



RESULTS-BASED CLIMATE FINANCE IN PRACTICE: DELIVERING CLIMATE FINANCE FOR LOW-CARBON DEVELOPMENT



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CONTENTS

- EXECUTIVE SUMMARY 1
- 1. INTRODUCTION5**
 - 1.1 WHAT IS RESULTS-BASED CLIMATE FINANCING (RBCF)? 5
 - 1.2 REPORT OBJECTIVES AND SCOPE..... 6
 - 1.3 REPORT STRUCTURE..... 7
- 2. EVOLUTION OF RBCF8**
 - 2.1 RBF IN THE LITERATURE 8
 - 2.1.1 *Principal-agent theory* 9
 - 2.1.2 *“Structural change” theory*..... 10
 - 2.2 CHALLENGES AND OPPORTUNITIES FOR RBCF 12
 - 2.3 RBF IN THE CLIMATE CONTEXT..... 14
 - 2.3.1 *Experiences from REDD+*..... 14
 - 2.3.2 *RBCF beyond REDD+* 15
- 3. THE RBCF LANDSCAPE17**
 - 3.1 PROFILE OF PROGRAMS REVIEWED 17
 - 3.2 KEY CHARACTERISTICS OF PROGRAMS REVIEWED..... 18
 - 3.2.1 *Assessment of RBCF programs by sector* 18
 - 3.2.2 *Geographical distribution of RBCF programs* 20
 - 3.2.3 *RBCF programs according to their objectives and indicators* 20
 - 3.2.4 *RBCF programs – financial volume and financing source by sector* 23
- 4. RBCF DESIGN VARIATIONS27**
 - 4.1 FINANCING STRUCTURE 27
 - 4.2 DEFINITION OF RESULTS..... 28
 - 4.2.1 *Types of Disbursement Linked Indicators (DLIs)*..... 28
 - 4.2.2 *Single vs. multiple results*..... 30
 - 4.3 INSTITUTIONAL STRUCTURE 32
- 5. LESSONS FROM RBCF PROGRAMS: THEORY VERSUS PRACTICE38**
 - 5.1 INCREASING MONITORING, REPORTING, AND VERIFICATION (MRV) CAPACITY..... 38
 - 5.1.1 *Leveraging existing systems* 39
 - 5.1.2 *Pairing RBCF with Technical Assistance (TA)* 40
 - 5.1.3 *MRV capacity building in the forestry sector*..... 40
 - 5.2 SUPPORTING DOMESTIC POLICY PROCESSES..... 41
 - 5.2.1 *Programs that strengthen implementation capacity* 41
 - 5.2.2 *Programs that align and enhance national sector policies*..... 43
 - 5.3 CROWDING IN PRIVATE ACTORS 43
 - 5.3.1 *How to measure private sector engagement?*..... 43
 - 5.3.2 *How have the programs reviewed been able to engage the private sector?* 44
 - 5.4 CONTRIBUTION TO MARKET CREATION 46
 - 5.4.1 *RBCF’s impact on carbon market development*..... 47
 - 5.4.2 *RBCF’s impact on markets for energy and forestry products* 49
 - 5.4.3 *RBCF’s impact on financial markets*..... 50
 - 5.5 REPLICATING AND SCALING UP SUCCESSFUL ACTIVITIES..... 50
 - 5.5.1 *Scaling up existing RBCF programs*..... 50
 - 5.5.2 *Boosting demand for climate-friendly technologies supports scaling up* 52
 - 5.6 SUCCESSFUL DELIVERY OF RESULTS 52

5.7	KEY FINDINGS	53
6.	CONCLUSIONS	55
APPENDIX A.	FIVE RBCF PROGRAMS EXAMINED IN DETAIL	56
	PILOT AUCTION FACILITY FOR METHANE AND CLIMATE CHANGE MITIGATION (PAF)	56
	GUYANA REDD+ INVESTMENT FUND (GRIF)	58
	ENERGY+ PARTNERSHIP (ENERGY+)	61
	GLOBAL ENERGY TRANSFER FEED-IN TARIFFS PROGRAM (GET FIT).....	63
	R4 RURAL RESILIENCE INITIATIVE (R4).....	66
	CONCLUSION	69
APPENDIX B.	RBF IN PRACTICE IN THE HEALTH AND EDUCATION SECTORS	70
APPENDIX C.	RBCF PROGRAMS REVIEWED.....	75
APPENDIX D.	THE 25 MAPPING PARAMETERS USED TO COLLECT DATA ON RBCF PROGRAMS REVIEWED ..	79
APPENDIX E.	ASSUMPTIONS IN ESTIMATION OF EXPECTED RBCF DISBURSEMENTS AND CAPITALIZATION OF INTERNATIONAL PUBLIC RBCF PROGRAMS.....	80
APPENDIX F.	EXAMPLES OF DISBURSEMENT-LINKED INDICATORS (DLIS), BY SECTOR.....	82
APPENDIX G.	GLOSSARY	84
	REFERENCES AND BIBLIOGRAPHY	89
	REFERENCE LIST: RBCF PROGRAM DATABASE.....	96

