result of unbalanced supply and demand (Warnecke, Day and Klein, 2015). For some project types, even if the projects had been running for a long period of time and were nearing the end of their crediting periods, the GHG abatement activities were likely to cease as soon as credit revenues had dried up because they were depending on a constant ongoing stream of revenue rather than only having upfront investment costs. Project types most affected by this issue include household cookstove projects, industrial gas abatement projects, and methane avoidance projects from smallholder farms, amongst others (Warnecke *et al.*, 2017). RBCF delivered through one off purchases of credits might not be the most suitable form of finance for these types of activities unless other measures are taken to address the long-term sustainability.

Additionality challenges and potential for perverse incentives

Because RBCF provides a financial incentive to reduce emissions, this can also create the incentive to increase emissions in order to be paid to reduce them. This is also a phenomena for RBF more generally (Pereira and Villota, 2012); and specifically in the case of RBCF may occur on either the project or the broader national policy level.

On the project level, if revenue through RBCF are significantly higher than abatement costs this creates a perverse incentive to increase the emitting activity in order to be paid to mitigate it (UNFCCC, 2005b; Schneider, 2011; Schneider and Kollmuss, 2015). This is particularly apparent in the case of HFC-23 and SF6 abatement (Ibid) but could occur for various other project types.

Further, on a national level, the additionality and baselines of an activity are closely related to the climate policies of the given host country. On the national level, the Paris Agreement calls for countries to submit Nationally Determined Contributions at regular intervals, where each should reflect the country's highest possible ambition (Paris Agreement Article 4.3). If RBCF only pays for reductions that would not have happened anyway, this creates an incentive to be less ambitious and ensure that emissions happen in order to be paid to reduce them. On a methodology level, project developers interested in hosting carbon reduction projects often have to invest significant resources to propose methodologies for new project activity types. This investment is based on the expectation that the investment will be recouped through the sale of emission reduction credits developed under those methodologies. If a *transformation point* is reached for a certain emission reducing technology and the measure is no longer additional, methodologies for that technology or practice may become obsolete. Under the Kyoto Protocol, this was addressed by rules that froze the emission increasing policies (such as fossil fuel subsidies) considered in a baseline context considered by the CDM to those that were in force in 1997. For policies that promote technologies that reduce emissions (such as a feed-in-tariff), the policy context was limited to those in force at the time of the Marrakech Accords in 2001 (UNFCCC, 2005a). This limitation is a contributing factor to Cames *et al.* (2016) finding that 73% of the potential 2013-2020 CER supply has a low likelihood of being additional and where the emission reductions are not likely to have been over estimated.

Limitations for least developed countries (LDCs)

Although providers of RBF and voluntary buyers of carbon credits are often particularly eager to promote the sustainable development co-benefits of the emission reduction credits they buy, there are a number of limitations with regard to the effectiveness of emission reduction credits to benefit the poorest populations, such as those in least developed countries (LDCs). In very generalised terms, populations in LDCs often have the least emissions to reduce and are therefore disadvantaged in terms of attracting finance that is tied to the unit of tonnes of emissions reduced. Historic crediting mechanism approaches have faced considerable difficulties to encourage the development of new projects in LDCs and areas where economic activities are typically small-scale and distributed; for example in 2012, African countries accounted for less than 2% of all CDM credits, while only five countries, China, India, South Korea, Brazil and Mexico represented 93% of all credits (Shishlov and Belassen, 2012). And only China and India represented 70% of projects in 2014 (Michaelowa, Jember and Diagne, 2014). Flues (Flues, 2010) argued that the lack of institutional and technological development level of LDCs was a key determinant of their potential for the CDM, rapidly growing emerging economies have lots of emissions to reduce, while weaker countries without growth don't and would be better served by support, for example, from the Global Environment Facility. Such limitations for LDCs also mirror a large body of literature on the "absorption capacity" of international development aid more generally where the lack of existing structures sets a presents a barrier to a large scale up of funding for low income countries and LDCs (Bourguignon and Sundberg, 2007).

