



INTEGRATING RBCF INTO FINANCIAL PRODUCTS

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Pengwern Associates

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Abbreviations and Acronyms

BRD	Development Bank of Rwanda
DFI	Development financing institution
DLI	Disbursement linked indicator
DPF	Development policy financing
DPL	Development policy loan
ESG	Environmental, social and governance
FI	Financial intermediary
FIL	Financial intermediary lending
GEF	Global Environment Facility
IADB	Inter-American Development Bank
IBRD	International Bank of Reconstruction and Development
ICMA	International Capital Market Association
IDA	International Development Association
IEG	Independent Evaluation Group
IPF	Investment project financing
KPI	Key performance indicator
MDB	Multilateral development bank
MIGA	Multilateral Investment Guarantee Agency
MRV	Monitoring, reporting and verification
MSMEs	Micro- small- and medium-sized enterprises
NDC	Nationally determined contribution
NPV	Net present value
PBG	Policy-based guarantee
PCR	Partial credit guarantee
PforR	Program for results
PRG	Partial risk guarantee
RBCF	Results-based climate finance
SCALE	Scaling Climate Action by Lowering Emissions
SDGs	Sustainable Development Goals
SLB	Sustainability-linked bond
SPT	Sustainability performance target
TA	Technical assistance
TCAF	Transformative Carbon Asset Facility
UN	United Nations
UNDP	United Nations Development Programme
UNFCCC	UN Framework Convention on Climate Change
UNICEF	United Nations Children's Fund
WB	World Bank

Summary for policymakers

This summary presents the key findings of a Transformative Carbon Asset Facility (TCAF) knowledge report exploring new modalities for results-based climate finance (RBCF). TCAF supports large-scale and transformative greenhouse gas (GHG) mitigation programs in developing countries through results-based climate finance (RBCF) and carbon market transactions for verified emission reductions. The report explores how RBCF could be integrated into existing funding and financing instruments of public-sector focused DFIs to help mobilize capital and accelerate NDC implementation. It builds on earlier work by TCAF exploring how carbon crediting approaches could help green the financial system.

RBCF involves disbursing grant payments to governments and other entities based on the achievement of climate outcomes - in particular, verified emission reductions. RBCF can strengthen incentives for partner governments to meet their NDCs where progress is lagging and to raise ambition. It can also help build capacity among stakeholders to document, verify and report on emission reductions. This can build confidence that progress towards national and global emission reduction targets is being robustly measured and facilitate access to the evolving international carbon market landscape (both Article 6 and voluntary carbon markets).

The innovation explored in this report is the integration of RBCF into financing and funding instruments and related financing advice. To date, most RBCF payments have been made either in parallel to, or entirely separate from, instruments that provide or mobilize capital. This has sometimes led to the perception that the use of RBCF involves a trade-off: it may be possible to use RBCF to strengthen incentives to reduce emissions, but it is not a modality that supports capital mobilization. However, as explored in this report, there are several ways in which financial benefits tied to the delivery of emission reductions could be integrated into the terms of upfront funding and financing instruments, or advice on such instruments. This offers the prospect of both mobilizing additional capital and strengthening incentives to reduce emissions. It may also save transaction costs and strengthen political support for NDC implementation among country stakeholders.

This report assesses whether the integration of donor-funded RBCF into DFI instruments and engagements is an effective way to use limited concessional resources to deliver mitigation outcomes. To provide a comprehensive assessment, it compares this to a range of alternative modalities. These include the instrument without a grant-funded RBCF, the parallel disbursement of RBCF, and the use of donor funding to make the instrument more concessional (but not on a results basis).

The analysis examines five use cases, covering the full range of the project and policy-related financing, Treasury funding activities, and advice on sovereign debt issuance by client countries. Specifically, it examines the integration of RBCF into:

- Financial intermediary lending (Use case 1)
- Development policy lending¹ (Use case 2)
- Policy-based guarantees (Use case 3)
- Treasury funding instruments, specifically outcome bonds (Use case 4)
- Support for sovereign issuance of a sustainability-linked bonds (Use case 5)

¹ The insights from this Use Case may also be relevant for other non-intermediated DFI operational lending modalities. However, to provide focus, the use-case discussion focuses specifically on development policy lending.

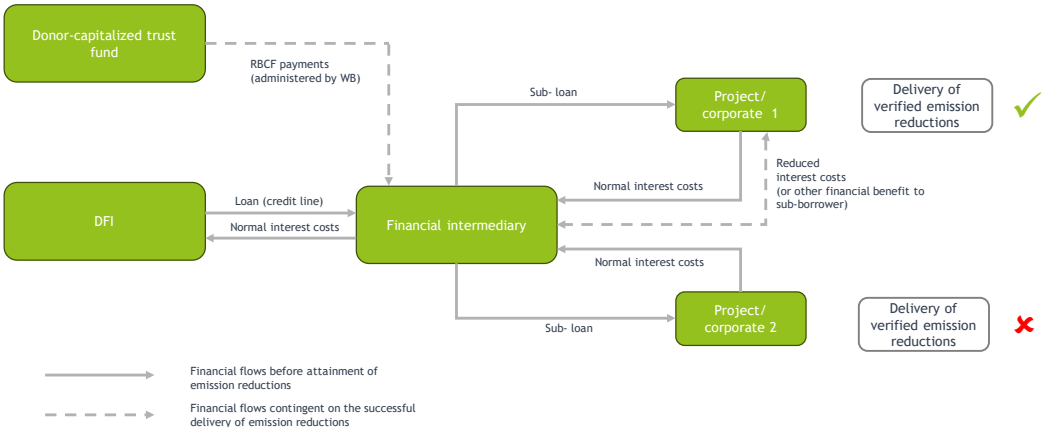
The report is aimed at stakeholders from developing country governments, World Bank (and other DFIs) staff and the trust fund and donor contributor community that could use their resources to support the development of integrated RBCF instruments. Further work will need to address more concrete quantification and the development of more specific designs.

Use case 1: Financing Intermediary Lending

DFI’s often provide loans (or other forms of capital) to a public-sector financial intermediary (FI) such as a national development bank. The FI will blend this capital with its own to lend to sub-borrowers that undertake emission reduction activities, typically focused on a particular technology e.g. energy efficiency or low-carbon waste treatment. The sub-borrowers also commit a portion of their existing capital to the project.

RBCF is integrated into this instrument by providing payments to the FI proportional to the verified emission reductions achieved by each sub-borrower. A portion of these RBCF payments is retained by the FI and the remainder is allocated to the sub-loan borrowers. The benefit to the sub-borrowers may only be passed on if the emission reductions are achieved; this implies that the risk of achieving the emission reductions lies mainly with the sub-borrowers. Alternatively, the FI may offer better terms to borrowers in anticipation of receiving RBCF payments, implying that the risk of achieving emission reductions is shared between the FI and the sub-borrowers. Figure ES1 illustrates the model. The focus on incentivizing emission reductions across a common set of technologies means that the integrated RBCF model bears some resemblance to programmatic crediting.

Figure ES1 Integrating RBCF into Financial Intermediary Lending



This model holds a lot of potential. A common challenge with conventional financial intermediary lending is that the on-lending is not fully aligned to the activities intended. RBCF aligns incentives, both financially and through its signaling role. This makes it more likely that the instrument will bring about long-term change by increasing familiarity with lending to/borrowing for unfamiliar low-carbon technologies. The model is also attractive because it addresses two challenges associated with the standalone provision of RBCF:

- it provides a low-cost way for DFIs to use RBCF to incentivize emission reductions where opportunities are spread across a large number of relatively small actors;
- it helps overcome access to finance constraints among these actors.

Identifying the best contexts to use this model is critical. Gaming risks can only be addressed by (the expectation of) strong MRV capacity at the sub-borrower level. Further, the provision of grants to state-owned FIs, even if results-based, may distort local credit markets. This implies the instrument requires a careful diagnosis of the local credit market prior to its

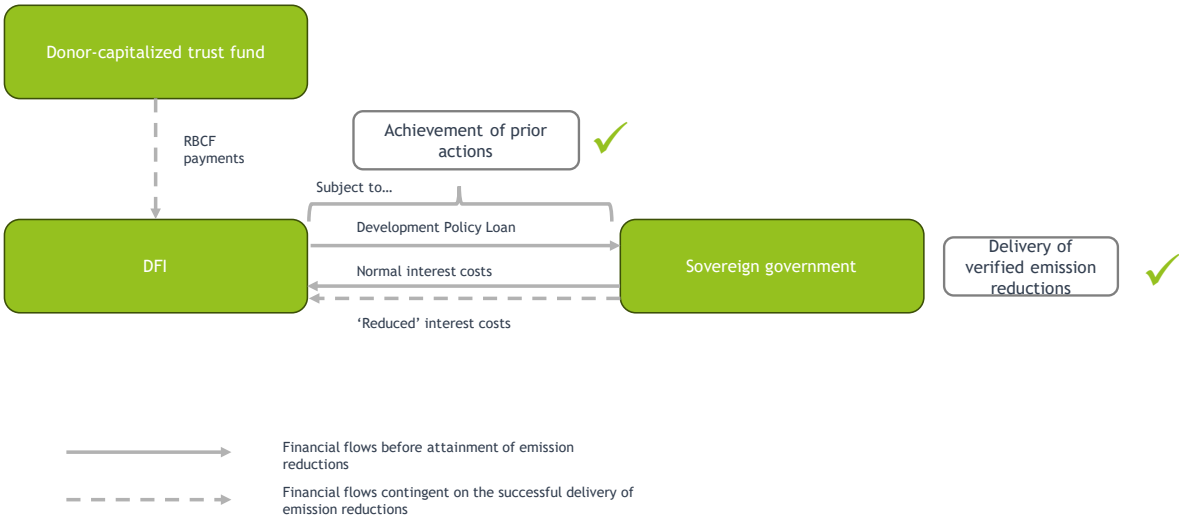
introduction (or, alternatively, some DFIs may be able to extend the instrument to all qualified domestic banks). The instrument should only be used where there is confidence that project-level emission reductions will add up to national reductions.

Use case 2: Development Policy Lending (DPL)

There is growing interest in using DPL to support climate mitigation objectives. This involves DFIs providing loans to support a set of policy and institutional actions with defined links to climate mitigation. Loan disbursement is linked to the successful completion of prior actions, with finance disbursed to the general budget. DPL can play a critical role in supporting the policy and institutional changes needed to achieve long-term and ambitious emission reductions.

RBCF is integrated into this instrument by identifying either a broad package of sectoral reforms or a specific policy that requires a DPL and that can deliver significant emission reductions. Once the DPL is disbursed, the quantity of emission reductions achieved by the reform determines whether, and by how much, an interest rate reduction is applied to the DFI’s loan: larger emission reductions result in a larger interest rate discount. RBCF is used to cover the cost of the interest rate reduction, implying that RBCF in this use case has some similarities to either sectoral or policy crediting, depending on its application. Figure ES2 illustrates.

Figure ES2 Integrating RBCF into Development Policy Lending



This model reinforces the incentives provided by the prior actions within DPLs and provides a longer-term incentive to achieve/maintain a low-carbon development path, including through persisting with difficult policy reforms. In addition, depending on the sectoral or country context, the changed policy or institutional landscape - for example, the removal of fossil fuel subsidies or the establishment of a national carbon budgeting body - will provide stronger incentives for private sector financing and implementation of mitigation actions. Channeling the loan/interest rate reduction through the Ministry of Finance should help coordinate a whole-of-government response to achieve emissions reductions.

The key issues to be addressed in this model relate to the transaction costs of monitoring, reporting and verifying emission reductions, as well as detailed design issues. These will be most valuable to cover/address when political economy considerations suggest that long-term commitment to NDC achievement may be in question.

Use case 3: Policy-based guarantees

Policy-based guarantees (PBGs) protect private investors against the risk of a sovereign borrower defaulting on its debt service obligations once a package of policy reforms has been agreed. They can be an effective tool for attracting private financing to public budgets, while strengthening government commitment to emissions-reducing reforms. For example, a PBG could support a DFI engagement program to implement fiscal policy reforms that target subsidies and tax incentives for fossil fuel consumption.

RBCF integration can work through ongoing support to the costs of a DFI guarantee on sovereign borrowing as long as agreed policies remain on track, and (partly) in proportion to the delivery of verified emission reductions associated with the reform. This implies that RBCF integration in this use-case is broadly equivalent to policy crediting. Trust fund resources could also support MRV capacity related to facilitate the verification of emission reductions attributable to the reform.

In countries where guarantees could be relevant to open capital market access, this form of RBCF integration could be a powerful tool. Especially in middle-income countries, additional budgetary resources raised on the back of guarantees could be allocated to climate change mitigation policies, possibly with complementary DFI support. In addition, the implementation of the agreed policy reforms would encourage greater private sector investment in low-carbon activities.

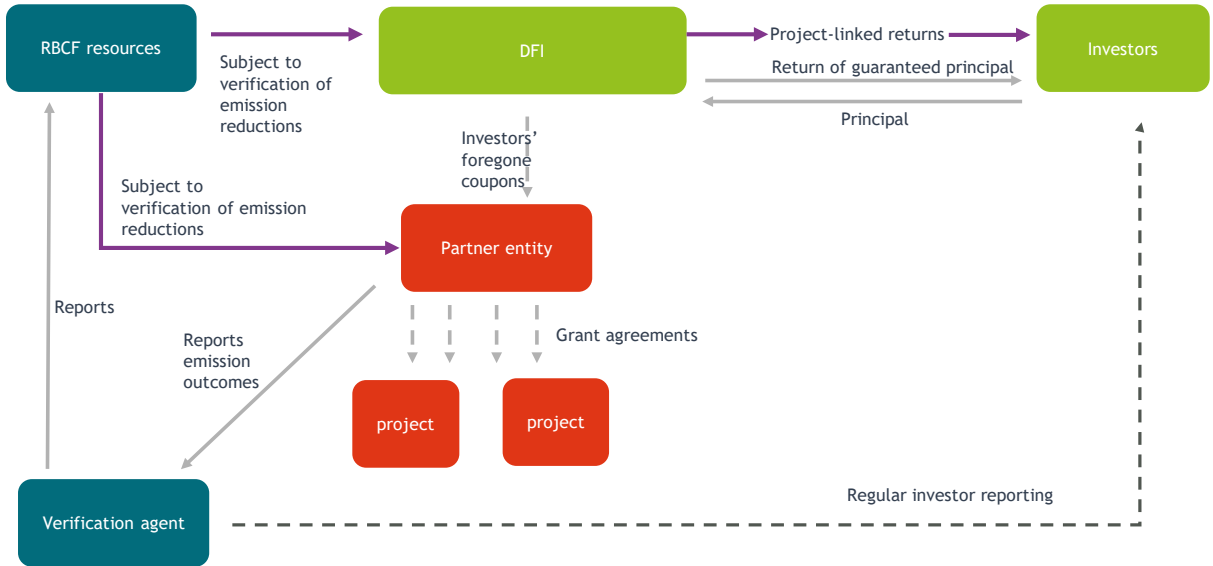
The application of this instrument will need to be carefully targeted. It will be most effective for countries with sufficient debt-bearing capacity, and where reforms agreed with DFIs will improve macroeconomic and financial stability in a way that is not yet recognized in commercial credit quality assessments. Moreover, the size and structure of the RBCF discount, in particular the balance between providing support for the introduction of reforms as opposed to the verified emission reductions it delivers, would need to be considered carefully. The use of the RBCF-integrated instrument could be combined with a (re-)assessment of the appropriate treatment of guarantees on DFI financing space to encourage a broader uptake of the instrument by client countries.

Use case 4: Outcome bonds

Outcome bonds are a recent innovation, with the World Bank one of the foremost pioneers. They involve the World Bank (or equivalent institution) issuing principal-protected bonds to mainstream investors. Investors forego interest payments which are capitalized and made available to finance projects that are expected to generate sustainability impact in low- or middle-income countries. Investors receive a return in the form of performance payments based on the extent to which the expected sustainability impact has been achieved. A recent bond was linked to the delivery of carbon credits. In effect, the instrument uses the World Bank's (or another institution's) borrowing program to provide capital to projects in countries that may otherwise have difficult accessing international markets, and possibly to very granular projects.

RBCF could play a role in scaling up this instrument. Whereas previous outcome bonds have relied on the commercial carbon credit market to monetize emission reductions, RBCF could be used to pay for verified emission reductions. Private impact investors would still be the providers of capital and play their usual monitoring role. Figure ES3 illustrates.

Figure ES3 Integrating RBCF into Outcome Bonds



The model could help scale up the instrument and attract additional investors. The trust fund would be a very credible off-taker and could commit to a fixed price. This could expand the pool of investors interested in the instrument. RBCF integration would also address the risk in the current instrument of credits being used to offset emissions reductions that would otherwise be realized.

However, outcome bonds are relatively complex instruments that are limited in the capital they mobilize. The capital provided is limited to the present value of the periodic coupon payments that investors forego. The model also requires strong local partners and a credible verification agent.

Use case 5: Sovereign sustainability-linked bonds

Sovereign sustainability-linked bonds (SLBs) link the debt service costs of a bond to the achievement of a sustainability outcome at a given point in time. Because these instruments do not require the issuing government to account for spending on specific projects or types of spending, the proceeds of the bond can be used within general budget revenues like any other financing operation. This is a key attraction compared to sovereign green bonds. At the same time, the potential change in service costs provides an incentive to achieve sustainability outcomes. Chile and Uruguay have already raised significant capital through this instrument, and an IDA credit enhancement helped the Rwanda Development Bank issue such a bond in 2023.