LIST OF BOXES

Box 1-1. Results-Based Climate Finance and International Carbon Market Mechanisms	7
Box 2-1: Global Partnership on Output-Based Aid (GPOBA).....	9
Box 2-2. Excerpt – Perspectives from the Health Sector.....	11
Box 2-3. Excerpt – Perspectives from the Education Sector	11
Box 4-1. Four Possible RBCF Scenarios for the Promotion of Solar Home Systems (SHSs).....	34
Box 5-1. Program-for-Results (PforR).....	42
Box 5-2. The Pilot Auction Facility (PAF) for Methane and Climate Change Mitigation	46
Box 5-3. The Transformative Carbon Asset Facility (TCAF)	48
Box B-1. RBF in the Health Sector	71
Box B-2. The Experience of RBF in Education.....	73

LIST OF FIGURES

Figure 3-1. Number of RBCF Programs Reviewed, by Sector	19
Figure 3-2. Number of RBCF Programs by WB Region	20
Figure 3-3. Primary Objectives as Stated in RBCF Program Documentation	22
Figure 3-4. Single or Multiple DLIs Associated with One or Multiple Objectives, by Sector	22
Figure 3-5. Estimated Capitalization of the 12 Largest International Public RBCF Programs by Sector, 2007–29	24
Figure 3-6. Estimated Disbursements of the 12 Largest International Public RBCF Programs by Sector, 2008–30	25
Figure 4-1. Three Types of Disbursement-Linked Indicators (DLIs)	29
Figure 4-2. Number of Disbursement-Linked Indicators (DLIs), by Type and Sector	30
Figure 4-3. Contingent vs. Independent Results	31
Figure 4-4. Schematic of a Multilevel RBCF Approach	33
Figure 4-5. Financing Flows from RBCF Provider to Recipient	35
Figure 4-6. Types of Actors Receiving RBCF for Delivering Results	37
Figure 5-1. Recipient Government’s three Approaches to Verification	39
Figure 5-2. MRV Capacity in the Forestry and Land Use Sector	41
Figure 5-3. Number of Energy Sector Programs Aiming to Contribute to Market Creation	54

LIST OF TABLES

Table 1-1. Results Chain of Results-Based Financing (RBF) Programs	5
Table 2-1. Key Challenges and Opportunities of RBF Identified in the Literature	13
Table 3-1. RBCF Programs Reviewed.....	17
Table 3-2. Contract Volume Voluntary Carbon Market	25
Table A-1. Key Elements of the PAF	57
Table A-2. Elements of GRIF	59
Table A-3. Key Elements of Energy+.....	62
Table A-4. Key Elements of GET FiT.....	64
Table A-5. Key Elements of R4.....	68

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LIST OF ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
AEPC	Alternative Energy Promotion Center (Nepal)
ANC	Absolute Neutrophil Count
Ci-Dev	Carbon Initiative for Development
CO ₂ e	Carbon dioxide equivalent
COD	Commercial Operations Date
COP	Conference of Parties
CPF	Carbon Partnership Facility
CTF	Clean Technology Fund
DLI	Disbursement-Linked Indicator
DMDP	Dar es Salaam Metropolitan Development Project
EE	Energy Efficiency
EnDev	Energising Development
Energy+	Energy+ Partnership
ERA	Electricity Regulatory Authority
ESMAP	Energy Sector Management Assistance Program
FCPF	Forest Carbon Partnership Facility
FIP	Forest Investment Program
FIT	Feed-in Tariff
GCF	Green Climate Fund
GEF	Global Environment Facility
GET FIT	Global Energy Transfer Feed-in Tariffs
GHG	Greenhouse Gas
GIZ	<i>Gesellschaft für Internationale Zusammenarbeit</i> (the German agency for international cooperation)
GPOBA	Global Partnership on Output-Based Aid
GRIF	Guyana REDD+ Investment Fund
ha	Hectare
HARITA	Horn of Africa Risk Transfer for Adaptation
HRITF	Health Results Innovation Trust Fund
IA	Interagency Agreement
IDA	International Development Association
IFA	Insurance-for-Assets
IFW	Insurance-for-Work
ISFL	Initiative for Sustainable Forest Landscapes (Bio Carbon Fund)
JCN	Joint Concept Note
LCDS	Low-Carbon Development Strategy
kW	Kilowatt
kWh	Kilowatt hour
KfW	<i>Kreditanstalt für Wiederaufbau</i> (a German, government-owned development bank)
M&E	Monitoring & Evaluation
MFI	Microfinance Institution
MoU	Memorandum of Understanding
MRV	Monitoring, Reporting and Verification
MW	Megawatt
MWh	Megawatt hour (= 1 million watt hours or 1,000 kWh)
N ₂ O	Nitrous oxide (a greenhouse gas)