Along with various other reforms to try to reduce transaction costs, a number of carbon market mechanisms also started to consider "suppressed demand" when calculating baselines from around 2011 / 2012. In such programmes such as the CDM and Gold Standard, emission reductions from some technology types can be counted against a counter-factual baseline to account for an emissions level that would have been emitted if the population was richer. For example, water purification in LDCs, CDM Methodology AMS-III.AV.: Low greenhouse gas emitting water purification systems assumes that fossil fuel or non-renewable biomass would have been used to boil water for purification if the project is not carried out (UNFCCC, 2011). A number of investigations have however found that for example, in Kenya, rural populations do not boil their water and therefore such projects do not reduce emissions (Starr, 2011)⁸. In such places, project implementation therefore misrepresents emissions reductions and RBCF based on carbon markets is likely not a suitable approach to address development challenges. As argued by Carbon Market Watch (then CDM Watch) not every development project makes for a good carbon market mechanism project, and projects that do not clearly reduce or avoid emissions should not use inflated baselines to enable finance (Carbon Market Watch, 2011).

Challenge of upfront finance costs

Because RBCF pays for emission reductions ex-post, the modality relies on third parties to have access to upfront finance to implement emission reduction activities and then be reimbursed. Depending on the activity and the possibility that it will not lead to the expected emission reductions and or that the RBCF financing will not come through, this can come at a significant risk to project implementers, which make financing expensive. In such a case, projects will not be developed or transaction costs increase and RBCF will not be able to flow (Warnecke *et al.*, 2015).

⁸ Starr further questions if such projects also reduce diarrheal disease under real-world community conditions.

Lack of sustainable development

Although Article 12.2 of the Kyoto Protocol sets out that the “purpose of the clean development mechanism shall be to assist Parties not included in Annex I in achieving sustainable development”, because finance disbursement was contingent on emission reductions, sustainable development aspects were often neglected (Warnecke *et al.*, 2015). Indeed since the CDM’s launch of the voluntary SD Tool in 2014, project developers elected to use the tool for only 72 projects in total (UNFCCC, 2020). With the increased interest in co-benefits from the voluntary market, this may be changing: some voluntary market standards have started increased efforts to measure, report and verify sustainable development co-benefits delivered through carbon offset projects (NewClimate forthcoming).

3.3 Options to address limitations and the RBCF niche

Having discussed the advantages to the use of carbon markets to deliver RBCF (3.1) and a number of limitations from past experience (**Error! Reference source not found.**), in this section, we discuss options to address some of the limitations for future RBCF approaches going forward regardless of whether it comes from public RBCF programmes or voluntary action.

Emphasise quality over quantity

RBF typically places a focus on tonnes of emission reductions as the single key indicator, such activities may seem to be an efficient use of funds but also likely to prioritise quantity over quality. The quantity and price of an emission reduction becomes cheaper the more mature a technology is, which – all else being equal – will give emission “reductions” where the additionality is questionable an important price advantage over truly additional interventions if rules are not constantly updated to consider the actual situation on the ground, especially with regard to constantly ratcheted efforts in the context of countries NDCs. Under the Paris Agreement, donors providing finance through RBCF will need to consider this challenge and ensure that any finance support continues to reassess additionality regardless of the reform processes of international carbon mechanism institutions and standards.

Further, there may be contexts in which it is beneficial to further complement quantity consideration with other additional selection criteria to provide more information to support providers on the activity and its impact, in order to better distinguish between activities. Especially for public RBCF, Warnecke *et al.* (2015) point out that purchase programmes or facilities can be designed to focus on specific regions or technologies.

Additional indicators related to the level of technology maturity, market penetration, and/or market readiness for the activity in the context, as well as the sustainable development impacts (see section 4), could provide more nuanced information about the impacts of the projects. This might help to channel more finance to projects in less developed countries, and to novel or “high-hanging fruit” activities. These activities can be understood as new projects for technologies and practices that are highly ambitious and beyond reasonable reach of unilateral host country action (NewClimate Institute, 2018). Such projects are likely more expensive, at a less mature stage of development, and are more clearly and justifiably additional even with ambitious NDCs in host countries. At the same time, depending on the technology some mitigation activities with future potential to support sectoral transformation, may not necessarily be able to result in immediately quantifiable emission reductions so while worthy of support, their full impact may not be quantifiable with carbon market MRV approaches.