Two inter-linked challenges have made wider use of this type of bond difficult. First, investors find it difficult to assess policy commitments. Second, investors appear unwilling to accept substantial interest rate discounts that could provide a strong incentive for successfully delivering sustainability outcomes.

Integrating complementary RBCF payments into the SLB structure into the advice that DFIs give on issuing these instruments could help increase the private sector capital that SLBs mobilize. In an already defined SLB that has an emission reduction test, RBCF payments would be made using the SLB's methodology for assessing emission reductions. These could be made either for emission reductions achieved before the test point, at the test point, or (so long as the emission reduction target in the test point is satisfied) for emission reductions achieved after the test point for the remainder of the bond's maturity. If the test point relates to a national-level emissions KPI, this would be similar to jurisdictional crediting.

This engagement would help address the two barriers to SLB scale up. First, the involvement of a DFI and RBCF providers would lend credibility to any targets in the SLB. For example, the World Bank has already published ESG metrics and designed a baseline scenario assessment framework that can help assess target ambition. The provision of MRV capacity would also help to meet the expectations of institutional investors. Second, the issuer's expectation of RBCF payments would allow it to offer investors a smaller step-down or a more ambitious target. Either or both would increase the attractiveness of the bond issuance to prospective investors.

However, it would be difficult to RBCF providers to shape the design of RBCF integration in this use case. A clear drawback would be that RBCF providers could only engage with the government once the structuring of the commercial bond, including of the nature and timing of targets, is well advanced.

Conclusion

The five use cases explored in this report demonstrate that there is a significant opportunity to integrate RBCF into the range of financing and funding instruments used by DFIs, and the financial advice they provide. While the context of the use cases differs significantly, all demonstrate that integrating RBCF can:

- strengthen incentives to deliver emission reductions
- while helping to ensure that the capital that is needed to respond to these incentives is available. Indeed, RBCF integration can often help mobilize additional capital.

The former is a particularly compelling rationale for using RBCF rather than other forms of donor-funded upfront concessionality. The latter benefit contrasts with the stand-alone provision of RBCF, where there is often concern that the RBCF recipient will not be able to access/mobilize capital. Table ES1 summarizes the key features of each use case.

However, the integration of RBCF in use cases such as those presented in this report will require several changes to current practice, as well as careful design. Some of the most important of these include the following:

- Recognition that middle-income countries will be prominent users of integrated RBCF solutions. Some of the opportunities to integrate RBCF in a way that can help mobilize large amounts of capital for emissions reductions lie in those instruments that are linked to international capital markets, such as policy-based guarantees (Use Case 3) and sustainability-linked bonds (Use Case 5). These instruments will be used predominantly by middle-income countries.
- The need for careful design to avoid market distortion. While RBCF provides attractive incentives for emission reductions, it still involves the allocation of grants. In cases where these grant payments are channeled into product and capital markets, there will be concerns that they may distort competition within these markets. Among the use cases considered in this report, this is likely to be most pronounced in the context of lending by financial intermediaries (Use Case 1).
- The integration of trust-fund provided RBCF into the operations and engagement of DFIs will require close harmonization between the processes and requirements of the trust fund and those associated with the underlying World Bank instrument or engagement. Without this harmonization, there is a risk that the transaction cost savings that RBCF integration potentially offers, especially to client countries, could be lost.

Table ES1 Summary of RBCF integration use cases

What is the model for integrating RBCF?		What are the expected benefits?	Key risks/challenges
<i>RBCF integrated into financing products</i>			
RBCF integrated into financial intermediary lending	RBCF payments to FI directly proportional to the ERs achieved at project level by sub-loan borrowers. Portion of the (expected) RBCF passed on to sub-loan borrowers either before or after the delivery of ERs. Akin to project/programmatic crediting.	Align incentives between DFI, FI and borrowers. Incentivize ERs among large number of diffuse actors, while ensuring these actors have access to finance.	Risk of distorting lending markets through grant payments to (state-owned) FI. Need for robust MRV capacity to avoid gaming. Need to focus on projects where risk of emission leakage is low.
RBCF integrated into development policy lending	DPL issued following completion of prior actions (as with conventional instrument) Extent of ERs delivered at sector or policy level determines interest rate reduction RBCF covers cost of interest rate reduction. Akin to sectoral or policy crediting.	Sustain incentives for institutional or policy change that deliver ERs for duration of loan with (typically) knock-on impacts for private sector investment and financing. Involvement of MoF allows for whole-of-government response to incentives.	Some increase in transaction costs for MRV of emission reductions.
RBCF integrated into policy-based guarantees	Country taking out a mitigation-relevant PBG receives RBCF payments to offset guarantee cost so long as reforms are on track and/or proportional to ERs delivered. Akin to policy crediting.	Opens up capital market access and improves financing terms leading to additional public resources allocated to mitigation policies. Policy reforms and (possible) lower cost of capital increases private sector low-carbon investment.	Verification of emission reductions will raise transaction costs and reduce clarity of the value of RBCF to the client government.
<i>RBCF integrated into funding instruments</i>			
RBCF integrated into outcome bond	RBCF used to pay for emission reductions delivered by projects/programs supported by outcome bond (through purchase and retirement of ER credits). Akin to project/programmatic crediting.	Outcome bond investors perceive lower risk from bond structure, increasing investor take up, allowing more capital to reach projects/programs.	High transaction costs/difficulties in mobilizing large amounts of capital of underlying structure persist.
<i>RBCF integrated into advisory</i>			
RBCF integrated into SLB advice	RBCF paid to sovereign issuing SLB with a step-down structure, using SLB structure for assessing ERs. Payments made either ahead, at same time, or after test point. Akin to sovereign crediting.	Increased investor uptake of SLB though (i) enhanced credibility in SLB targets and ER assessment and/or (ii) RBCF payments allowing issuer to offer smaller step-down and/or more ambitious target (iii) strengthened government incentives.	The SLB structure would define the outcomes rewarded by the trust fund and their timing.

1. Introduction

1.1. The context for grant-based climate finance

The global stocktake of national climate plans released by the United Nations Framework Convention on Climate Change (UNFCCC) ahead of COP28 once again found that climate mitigation plans in most countries remain insufficient. Current Nationally Determined Contributions (NDCs) imply that global emissions will peak this decade but only decline marginally by 2030 relative to 2019 levels. This falls well short of the needed emission reductions of 43% needed over this period to stay within the targeted path for 1.5 degrees Celsius by the end of the century and avoid the worst impact of climate change (UNFCCC 2023).

One of the main reasons for the difficulty of reducing emissions in line with the Paris Agreement targets is the challenge of financing the necessary upfront investments, particularly in emerging markets and developing economies (EMDEs). The technical report accompanying the global stocktake identifies that the investment needs associated with mitigation activities in the NDCs of developing countries amounts to at least \$2.2 trillion in the period to 2030² and further notes that ‘developing country regions have the largest investment gaps compared with historical trends to achieving climate scenarios in line with the Paris Agreement’ (UNFCCC 2022). Higher growth, population increases, and the ongoing use of fossil-fuel technologies underline the need to redouble efforts on greenhouse gas emission reductions within EMDEs.

Looking specifically at the World Bank, several initiatives foreshadow an increased use or redesign of World Bank instruments to provide incentives for the setting and delivery of ambitious NDCs. The World Bank ‘Roadmap’, which informs the ongoing redesign of the Bank’s mission, places the realization of global public goods center stage, alongside poverty reduction. Within this ongoing agenda, the Bank is examining country prioritization, the toolbox of financing instruments, and the more effective and targeted use of concessionality and trust funds, including in middle-income countries.³ It notes that:

“Today, developing countries face enormous challenges to meet their climate targets and transition to low carbon economies. Climate action requires financing at significant scale, and constrained public resources alone will not be enough to provide the funding required to meet this challenge. High levels of debt and low levels of grant-based climate resources compound this problem. [...] Key to this effort will be identifying options for creating partnerships that are integrated fully within the World Bank Group’s operations, helping amplify concessional finance which, combined with providing capacity building support, will help countries achieve their

² This is based only on those NDCs with costed mitigation and adaptation needs and is also lower than the estimates derived from Biennial Update Reports and National Communications for which mitigation investment needs exceed \$5 trillion.

³ A fund for global public goods already augments lending operations.

development objectives” (World Bank 2022b).

Other DFIs are or will need to consider similar issues.

The need to explore this agenda was echoed by the Independent Expert Group on the strengthening of the multilateral development banks established under India’s G20 Presidency, also known as the ‘triple agenda’. It called for a more active use of MDB financial instruments in climate mitigation and a more streamlined use of concessional funds, to be channeled primarily through the MDBs (G20 Independent Experts Group 2023).

1.2. A possible application of results-based climate finance

Results-based climate finance (RBCF) involves providing grant payments, which are sourced from donors, according to the achievement of climate outcomes - most notably verified emission reductions. This has already played an important role in facilities like the Transformative Carbon Asset Facility (TCAF). In its 2019 capital increase, the World Bank also set up a fund for global public goods is intended to support clients in integrating global challenges, such as climate change, into their development strategies.

At present, RBCF accounts for only a minor part of the climate finance provided or mobilized by the multilateral development banks (MDBs). The latest Joint Multilateral Development Bank Climate Finance tracking reports shows that just 3.4% of both total MDB climate finance and MDB mitigation climate finance is provided as RBCF (European Investment Bank 2023).

Until now, most applications and analysis of RBCF have focused on its provision as a standalone stream of payments made upon the delivery of results. In these scenarios, upfront financing needs for projects need to be met through the conventional suite of DFI financing instruments (or by finance provided by other actors).

TCAF is now exploring the integration of RBCF in the established financial products offered by DFIs to client countries, as well as in other activities, such as funding. These alternative modalities might help mobilize additional capital, build capacity throughout the financial system, and more directly engage Ministries of Finance and other government stakeholders in emission reduction efforts. The central focus of this report is to explore some of these alternative modalities, and consider the advantages and disadvantages that they might offer when targeting climate mitigation outcomes.⁴

1.3. Outline of the report

The purpose of this project is to explore in detail the consistent integration of RBCF in public sector DFI financial instruments. It examines five use cases where RBCF could be

⁴ Additional issues, such as distortion of competition and the importance of minimum concessionality, are raised when considering integrating RBCF into the private sector activities of DFIs.

introduced into financial instruments, why this may be desirable, and the risks and challenges that need to be considered. This will help to provide guidance on the inclusion of RBCF.

Following this introduction, the rest of the report is structured as follows. Section 2 sets the scene with a rationale for RBCF and a selection of those use cases that will be examined in detail. Section 3, which forms the bulk of the report, then sets out a methodology that guides the assessment of the five use cases. For each use case, the analysis broadly follows the same approach: how the financial instrument has worked to date including in delivering emission reductions; how RBCF could be integrated into the instrument and the impacts this might have; how incentives would change if, instead, RBCF was delivered separately towards the same ends and for the same beneficiaries; and, finally, how a one-off grant or other type of upfront concessionality, compares to the integrated RBCF model. Section 4 concludes with a summary of the five use cases and discussion of the potential and challenges that are common to the five use cases. An Annex provides more detail about the Theory of Change associated with each use case.

2. Selecting financial instruments suitable for the integration of RBCF

Disbursing grants in relation to results is a long-established concept in development finance. In public sector programs, it is an approach that harnesses several interlinked theories of how aid programs can be effective: it provides governments with a direct budgetary incentive to deliver and adapt policy priorities; it makes stakeholders accountable for outcomes; results become more transparent within the local administration with the attention of officials drawn to these results; and, finally, recipients are given greater discretion and find the most efficient way towards desired outcomes (Perakis and Savedoff 2015).

Specifically when it comes to climate mitigation outcomes (emission reductions), there are two main rationales and benefits of using results-based payments i.e. RBCF (World Bank 2017):

- A first rationale suggests that RBCF aligns incentives between donor and the recipient of the funds. The client government, left to its own devices, may have insufficient incentives to deliver on its NDC. By contrast, with RBCF the recipient agrees or recommits to these targets and then bears some financial risk for non-delivery of results. This rationale would point to a long-term misalignment of incentives between donors and recipient governments. There is prima facie evidence for this: many NDC commitments that countries made since the Paris Agreement were conditional, in part based on the provision of financial support.
- The second rationale is more technical and points to the need to create capacity to deliver, track and verify emission reductions. This is related to support for policy implementation, market creation and the infrastructure required for monitoring, reporting and verification (MRV). Following the RBCF program, and based on the capacity building it supports, the client country may be better positioned to engage in the carbon markets.

There are in principle a wide range of options for integrating RBCF into the funding and financing instruments of DFIs. In terms of financial instruments, RBCF could be integrated into DFI financing instruments, such as investment project financing (to different types of publicly guaranteed entities) or development policy financing and program-for-results lending (World Bank 2024b). There are also options for integrating RBCF into funding operations, including those funding operations such as outcome bonds that help directly mobilize capital into specific projects. Finally, DFIs also provide financial advice to sovereign governments and related institutions, and through this, can possibly supporting the use of trust fund resources .

Three recent flagship World Bank projects underline the potential for RBCF integration:

- A development policy loan provided by the World Bank to the government of Uruguay offers the prospect of lower interest repayments if the country is able to reduce the methane-intensity of its livestock (World Bank 2023f). In future instances, the cost of providing any future interest rate reduction could in principle be covered by RBCF.

- In the Emission Reduction Linked Bond in Vietnam a part of the interest payments which investors in IBRD bonds would normally expect were foregone and converted into upfront capital for a third-party water purifier project in Vietnam. In this example, the investor returns are determined by carbon credits that the water purifier project generates under a carbon market transaction (World Bank 2023b). However, in other cases, the returns received by investors in the outcome bond could be covered by RBCF (or RBCF could be used to purchase the credits).
- The World Bank provided a credit enhancement to the Development Bank of Rwanda and its issue of a sustainability-linked bond, thereby leveraging private investors through IDA resources (World Bank 2023e). Many sovereign issuers are examining the potential benefits and time-path of funding costs of sustainability-linked bonds. RBCF could be used to strengthen the incentives associated with these types of instruments.

Four criteria were used to narrow down the focus of the analysis of integrated RBCF. The most interesting use cases will be those where integrated RBCF has the potential to:

- deliver emissions reductions that are credibly verified, and which are additional and permanent;
- support capacity building efforts that sustain further emission reductions;
- be applicable in a wide range of different country and sectoral contexts;
- mobilize additional private sector capital or facilitate loans that would not otherwise have taken place.

Based on these criteria, five potential use cases for the integration of RBCF were selected:

1. the provision of a credit line to a financial intermediary such as a national development bank, for on-lending to activities that generate emission reductions
2. the provision of a development policy loan (DPL) operation that seeks to achieve emission reductions
3. the provision of a policy-based guarantee
4. the issuance of an outcome-based bond related to specific projects or activities that deliver emission reductions
5. advice or facilitation of the issuance of a sovereign sustainability-linked bond.

While these use cases are largely explored in the context of World Bank activities, as noted above, they could also be applicable for other DFIs.

A range of design questions and other issues that arise when considering the integration of RBCF. These are independent of the specific use case but represent issues where the optimal approach may differ from when grants are used in conventional development programming, or

only arise when considering RBCF. Box 1 introduces some of these issues.

Box 1 Key issues when designing RBCF integration in other financial instruments

A critical question concerns the type of countries in which grant-based RBCF should be introduced. The allocation of grants will need to comply with relevant operational guidelines on concessionality and trust fund guidelines on country eligibility. Conventionally, grants would be primarily deployed in low-income countries where the ability to access capital markets is severely hampered by poverty, institutional capacity and debt-bearing capacity. However, the grants used in RBCF are setting a price at which verified emission reductions are ‘bought’ by the trust fund. This extra incentive may help overcome institutional and policy constraints in low-income countries. At the same time, mitigation subsidies in low-income countries typically have to be larger for the same reduction in emissions, given that the cost of capital is higher (Kenny 2023b). Consequently, there is growing recognition that grants targeted specifically at delivering emission reductions are justified and effective in middle income countries, which are large emitters and where the local private sector and policy environment is often more conducive to ambitious climate mitigation. Moreover, these countries are re-entering the sovereign debt markets and RBCF could be highly effective in mobilizing additional international institutional investors.

A further question relates to the value at which the RBCF incentive is set. The implicit carbon price will need to be calibrated given the local context to ensure effectiveness. It should take account of whether the country has a domestic carbon price and/or whether there is engagement in international carbon markets. Past interventions showed a huge variation in the implicit price of carbon (Judén and Mitchell 2021). The RBCF valuation will be a particular concern where DFIs target private sector entities through its counterparts in the public sector, such as national development banks. As a principle, RBCF payments should close financial gaps in project implementation avoiding overpayment and unjustified windfalls.

3. Review of the selected use cases

This section reviews the case for the inclusion of RBCF in five established financial instruments and funding activities. These already target a wide range of climate mitigation outcomes within government policies and the activities of individual public sector institutions, with many also impacting private sector practices. The question is whether pairing these activities with RBCF can help better achieve climate-related outcomes, specifically emission reductions.