NAMAs	Nationally Appropriate Mitigation Actions
NCF	Nordic Climate Facility
NDCs	Nationally Determined Contributions
NDF	Nordic Development Fund
NDRC	National Development and Reform Commission
NGO	Nongovernmental Organization
NICFI	Norway's International Climate and Forest Initiative
NOK	Norwegian Krone
OBA	Output-Based Aid
OECD	Organisation for Economic Co-operation and Development
ORDA	Organization for Rehabilitation and Development in Amhara
PAF	Pilot Auction Facility (for Methane and Climate Change Mitigation)
PforR	Program-for-Results
PLN	Indonesia's State Electricity Corporation
PPA	Power Purchase Agreement
PRG	Partial Risk Guarantee
PSEI	Power System Efficiency Improvement Project Bangladesh
PSNP	Productive Safety Net Program
R4	R4 Rural Resilience Initiative
RBCF	Results-Based Climate Financing/Finance
RBF	Results-Based Financing/Finance
RE	Renewable Energy
REA	Rural Energy Agency
REDD	Reducing Emissions from Deforestation and Forest Degradation
REDD+	REDD <i>plus</i> Conservation, Sustainable Management of Forests, and Enhancement of Forest Carbon Stocks
REE	Rural Electrification Expansion
REIPPP	Renewable Energy Independent Power Producer Procurement
REL	Reference Emissions Level
REM	REDD Early Movers
RERED	Rural Electrification and Renewable Energy Development
REST	Relief Society of Tigray
SDG	Sustainable Development Goal
SHS	Solar Home Systems
SREP	Scaling-up Renewable Energy Program (Nepal)
TA	Technical Assistance
TCAF	Transformative Carbon Asset Facility
tCO ₂ e	Metric tons of Carbon Dioxide equivalent
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USD	United States Dollar
VCS	Verified Carbon Standard
VER	Verified Emission Reduction
WB	World Bank
WBG	World Bank Group
WFP	World Food Programme
WHO	World Health Organization

All dollar amounts are U.S. dollars unless otherwise indicated.

EXECUTIVE SUMMARY

The 21st Conference of Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC), held in Paris in 2015, introduced a new era for climate finance, policies, and markets. The Paris Agreement has defined a global action plan to put the world on track to avoid dangerous climate change by limiting global warming to well below 2°C above preindustrial levels. Parties to the Agreement have accepted, among other things, the following responsibilities: to set more ambitious targets every 5 years as required by science; to report to each other and the public on how well they are doing in meeting their targets; to track progress toward the long-term goal through a robust transparency and accountability system; and to strengthen societies' ability to deal with the impacts of climate change. Developed countries shall provide financial resources to assist developing country Parties with respect to both mitigation and adaptation.

At the *domestic* level, nearly all countries have established—for the first time—climate mitigation and adaptation goals through their Nationally Determined Contributions (NDCs). At the *international* level, the Paris Agreement has provided a strong signal for increasing ambition through a scaling-up of efforts to mitigate the effects of climate change and adapt to it, and to make “finance flows consistent with a pathway towards low greenhouse gas emissions and climate resilient development.”¹

The Paris Agreement may result in continued and perhaps accelerated growth in climate finance (Kempa and Moslener 2016; World Bank 2015a), depending on the evolving climate policy environment. Over the past decade, development bank financing for clean energy more than doubled (McCrone et al. 2015), and since 2011 governments have allocated \$9.9 billion to the Green Climate Fund (GCF) in order to drive the investment required to facilitate transformational change toward low carbon development. This transformation will rely on the capacity of climate finance to support and deliver (i) robust monitoring, reporting, and verification (MRV) systems; (ii) strong national institutions and infrastructure to support policy implementation; (iii) appropriate incentives for private investment; (iv) efficient markets; and (v) pathways to successfully scale up mitigation and adaptation efforts.