Reduce transaction costs

The introduction of so called CDM Programmes of Activities (PoA's) where multiple small-scale activities are bundled together for one single approval decision reduced transaction costs. The larger CDM market however crashed after 2012 which also reduced funding for PoAs. This may also provide some insight for RBCF going forward in particular whether further streamlining is possible in the case that credits are only used for RBF but not *transferred* for use towards other targets.

As previously mentioned, transaction costs including the ease of MRV is highly dependent on the mitigation activity in question. Therefore, another measure introduced to reduce transaction costs was the introduction of positive lists for certain project types, where considered automatically additional instead of having them go through project by project evaluation and testing. Some of these positive lists undergo regular review to examine their ongoing validity and Cames et al. recommend that such review be expanded (Cames *et al.*, 2016). This is important not only for carbon markets in general, but also for RBCF.

The rules and procedures developed in existing crediting mechanisms originally meant to be particularly stringent given the particularly high importance of environmental integrity and certainty in the quantification of emission reduction outcomes; if credits are being used to offset other emissions and ensure compliance with targets, the net outcome can be an increase in GHG emissions if the integrity of the credit is not completely assured. In many cases the rules and procedures were undermined by assumptions and a lack of ability to keep up with technological progression. To some extent, in the case of RBCF, where credits are not used to offset or towards targets for compliance purposes, it might be considered whether the degree of stringency required for the objective remains the same as that of existing crediting mechanisms, or if MRV processes could be further streamlined at the potential expense of emission reduction certainty.

Similarly, it could be considered whether some aspects of existing credit issuance, verification and transfer process are partially redundant in the case that credits are used differently. While these may be legitimate considerations, they should be approached very cautiously; downplaying stringency requirements for environmental integrity could be a potentially dangerous precedent, and there is also no certainty that RBF-designated credits would not be misused and counted as offsets to claim carbon neutrality, which can be harmful even if in a voluntary context.

Provide longer term certainty

While many mitigation projects only need upfront financing and they can generate their own revenue such as the sale of a product or service such as renewable energy, or savings through a reduction in energy consumption, some projects are vulnerable to discontinuing their abatement activity without ongoing finance (Warnecke *et al.*, 2017). For such vulnerable projects, it is important that RBCF includes commitments for longer term financial support for example through specially designed and long-term emission reduction purchase agreements (ERPAs).

Shift from rewarding to enabling

Section 3.1 set out various risks that RBCF approaches could entail, such as perverse incentives for host country unilateral action and ambition raising, in order to qualify activities for potential ITMO revenues. Where support is beyond the reasonable reach of unilateral action on the part of the host country, such as for many emission reduction measures for LDCs, RBCF donors could negotiate agreements with host countries that domestic policy measures will be introduced to ensure the continuation of the abatement activity after a certain period of RBCF support. This can help further sectoral transformation. For example, the Nitric Acid Climate Action Group launched by Germany's Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), partially uses RBF to provide support for nitrous oxide emission abatement at nitric acid production plants around

the world up to 2023, on the pre-condition that host countries will take over responsibility for the continuation of abatement from 2024 (NACAG Secretariat, 2020). Such a policy development obligation can help to overcome some of the sustainability issues associated with credited support that have identified for some project types under the CDM as well as other crediting mechanisms, as identified in section **Error! Reference source not found.** However, the extent to which support providers can hold host country governments to such commitments is unclear; the approach does not necessarily adjust the economic incentives for the continuation of abatement in the long-run but rather relies upon political commitment, for which there is not necessarily a guarantee of compliance. At the same time, according to Pereira and Villota (2012) host country ownership is increased when the responsibility for designing the programme and future measures is shared with the donor government.