In assessing the case for the inclusion of RBCF in this section, the analysis proceeds along broadly similar steps in all five cases⁵. Each case first sets out how the instrument is currently used, also referencing recent cases. It briefly explores the extent to which it is delivering climate mitigation objectives. It then sets out how RBCF could be integrated and tackles some of the key design questions that will arise. This RBCF-integrated product is then compared with several alternatives:

- the standard (or ‘plain vanilla’⁶) application of the product;
- the standard application of the product with the parallel disbursement of RBCF funds;
- a further alternative where the disbursement of donor trust funds is embedded in the standard product as an upfront grant or other concessionality which has the same value to the recipient as the expected net present value of the RBCF payments.

In undertaking the comparison between the integrated RBCF product and the various alternatives, the analysis is guided by the following six criteria:

- Country incentives (especially in the government) for NDC delivery and increased ambition.
- Country ownership, especially whether the instrument design can be expected to generate broad-based and lasting support within all key government departments.
- Whether the design will help address any capacity constraints in public institutions and in the private sector, including related to MRV.
- The likely impact on up-front mobilization of capital for mitigation efforts including both from domestic resources and private foreign investors.
- The impact on local private sector practices in adopting low-carbon technologies, their replicability and durability.
- Transaction costs.

Each section concludes with a summary of the key advantages and risks of the integrated RBCF product and when it may be most suitable. The annex provides more detail concerning the ‘theory of change’ of each use case.

⁵ In some use cases, the analysis departs slightly from this structure as some alternatives are not feasible in the use case.

⁶ The term ‘plain-vanilla’ is only used to distinguish the RBCF-integrated product with the product as currently used. In practice, the existing instrument explored in each use case is often already innovative by comparison to wider market practice.

3.1. Funding mitigation outcomes: financial intermediary lending

Modalities at a glance

- *A DFI extends a loan (or provides another form of capital) to a public-sector financial intermediary (FI) such as a National Development Bank. The National Development Bank blends this capital with its own to make loans to sub-borrowers undertaking emission reduction activities using a particular technology e.g. energy efficiency, low-carbon waste treatment. The sub-borrowers also commit some of their existing capital to the project.*
- *RBCF is provided to the FI according to the verified emission reductions achieved by each sub-borrower multiplied by a pre-agreed carbon price.*
- *Some proportion of these RBCF payments are retained by the FI with the remainder allocated to the sub-loan borrowers. The benefit to sub-borrowers may be passed through only upon achievement of the emission reductions; implying emission reduction delivery risk resides mainly with them. Alternatively, the FI provides better terms to borrowers in anticipation of the receipt of RBCF payments, implying emission reduction delivery risk is shared between FI and sub-borrower.*
- *The model provides a practical way of using RBCF to incentivize a large number of diffuse emission reduction opportunities, while also allowing the DFI to mobilize additional capital towards these opportunities.*
- *However, it relies on robust MRV capacity and a careful diagnosis of market conditions to reduce the risk of distorting lending markets.*

3.1.1. Existing formats and track record

Public-sector DFIs can provide capital (typically loans in the form of credit lines, but also grants or equity) to publicly owned financial intermediaries (FIs) - most obviously national development banks (NDBs) - to achieve development outcomes. The FI uses this additional capital to provide sub-loans for specific activities. The intention may either be that the portfolio of sub-loans is directed towards a specific use of proceeds, or the FI may have the flexibility to use the capital towards any activities aligned with its overall mandate. The capital may also be accompanied with complementary technical assistance (TA) to support the financial institution in identifying and appraising projects. In this operation, the FI will also typically be required to establish a ring-fenced facility for managing the capital. This will both be the focus for any TA and give additional assurance around fiduciary risks.

DFI loans to financial institutions to support mitigation have tended to focus on specific activities such as energy efficiency. For example, over the period 2008-2018, the World Bank extended 12 loans to FIs for energy efficiency, accounting for around \$3bn of lending. This covered countries such as China, Turkiye, Vietnam, Jamaica and Ethiopia, with a focus on middle-income countries (see further below) (World Bank 2018). On occasion, the instrument has also been used to target climate outcomes in other sectors. For example, in 2022, a \$500m loan was approved to Banco do Brazil to on-lend to companies with credible mitigation plans, with an expectation that many of these beneficiaries will be micro-, small and medium-sized

enterprises (MSMEs) MSMEs in agribusiness supply chains (World Bank 2022a).⁷

This product can relieve credit constraints among many relatively small entities. In these contexts, the provision of individual loans from a DFI to each transaction would be prohibitively costly. The provision of loan finance to an FI can overcome this constraint. When financial intermediary loans (FILs) are targeted at specific sectors, such as energy efficiency, it allows the FI to learn more about that lending opportunity - for example, risk profiles, cashflows - and to develop standardized procedures to reduce transaction costs. It is typically expected that this learning will mean that the FI will continue to lend to that specific sector after the DFI has withdrawn. A further attractive feature of the product is its potential to leverage additional capital: the participating FI will combine the DFI capital with a portion of its own balance sheet resources, and it will require the sub-loan beneficiary to contribute into individual projects from its existing balance sheet.

Previous evaluations of the World Bank’s FILs have found that they can deliver effective development outcomes, but they are also subject to several challenges. A 2019 review exploring different ways in which the World Bank supported small and medium-sized enterprises found that, of the different financial instruments that the Bank could use, projects using lines of credit to financial intermediaries, had higher success ratings than other instruments (Independent Evaluation Group World Bank 2019)⁸. Likewise, a review of the provision of credit lines for energy efficiency lending found that they can provide ‘dramatic results’ - by addressing perceptions of high technical and financial risks, lack of liquidity, inadequate expertise and capacity and high transaction costs (World Bank 2018). However, evaluations and other reviews have also identified challenges or limitations associated with the instrument, including (Independent Evaluation Group World Bank 2020; World Bank 2018):

- Narrow applicability: FIL requires financially strong and highly capacitated financial institutions and is not well-suited for addressing wider policy and systemic issues that may be holding back investment in a sector.
- Difficulty in ensuring targeting: FIs often do not allocate sub-loans to the types of customers intended when the instrument is designed. For example, evaluations found that the use of FIL *‘to ensure sustained outreach to small and rural enterprises was difficult’*.
- Problems with allocating capital to public sector institutions: in particular, a concern that working through state-owned FIs can lead to a *‘risk of political capture, a deterioration of loan quality, and nonoptimal allocation of resources’*.
- Slow disbursement: this appears to be particularly problematic when the FI does not have prior experience working with the World Bank (the same would also likely apply for other DFIs).

3.1.2. Model for integrating RBCF

RBCF could be introduced into FIL through a mechanism in which RBCF payments,

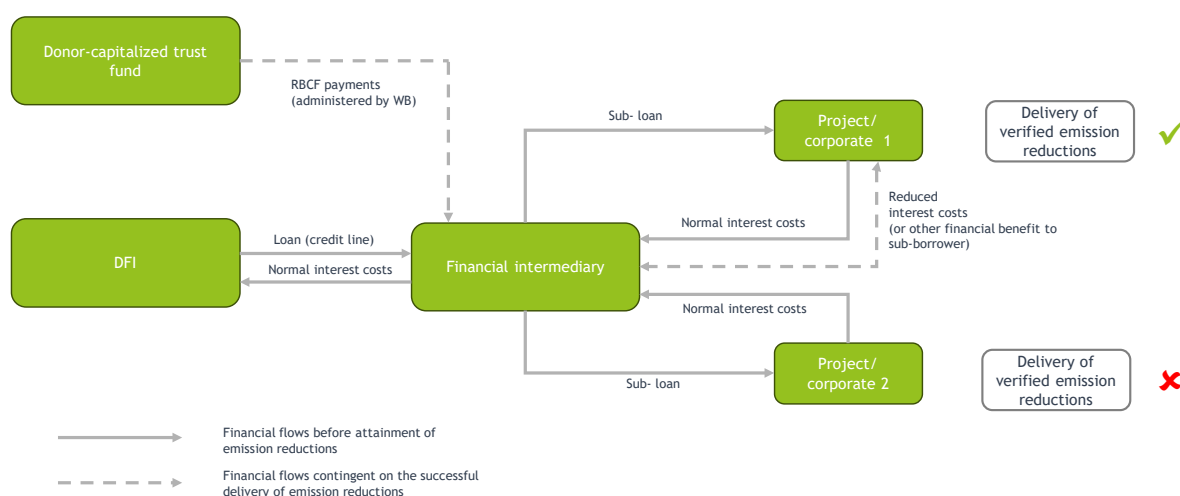
⁷ A particular feature of this Banco de Brazil project is that the on-lending will be in the form of a sustainability linked loan. However, this is not intrinsic to the design of the instrument.

⁸ The same finding also applied to the IFC’s operations.

ultimately sourced from donors, are made to the FI according to the emission reductions performance of the FI's sub-borrowers. The FI would then pass on some of this financial benefit to sub-borrowers.

Figure 1 illustrates the model. The DFI would extend a credit line to an FI. In turn, that FI would extend loans to specific projects or corporates (in the simplified example shown in Figure 1, there are only two sub loans). The activities financed by these sub-loans would be monitored for the verified emission reductions they deliver. The emission reduction performance of the sub-borrowers would determine the extent to which the FI receives RBCF payments from the trust fund. The FI would then pass on some of these benefits to those sub-loan borrowers that contributed to the delivery of the emission reductions (in Figure 1, this is project/corporate 1, but not project/corporate 2).

Figure 1: Integrating RBCF into financial intermediary lending



This model would be easiest to administer in cases where the expected emission reductions were delivered by broadly the same technologies. This would simplify and enhance the transparency concerning the MRV of emission reductions. It would also align with a frequent objective of FIL in supporting FIs to become more familiar with a particular set of (mitigation) technologies that offer strong (emission reduction) potential but which are unfamiliar, and hence treated as risky, by the FI. The focus on a common set of technologies means that, in this model RBCF is akin to programmatic crediting in a carbon market transaction, with the financial intermediary acting as the Coordinating/Managing Entity, but with RBCF replacing revenues from carbon credit sales.

Two of the most important design issues to consider in relation to this instrument are:

- How to determine the relationship between the emission reductions achieved by the sub-loans and the RBCF payments received by the FI?
- How the (expected) receipt of RBCF payments are passed onto the sub-loan beneficiaries?

The most attractive model for the relationship between the emission reductions achieved by the sub-loans and the RBCF payments would be to link every ton of verified ERs to the

RBCF payment received by the FI. This would be an arrangement where RBCF most closely resembled a shadow carbon price and would provide a continuous incentive to deliver emission reductions. Other options - such as setting tiers (i.e. gold, silver, bronze) and then paying the FI different amounts according to which tier the sum of annual emission reductions met - could be simpler to understand but would risk creating threshold effects where the extent to which there is an incentive to achieve emission reduction in one project could be higher or lower depending on the performance of other projects.

There are three main options through which the RBCF payments might be passed on to sub-loan beneficiaries. For each option, the details would need to be negotiated between the FI, DFI and Trust Fund donors prior to the launch of the instrument/program to give clarity and confidence to stakeholders.

- *Pass through arrangements.* Under this approach, some of the RBCF payment would be retained by the financial intermediary for it to have an incentive to seek out financing opportunities with high emission reduction potential. However, much of the RBCF payments would be passed on directly to the sub-loan beneficiaries, most likely as a ‘bonus payment’ administered to the FI. This implies that most of the risk associated with generating emission reductions would be allocated to the sub-loan borrower who would only see a financial benefit if they delivered emission reductions. The FI would only take a small amount of emission reduction deliver risk (equivalent to the share of the RBCF payment retained by the FI if emission reductions are achieved).
- *Sustainability-linked loan (SLL) structures.* Under this model, the FI would offer a SLL to sub-borrowers, where the sub-borrowers would benefit from a step-down in the interest rate on their loan if a threshold level of emission reductions was achieved at a pre-specified test point. The RBCF payments to the FI would help cover the cost of this step-down. This implies a difference between the way in which the FI would receive RBCF payments - annually, according to the emission reductions achieved across the portfolio of sub-loans - and the arrangements for passing these RBCF payments on to the sub-borrowers - through an assessment at a one-off point within the SLL structure. The carbon delivery risk in this arrangement would depend on the pricing arrangements for the SLL. Typically, FIs offering SLLs with interest rate step-downs set higher interest rates before the test point to compensate for the possibility that they will receive only lower interest payments after the test point. This can make SLLs unattractive from a borrower's perspective. If the expectation of RBCF payments meant that the FI did not set a higher interest rate on the SLL before the test point, then the FI would be taking on some of the risk of delivering the emission reduction. However, if the FI continued to set a higher initial interest rate for the SLL (than for normal loans) and used the RBCF payments to offer a deeper interest rate reduction if the test point conditions were met, then most of the carbon delivery risk would lie with the sub-borrower.
- *Upfront reduction in interest rate on standard loan.* Under this arrangement, the FI, on the expectation that it will receive RBCF payments in the future, would offer a lower interest rate on sub-loans from the outset. This arrangement would imply significant emission reduction delivery risk would be allocated to the FI.

3.1.3. Comparison to the ‘plain vanilla’ product

Advantages

Compared to the ‘plain vanilla’ FI loan, the provision of RBCF in this way will provide stronger incentives for the financial intermediary to finance and the sub-loan beneficiaries to undertake emission reduction activities aligned to, or exceeding the ambition of, the country’s NDC. From the perspective of both actors, the RBCF reduces the perceived costs of undertaking the activity. However, there are two different mechanisms through which incentives may be changed:

- Before a project is undertaken, the effective net present value (NPV) of the financing costs of lending to, and borrowing for, an emission reduction project will be lowered. The FI will know that there is a reasonable probability that they will receive RBCF payments in relation to its sub-loans, some of which it will retain. Likewise, at the very least, the sub-loan borrower will know that, it will receive a financial benefit in the future if its project delivers emission reductions. In addition, the greater the extent to which the risk of delivering emission reductions is transferred to the FI, the lower the borrower’s upfront interest rates should be. This should feed into the appraisal processes that both actors undertake and can be expected to lead to some projects proceeding that would not have been done without the RBCF payments. The size of this incentive will be greater, the quicker the emission reductions are delivered.
- In addition, once a project has started, knowledge that the continued operation of the project might be associated with an ongoing financial flow to the sub-loan borrower could mean that some activities continue to operate that would otherwise cease (and go into default). This is most likely to be relevant when the RBCF payments are only passed through to sub-borrowers when emission reductions are achieved.

As well as altering financial incentives, RBCF can also provide an important signaling benefit. In many cases, financial institutions and companies do not make financing decisions purely based on the assessment of which projects are most financially attractive. Instead, decisions can be driven by heuristics that entrench ‘business-as-usual’ decision making (Hall, Foxon, and Bolton 2017). The integration of RBCF into FIL, as well as (typically) technical assistance, may play an important role in addressing these non-financial barriers.

Reflecting these changed incentives and focus, the integrated RBCF product should lead to an increase in the upfront capital available for emission reduction activities. As discussed above, the expectation of receiving RBCF payments should increase the willingness of the FI to lend to the emission reduction activity. This increase in capital should be greater than the value of the capital provided by the DFI: the FI will normally complement the credit line with its own resources and also expect project owners to invest capital into these projects. The co-financing rate associated with the World Bank’s energy efficiency credit lines identified was 1.6:1 (World Bank 2018). Moreover, the integration of RBCF should help ensure that the increase in capital flows is directed specifically to emission reduction activities, whereas, as noted above, it can sometimes be difficult to ensure that the ‘plain vanilla’ product is used towards the activities intended. The application of RBCF would help overcome this problem of incentive misalignment.

Further benefits from the integrated RBCF product include:

- **Increase interest in emission reduction activities within the private sector:** consistent with the logic above, the possibility of benefiting from a lower interest rate, and the additional focus provided by an RBCF-supported FI loan, should increase interest among the private sector to consider eligible activities that will reduce emissions.
- **Help to strengthen capacity to measure emission reductions at the national level.** The tying of RBCF payments to project-level emission reductions would place a premium on ensuring that these assessments could be undertaken robustly. As noted above, this is one of the main rationales for providing RBCF.
- **Increased country ownership:** The combined impact of the above effects should increase country ownership.

Weaknesses

The integrated RBCF requires robust and credible processes. Tying RBCF payments to the emission reduction achieved by a collection of individual projects creates an incentive to game the monitoring, reporting and verification (MRV) of emission reductions. This may be more difficult to detect at the project level - the level at which this instrument applies - than at the sectoral or economy-wide level. Gaming may also be more difficult to detect when RBCF is provided for avoided emissions than absolute emission reductions. Related to this, there may also be concerns that the RBCF would encourage FIs to mis-sell sub-loans to end users in the hope of benefiting from the RBCF payments. This could create future credit quality problems and/or problems in terms of non-performing loans.

The establishment and implementation of these robust and credible processes will generate additional transaction costs. Complementary technical assistance will likely be needed to set up and implement processes for undertaking MRV of emission reductions at the project level, and to reduce mis-selling risks. These transaction costs can be minimized by focusing the application of the instrument on a standardized set of technologies (as noted above), as this allows MRV to be done on a sample basis. Nonetheless, the integration of RBCF will necessarily increase transaction costs compared to the standard instrument use. These transaction costs are likely to be largely borne by national stakeholders, who would take the lead in monitoring emission reductions. However, some may also fall on DFI staff, especially to check that there is sound ongoing implementation. In some cases, this may result in longer project durations than is typical for DFI projects.