Results-Based Financing (RBF) demonstrates strong potential to deliver on each of these prerequisites for low-carbon development. Broadly defined, RBF is a financing modality under which funds are disbursed by an investor or donor to a recipient upon the achievement of a pre-agreed set of results, with achievement of these results being subject to independent verification. Results-Based *Climate* Financing (RBCF) can therefore be understood as RBF provided specifically for climate mitigation or adaptation results.

This report is based on a review of 74 RBCF programs implemented in developing countries.² It aims to (i) assess the characteristics and overall volume of funding flowing through RBCF programs, (ii) describe the various approaches to designing and implementing RBCF programs, and (iii) compare practical experiences in applying RBCF with the existing theory and literature describing this financing approach. While every effort has been made to identify a varied selection of existing RBCF initiatives, there are probably many more active initiatives that could not be included in this report.

¹ The full text of the Paris Agreement, adopted on December 12, 2015, is available at: <https://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf>.

² Though not comprehensive, the sample included several major public and private RBCF initiatives, selected on the basis of their *volume*, *emission reduction potential*, and *innovative design* at the time of writing. Most of these programs are still active.

Why implement RBCF?

A review of the literature on RBCF and practitioners' experience in this area suggest two rationales for linking financing to the achievement of results. The first and more theoretical rationale is based on the economic perspective that RBCF provides a financial incentive to align the objectives of the "principal" (i.e., the donor or investor) with those of the "agent" (i.e., the recipient of funds). According to this **principal-agent rationale**, RBCF shifts the financial risk of nondelivery of results from the principal to the agent, thus addressing information asymmetry and potentially contributing to increasing the effectiveness and cost efficiency of support.

The second rationale, reflecting more the practitioner's perspective, is that RBCF can be seen as an approach that supports structural changes leading to the long-term delivery of results. This rationale is referred to as the **structural change rationale** in this report. It does not focus solely on the efficient achievement of desired results through RBCF, but also on support for policy implementation, market creation, and the development or further strengthening of MRV infrastructure. The structural change rationale strongly supports the use of RBCF in combination with upfront financing.

What is the volume of RBCF?

The 12 largest programs providing international public RBCF to developing countries identified in this report reached their estimated peak capitalization of \$2.6 billion in 2015. About 90 percent of these funds are dedicated to the forestry and land use sector. While this number was up from \$2 billion in 2010, it is expected to rapidly decline over the next few years, unless additional funds are provided. The assessment of the RBCF potential and the experiences provided in this report speak in favor of additional fund mobilization and scaling-up of RBCF in all climate-relevant sectors.

Estimated annual RBCF disbursements from these programs stood at \$280 million in 2015 and 2016. In contrast to capitalization, disbursements are expected to increase by a further \$200 million, and peak in the period 2018–20.

In 2015, private investors committed \$0.3 billion on the voluntary carbon market for the purchase of carbon credits, thereby adding to the available RBCF funds.

It is worth comparing these numbers with the more than \$40 billion in overall international public climate finance provided to developing countries in 2014, as estimated by the OECD (OECD 2015), and the average annual payment flows for certified emission reductions (CERs) under the Clean Development Mechanism (CDM), which is an amount 20 times larger. The latter amount reached the figure of \$28 billion (World Bank 2014) in the first 5-year commitment period of the Kyoto Protocol (2008–12).

Where is RBCF located?

The 74 programs of the sample underlying this report are evenly distributed among the Sub-Saharan Africa Region (29 programs), the Latin America and the Caribbean Region (29 programs), and the East Asia and Pacific Region (28 programs). Several programs are implemented in more than one region. The prevalence of RBCF in low-income countries, as well as its application in middle-income countries, indicates the potential for the broad application of the approach, and its ability to overcome several barriers to investment identified in the literature, including limited access to financing and a weak MRV infrastructure.

What are the possible variations in RBCF design?

The programs reviewed reveal several variations in RBCF design. RBCF can be delivered through different financial instruments such as grants, loans or risk mitigation instruments; it can be used as a stand-alone modality or combined with upfront financing. Of the 74 RBCF examples reviewed, the majority had chosen the latter option—with RBCF complementing upfront financing delivering either loans or grants. Combining RBCF and upfront financing is especially common for publicly financed programs, which often

have dual objectives: to incentivize certain actors to deliver results and strengthen domestic institutions and infrastructure.