Complement with other enabling measures

RBCF in the future, as in the past requires a number of complementing enabling measures to get up and running (Warnecke *et al.*, 2015). To the extent that upfront costs for project development present a challenge for potential project developers, RBCF efforts could consider loan or grant schemes to support project development. In an effort to try and address the imbalance in the regional distribution of projects, especially the lack of finance in LDCs, the UNFCCC, the United Nations Office for Project Services (UNOPS), and the United Nations Environment Programme (UNEP) Risoe Centre launched a CDM loan scheme in 2012 to “cover development of project design documents; validation by a designated operational entity; registration of the project; and monitoring and verification of emission reductions” in LDCs and countries with fewer than 10 registered CDM projects (UNFCCC, 2012). Such an approach could complement RBCF efforts to specifically address the challenges of upfront costs for developing projects under Article 6 of the Paris Agreement.

Some of the existing capacity and governance built for the CDM and other voluntary carbon market standards can be built upon, but these will require reform to make them fit for the Paris era. Developing countries will further require support to be able to consider and plan next steps after discontinuation of RBCF support in order to scale up to larger scale sectoral interventions on both sectoral and national levels. Clearly detailed involvement of stakeholders in NDC update processes and the development of Long-Term Strategies (LTS) can help potential host countries steer RBCF to areas most needed.

3.4 The RBCF niche

The outlined potential strengths of RBCF, the historical limitations, and potential options to overcome some of the limitations, suggest that its role in the overall climate finance landscape is best suited to support new technologies that are late in the research and development stage to upscale on their way towards market maturity.