The instrument will be more relevant for some activities than others. The logic of the integrated product is that it incentivizes finance to flow to projects that deliver emissions reductions and that this supports a country in meeting or exceeding its NDC. This requires that emissions reductions achieved at a project level translate into NDC progress. However, in some cases, emission reductions within a project boundary might be partly or wholly offset by increased emissions beyond the project boundary. This 'leakage risk' has been identified as particularly high in relation to, for example, activities in the land sector (as changing what is grown on one parcel of land does not alter the demand for emissions intensive products leading to land use change elsewhere) (Ward et al. 2024). The use of RBCF to support project-based emission reductions could be risky in this, and equivalent, contexts.

The integration of RBCF may exacerbate concerns regarding lending market distortion. As discussed in 3.1.1, one of the challenges with FIL to publicly owned banks is the concern that political capture can lead to distorted lending decisions. This problem could be worsened by

the provision of RBCF as this would (effectively) lower the wholesale borrowing costs for the beneficiary FI. The extent of this concern will depend on the extent to which there is (the potential for) strong competition between the FI benefiting from the RBCF integrated credit line and other (private sector) banks. However, this challenge will be eliminated in cases where the DFI can offer the RBCF-integrated product to all qualifying FIs in a jurisdiction.

3.1.4. Comparison to the separate delivery of RBCF payments

An alternative set of arrangements would provide RBCF according to the emission reductions achieved by the sub-loans, but for these payments not to be integrated within the DFI's lending product. This could be achieved through making payments directly to the sub-loan recipients according to the emission reductions that they individually deliver. These payments might either be made directly by the DFI, if it is technically possible for it to have this financial relationship, or by a third-party implementation agent.

The integrated RBCF product offers several advantages compared to the separate provision of RBCF.

- **Overcome access to finance constraints.** Critically, the integrated RBCF product should address any access to finance constraints that could otherwise impede the sub-loan recipient from responding to the RBCF incentive. The fact that conventional (unintegrated) RBCF does not directly target capital market barriers is often seen as a critical weakness (Vivid Economics 2013): private sector actors may want to respond to the incentive provided by RBCF but adverse selection problems and other capital market failures mean that they are unable to access the necessary finance to deliver the project that would unlock the RBCF payments. Integrating RBCF payments with the FI loan, especially if it is accompanied by complementary technical assistance to help the financial intermediary better understand how to appraise relevant loan applications, addresses this challenge. This benefit of integrating the RBCF into the FI loan will be particularly pronounced if the FI is willing to take emission reduction delivery risk, such that the value of the RBCF is (partly) reflected in the upfront terms that the FI offers the sub-borrower.
- **Increased political incentives to act:** the integrated RBCF loan product will effectively reduce the cost of borrowing for the financial intermediary, so long as its sub loans deliver emission reductions. Given the politically influential role of many FIs - typically national development banks or equivalent - it is plausible that this will lead to greater policymaker salience concerning the value of achieving emission reductions compared to a situation where the RBCF is paid directly to individual private sector actors. This implies a greater likelihood that the integrated RBCF product will help secure improvements to the policy and enabling environment that will make it easier to deliver emission reductions than the conventional RBCF alternative. This could benefit both sub-loan recipients and the wider private sector.
- **Lower transaction costs:** critically, integrating the RBCF payment into the loan product, and then 'piggybacking' on existing in-country relationships, will be administratively much easier and lower cost than an alternative in which the DFI or a third party is responsible for allocating the RBCF payment to individual companies or households delivering emission reductions. Indeed, previous TCAF experiences suggests that it can be difficult to justify the transaction costs of engaging with a single source of emissions unless that source is expected to deliver more than 10,000 tons of emission reductions per year.

However, there are also two potential disadvantages from the integrated RBCF model compared to the separate provision of RBCF.

- **Greater risk of distorting credit markets.** As discussed above, allowing the financial intermediary to benefit from (effectively) a lower cost of funding (if its sub-loans realize emission reductions) could distort local lending markets, crowding out other financial institutions who would have otherwise been willing to lend to the same private sector actors. This suggests that a careful diagnosis of lending market conditions is needed before the product is deployed, with the instrument use targeted to cases where the private sector would face clear barriers in accessing finance for these activities without the provision of the integrated RBCF product. If there is a high potential that the private sector could access finance from private sector banks, then the separate provision of RBCF payments will likely be preferable. Alternatively, it may be possible for some DFIs to provide RBCF payments to all qualifying FIs within a jurisdiction, which would eliminate this risk.
- **Less private sector engagement.** Private sector actors may find the separate provision of RBCF through a DFI-managed process offers a more credible emission reduction incentive than the prospect of an RBCF payment received by the FI and only benefits the private sector to the extent that it is passed on. However, as noted above, this will often be impractical. As an alternative, this consideration suggests there should be transparent rules established in advance that specify how the benefits of any RBCF payments will be shared with the FI's clients and/or an arrangement should be sought that allows the private sector to access some of the value of the expected RBCF payments in the upfront borrowing terms that it faces (implying that some emission reduction delivery risk is taken by the FI).

On balance, this suggests that the integrated RBCF model will often be preferred to the separate provision of RBCF. The two key conditions that need to be satisfied are:

- there is clear evidence that there are credit market failures that justify channeling RBCF payments to one or a small number of FIs (or the DFI can extend the RBCF-integrated product to all qualifying FIs in a jurisdiction); and
- there are clear rules determining when and how the RBCF payments are either passed onto sub-loan borrowers and/or some of the expected value of the RBCF payments are reflected in the upfront financing terms observed by the private sector.

3.1.5. Comparison to a more heavily concessional product

Another alternative to the integrated RBCF product would be for the DFI to blend trust fund resources with its own capital to lend to a financial intermediary on more concessional terms than the Bank's 'plain vanilla' product. This type of model has been used, for example, when MDBs act as implementing entities for the Climate Investment Funds.

Two key attractions of the integrated RBCF product compared to a more heavily

concessional FI loan are⁹:

- **Stronger financial incentives for emission reductions/NDC attainment** as the concessional, in the form of RBCF payments to the FI, is only available once emission reductions are delivered. There will also often be an important signaling role provided by tying RBCF payments to emission reductions from certain technologies. Importantly, these stronger incentives are provided while still overcoming any access to finance constraints. Building on the discussion in section 3.1.3, this benefit may be particularly important when sub-loans are financing activities which can deliver emission reductions in the relatively near-term. By contrast, when emission reductions are only expected a long-time into the future, the financial incentives associated with expected RBCF payments may be lower.
- **Potential for greater country ownership.** From the perspective of the RBCF recipient (i.e. the FI), an often-stated advantage of RBCF is that it might allow the recipient greater flexibility in accessing the RBCF benefits. In this context, this might mean that, for example, the FI is subject to fewer loan covenants or is able to make greater use of its existing processes. This reflects that the integration of RBCF is expected to better align incentives between the WB and the FI, reducing the need for these constraints that might be more common in a concessional loan agreement.

However, these benefits need to be traded off against the integrated RBCF model requiring higher and uncertain subsidy amounts than the more heavily concessional FI product and requiring higher transaction costs. The integrated RBCF product provides a benefit to the FI only at some point in the future and with some degree of uncertainty.¹⁰ In contrast, the concessional FI loan provides this benefit to the FI upfront and with certainty. For these two options to be of equal value to the FI, the absolute amount of subsidy provided for the integrated RBCF product must be greater. This may be a disincentive for some trust fund providers, as may the fact that the amount of RBCF payments that will ultimately be made is unknown when the instrument is designed. In addition, the integrated RBCF model will impose costs in terms of setting up and implementing robust processes for monitoring and verifying emission reductions which will not be required by the more heavily concessional FI product.

3.1.6. Summary

In summary, integrating RBCF could be effective in achieving mitigation outcomes among private sector entities if applied in the right circumstances. The integrated RBCF product can help overcome financing barriers, increase the familiarity of low-carbon technologies in local markets and lead to their adoption in the longer-term. This incentive will be more

⁹ In making this comparison, the analysis assumes that the degree of upfront concessional embedded in the FI loan is identical to the expected NPV of the interest rate reduction in the integrated RBCF product.

¹⁰ As discussed above, the FI might pass most of this risk on to the sub-borrowers through an arrangement where interest rate reductions are provided only after emission reductions are achieved or it might assume a greater share of this risk itself by changing the pricing of its loans according to the expected emission reductions (and RBCF payments). Nonetheless, the aggregate uncertainty for the FI and borrower is greater than when the donor concessional is provided upfront.

powerful for emission reduction opportunities can be delivered quickly and or where non-financial barriers are significant. However, the product risks being gamed and the provision of grants to state-owned financial institutions, even if results-based, might distort local lending markets. As such, careful diagnosis of both the lending market and the project economics of the mitigation being targeted is needed before this form of integrated RBCF should be pursued.

Table 1 below summarizes how the integrated RBCF product compares against various alternatives using the criteria identified.

Table 1: An assessment of financial intermediary lending with integrated RBCF with various alternatives

RBCF integrated into FI loan in comparison to...			
	'Plain vanilla' FI lending product	FI lending with RBCF payments delivered separately	FI lending with enhanced concessionality
Incentives for emission reductions/NDC delivery	Stronger. Sub loans for ER projects will have stronger risk-return profile; there may be a stronger incentive for emission reduction projects to continue to operate. RBCF also provides a strong signaling benefit.	Unchanged. The NPV of additional payments (and when they are made) is unchanged.	Depends on context. RBCF product may have stronger signaling impact; financial incentives from RBCF strengthened most when emission reductions can be delivered in short term.
Country ownership	Stronger. Given more favorable terms and possibility of less onerous loan covenants and restrictions for FI.	Stronger. Flow of benefits channeled through a politically salient institution.	Possibly stronger. RBCF integrated product may have less onerous loan covenants and restrictions for FI.
Addressing institutional and capacity constraints	Enhanced. Additional focus on monitoring/verifying emissions, although this will be costly. No change in extent to which wider enabling environment is addressed.	Unchanged. Both require additional focus on monitoring/verifying emission reductions.	Enhanced. Additional focus on monitoring/verifying emissions, although this will be costly. No change in extent to which wider enabling environment addressed.
Upfront mobilization of resources	Stronger. Emission reduction projects financed by sub loans will have stronger risk-return profile which will mobilize FI debt and project sponsor equity.	Ambiguous. Where there are market failures in the credit market, RBCF-integrated products are more likely to mobilize resources. However, integrated RBCF may crowd out private sector FIs in a way that separate RBCF would not.	Possibly worse. To mobilize the same capital, absolute value of RBCF payments will need to be higher than value of grant blended with loan, reducing leverage ratios.
Impact on the local private sector	Stronger. Emission reduction projects will have stronger risk -return profiles although there may be an increased risk of distorting lending markets.	Worse. If it was practically possible to deliver (see below), the private sector is likely to prefer to be the direct recipient of RBCF payments (unless RBCF payments reflected in changing upfront terms of sub-loans).	No obvious difference.
Transaction costs	Increased. Need to establish and/or operate processes for verifying emission reductions.	Lower costs. Separate RBCF payments to each sub-loan recipient would be administratively impractical.	Increased. Need to establish and/or operate processes for verifying emission reductions.

3.2. Using RBCF to strengthen DPLs

Modalities at a glance

- *The client government and DFI agree a development policy loan, and associated prior actions, to support the delivery of emission reductions. This could either be in support of a broad package of reforms in a sector or to support the implementation of a particular policy that will deliver emission reductions.*
- *The emission reductions from the sector or policy targeted by the operation are subject to monitoring and verification. The extent of emission reductions determines whether and how much an interest rate reduction is applied to the loan made by the DFI.*
- *RBCF is used to cover the cost of any interest rate reduction offered.*
- *This model provides an incentive for client governments to implement and, critically, sustain a set of sector or policy reforms that reduce emissions and, depending on the sectoral/country context, provide stronger incentives for private sector financing and implementation of mitigation actions.*
- *A similar approach could also be adopted for other DFI lending instruments, such as investment policy lending or payments-for-results/results-based lending. Many of the same dynamics would apply. However, these options have not been explored in depth.*

3.2.1. Existing formats and track record

An alternative use case for RBCF integration would be within DFI's development policy financing (DPF). DPF supports a set of policy and institutional actions with defined development objectives and results, disbursing is to the general budget once a set of prior policy/institutional actions have been met.

DPF is relatively common within World Bank portfolio and expected to become more prevalent in future. It accounted for between 20% and 35% of World Bank lending in every year but one in the period between FY11 and FY21. (World Bank n.d.). Moreover, across the development finance community as a whole, it is anticipated that this form of lending is set to expand in line with a greater focus on strengthening government implementation systems and aligning multiple government actors behind programs as expressed in 'country platforms' (Kharas and Bhattacharya 2023).

DPF has been recognized as a critical instrument for the World Bank to achieve its mandate, including for climate. A 2021 'Retrospective' found that DPF continued '*to promote sustained policy dialogue and reform across diverse clients*' that '*policy on DPF remains fundamentally sound and its use has proven robust yet flexible over time and space in supporting countries' reform programs*' and that the instrument '*delivered results, contributed positively to enhancing the quality of policy and institutions in client countries, in line with the Bank's outcome orientation agenda*'. The Retrospective was similarly positive about the role that the DPF was playing in support climate change related outcomes and noted that '*DPF can play a critical role to support the policy and institutional shifts for countries seeking to transition their economy to a path compatible with their NDCs and the Paris Agreement*' (World Bank 2021).

Recognizing these benefits, the role of DPF in climate finance has been growing; although it remains limited compared to investment financing. The Retrospective found that by FY21, 97% of DPFs were intended to deliver climate co-benefits, up from just 7% in FY15, with mitigation co-benefits tending to be targeted more than adaptation co-benefits. The latest World Bank database identifies that 65 climate mitigation-related measures have been introduced in prior actions in DPF loans over the period 2008-23.¹¹ Despite this growth, the latest MDB climate finance report shows that policy-based financing accounted for just 8% of MDB mitigation finance in 2022, compared to 70% allocated through investment lending (European Investment Bank 2023).

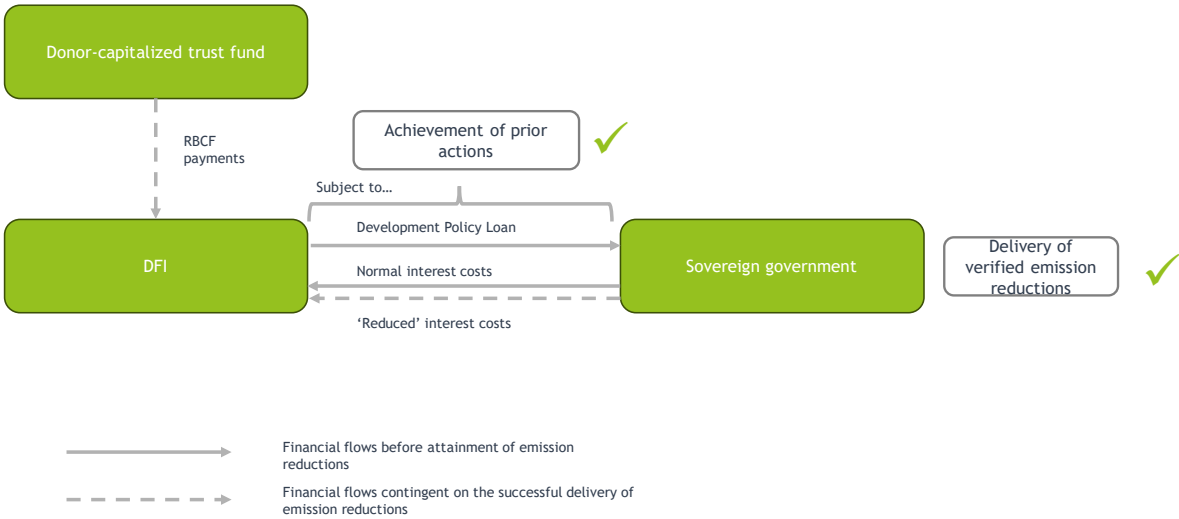
There can be concerns that DPF does not always have strong government ownership which limits the long-term success of operations, despite prior actions being met. The Retrospective referenced above found that DPFs have very slightly lower success rates than IPF, and also reports that around a quarter of all prior actions did not achieve results or did not have observable results (World Bank 2021). An IEG review of the application of DPF in IDA countries found that the political will of the government to implement reforms is a critical driver of the success of the instrument and that where this is not present, it may be difficult for DPF to drive through long-lasting and sustainable reforms (Independent Evaluation Group World Bank 2018). The same review noted that the Bank should ensure that DPFs placed greater focus on fiscal and debt reforms and that more efforts should be taken to track the impact that DPFs had on mobilizing the private sector.

3.2.2. Model for integrating RBCF

The integration of RBCF into DPF lending would be through using RBCF to cover the costs of an interest rate reduction calibrated to emission reductions performance. In other words, RBCF would facilitate the linking of loan terms to sustainability outcomes, specifically emission reductions. Figure 2 below shows how the mechanism might work.

¹¹ World Bank DPF database (World Bank 2024a)

Figure 2: Integrating RBCF into Development Policy Lending



Depending on the focus of the operation, it is most likely that emission reduction performance would be measured at the sectoral or policy level. In other words, the mechanism would most likely be RBCF-based sectoral or policy crediting. This contrasts with the project-based or programmatic focus of use case 1.