RBCF programs also differ in the way they define “results,” often referred to as Disbursement-Linked Indicators (DLIs). Whereas carbon markets rely on emission reductions measured in tons of carbon dioxide equivalent (tCO₂e), the programs reviewed use a range of *quantitative* DLIs (e.g., megawatt hours of installed renewable energy (RE) capacity, and number of cook stoves distributed) as well as *qualitative* DLIs (e.g., the implementation of a policy or the strengthening of MRV capacity). While the programs in this report demonstrated a prevalence of unit-based or scalable indicators (i.e., those that disburse funds in proportion to the results delivered), just over half of these programs disburse against a mix of unit-based indicators and qualitative milestone indicators.

The 74 programs provide results-based incentives to a range of actors—including governments, implementing agencies, and project entities. The RBCF in these programs can be designed in several ways that target specific or multiple actors, illustrating its flexibility. Several programs adopted a “multilevel” RBF approach, in which the donor or investor provides RBF to a government or implementing agency, which in turn provides RBF to the relevant project entities.

How does RBCF support the objectives of the Paris Agreement?

The climate finance literature considers RBCF a promising approach for delivering on several key objectives of the Paris Agreement, which include advancing the monitoring of emission reductions; enhancing national policies, strategies, regulations, and plans for climate action; recognizing the role of nonparty stakeholders, and supporting carbon pricing and market mechanisms.

Based on a review of the 74 programs selected, this report seeks to establish to what extent the RBCF can *in practice* achieve the following goals:

Increase MRV capacity: RBCF relies on strong MRV capacity since the financing is contingent on the delivery of predefined outputs and outcomes. The MRV systems establish baselines, track progress, and verify the quality of mitigation and adaptation results. Across the cases examined, RBCF was able to support and strengthen MRV systems by either (i) leveraging existing system components such as the verification capacity of the government or implementing agency, or (ii) pairing RBCF with TA. The ability of RBCF to support MRV capacity is especially apparent in the forestry sector, where donors often use results-based incentives to directly strengthen MRV systems.

Support domestic policy processes: RBCF can support domestic policies by working through country systems to achieve efficient delivery of results, and/or by aligning incentives with sector-specific policies by paying for the risks or costs that are not covered by private sector actors. For example, the World Bank (WB) Program-for-Results (PforR) instrument responds to client countries’ wish to be able to use national financial management systems as opposed to developing new processes. Doing so has the advantage of reducing the risk of duplicate practices while also strengthening domestic institutions and infrastructure. In other cases, donors or investors used RBCF alongside policy processes or MRV capacity-building efforts.

“Crowd in” private actors: Engaging the private sector is critical for the objectives of the Paris Agreement to be reached. To limit the rise in global temperature to 2°C above preindustrial levels and to address adaptation requirements, limited public funds must be used to catalyze private sector initiative and financing. The RBCF programs examined in this report have a strong focus on mobilizing private sector activity. Throughout these programs, RBCF is used to create income streams for delivering climate results that incentivize private sector investments, service provisions, and related project development and innovation. Such income streams also hold the potential to improve access to private finance. Finally, as RBCF supports building up and strengthening of technical capacity, it reduces the risks of private sector engagement.

Contribute to market creation: The programs reviewed illustrate ways in which RBCF can support existing markets and contribute to the creation of new markets. For example, several RBCF programs generate income from the commercialization of carbon credits in existing voluntary markets. Others support markets for energy products through targeted incentives—such as increasing the supply of products at affordable prices or increasing demand for products through price reductions—with 13 programs identifying “energy market stabilization” and 12 identifying “establishment of a self-sustaining market” as key objectives. Similarly, in the forestry sector, RBCF has been used to support the stabilization of markets for agroforestry products. Finally, there were also some examples of RBCF being used to support market creation through the strengthening of relevant financial markets.

This report’s main conclusion is that RBCF is a financing modality particularly suitable to climate mitigation since it focuses on carbon emissions—a well-defined, measurable global externality. RBCF has also shown potential in adaptation albeit so far through fewer programs than in mitigation.

RBCF facilitates carbon pricing and market building, supports host countries’ policy processes to achieve their NDCs, and leverages private sector activity and financing. It can thus play a critical role in mobilizing the resources needed to achieve the objectives of the Paris Agreement.