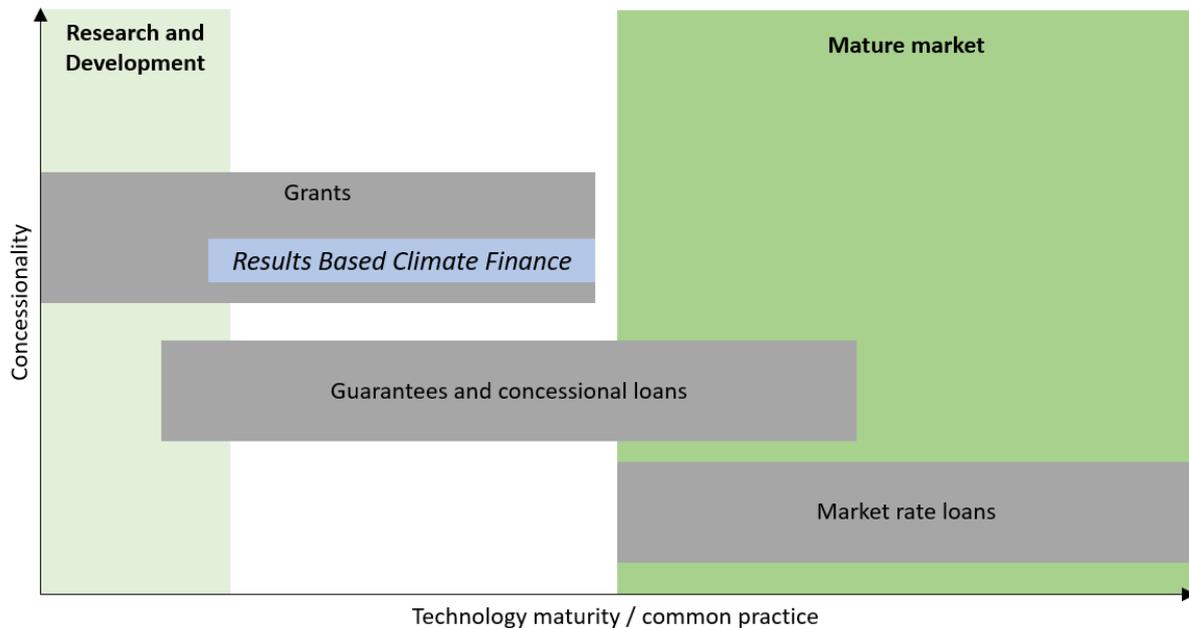


Figure 1: RBCF Niche

Because of the uncertainty regarding the success of unproven technologies in the research and development stage, project developers are likely loth to take the risk that developing projects with such technologies do not generate the expected emission reductions, at least in the very early stages. Specific facilities targeting high hanging fruit could be considered to support late stage research and development technologies on a pilot basis. At the same time as a technology matures, increases market penetration, and becomes common practice, the additionality and therefore the actual “results” of the mobilised finance decreases. Approaching mature markets, concessional loans may be used for technologies that still need support for uptake, but where additionality is increasingly uncertain. Finally, when an abatement technology reaches maturity market rate loans can then be used to provide continued climate finance.

It is worth noting that this niche has not necessarily been the role that carbon markets and climate finance channelled through carbon markets has played in the past. In the case of the CDM, for example, a lack of review and updating of baselines and methodologies has led to the issuance of a large number of emission credits from mature technologies that had become common practice in their local context or in other words, a large portion of finance flowed to activities that would have likely happened anyway or where estimations of reductions were overestimated, sometimes intentionally, such as in the case of “suppressed demand” assumptions (Cames *et al.*, 2016).

4 Carbon market lessons for sustainable development RBF

As discussed, there are various limitations of RBCF that pose challenges for low-income countries compared to emerging economies, including transaction costs and the availability of upfront financing for project developers, each of which can be addressed to some extent through bundling of PoAs and loan schemes. However, one important limitation for carbon market RBCF is that it is ill suited to distribute finance when there are few or no emissions to reduce, such as is often the case in LDCs, in particular. In many cases for LDCs, the pressing need for finance in this context is not in order to reduce emissions that are not occurring and may not occur - but rather to support sustainable development objectives.

While non-carbon market forms of development and climate finance will need to play the largest role in helping LDCs, some carbon market innovations can help inform RBF interventions for LDCs including in using the voluntary market approach to crowd source finance for projects that may have a mitigation benefit as well, even if it is not possible to quantify. Examples of such initiatives include the African Development Bank's Adaptation Benefit Mechanism (ABM)⁹ or the Gold Standard's Water Benefit Certificates¹⁰. With respect to the ABM, proposed pilots range from solar powered irrigation pumps to help farmers overcome unreliable rainfall to coastal protection through afforestation with mangrove trees. Such projects could have a mitigation benefit, for example if one were able to accurately measure the (temporarily) stored carbon in the mangrove tree biomass. However, in this case, the quantitative metric is not measured in terms of reduced or captured CO₂, but rather on more readily verified variables such as acres of crops no longer dependent on rain fed agriculture, or miles of coastline protected from erosion, depending on the individual project and context.

Although such innovative interventions may have potential, such an approach is however not a panacea. A great deal of research is available for policy makers to draw upon to inform the decision to use RBF as opposed to other kinds of climate or development finance as a tool, and how to design such schemes in detail. Grittner (2013) for example points out that other forms of non-climate RBF may also have limitations and create perverse incentives. Mathonnat and Pélissier (2017) find that RBF, while a promising option for finance disbursement – is not a silver bullet, and should be based on a theory of change with incentives related to the specificity of every context.

5 Conclusions

Carbon markets can only play a limited role in global climate change efforts compatible with a 1.5 - 2 °C pathway when used for offsetting but can also serve as a channel for disbursing climate finance

Carbon market mechanisms have primarily been used for the purpose of offsetting emissions – that is, to allow for increased or continued emissions in one place by compensating for them in another. Used as an offset, carbon market mechanisms and the structures developed for them have a limited role to play in a world where rapid and far-reaching decarbonisation is necessary in all sectors in order to reach the temperature goals of the Paris Agreement. Carbon market mechanisms, or potentially the infrastructure built for them do not necessarily have to perform that function – instead, they can be used to fulfil an MRV function to quantify the GHG reduction impact of climate finance as RBCF. If not traded as credits, it may be worth considering what institutions and infrastructure of carbon markets need to perform an MRV function in a context of RBCF.