There are several ways in which the relationship between emission reduction performance and any interest rate reduction might be defined. The key options would be:

- To set a continuous incentive such that for every additional ton of cumulative emission reduction, there would be a (very modest) reduction in the interest rate. This would likely be subject to a minimum amount of emission reductions to be achieved and a maximum amount beyond which no further interest rate reductions would be applied.
- A tiered incentive arrangement whereby a small interest rate reduction would be offered when cumulative emission reductions are within a certain tier, with the interest rate reduction available increasing as emission reductions increase through the tiers.
- To set a target for emission reductions to be achieved in each year with interest payments in that year attracting a lower interest rate if the target is met.
- A one-off target (or test point) that, if met, would allow a lower interest rate to apply for the remainder of the loan tenor.

All these arrangements require a value to be placed on the emission reductions being sought through the integration of RBCF. This might be informed by a combination of carbon prices available in the international carbon market and estimates of the costs of achieving emission reductions.

There are already precedents within the World Bank portfolio that shows how this arrangement could work.

- The closest example, already highlighted above, is akin to a sectoral crediting approach. In 2023, the Bank directly supported Uruguay with a \$350m Development Policy Loan (DPL). Under the terms of this loan, interest costs for the government will go down in each year from 2028 so long as the government meets a target for methane emissions per unit of

livestock in that year¹². The targets have been set to be somewhat more ambitious than those in the country's NDC and the emission reduction assessment will be undertaken by the United Nations Development Programme (UNDP). Attainment of the targets could allow Uruguay to save up to \$12.5 million cumulatively on interest costs (World Bank 2023f). The country will also receive a \$1m grant to help achieve the targets. The only difference between this example and the more general potential application of this model is that in the Uruguay case the costs associated with the interest rate reduction will be covered by the Fund for Innovative Global Public Goods Solutions, which is capitalized with the net income from World Bank loans, rather than through a donor trust fund arrangement (which might allow for a much deeper and/or wider application).

- In terms of an analogue to policy crediting, there are some similarities to the World Bank's operation to support energy subsidy reform in Uzbekistan (iCRAFT), approved in 2023 (World Bank 2023c). Under this arrangement, payments, sourced from donors, will be made to the Government of Uzbekistan according to the emission reductions delivered by the implementation of an energy subsidy policy reform package.¹³ Previous World Bank work also (hypothetically) illustrates how similar arrangements could be established to support policies such as feebate policies for low-carbon vehicles or to introduce appliance energy efficiency policies (World Bank 2023d). However, in the Uzbek case (and the other hypothetical examples) the emission reduction payments are not integrated within a lending operation. By contrast, in the proposed model, a development policy loan would first support the energy subsidy policy reform and the emission reductions generated by the reform package would be associated with a subsequent reduction in the interest rate on this loan.

3.2.3. Comparison to the 'plain vanilla' product

Advantages

The product should increase incentives for NDC delivery. The most obvious advantage of this model is that it should provide stronger ongoing incentives for the borrower to reduce emissions at a sectoral or policy level for the lifetime of the financing agreement. This will typically be significantly longer than the project's duration. This feature may be particularly valuable because, while there may be a strong focus on achieving the policy or institutional reforms specified in the agreed Prior Actions for a DPL to enable disbursement, there is some risk of "backsliding" after the last tranche has been disbursed, particularly due to a lack of country ownership. The integration of RBCF offers the potential of a more holistic approach where prior actions help to improve the enabling environment for emission reduction activities with RBCF then providing a longer-term incentive to embed and maintain this enhanced

¹² In other words, it is the third option of those set out above.

¹³ \$20m of the payments will be in the form of climate finance and so Uzbekistan can use these emission reductions towards its own NDC. \$26m of the payments will be for the acquisition of Internationally Transferred Mitigation Outcomes (ITMOs) that trust fund donors can use towards their NDC targets.

enabling environment.¹⁴

The strength of these incentives will depend on the specific design of the instrument.

Arrangements where every ton of emission reduction can help deliver emission reductions, where the magnitude of this incentive is large, and which require frequent assessments of emission reduction performance will offer stronger incentives for ongoing emission reductions. Arrangements where emissions performance is only assessed infrequently, the potential interest rate reduction is small, and where emission reductions more than a target are not relevant for determining the size of the reduction will offer less powerful incentives. This implies that the first option in the list above will offer the greatest incentive, especially if the size of the incentive is material, with subsequent options offering progressively less powerful incentives. However, this must be traded off against complexity and ease of communication. The third option - where there is a target for emission reductions to be achieved in each year with interest payments in that year attracting a lower interest rate if the target is met - may often offer the best balance between ongoing incentives and ease of communication.

The product should also lead to increased upfront financing being available for mitigation.

This additional capital could come from two sources.

- First, the prospect of lower interest rate costs should mean that the borrower is more willing to take the DFI loan. Moreover, while the DFI loan would not be tied to specific mitigation assets, it is plausible that the government may use some of the proceeds in a way that increases the likelihood of realizing the interest rate reduction. This would indirectly result in more capital being allocated to mitigation.
- Second, the combination of, on the one hand, the prior actions and/or DLIs associated with these products and, on the other hand, the prospect of an interest rate reduction, should lead to enduring changes in the enabling environment that give private capital providers more confidence to allocate finance towards mitigation activities. This effect is likely to be strongest when the reduced interest rate is tied to emission reductions associated with specific policies.

Correspondingly, the product should lead to greater private sector interest in mitigation than would be achieved by the ‘plain vanilla’ product. The expected improvements in the enabling environment that RBCF integration within this product should provide can be expected to increase private sector interest in reducing emissions. This would provide an opportunity to improve tracking of the private sector mobilization achieved by the DPF lending, in line with the finding from the 2021 Retrospective noted above.

The RBCF-integrated product should help strengthen capacity for monitoring, reporting and

¹⁴ It could also be possible to consider an emissions-linked interest rate reduction on a DPF that was not focused on improving the enabling environment for mitigation activity. For example, the DPF might be used for health system strengthening and then the interest rate reduction applied in relation to emissions performance in a different sector or at a national level. However, because this arrangement would not require fulfilment of prior actions that support emission reductions, it may be less likely to lead to a permanent improvement in the enabling environment for mitigation.

verification (MRV) relative to the ‘plain vanilla’ product. Because the realization of the interest rate reduction will depend on the ability of the counterpart in the government to measure emissions, there will be a strong focus on ensuring that the MRV of emissions reduction is sufficiently robust that all stakeholders have confidence in their measurement. The opportunity to increase this capacity is one of the core benefits of any form of RBCF (see section 1.2 above).

As a result of the combined impact of the effects described above, the RBCF integrated product is perceived more favorably than the ‘plain vanilla’ DPF product. This effect is likely to be particularly strong among those clients that already have a strong interest in meeting and exceeding their NDC targets.

Disadvantages

Against these main attractions, the key downside of the integration of RBCF into this product is the increase in transaction costs that it will entail. The extent of this increase will depend on a range of factors:

- **Current level of MRV capacity.** While an attraction of (all) RBCF instruments is that they increase capacity to undertake MRV on emission reductions, the greater the need for this capacity, the greater will be the transaction costs that have to be incurred to ensure that these processes are in place.
- **Alignment with NDC/emissions inventories.** If the scope of emissions/emission reductions that need to be measured (and compared against any thresholds) closely matches the way in which emissions are measured within the national inventory or for the purposes of tracking NDC attainment, then the additional transaction costs will be limited. By contrast, if the integrated RBCF product focuses on achievement of emission reduction that do not align with the way emissions are accounted for in the national inventory and/or in the NDC - for example, it might focus on emission reductions in a certain part of the country or require emissions to be assessed using a more methodologically advanced approach than currently used in the inventory¹⁵ - then costs will increase significantly. Transaction costs are likely to be higher when there is a need to identify the emission reductions delivered by a specific policy.
- **Frequency of emission reduction assessment.** As discussed above, the more frequently that emissions performance is assessed, the clearer will be the incentive to reduce emissions and the risk of perverse outcomes will be reduced. However, this will also increase transaction costs.

The instrument would also need to be designed carefully. This would include calibrating the scale of the interest rate reduction so that it provides a compelling incentive but continues to represent good use of trust fund resources. It would also require that careful attention be given to the additionality of using trust fund resources in this way: additionality will be achieved where RBCF is integrated into the product in cases where the borrower could

¹⁵ In other words, using a higher tier of emissions accounting.

otherwise face challenges in delivering emission reductions in the medium and long term. This might be where political economy and/or the electoral cycle suggest that the long-term commitment to NDC attainment could be questionable. There would also need to be confidence that the financial resources to cover the cost of any interest rate reduction would be immediately available at the point that the reduction was made.

3.2.4. Comparison to the separate delivery of RBCF payments

An alternative arrangement to the integration of RBCF within the DPF would involve the direct payment of RBCF to the government according to the emission reductions achieved in a particular sector or because of a particular policy. Depending on where in the economy the emission reductions are expected, these payments might either be made to the same government ministry that would be responsible for signing a loan agreement (typically the Ministry of Finance), or they could be made to a specific line ministry. The latter model may be quite common as the line ministry would argue that they are the agency responsible for delivering the emission reductions and so should be the agency to directly receive the grant payments.¹⁶ By contrast, it is a well-established practice that World Bank (and other Development Finance Institution (DFI)) loans are channeled through the Ministry of Finance (or equivalent).

The differences between the integrated and separate provision of RBCF depend largely on whether the separate payments would be made to the Ministry of Finance (or equivalent). If the separate RBCF payments would also be made to the Ministry of Finance, then there will be little difference between the two approaches. There may be modest transaction cost savings from the integrated RBCF product especially if there are to be conditions placed on, for example, how emission reductions can and cannot be delivered. However, these are unlikely to be significant.

By contrast, if the separate RBCF is to be channeled directly to a specific line ministry then there will be greater differences between the integrated and separate models. Generally speaking, Ministries of Finance should be in a better position to organize a whole-of-government response to the incentives provided by the integrated RBCF product (Coalition of Finance Ministers for Climate Action 2023). For example, as well as supporting and providing funding to a specific line ministry that might have the most immediate opportunity to deliver the emission reductions that could trigger the interest rate reduction, a Finance Ministry could also coordinate and facilitate complementary actions from other line ministries. This implies that the response to the incentives provided by RBCF is likely to be greater when RBCF is integrated into the financial product, making it more likely that there will be an increase in the availability of upfront finance for mitigation, greater private sector interest and ultimately

¹⁶ The Uruguay loan discussed above illustrates the possibility that direct RBCF payments might be made to a different part of the government to that responsible for signing loan agreements. In this case, while the Ministry of Economy and Finance has been the lead agency for the loan agreement, the Ministry of Livestock, Agriculture and Fisheries has received a \$1m grant to help deliver the emission reductions.

an increased likelihood of significant emission reductions. There may also be modest transaction cost savings from all financial flows being channeled through the same institution and instrument.

3.2.5. Comparison to a more heavily concessional product

A further alternative to a programmatic loan with integrated RBCF would be to offer a more highly concessional DPF loan. This could be designed so that the extent of upfront concessionality provided in the loan would be equivalent, in present value terms, to the value of the interest rate reduction expected to be provided in the RBCF integrated product (i.e. to the value of the emission reductions).

The RBCF-integrated product would be preferable to the NPV-equivalent concessional loan product on several dimensions. It would offer stronger incentives for emission reductions and NDC attainment, helping to provide longer-lasting incentives to maintain the actions supported by the loan. This, in turn, should help foster a more conducive enabling environment that will both increase private sector engagement in delivering emission reductions and allow capital providers to feel more confident in financing low-carbon projects or activities. These are the same advantages that the integrated RBCF product offers over the ‘plain-vanilla’ DPL.

On the other hand, there are also disadvantages to the integrated RBCF product. Most notably, to make the two products comparable from the borrower’s perspective, the absolute value of the interest rate reduction provided - given that it will only happen in the future and with some uncertainty - would need to be greater than if the concessionality is provided with certainty upfront. Alternatively, if the size of the prospective interest rate reduction was not made large enough to make it comparable to the upfront concessional loan, then the extent of country ownership attached to the use of the integrated RBCF instrument would likely decline.

The transaction cost difference between these two alternatives is ambiguous. On the one hand, the integrated RBCF product would incur transaction costs in establishing and implementing protocols for monitoring and verifying emission reductions. On the other hand, to provide a more heavily concessional product will require the separate processing of the trust fund grant that would be used to make the product more heavily concessional. The transaction costs associated with monitoring and verifying emission reductions in this use case will be smaller than in the FIL use case, due to the scale at which emission reductions can be monitored.

3.2.6. Summary

In summary, the integration of RBCF into DPL holds considerable potential. It can reinforce the incentives provided by the prior actions within these instruments and provide a longer-term incentive to deliver/maintain a low-carbon development trajectory, including through persisting with challenging policy reforms. This can ensure a clearer link between the design of these instruments and the development outcomes they seek to achieve and help build country ownership. Stronger incentives to maintain and improve the policy and institutional enabling environment for emission reductions should lead to increases in capital mobilization for, and private sector participation in, emission reduction activities.

Table 2 below summarizes the key advantages and disadvantages of the RBCF integrated DPL.

Table 2: An assessment of development policy lending with integrated RBCF with various alternatives

	RBCF integrated into programmatic loan in comparison to...		
	'Plain vanilla' DPL	DPL with RBCF payments delivered separately	DPL with enhanced concessionality
Incentives for emission reductions /NDC delivery	Stronger. The prospect of reduced interest costs strengthens incentives for NDC delivery.	Unchanged The financial flows in response to emissions performance is unchanged.	Stronger. The prospect of reduced interest costs strengthens incentives for NDC delivery.
Country ownership	Stronger. The prospect of the financial terms being lower than the 'plain vanilla' product will make it more attractive.	Stronger. Channeling interest rate reduction through loan administered by MoF should increase high-level awareness of value of emission reductions.	Possibly worse. Government would prefer to receive concessionality immediately and with certainty.
Addressing institutional and capacity constraints	Enhanced. The incentives created by the instrument increases the likelihood that institutional or policy reforms persist.	Stronger. MoF should be in a strong position to coordinate a whole of government response to incentive structure, making it more likely that constraints are addressed.	Enhanced. The incentives created by the instrument increases the likelihood that institutional reforms persist.
Upfront mobilization of resources	Stronger. Both directly through the allocation of the WB loan proceeds and indirectly through improvements to the enabling/policy environment.	Stronger. MoF should be in a strong position to coordinate whole of government response to incentive structure, increasing likely upfront mobilization of resources.	Enhanced. Increased likelihood of persistent reform should increase mobilization of resources.
Impact on the local private sector	Stronger. The expected improvements in the enabling/policy environment should lead to greater private sector engagement.	Stronger. As above, the enhanced response to the incentives made possible by the MoF should feed through into greater private sector opportunities.	Enhanced. Because of desire to respond to incentives.
Transaction costs	Increased. The need to monitor and verify emission reductions will increase transaction costs but, depending on design, impact can be modest.	Slightly lower. May be small advantage from having all finance flows channeled through one instrument and institution but only modest.	Ambiguous. The cost of monitoring emission reductions needs to be traded off against the cost of processing more than one transaction.

3.3. Policy-based guarantees

Modalities at a glance

- *The client government agrees a package of climate-related reforms with a DFI, for example including the reform of fossil-fuel subsidies and taxation.*
- *RBCF is used to partially cover the commitment fee or ongoing charges related to the guarantee, and this support remains in place for as long as policies remain on track, and yield verified emission reductions.*
- *A rigorous MRV system provides quantification and verification of emission reductions resulting from policy reform.*
- *As the government has debt-bearing capacity, it independently issues in the bond markets backed by the guarantee, including to fund its climate-related expenditures.*
- *To the extent RBCF payments encourage the uptake of the guarantee and implementation of the associated policy reforms, this will also result in private sector investment in low-carbon technologies.*

3.3.1. Existing formats and track record

Policy-based guarantees (PBGs) protect private investors against the risk of debt service default by a sovereign borrower once a package of policy reforms has been agreed.

Normally, support is offered in the form of a partial credit guarantee on both principal and interest repayment. A 2016 IEG report found that ‘PBGs can represent an important instrument of development policy financing that can be used effectively to help members overcome difficult financing and reform challenges’. (Independent Evaluation Group World Bank 2016).

Such guarantees are still a relatively marginal instrument in the toolkit of both the World Bank and other large DFIs. They have been mainly used by upper-middle-income countries that have faced difficulties in accessing international capital markets. The World Bank used such guarantees extensively in emerging Europe in the aftermath of the 2010 financial crisis to overcome external financing and sovereign debt roll-over problems. For instance, the guarantee granted to Albania in 2015 helped to significantly reduced risk spreads, including in subsequent borrowing not supported by the guarantee (Navarro 2015). Across a sample of nine countries and several MDBs, a recent study finds a strong effect of guarantees on risk spreads and capital mobilization. At the same time, guarantees are often treated as absorbing as much of a country’s financing envelope as a loan of an equivalent amount, with client countries often not perceiving pricing to be sufficiently advantageous given this treatment (Landers and Aboneaj 2022).

Policy based guarantees are typically part of a broader package of programmatic support.