1. INTRODUCTION

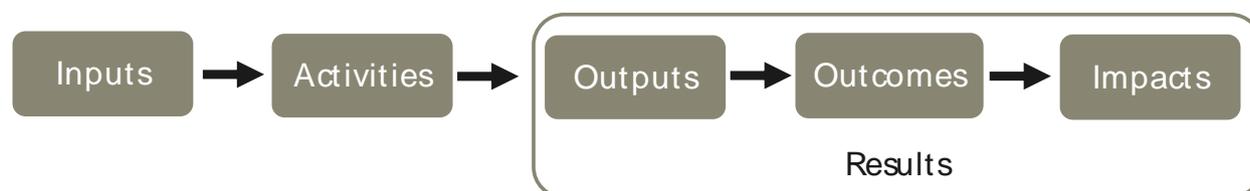
This report discusses the potential role of Results-Based Climate Financing (RBCF) in supporting governments' efforts to reach the objectives of the Paris Agreement and as a complement to upfront climate financing such as upfront investment loans or upfront grants.

1.1 What is Results-Based Climate Financing (RBCF)?

Broadly defined, Results-Based Financing³ (RBF) is a financing modality or approach under which a donor or investor (also known as “principal”) disburses funds to a recipient (also known as “agent”) upon the achievement and independent verification of a pre-agreed set of results. By definition, RBF is based on the principle of providing payments if/when a result is delivered (Differ 2016), contrary to the case of upfront financing, thus providing incentives for certain actions to be taken. The most obvious difference between RBCF and upfront financing is the *timing*—RBCF provides funds *ex post* while upfront financing provides them *ex ante*.⁴ Results-Based Climate Financing (RBCF) can therefore be understood as RBF for climate mitigation or adaptation results.

There is no universal definition of RBF or RBCF. Yet the literature generally indicates that for financing to qualify as RBCF, it must meet the following four criteria: (i) payments are made for climate mitigation or adaptation results; (ii) payments are made *ex post*; (iii) payments are made once predefined results have been achieved; and (iv) reported results have been independently verified. In the established terminology, “results” generally refer to outputs, outcomes, and/or impacts (figure 1-1), which are translated into measurable Disbursement-Linked Indicators (DLIs). The latter are the metric used to establish whether an activity has achieved one or more specific, predefined results, and are discussed in more detail in chapter 3.

Table 1-1. Results Chain of Results-Based Financing (RBF) Programs⁵



To understand how the terms outputs, outcomes, and impacts are used in this context, assume an RBCF program is designed to increase energy access and reduce CO₂ emissions by installing solar home systems (SHSs). Activities under the program include awareness raising, SHS installation, and SHS services provision. Once the projects have been implemented, a certain number of SHSs will have been installed (**output**) and a certain volume of measurable CO₂ emissions will have been avoided (**outcomes**). In the long term, this program should thus contribute to combating climate change and reducing poverty by providing access to clean energy (**impacts**). Since the program is an RBCF program, the financial support

³ The terms “finance” and “financing” are increasingly used interchangeably. However, RBF is usually referred to as Results-Based *Financing*, while RBCF is defined as either Results-Based Climate *Financing* or Results-Based Climate *Finance*.

⁴ This report distinguishes “financing approaches” (synonymous with modalities) from “financial instruments.” And within the financing approaches, a distinction can be made between upfront financing and RBF. Financial instruments include, among other things, grants, loans, and guarantees. These instruments can be used under both financing approaches.

⁵ In policy-level RBCF programs, results can also relate to policy processes and actions.

is not given at the outset—to finance any input purchases or activities—but upon verification of the predefined outputs and/or outcomes.

The immediate implication of using RBCF is that the activities it supports will need to secure prefinancing in addition to the (conditional) financing they will eventually receive through RBCF. The ability to secure prefinancing will depend strongly on the project in question, the borrower, and the quality of the capital market in which the climate actions are set. Even though RBCF does offer some security of future financing flows to the activities it supports, the recipient still runs the risk of certain activities underperforming or being unable to deliver the predefined results. Thus, RBCF involves a risk transfer, leaving the recipient with greater risks than in the case of upfront financing.

To understand the role RBCF can play in supporting the Paris Agreement, it is important to recognize RBCF is both an approach that can be combined in a program with other financial instruments—such as upfront grants, loans, or guarantees—and a vehicle for delivering the funding associated with those financial instruments (see chapter 4 for more details). As such, RBCF does not need to compete with existing financial instruments but can be used to complement them.

1.2 Report Objectives and Scope

This report is based on a review of 74 RBCF programs implemented in developing countries.⁶ These programs were selected according to their volume, emission reduction potential, and innovative design.⁷ Their aim is to (i) assess the characteristics and estimate the overall volume of RBCF; (ii) provide an overview of possible approaches to RBCF design; and (iii) compile practical experiences illustrating the application of RBCF and assess those experiences in the light of RBCF’s theoretical potential.