⁹ See: <https://www.afdb.org/en/topics-and-sectors/initiatives-partnerships/adaptation-benefit-mechanism-abm>

¹⁰ See: <https://www.goldstandard.org/articles/gold-standard-water-benefit-certificates>

RBCF could go towards helping countries achieve their NDCs or an overall climate benefit

For the purposes of climate finance targets, it is important to avoid double counting between mitigation and finance goals - if emission credits are used towards a claim of carbon neutrality or towards a credit purchaser's mitigation goals this should not be counted as climate finance. If not counted towards a support provider's mitigation targets, RBCF could be delivered either with or without host country corresponding adjustments. Without a host country corresponding adjustment, claim to the emission reductions would remain with the host country and would clearly contribute to the \$100 Billion USD climate finance floor target that developed countries committed to mobilise for developing countries on an annual basis from 2020. If a corresponding adjustment is made and the units are cancelled instead of being used towards a mitigation target, this would represent an overall climate benefit, could also be considered climate finance, but would also contribute to a discrepancy between funds mobilised by developed countries and funds received by developing countries.

RBCF may be attractive to funders looking to quantify impact and as an innovative option to mobilise climate finance through crowd sourcing

RBCF can play an important niche role especially for funders particularly interested in having a quantification of the impact of the funding that they have mobilised. Further, carbon markets can also serve a crowd funding intermediary function allowing private individuals and companies to come together and fund projects— though here it is important that the claim associated with such finance is not that of carbon neutrality, but that of a climate finance contribution. Further, because RBCF is distributed ex-post – in other words, after emission reductions have taken place and been verified – it provides an important incentive to ensure interventions continue, in contrast to one off grant finance, the impact of which may not continue to be tracked in the years after disbursement.

The historical experience of international carbon market mechanisms demonstrated various limitations, some of which can be addressed through RBCF design

Depending on the local context and mitigation options, using carbon markets to disburse RBCF has a number of limitations. These include a general focus on the cheapest mitigation options rather than necessarily the most needed to promote sectoral transitions; high transaction costs for baseline development and MRV that could otherwise have gone towards promoting more actual mitigation activity; and an inappropriate channel for development finance in the poorest countries where there are few emissions to reduce.

Some of these limitations can be addressed – RBCF can be designed to target specific technology interventions and combine such support with host country commitments to implement policies to promote the mitigating technology after a certain period of time. Here, depending on the intervention, further options to reduce transaction costs may be considered, and a cost benefit analysis could be conducted for the specific intervention with regard to the extent that an exact quantification of the GHG mitigation impact is really needed considering the baseline calculation and MRV transaction costs that are associated with such quantification. Reducing transaction costs may help target some mitigation opportunities in lower income countries where the cost of baseline development and MRV made such abatement opportunities unattractive.

RBCF is best suited to a niche role to support adoption of new technologies on their way to technological maturity

The strengths, limitations, and the various opportunities to address these limitations means that RBCF is best suited and can have an important role to play in a niche to support new technologies that are no longer in the research and development stage to upscale on their way towards market maturity. Because of the inherent risk of very new technologies in the research and development stage, grant finance not channelled through RBCF is likely better suited to supporting where the success of the

technology or its mitigation potential is unclear at the present time. Similarly, RBCF is not an appropriate tool to promote more mature abatement options where additionality is more questionable, which are likely better supported through concessional loans that approach market rates as the technology matures and market penetration increases.

Current innovations in voluntary carbon markets can inform RBF approaches not based on GHG reductions

RBCF channelled through carbon markets may not be the most appropriate tool for contexts where there are little to no existing emissions to reduce. Approaches taken to inflate baselines in order to pay for reductions may not paint a reasonable picture of the GHG emission mitigation “result” that RBCF is meant to portray. In such cases, even if RBCF’s role as a channel for development finance is limited, innovations and experience from quantifying sustainable development co-benefits in carbon markets may play a role for other RBF not based on emission reductions, although the project activities being supported may in some cases have GHG mitigation co-benefits.

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