As such, they are supported by a policy reform package, which is expressed in prior policy and institutional actions. World Bank guarantees have been mainly used in DPLs with policy actions relating to macroeconomic and fiscal reform. For instance, in the case of the guarantee to Albania strengthened public financial management and tax and pension reforms were designed to improve fiscal capacity and sustainability.

3.3.2. A possible model for integrating RBCF

There is only limited experience from across the MDBs in linking the provision of PBGs with climate mitigation achievements. In part, this may be due to the limited use of climate related policy conditionality in policy loans (prior actions in DPF were reviewed in Section 3.2). In future, there may well be greater support of DPFs to the reform of environmental taxes or of fossil fuel and agricultural subsidies that encourage inefficient and excessive use of polluting fuels. A recent World Bank report found that in addition to implicit subsidies, countries paid about USD 577 billion per year to artificially lower the price of such fuels. Subsidy reform could be effective in reducing demand and encouraging investment in energy efficiency and the development of cleaner or renewable sources of energy, although the elasticity of demand may be low in the short term where no alternative sources of energy input are readily available (World Bank 2023a).

For its part, the client country government would need to be satisfied that a guarantee will enable it to access capital markets, mobilizing budget funding over and above that available from development finance sources. This may well be the case in middle-income countries where fiscal debt has rapidly risen.

RBCF payments could make policy-based guarantees more attractive to client countries.

The cost of a guarantee consists of an upfront charge and an ongoing (annual) standby guarantee fee. RBCF payments could be made to the government to help offset the cost of these fees according to one or both of the following considerations:

- some portion of the RBCF payments could continue for as long as the government delivers, or does not revoke, the agreed policies;
- to make the mechanism focused on verified emission reductions, a further portion of RBCF payments could be linked to the verified emission reductions associated with the policy. In this way the RBCF payments would bear some resemblance to policy-based crediting.

The government would then rely on the guarantee in its debt financing strategy. Investors would need a clear understanding of the terms of guarantees or other credit enhancements.¹⁷

¹⁷ A further option may be to tie policy-based guarantees to commitments made by a government in a sovereign sustainability-linked bond. The default protection awarded by the guarantee could be made conditional on certain NDC or other emission targets having been met. The idea would be similar to that proposed in a recent paper which proposed that a DFI offers a credit enhancement, such as a partial guarantee, contingent on the issuer achieving a pre-announced sustainability performance target (SPT) on resilience, which would raise the sovereign's credit quality and repayment capacity (Erlandson 2023). See also the discussion in section 3.5.

3.3.3. Comparison to the ‘plain vanilla’ guarantee

RBCF integration in policy-based guarantees would likely strengthen incentives for NDC delivery by governments. The prospect of paying less for a guarantee that enables the country to have continued access to debt capital markets could be a strong incentive for the country to deliver key policy reforms. It may also increase the focus on addressing institutional constraints on accounting and verifying emission reductions. In turn, these effects will likely increase country ownership.

In cases where the prospect of a reduced price of the guarantee persuades the country to take out the guarantee, there could be a significant impact on the mobilization of private capital for budgetary funding, some of which would be allocated to climate mitigation. Under the assumption that the guarantee opens up additional fiscal headroom, it clearly has a beneficial impact on fiscal support to the low-carbon transition.

There could also be additional benefits for private sector activity. These result in the first instance from the program of policy reforms associated with the guarantee. A reduction in fossil-fuel subsidies, for instance, would encourage greater investment in low-carbon technologies in the private sector. Under certain conditions, the government’s improved financing terms may also translate into a lower cost of capital in the private sector.

These benefits need to be considered in the context of some possible downsides:

- As with all RBCF products, there would be an increase in transaction costs due to the need to assess the extent of emission reductions resulting from policy reforms, depending on existing MRV capacity and tracking of NDC delivery.
- A further concern could be the effect of a possible withdrawal of RBCF support if policy reforms go off-track. While the guarantee itself would not be revoked, investors may be concerned about the additional costs that the government would have to pay for the guarantee, whether there may be less engagement between the DFI and the client government moving forward, and the fiscal headroom should the government choose to terminate the guarantee.

3.3.4. Alternative designs¹⁸

The separate provision of RBCF is not a feasible alternative in the context of this instrument.

An alternative structure could involve the use of trust fund resources to reduce the upfront cost of a policy-based guarantee. In principle, this could either be done through the trust fund providing a transfer to a country with an agreement that it takes out a PBG or through the trust fund covering the costs of the DFI offering a guarantee at a lower price.

¹⁸ In this, and subsequent, use cases we combine the alternative designs into one sub-section as they are relative unattractive and/or sometimes quite theoretical.

The pros and cons of the integrated RBCF product compared to this alternative are relatively similar to the equivalent comparison for the development policy lending instrument discussed in section 3.2. The upfront provision of a guarantee would result in weaker (or no) additional incentives for NDC delivery, which would also mean that it is likely that there would be less additional engagement by the private sector in climate mitigation. Likewise, while the concessional guarantee should allow for continued/improved access to capital needed for investments, there might be less expectation that this would be disproportionately allocated to low-carbon investments. The upfront concessional product would be unlikely to address any institutional and capacity constraints around emissions monitoring and verification. However, it would require fewer trust fund resources to make it attractive for the client. This effect will be particularly pronounced to the extent that the provision of RBCF is linked to the verified emission reductions (rather than the maintenance of the reform package). This, plus the lack of conditionality, may mean that the upfront more heavily concessional PBG may be preferred by the client government. The impact on transaction costs would be ambiguous, depending on whether the additional costs of monitoring and verifying emission reductions were greater or less than the cost of processing the grant agreement needed to make the guarantee more heavily concessional from the outset.

Table 3 summarizes the key strengths and weaknesses of integrating RBCF in this use case.

3.3.5. Summary

Policy-based guarantees of public sector borrowing can be an effective in mobilizing private climate finance and strengthen commitment to reforms aimed at emission reductions. Fiscal policies that offer subsidies for fossil-fuel consumption could be a particularly suitable candidate for DFI engagement on policy reform and the associated provision of a PBG. However, to date, the pricing of PBGs, in the context of their implications for the financing headroom from the DFIs, has been an obstacle to sustained uptake.

RBCF could be used to reduce guarantee fees for as long as agreed policies remain on track, and/or according to the resulting verified emission reductions the reforms deliver. Especially in middle-income countries with additional debt-bearing capacity, this could improve capital market access and financing terms. Additional budgetary resources may then be allocated to climate mitigation policies, potentially those supported by other DFI instruments. However, the greater the extent to which the RBCF payments are tied to verified emission reductions, rather than just progress/maintenance of the policy reform package, the greater will be the uncertainty of the value of the RBCF payments, reducing their value to the client government.

Table 3: An assessment of policy-based guarantees with integrated RBCF with various alternatives

	RBCF-supported PBG in comparison to	
	'Plain vanilla' PBG	A more heavily concessional PBG
Incentives for emission reductions/NDC delivery	Stronger. RBCF would mean that the annual charges on the guarantee would be lower if the country made progress towards its NDC.	Stronger. Ongoing support, e.g. through a reduction of guarantee fees, is more likely to sustain incentives.
Country ownership	Stronger. RBCF offer the prospect of a lower cost guarantee product.	Weaker. The government is likely to prefer the upfront concessional product, especially if the RBCF payments are heavily linked to verified emission reductions (rather than just maintaining the policy package).
Addressing institutional and capacity constraints	Higher. Country would only be able to access the lower cost guarantee if institutional and capacity constraints around measuring emission reductions were addressed.	Higher, Country would only be able to access the lower cost guarantee if institutional and capacity constraints around measuring emission reductions were addressed.
Upfront mobilization of resources	Higher. Integration of RBCF may make the country more likely to take out PBG, supporting capital market access and a greater proportion of any resources mobilized should be allocated to mitigation,	Ambiguous. The more heavily concessional PBG may be a more powerful incentive to take out the guarantee than the RBCF-integrated PBG, but there would be no additional incentive for these to be directed to mitigation.
Impact on the local private sector	Improved. Government incentives from RBCF should lead to an improved enabling environment for the private sector to undertake mitigation.	Ambiguous. The more heavily concessional PBG may be a more powerful incentive to take out the guarantee therefore more likely to lead to a cost of capital reduction for the private sector, but there would be no additional incentives for private sector participation in mitigation.
Transaction costs	Higher, as emissions performance or policy delivery needs to be additionally monitored as part of the product's terms and conditions.	Higher. Especially if there is a need to verify emission performance.

Note: As discussed in the body of the text, the separate provision of RBCF is not considered realistic in this use case

3.4. Outcome bonds

Modalities at a glance

- *A DFI issues a principal protected bond under its own name.*
- *Investors are not paid coupon returns. Instead, these are capitalized and passed on to a partner entity and then to sub-projects.*
- *These sub-projects deliver verified emission reductions. RBCF is used to pay for the emission reductions at a pre-agreed fixed price, partially rewarding the project partner.*
- *Over the lifetime of the bond and at maturity, an agreed proportion of the RBCF payments are returned to bond issuer; this is passed on as a success payment to investors in the bond. There is a prospect for investors to earn higher returns than they would on a conventional DFI bond.*
- *Projects in countries with no or limited international capital market access will be funded indirectly through the DFI's established investors. Investors hold a principal-protected bond but take on emission reduction delivery risk. An independent agent monitors and verifies emission reductions and may build MRV capacity.*

3.4.1. Existing formats and track record

Outcome bonds are a recent innovation, used most frequently by the World Bank but also an option that other large DFIs, that attract impact-oriented investors into small-scale projects that generate climate or other sustainability outcomes. Because the bonds utilize a DFI's established global issuance program and are principal-protected, mainstream institutional investors can be attracted into projects that are highly impactful.

Outcome bonds are issued by a top-notch, AAA rated DFI. Investors nevertheless accept that they will not receive coupons. The amount saved by the DFI is passed on to specific projects which endeavor to deliver on certain outcomes, such as carbon emission reductions. These outcomes are monetized in the country, for instance by selling carbon credits, and part of the revenue is passed on as a return to bondholders. If the projects financed are successful at delivering the agreed outcomes, then the returns received by investors can exceed the coupon payments foregone.

Four bonds have been issued to date by the World Bank, each with customized metrics, tracking and reporting and payment structures. Each raised between \$50 million and \$150 million for global IBRD operations. They have been a versatile tool supporting emission reductions, biodiversity outcomes and social objectives as is underlined by the four transactions (also summarized in Table 4) (Bennett and Jain 2023):

- The \$100 million in 2021 in support of the United Nations Children's Fund (UNICEF) COVID-19 work. Payments to bond holders on the half of the issuance amount channeled to UNICEF

were conditional on private donations in several countries - in effect the bond securitized these donations and accelerated receipt by UNICEF.¹⁹

- A \$150 million wildlife conservation bond in South Africa ('Rhino bond') in 2022. Savings from coupons that would normally be paid by the World Bank to investors are channeled to wildlife conservation projects in South Africa. Investors instead receive a success payment related to the recovery of the rhino population in the selected sites of up to \$13.8 million (Bennett and Wright 2022).
- The emission reduction-linked ('carbon') bond of \$50 million in which the World Bank saved ordinary coupon payments of about \$7.2 million, which were directed to a project developer installing water purifiers in Vietnamese schools. Use of the water purifiers generated carbon credits, which, once sold, fund returns for holders of the bonds (World Bank 2023b).
- A \$100 million bond in January 2024 related to the reduction of plastic waste in Indonesia and Ghana making use of a new tool to measure and monetize plastic waste reduction (World Bank 2024d).

Table 4: The World Bank has issued various outcome bonds in recent years

Transaction	Overall IBRD issuance	Beneficiary payment, \$	Maturity	Investor payments	Outcome objective	Means of verification
UNICEF bond, 2021	\$100m (of which 50% guaranteed by the WB)	\$50m	5 years	Local donations to UNICEF	UNICEF pandemic response policies	Reporting of donations by UNICEF
South Africa 'Rhino bond', 2022	\$150m		5 years	Payments by the Global Environment Facility (GEF)	Wildlife conservation: growth rate of the rhino population	Rhino population as assessed by Zoological Society of London
Vietnam water purifiers, 2023	\$50m	\$7.2m	5 years	Sale of carbon credits	Carbon emissions saved in providing alternative water filtration devices	Carbon units as verified by VERRA
Indonesia and Ghana plastic waste, 2023	\$100m	\$14m	7 years	Sale of plastic credits ²⁰	Plastic waste reduction	VERRA registered plastic credits

These outcome bonds gave entities in four middle-income countries access to finance in support of nature and climate outcomes. Even though the bonds are offered at the highest credit quality of the IBRD, entities without capital market access are ultimately funded. The World Bank essentially acts as a go-between vetting the project structure and ensuring investors face minimal credit risk. However, investors do bear project-specific risk, which will

¹⁹ In this instance, the bond was not principal-protected.

²⁰ The transaction also included a small amount of carbon emission credits

materialize if fewer of the targeted outcomes materialize or produce a lower return. Outcome bonds also overcome a timing mismatch problem, as financing from capital market investors becomes available upfront in the expectation of nature and climate outcomes generating a return in future. The bond issues are therefore additional and impactful.

While there have been no formal evaluations of outcome bonds to date, some strengths and weaknesses are readily apparent:

- **Strong incentives.** The outcome bond is additional (funding may have been unlikely to have materialized otherwise in a sub-investment grade market), and it is impactful, as, direct emission reductions or other sustainability outcomes are incentivized and verified. The incentives of the contracted entity (e.g. the plastic waste collection and recycling firms) are aligned with those of impact investors and of the DFI throughout the lifetime of the bond.
- **Country ownership.** The bond funds entities that deliver on national climate (or social or biodiversity) objectives. These entities are directly party to the bond's contractual format and are strongly incentivized. However, the government, which sets the broader policy and incentive structure under which the activities take place, is not party to this scheme.
- **Addressing institutional and capacity constraints, e.g. on MRV.** Because investor payments are directly related to, for example, documented emission reductions, this capacity is strong from the start, or it is set up as part of the project.
- **Upfront mobilization of resources from domestic and/or foreign investors.** This is a key benefit of outcome bonds as investors make resources available in the expectation of subsequent monetization of outcomes.
- **Impact on the local private sector.** Because the entity is rewarded on an ongoing basis, incentives are aligned with those of investors in the outcome bond. The spillover benefits to other similar parties outside of the agreed transaction structure may not be large.
- **Transaction costs.** These are relatively high; a comparative weakness of the outcome bond structure.

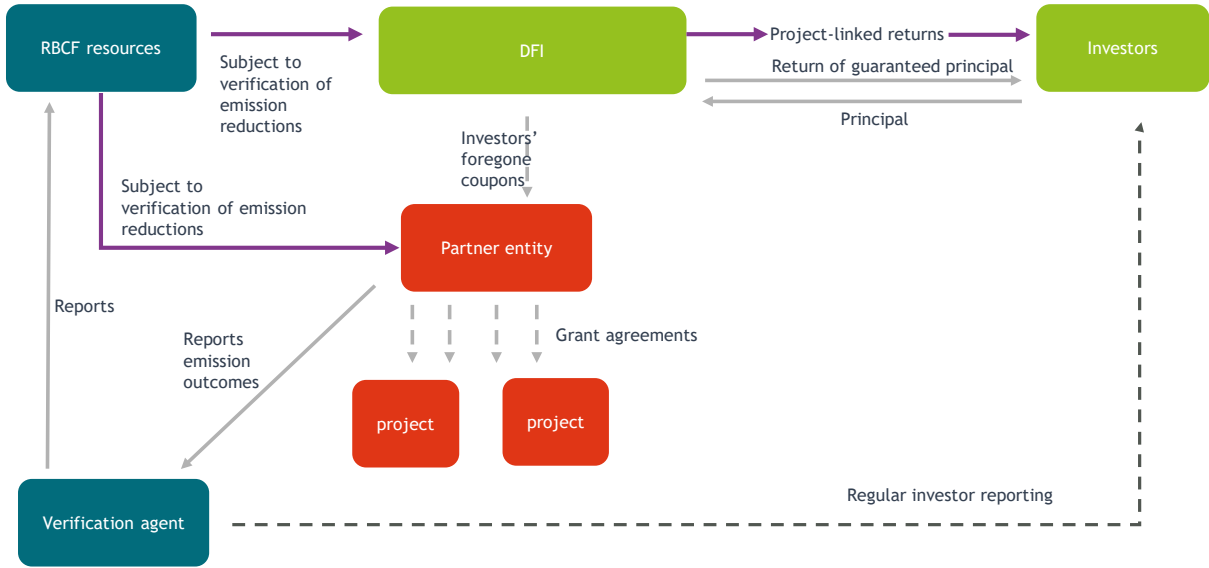
3.4.2. A possible model for the integration of RBCF

Outcome bonds lend themselves to the integration of RBCF, as investors and the RBCF providers require similar reporting and verification and are motivated by similar incentives. The instrument may therefore be very suitable for further incentivizing and funding private sector emission reductions or giving the projects critical scale or viability.

One option for integrating RBCF payments in the outcome bond structure would be to use RBCF to make success payments to investors upon the verification of emissions reductions by the local partner entity. This is illustrated in Figure 3, based on a structure that was used in the World Bank's conservation ('rhino') bond. The trust fund would pay for verified emission reductions. The trust fund (and investors) would also regularly obtain verification reports from a designated agent.