The RBCF’s *theoretical* potential is determined by the following aspects:

- RBCF supports the development of monitoring, reporting, and verification (MRV) capacity
- RBCF supports domestic climate mitigation and adaptation policy processes
- RBCF supports the creation of new markets for climate results
- RBCF “engages” private actors and ensures that public funds are *not* used for activities that could be supported through *private* financing
- RBCF programs are relatively easy to replicate and scale up in a comparatively short time period
- RBCF programs can increase the likelihood of delivering climate results.

This evidence-based assessment is meant to help orient the design of RBCF, duly taking into account the contextual priorities of program development. It does not offer an evaluation of RBCF programs. The report focuses on *mitigation* and only discusses a few adaptation programs. Compliance carbon markets are *not* covered in this report, whereas voluntary carbon crediting programs *are* covered (box 1-1).

⁶ This report uses the term “RBCF program” in a broad sense—including individual projects and programs on a jurisdictional/national or sectoral level, as well as large international initiatives comprising a portfolio of projects or programs.

⁷ Though not comprehensive, the sample included several major public and private RBCF initiatives (selected on the basis of their volume, emission reduction potential, and innovative design) at the time of writing. Most of these programs are still active.

Box 1-1. Results-Based Climate Finance and International Carbon Market Mechanisms

This report does not consider international transfers for mitigation outcomes as RBCF if these outcomes are used for *compliance purposes* under the United Nations Framework Convention on Climate Change (UNFCCC). The reason for this is that the report applies the UNFCCC distinction between “international carbon market mechanisms” and “international climate finance.”

In concrete terms, this means that programs purchasing Certified Emission Reductions (CERs) under the Clean Development Mechanism (CDM) are *not* included in our estimates of RBCF volumes if those CERs are used by parties of the Kyoto Protocol to comply with their mitigation targets. However, such purchases *are* considered RBCF if the parties in question *cancel* purchased CERs, that is, exclude them from being used for compliance purposes.

The UNFCCC distinction is also applied to transactions between (private) entities, in other words, transactions on the *voluntary* carbon market. These transactions are considered RBCF irrespective of the carbon standard used. Moreover, the report does include purchases of Verified Emission Reductions (VERs) that do not qualify for use as UNFCCC compliance standards under the Kyoto Protocol or the Paris Agreement, even if those VER transactions are partially motivated by pilot activities intended to inform the evolution of new international carbon market mechanisms.

The report is primarily addressed to practitioners of RBCF, both on the implementing and funding side.

1.3 Report Structure

Chapter 2 describes the evolution of RBCF and summarizes the principal findings in the literature on RBF; chapter 3 gives an overview of RBCF based on the 74 programs reviewed; chapter 4 examines individual RBCF design elements; chapter 5 assesses the effectiveness of RBCF in practice; and chapter 6 highlights the report’s main conclusions.

2. EVOLUTION OF RBCF

RBCF builds on the experiences and insights gained from the application of results-based approaches in the field of development cooperation, notably in the health and education sectors. This chapter reviews the literature on RBF in these sectors and examines some of the experiences with RBF approaches in international development cooperation. The following questions are addressed in this chapter:

- When should RBF approaches be used?
- What is the rationale for using RBF approaches?
- Under what circumstances has RBCF been applied and how is this approach evolving?

2.1 RBF in the Literature

When to use RBF? There is general consensus in the literature that RBF is an appropriate approach for either addressing market failures or increasing the efficiency in the procurement of goods and services. Thus, RBF is typically applied to address issues such as the following (Vivid Economics 2013):

- *Externalities*, when an individual's actions have an impact on others (either positive or negative), which is not reflected in the price or cost of that good or service;
- *Information asymmetry*, when one party has better information than another party, or acquiring information is costly;
- *Market power*, when a few firms hold a dominant position in a given market and face insufficient competition, in which case they may restrict the output of certain goods or raise their prices, offer goods of relatively poor quality, or use their position to restrict the ability of others to compete;
- *Coordination failures*, where the consumption of one good requires the consumption of another good or where benefits do not accrue to those goods that incur the costs.
- *Public goods*, those that are characterized by being nonrival and nonexcludable. Being nonrival implies that even if someone consumes it, this does not prevent someone else from doing so as well; in other words, a nonrival good can be used again and again. Being nonexcludable implies that no one can be prevented from consuming the good.⁸

RBF may also be used to procure goods and services. This is recommended in the literature particularly under two specific scenarios of market failure:

- Where the public sector is purchasing goods that have some public good characteristics—such as infrastructure, policing and security, and health services—and it has been concluded that the private sector should not, or will not, supply adequate amounts of the goods in question;
- Where the “principal” (in this context, the donor or investor) is contracting with an external agency or parastatal for the delivery of certain goods and/or services, and the funder wishes to improve the efficiency with which that body provides its goods and/or services.