The objectives of the outcome bonds should be aligned with donor interest. The ongoing disbursement of RBCF as emission reductions are achieved would still facilitate the upfront mobilization of private bond investor resources, and it would be backed up by the verification and reporting capacity that in any case needs to be established for the bond.

Figure 3: Structure of an RBCF-integrated outcome bond



3.4.3. Comparison to existing product

Using RBCF payments to pay for emission reductions can be justified by the marginal investment case for many mitigation-related investment projects. Trust fund payments would likely strengthen impact and country ownership, for instance if a larger set of beneficiaries can be accessed on the back of the same investor pool. On the back of greater scale, demonstration effects could be considerably enhanced, making it more likely other impact investors would replicate the project.

RBCF payments would strengthen the impact sought through the outcome bonds. RBCF delivery would utilize and benefit from the institutional capacity built around the outcome bond structure (through the verifying entity).

At the same time, there are drawbacks. The outcome bond structure necessarily requires a fixed pool of beneficiaries that determine investor returns. A further challenge will be in identifying projects where RBCF will make a difference in mobilizing investors, thereby giving comfort that the RBCF is essential for achieving additional emission reductions. Finally, the four outcome bonds developed to date have been relatively complex, in part given the novel type of bond structure and the number of additional private actors involved. Replication and scaling up may be difficult.

3.4.4. Alternative designs

A separate delivery of RBCF to the same targeted entities would be very difficult, if not impossible. Only the outcome bond structure engage investors through a principal-protected bond that make capital available up front. By contrast, the separate provision of RBCF would only provide ongoing payments as emission reductions materialize. The economics of the

support would be much weaker.

In principle, emission reductions by the same entities targeted in the outcome bond could be incentivized through direct RBCF payment upon the documentation of successful emission reductions. This is realistic where a limited number of distinct entities are targeted (as the two wildlife parks in the case of the ‘rhino bond’). It is more difficult to see how this could be achieved when emission reductions are to be delivered by a dispersed set of local entities (e.g. schools, or private plastic waste collectors) unless a strong public sector intermediary is involved.²¹ A parallel structure would clearly entail additional transaction costs.

That said, a separate delivery of RBCF may be more flexible in targeting a gradually expanding number of entities. It would allow RBCF providers to be free to seek emission reductions from other additional entities (which could not be done under the bond structure), thereby enhancing private sector benefits.

There is in principle also an option for the trust fund to embed an additional concessional element in the outcome bond. Rather than make RBCF payments as emission reductions are delivered, the expected value of emission reductions could be capitalized and disbursed to partner entities at the outset. This might be justified given the upfront investment costs needed to generate emissions outcomes or to cover the costs of investment for monitoring and reporting of emission reductions. In this model, RBCF will primarily benefit the partner entities, not investors. The integrated model (presented in 3.3.2) would be superior in terms of investor mobilization (due to the subsidy of returns), but inferior in terms of private sector impact and addressing capacity constraints (as the initial capital injection in the country is lower). The upfront subsidy may do little for country ownership or incentives to delivery emission reductions on an ongoing basis, as project returns remain determined by the amount of emission reductions generated. The upfront provision of a grant would considerably weaken ongoing incentives.

Table 5 summarizes the advantages and disadvantages of integrating RBCF into outcome bonds with these alternative structures.

3.4.5. Summary

Outcome bonds are currently a niche instrument, though they have proven useful in channeling impact investment funds to smaller entities that generate carbon or other sustainability outcomes. Investors are attracted by the principal protected bonds from a AAA-rated institution, and by a structure for the tracking of emission reductions (or other outcomes) that are vetted by a DFI and implemented by a credible verification provider.

²¹ For instance, in the case of the Vietnam bond, the schools were supplied by a local company (Sustainability Investment Promotion and Development Joint Stock Company), which accounted for carbon credits.

Outcome bonds are innovative, though they are also a costly and relatively complex model. Flows of funds are limited to the interest costs of the bond that can be ‘front-loaded’ and channeled to recipients. While suitable for small private entities who would otherwise not access international capital markets, it may be difficult to scale this model. Because the bond brings forward a future payment stream from payments of emission reductions or similar outcomes, pricing or the incentives for the contracted entities may be difficult to design ex-ante.

Table 5: An assessment of outcomes bonds with integrated RBCF with various alternatives

	RBCF-supported outcome bond in comparison to	
	RBCF payments delivered separately	Other concessionality integrated in the bond
Incentives for emissions reduction /NDC delivery	Stronger , given the separate provision of RBCF payments likely detached from the outcome bond or benefiting other entities	Stronger , as upfront conditionality will weaken subsequent incentives. As the ongoing payments to the partner entities are the same in both models.
Country ownership	Stronger , given additional visibility.	Possibly worse . Government and partner entities would prefer to receive concessionality immediately and with certainty
Addressing institutional and capacity constraints	Unchanged or could be lower if separate RBCF payments would allow other entities in the country which are not contracted under the outcome bond to also benefit.	Weaker . An upfront subsidy would support capacity building.
Upfront mobilization of resources	Stronger . Impact investors are attracted into the principal-protected outcome bonds, whereas capital mobilization would be limited if the trust fund engages on its own.	Stronger . As investors are paid a subsidy, return expectations and investor mobilization are higher.
Impact on the local private sector	Stronger . As the private sector would likely have difficulty raising capital without the outcome bond structure.	Weaker . An upfront subsidy could support capacity building.
Transaction costs	Lower cost , as separate payments would require a parallel program with additional documentation requirements.	Unchanged , as MRV of carbon credits generated still needs to be undertaken.

3.5. Sovereign sustainability-linked bonds

Modalities at a glance

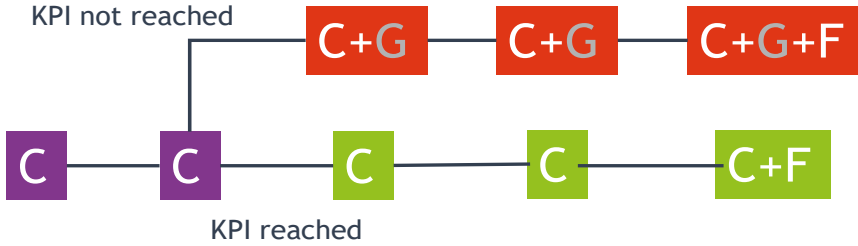
- *A government agrees with private sector arrangers a sovereign sustainability-linked bond (SLB) which foresees a step-down in coupon payments if the issuer meets an economy-wide emissions target expressed in a key performance indicator (KPI).*
- *RBCF payments are made to the government. These use the same assessment methodology as the SLB and a pre-determined carbon price. They could be made ahead of the test points as ERs materialize, at the test point, or over the remainder of the bond's maturity depending on when policy uncertainty is greatest.*
- *The RBCF provision also ensures that there is a robust MRV system that supports the rigorous quantification and verification of ERs.*
- *In the expectation of this payment the government can offer to investors a smaller step-down or a more ambitious emission reduction target. The RBCF support also makes the targets and their reporting more credible. This attracts a larger pool of commercial investors into the bond and strengthens government incentives to deliver on the target.*

3.5.1. Existing formats and track record

Governments are increasingly interested in sustainability-linked bonds (SLBs), which link the financial terms of a bond to sustainability outcomes delivered and accounted for by the issuer, which act as an incentive for the issuer. Unlike green bonds, the funds raised through an SLB are not earmarked for specific spending categories, greatly facilitating budgetary cash management. In their most common format, missing a sustainability performance target (SPT), such as national emissions reductions results in a penalty interest rate for the remaining duration of the bond (Figure 4). However, an alternative 'step-down' format, where achieving a target results in a lower interest rate, can be equivalent in financial terms, and has attractions for some investors which may not want to be paid a reward if the issuer fails to deliver on a target (Erlandson and Richardson 2024).

The SLB format can accommodate a variety of sustainability objectives, timelines and incentive structures. This can potentially reflect economy wide NDC targets, or other outcomes related to specific sectors or other Sustainable Development Goal (SDG) objectives. The International Capital Market Association (ICMA) has proposed a common format and a range of SPTs, many of which relate to climate mitigation (ICMA 2020). On this basis, the market is expected to adopt more coherent standards.

Figure 4: SLB payment structure (step-up model)



Source: Based on (Berrada et al. 2022), illustrating a simple structure for coupon payments C, penalty payments G, and the final payment F.

SLBs have been popular in corporate bond markets, in particular in Europe, though they remain a niche product in sovereign bond markets. At the time of writing, there have been only two sovereign SLBs²² - by Chile and Uruguay in 2022 - though several larger emerging market sovereigns are preparing to issue these instruments.

- In 2022 the SLB issued by Chile raised \$2 billion, for which the coupon payments would go up for each missed KPIs, one relating to cumulative greenhouse gas emissions, the other to the share of renewables in the domestic energy mix. The bond in effect linked delivering of the NDC commitment to debt finance costs for the sovereign (Environmental Finance 2023).
- Later that same year, Uruguay issued a \$1.5 billion bond in a ‘step-down’ format that was linked to two sustainability performance targets (SPTs), one on the reduction in aggregate emission intensity, the other referring to the preservation and expansion of native forests. The second party opinion, in which a private firm assesses the bond framework independently, deemed both targets ambitious and well-defined (Sustainalytics 2022).

In addition, there have been bonds linked to emission reductions issued by several European municipalities.

Several factors may have held back SLB issuance in developing countries. A recent study points out that SLB issuance requires a reasonably well developed local capital market and regulation (OECD 2024). A government issuer would need to define clear sustainability performance targets and key performance indicators, and investors would need to be convinced that such targets are reasonably ambitious. Corporate SLBs have been criticized for stipulating only marginal changes in debt service costs compared to normal financing terms. Investors may see such flaws as particularly problematic for a government issuer where the regular financing instruments provide a readily available financing tool that may mute the disciplining effect that investors expect sustainability-linked bonds to exert.

²² As discussed below, the WB has supported an SLB issuance by a non-sovereign public body in Rwanda.

3.5.2. Possible models for integrating RBCF payments

RBCF payments from trust funds could reinforce the incentives defined in an SLB. While keeping the definition of the SPT, and the nature and timing of the KPIs, as given, RBCF payments could further incentivize and reward commitments made by the government in the context of a commercial bond contract. These arrangements would be made bilaterally between the trust fund and the government and would not be covered in the bond's term sheet.

This design would require the nature and ambition of targets stipulated under a commercial bond contract to determine the structure of the RBCF transaction. This is likely to be the case where the emission path reflected in an SLB would come from a published NDC and associated transition plan. Further comfort could be derived from the advisory work that the World Bank and some other MDBs undertake on public debt management, while the World Bank publishes ESG metrics for most countries and has designed a framework for assessing baseline scenarios that can help judge to what extent targets are ambitious and how KPIs could be set to attract investors (World Bank 2024c). Assuming that the bond contract is based on economy-wide emission reductions, the provision of RBCF payments in this use case would be somewhat similar to jurisdictional crediting approaches.

Most SLBs work through a step-up structure. As set out above, under this structure, the issuer pays a premium coupon rate beyond the test point should the performance target be missed. Under the assumption that investors seek a valuation on probability-weighted net present value terms that is the same as that of a 'plain-vanilla' bond, this implies that the issuer benefits from a discount in the early days of the bond's lifetime. This is likely to explain the attractiveness of the instrument for sovereign debt managers who value the near-term reduction in coupon rate (i.e. they may be myopic)

RBCF could help encourage a move away from step-up structures which could be more attractive to investors in government debt but which is currently unattractive to many issuers. Investors are attracted to step-down structures as the reward in terms of lower coupon payments is only granted once targets have been met. However, this implies that the issuer must pay an up-front *premium* relative to the 'plain vanilla' coupon rate, and this premium will be higher if the target is close to the issuance date or not ambitious and therefore likely to be achieved. This makes a step-down structure unattractive to many issuers.

RBCF payments would help to redistribute the time profile of debt service costs over the lifetime of the SLB. There would be three main design options for RBCF payments and Box 2 illustrates these different options graphically:

- i. **On an ongoing basis as emission reductions relative to a baseline accrue ahead of the test point.** In the case of a 'step-down' SLB structure, RBCF payments could lower (effective) debt service costs in the early years. In this model, the SLB contract helps the government issuer access investors interested in emission outcomes through an SLB, while the early RBCF payments would defray upfront debt service costs and the one-off expenses.
- ii. **Once the sustainability-performance targets in the SLB have been achieved.** In this case, the disbursement from the trust fund would be contingent on the government

meeting its KPIs relating to emission reductions defined in the SLB terms and made at the test point. Payments would correspond to emissions reduced relative to the economy's baseline emissions path and the trust fund's carbon shadow price. This strengthens incentives already defined in the SLB.

- iii. **On an ongoing basis beyond the test point.** In this case, if the sustainability performance target in the SLB was met, the donor would reward sustained reductions relative to the base case over the remainder of the lifetime of the bond. Leveraging the SLB contractual structure for additional RBCF payments would raise incentives for the issuer to design such a relatively complex structure.

In all cases, the prospect of RBCF payments should strengthen the government's incentives to deliver emission reductions. It is notable that most SLB contracts only specify minimal variations in interest rates (typically in the order of 0.5 per cent), implying a reluctance by investors to accept larger discounts. However, this also means that the incentive effects of the SLB structure may be limited. In this context, RBCF payments effectively harness the SLB structure to ensure that the issuer perceives a larger reduction in debt service costs than would be the case under a stand-alone commercial bond contract, strengthening the issuer's incentives to deliver emission reductions. In essence, the commercial bond contract defines the contingent path for interest rates and maturity of the bond (T_M in the diagram in Box 2) given the government's sustainability target (lower emissions e_r at test point T). In the expectation of RBCF payments (irrespective of when these would be paid), the government may offer a more ambitious target (lower e_r or earlier delivery of the target) or it may be prepared to accept a lower step-down (a higher c_1).

However, the timing of RBCF will have important implications for incentives. Assuming the government delivers on its target, payments before, at or following the test point could be constructed to be the same in net present value terms, yet motivations for policy makers will vary drastically. Where early policy reversal is a risk, payments ahead of the test date (option 1) would incentivize up-front delivery of emission reductions. This may be valuable if the decrease in future debt service costs under the standard SLB terms is too marginal or distant to provide sufficient incentives. Payment at the test date (option 2) would leverage the incentives defined by the SLB (but discipline would be lost post a successful test point). Finally, payments post-test date (option 3) would be sensible where ongoing policy commitment is in doubt.

3.5.3. Alternative models for RBCF payments

The above model of RBCF integration leverages private sector investors' capital and monitoring. The issuance of a sovereign bond whose terms are linked to emission outcomes defines a strong discipline and effective accountability for a government, even though sovereign bond formats may only be limited to a partial climate mitigation target expressed in a small number of KPIs, and a single test point. Efforts to directly provide RBCF to a government but outside of SLB structure may provide flexibility in terms of defining test points or targets. However, this would come at the considerable cost that the RBCF would no longer leverage the mobilization of private investors, nor benefit from the ongoing monitoring of the convergence to targets that they would demand. Incentives for the government could be confused.

Box 2 Options for integrating RBCF into SLBs

Figure 5 helps to illustrate timing and determinants of possible RBCF payments. The bond sets a single SPT test at time T , as to whether emissions are at or below e_r , which is lower than e_b in the base case. Between issuance at T_0 test date T the coupon rate is c_b , and then $c_1 < c_b$ if the SPT is met, c_2 otherwise. In most cases, the bond will be more expensive than the equivalent 'plain vanilla' bond instrument ahead of the test date ($c_b > c_{PV}$, the associated normal coupon rate), but cheaper between T and maturity at T_M if the SPT is met.

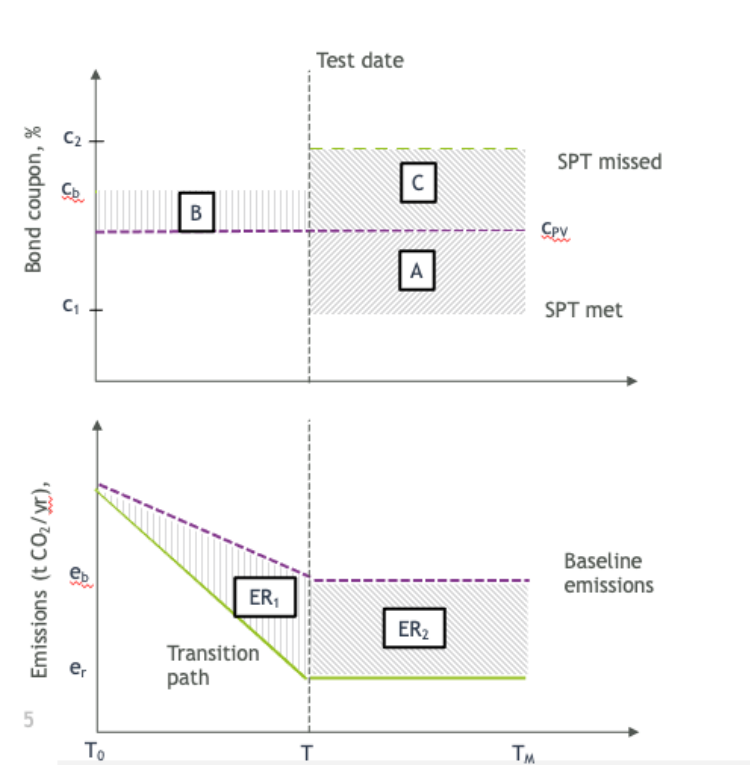
Abstracting from any discounting, interest costs to the issuer will be $c_b(T-T_0) + c_1(T_M-T)$ if the SPT is met and $c_b(T-T_0) + c_2(T_M-T)$ otherwise. If the investor attaches a probability p to the success of the target she would anticipate a probability weighted average of these two revenue streams ex ante. A strong no arbitrage assumption would stipulate that this is equal to $c_{PV}(T_M-T_0)$, the interest costs of the 'plain vanilla' instrument ($B=A-C$ in the diagram). Note that taking c_1 and c_2 as given, a higher success probability p (e.g. due to a less ambitious target or additional support to policy delivery) would result in higher up-front costs (c_b), as investors would attach a greater likelihood to a later discounted coupon rate.

The three options for additional RBCF payments outlined in the text are:

- i. Payments on an ongoing basis between T_0 and T as the government delivers emission reductions reflected in area ER_1 ahead of the test date. Payments would be $R_1 = ER_1 * p_c$, where p_c is the shadow price of carbon emissions set by the trust fund.
- ii. That same payment could be made in one lump sum at T if and only if the KPI is met ($e(T) < e_r$), though the issuer would attach a lower present value to that payment.
- iii. Thirdly, an ongoing payment of R_2 could be made from the test date to maturity, reflecting the target outcome over the remainder of the bond's life: $R_2 = (T_M - T) * p_c * (e_b - e_r)$.

Ongoing payment in the total amount of R_1 could reduce the upfront cost of the bond but would weaken the disciplining effect of the test date on policy. A payment of the same amount at T could keep the issuer focused on policy delivery, though would be discounted, given the later and single payment date. The ongoing payment following T would be effective in locking in subsequent policy delivery, a period when bond investors no longer have any leverage.

Figure 5: Coupon rates under SLBs and different options for integrating RBCF



At least theoretically, there is also an alternative option of an upfront grant payment to the SLB issuer of the same expected value as the RBCF payments, but unrelated to future emission reductions. This may for instance fund the government's capacity to account for emission reductions under the SLB. A lump-sum payment unrelated to mitigation performance would do nothing to change government incentives to ultimately deliver emission reductions. However, institutional constraints are likely to be better addressed, backed by a grant payment towards MRV capacity, and this may well reassure investors in the primary issue. However, overall, there is little to commend this model other than boosting the government's commitment to undertake the issuance.

3.5.4. Summary

Where emission reduction targets defined in commercially-structured SLBs are ambitious and well-defined, RBCF payments could strengthen policy incentives. SLBs may be attractive in terms of the traditional debt management objectives and two recent bonds raised substantial funding for economy-wide climate and nature outcomes. Reporting on highly visible KPIs creates ongoing discipline and may coalesce government decision makers around sustainability performance targets. The timing of the RBCF payments, ahead of the test date, at the test date, or after the test date up to the maturity of the bond, could address weakening policy commitment. Table 6 lists the key benefits relative to a stand-alone SLB and the alternative structures considered.

SLBs will be primarily relevant for governments in middle income countries of relatively high credit quality with an established capital market presence and sound and transparent reporting frameworks. The allocation of donor trust funds towards such countries will therefore need to be well targeted, in particular towards issuers with ambitious targets, limited fiscal space and sound programmatic engagements with relevant DFIs.

Table 6: An assessment of SLBs with integrated RBCF with various alternatives

	RBCF-supported SLB in comparison to		
	'Plain vanilla' SLB	Separate provision of RBCF not linked to SLB structure	A grant offered up front to support SLB issuance
Incentives for emission reduction/NDC delivery	Stronger. RBCF could reinforce the incentives defined in the SLB.	Stronger. Separate provision will likely result in a complex set of incentives that may not be consistent.	Much stronger. The upfront grant will not address the upfront debt service costs associated with a SLB step down structure.
Country ownership	Stronger. Due to the coordination between RBCF providers and investors.	Stronger, Due to the coordination between RBCF providers and investors.	Weaker. The upfront grant would likely be preferred by the government due to the certainty of its realization.
Addressing institutional and capacity constraints	Unchanged. This would in any case need to be done to set up the commercial SLB contract.	Unchanged. This would in any case need to be done to set up the commercial SLB contract.	Weaker. The upfront grant could help address institutional and capacity constraints in a way that an RBCF-supported SLB would not.
Upfront mobilization of resources	Unchanged or slightly better. The issue of the SLB is likely to be more realistic as investors are more confident in the KPIs being achieved on the back of additional RBCF incentives.	Stronger, Providing RBCF outside of the SLB structure would have a much smaller mobilization impact	Unchanged.
Impact on the local private sector	Stronger. RBCF-integration defines a more transparent transition path which benefits the private sector.	Stronger. The more transparent transition path, more powerful incentives and additional government resources should support private-sector engagement	Stronger. Relative to the stand-alone model. KPIs and time path define a more transparent transition path that should benefit the private sector.
Transaction costs	Slightly higher. Due to the reporting requirements associated with the provision of the RBCF.	Lower. The separate provision of RBCF would create parallel processes for assessing emissions performance, raising transaction costs.	Higher. Provision of an upfront grant would have lower transaction costs.

4. Conclusions

The five use cases explored in this report demonstrate that there is a significant opportunity to integrate RBCF into the range of financing and funding instruments used by DFIs, and the financial advice they provide. While the context of the use cases differs significantly, all demonstrate that integrating RBCF can:

- strengthen incentives to deliver emission reductions
- while helping to ensure that the capital that is needed to respond to these incentives is available. Indeed, RBCF integration can often help mobilize additional capital.

The former is a particularly compelling rationale for using RBCF rather than other forms of donor-funded upfront concessionality. The latter benefit contrasts with the stand-alone provision of RBCF, where there is often concern that the RBCF recipient will not be able to access/mobilize capital. Table 7 summarizes the key features of each use case.

However, the integration of RBCF in use cases such as those presented in this report will require several changes to current practice, as well as careful design. Some of the most important of these include the following:

- Recognition that middle-income countries will be prominent users of integrated RBCF solutions. Some of the opportunities to integrate RBCF in a way that can help mobilize large amounts of capital for emissions reductions lie in those instruments that are linked to international capital markets, such as policy-based guarantees (Use Case 3) and sustainability-linked bonds (Use Case 5). These instruments will be predominantly used by middle-income countries.
- The need for careful design to avoid market distortion. While RBCF provides attractive incentives for emission reductions, it still involves the allocation of grants. In cases where these grant payments are channeled into product and capital markets, there will be concerns that they may distort competition within these markets. Among the use cases considered in this report, this is likely to be most pronounced in the context of lending by financial intermediaries (Use Case 1).
- The integration of trust-fund provided RBCF into the operations and engagement of DFIs will require close harmonization between the processes and requirements of the trust fund and those associated with the underlying World Bank instrument or engagement. Without this harmonization, there is a risk that the transaction cost savings that RBCF integration potentially offers, especially to client countries, could be lost.

Table 7: Summary of RBCF integration use cases

What is the model for integrating RBCF?		What are the expected benefits?	Key risks/challenges
RBCF integrated into financing products			
RBCF integrated into financial intermediary lending	RBCF payments to FI directly proportional to the ERs achieved at project level by sub-loan borrowers. Portion of the (expected) RBCF passed on to sub-loan borrowers either before or after the delivery of ERs.	Align incentives between DFI, FI and borrowers. Incentivize ERs among large number of diffuse actors, while ensuring these actors have access to finance.	Risk of distorting lending markets through grant payments to (state-owned) FI. Need for MRV capacity to be deeply entrenched in country to avoid gaming. Need to focus on projects where risk of emission leakage is low.
RBCF integrated into development policy lending	DPL issued following completion of prior actions (as with conventional instrument). Extent of ERs delivered at sector or policy level determines interest rate reduction. RBCF covers cost of interest rate reduction.	Sustain incentives for institutional or policy change that deliver ERs for duration of loan with (typically) knock-on impacts for private sector investment and financing. Involvement of MoF allows for whole-of-government response to incentives.	Some increase in transaction costs for MRV of emission reductions.
RBCF integrated into policy-based guarantees	Country taking out a mitigation-relevant PBG receives RBCF payments to offset guarantee cost so long as reforms are on track and proportional to ERs delivered.	Opens up capital market access and improves financing terms leading to additional public resources allocated to mitigation policies. Policy reforms and (possible) lower cost of capital increases private sector low-carbon investment.	Verification of emission reductions, in addition to policy implementation, will raise transaction costs and reduce clarity on outcomes and costs arising for the government.
RBCF integrated into funding instruments			
RBCF integrated into outcome bond	RBCF used to pay for emission reductions delivered by projects/programs supported by outcome bond (through purchase and retirement of ER credits).	Outcome bond investors perceive lower risk from bond structure, increasing investor take up, allowing more capital to reach projects/programs.	High transaction costs/difficulties in mobilizing large amounts of capital of underlying structure persist.
RBCF integrated into advisory			
RBCF integrated into SLB advice	RBCF paid to sovereign issuing SLB with a step-down structure, using SLB structure for assessing ERs. Payments made either ahead, at same time, or after test point.	Increased investor uptake of SLB though (i) enhanced credibility in SLB targets and ER assessment and/or (ii) RBCF payments allowing issuer to offer smaller step-down and/or more ambitious target.	The SLB structure would define the outcomes rewarded by the trust fund and their timing.

Annex

The Annex sets out more details about the theory of change and assumptions associated with each use case.

Model 1: Financial Intermediary Lending

The ‘theory of change’ for integrating RBCF into FIL has the following key elements:

- if FIs and sub-borrowers within a financial intermediary loan receive the benefit of additional payments conditional on achieving verified emission reductions;
- Then, in the short term, and for activities that are often difficult for a DFI to otherwise facilitate, there will be stronger incentives to monitor and deliver high-quality emission reductions, resulting in greater upfront capital mobilization and private sector interest, hence supporting the attainment of the NDC in a way that enhances country ownership.
- And, in the longer term, the greater familiarity and comfort that FIs and private sector will obtain concerning emission reduction activities (their risk and repayment profile etc.) will result in future capital mobilization towards these activities without the use of RBCF, helping move the domestic financial sector towards the transformational change that the Paris Agreement requires.

The assumptions that need to hold for this theory of change to apply can be broken down into three groups. The assumptions that motivate the use of FIL are that:

- A diffuse set of private sector actors who are expected to deliver emissions reductions to meet the NDC face a binding constraint on access to finance because the emissions reducing technologies or practices are unfamiliar or untested in the local credit market. This motivates the use of an FIL rather than an alternative financial product.
- The DFI can be confident that the achievement of project-based emission reductions can be aggregated to support NDC attainment i.e. the risk of leakage is minimal. This is a further necessary condition to make use of a financial institution loan disbursed to individual sub-borrowers attractive compared to an alternative financial product.

The assumption that needs to hold to make embedding grants within the FIL attractive is:

- There is a realistic possibility that a short-term grant element will have a lasting impact by helping to change perceptions about the activity or technology. The corollary of this is that there is a broadly supportive policy environment for reducing emissions, including, for example, that relative prices of emissions intensive activities are not distorted. Without this, there is a strong risk that emission reductions are only achieved for as long as grant payments (lower-interest rates) are available. This is required to ensure that the use of grant payments represents value for money.

The assumptions that need to be in place to tie the provision of these grants to the delivery of emission reductions are:

- There emission reduction opportunities are sufficiently homogenous that standardized MRV approaches for assessing emission reductions can be established.
- Institutional capacity to measure and report on emission reductions is robust or is being established as part of the DFI engagement and this can be done at relatively low cost. Building on the discussion above, this assumption will be more likely to hold when the

emission reduction opportunities are relatively homogenous. Ensuring this capacity is in place is essential for all parties to have confidence that RBCF payments tied to the delivery of project-based emission reductions can be credibly delivered.

- The activities being financed by the sub-loans deliver emission reductions relatively quickly and/or there are important non-financial behavioral barriers holding back lending towards emission reduction activities. The former is important if the financial incentives provided by the RBCF are going to be a powerful signal to FI's or borrowers (or to avoid donors needing to provide large amounts of RBCF to incentivize emission reductions). The latter can mean that even relatively small amounts of RBCF payments can have outsized impacts on the take-up of mitigation technologies.
- Arrangements for passing on the benefits of the RBCF payments to sub-recipients are transparent and clear. This helps to ensure that channeling the grant payment through an interest rate reduction provides a sufficiently strong signal to reduce emissions to private sector actors. This strongest, most transformative way in which this assumption can hold is when the FI makes changes to its upfront borrowing terms on account of the expectation of future receipt of RBCF payments (i.e. when the FI takes on significant emission reduction delivery risk).

Model 2: Development Policy Lending

The 'theory of change' for the integrated RBCF product in this use case is relatively simple:

- if there is a need to improve the institutional, policy and/or enabling environment within a country or sector to accelerate emission reduction efforts;
- then, especially in contexts in which there is a reasonable chance that the desired reforms may not 'stick' under traditional policy conditionality, the provision of an interest rate reduction contingent on the delivery of emission reductions is more likely to lead to long term improvements. In turn, these improvements will increase capital flows towards, and private sector interest in, emission reduction activities.

The key assumptions that need to hold for this Theory of Change to be robust can be split into three categories.

The assumptions that motivate the use of the programmatic loan are:

- The current institutional and/or policy environment for the delivery of emission reductions at the national or sectoral level is a binding constraint to the delivery of emission reductions. By contrast, other factors that can hold back the delivery of mitigation, such as concerns regarding uncertain technologies or practices, are less significant.
- Linked to this, the delivery of emission reductions requires coordination across a range of different public and private actors. Without programmatic reform, there is a risk that actions by one actor to reduce their emissions will be largely offset by (in)action by others.

The assumptions that motivate channeling grant payments conditional on emission reductions, rather than providing a DPL that has concessionality embedded upfront are:

- Concerns regarding government borrowing capacity and the ability to meet interest payment (regardless of future action or inaction in relation to mitigation) are not that significant.
- There is a reasonable possibility that the supportive reforms associated with the DPL might be reversed in the future. This might be, for example, because of the possible impact of future changes in government or where there is a strong domestic constituency resistant to the changes needed to deliver the NDC.

The assumption that needs to hold to channel this incentive payment as an interest rate reduction embedded in the programmatic loan is that:

- The barriers that prevent the delivery of emission reductions, or the risk that favorable reforms may be reversed, are best addressed through a ‘whole-of-government’ response and that that counterpart to the DFI loan is a ministry well-positioned to provide or coordinate such efforts.

Model 3: Policy-based guarantees

The theory of change for integrating RBCF into a PBG is that:

- where challenges in accessing international capital markets motivate a PBG;
- and the baseline cost of the guarantee is a disincentive, also given how that guarantee will use up the country’s borrowing envelope with the DFI;
- then the integration of RBCF such that lower annual charges for the guarantee are made contingent on emission reductions performance could help overcome access to finance challenges and strengthen incentives for NDC delivery, increasing the fiscal resources available for mitigation efforts.

The key assumptions that would need to hold for this theory of change to be robust are that:

- The client considers that a PBG, with integrated RBCF, is an attractive instrument. This is potentially quite a strong assumption given that PBGs have often been unattractive to clients, a feature which is often attributed to the way that DFIs treat guarantees relative to country lending limits (Landers and Aboneaaj 2022). Of course, the attractiveness of the RBCF-integrated PBG will be partly affected by its design.
- The amount of lending guaranteed, and the duration of the guarantee is long enough, to establish a material incentive to reduce emissions.

Model 4: Outcome bonds

The overall theory of change for this intervention is that:

- if there are emission reduction projects that might be supported by an outcome bond, but the economics of the carbon credit monetization is uncertain or does not cover investor return expectations, or the expected investor interest does not create a critical scale of partner entities in a specific country and sector;

- then the integration of RBCF into the outcome bond structure could make a critical difference to project economics of the project(s), allowing for the mobilization of more and/or additional investors, thereby supporting NDC attainment in that country.

The key assumptions for this theory of change to hold are:

- the baseline outcome bond structure is sound, specifically with a credible verification provider;
- it is possible to identify projects where the use of RBCF as an off-taker of carbon credits would make a critical difference to investor engagement; and
- the realization of emission reductions achieved at the project level can be confidently aggregated to support whole-economy NDC attainment.

Model 5: Sovereign sustainability-linked bonds

The theory of change for this intervention would be:

- if a government is in the process of issuing a ‘step-down’ SLB (and the associated resources it can mobilize) but is uncertain about issuance costs and higher coupon costs in the early years of the bond;
- then RBCF payments can help overcome these reservations, allow the mobilization of significant amounts of private capital and reinforce government incentives for policy delivery associated with the SLB.

The key assumptions that need to hold for this theory of change are that:

- the government is at or close to investment grade credit quality and has debt-bearing capacity;
- it has set within the SLB bond a sustainability-performance target and KPI that is suitably ambitious relative to its NDC;
- the government has a sound and transparent framework for reporting on sustainability outcomes.

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Pengwern Associates is a UK-based consultancy specialising in the economics of climate change, the environment, international development and the linkages between them. Across these areas, it provides advice to support strategy development, decision-making and implementation, drawing on both quantitative and qualitative analysis.



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