The cross-sectoral uses of RBF in international development are illustrated by the Global Partnership on Output-Based Aid (GPOBA) activities of the World Bank (box 2-1), which applies the approach to improve the delivery of basic services to the poor in developing countries.

⁸ Examples of *nonrival goods* are designs, movies, fireworks, algorithms, and patents. Examples of *nonexcludable goods* are public parks and roads.

Box 2-1: Global Partnership on Output-Based Aid (GPOBA)

GPOBA is a partnership of donors working together to support output-based aid (OBA) approaches. GPOBA was established in 2003 by the United Kingdom's [Department for International Development](#) as a multidonor trust fund administered by the World Bank (WB). Since 2003, another four donors have joined the Partnership—the Australian Department of Foreign Affairs and Trade, the Dutch Directorate-General for International Cooperation, the International Finance Corporation, and the Swedish International Development Cooperation Agency.

GPOBA's mandate is to fund, design, demonstrate, and document OBA approaches to improve the delivery of basic services to the poor in developing countries. It is housed within the WB's Social, Urban, Rural and Resilience Global Practice, which works to create more sustainable, inclusive, and resilient communities. Over its 13 years of operation, GPOBA has built a diverse portfolio comprising 46 subsidy projects totaling \$234 million. In parallel, it has evolved into a center of expertise on OBA and other forms of RBF, building a repository of lessons and experience, as reflected in its portfolio of subsidy projects, technical assistance (TA), and knowledge activities. GPOBA works in seven sectors: energy, water, health, solid waste management, sanitation, education, and telecoms. In 2016, energy remained the largest sector in the GPOBA portfolio, at 44 percent, water being the second largest, at 24 percent. Sub-Saharan Africa is the Bank Region with the highest percentage of GPOBA funding (52 percent), followed by the South Asia Region (20 percent), and the East Asia Region (12 percent).

With OBA, the delivery of a service—such as household connections to water supply or the electricity grid, or the installation of renewable energy (RE) systems—is contracted out to a third party, either a government or private sector entity, which receives a subsidy to complement or replace user fees. The service provider is responsible for prefinancing outputs and services, with the subsidies being paid out on the delivery and verification of specific outputs; this is the crucial difference between OBA and traditional aid, which disburses money against expenditures or contracts. By linking payments to measurable results, OBA helps to ensure quality and accountability in service provision.

Source: GPOBA website (<https://www.gpoba.org/>).

Two different rationales may be found in the literature for using RBF. The main rationale from an *economic* perspective is that RBF is an approach for providing financial incentives that promote the alignment of the goals of the principal (= the actual funder) with those of the recipient (= the agent receiving the funds). The primary goal of RBCF in this case is to ensure cost-effective provision of financing. The second rationale is derived from the practitioner's perspective, and sees RBF as an approach that supports structural changes leading to long-term delivery of desired results. These two rationales are elaborated in subsections 2.1.1 and 2.1.2, since any assessment of RBF approaches, including RBCF, will be influenced by the underlying objectives pursued and these differ according to the perspective held (table 2.1).

2.1.1 Principal-agent theory

Most of the literature on RBF sees it as an approach for addressing the classical economic principal-agent problem (Birdsall and Savedoff 2010; Clist and Verschoor 2014). The principal-agent problem relates to the asymmetric information distribution in a contract relationship. The general argument is that an agent receiving funding has more information on a specific task or project to be executed, or a product to be sold than the principal. And the agent can use this information advantage to further his own interest at the expense of the interests of the principal; in fact, the principal has no way of ensuring that the agent will always act in the principal's best interest.

RBF is considered an effective approach for overcoming this classical problem because it actually aligns the goals of the principal with those of the agent by providing the agent with a monetary incentive to pursue the principal's goal. In the pure form of RBF, the principal defines exactly and ex ante which of the results achieved by the agent will be paid for ex post. The results are therefore similar to performance targets, since payment is conditional on these defined results/targets being achieved. Those who support this line of reasoning note that, in a world where development agencies are under growing pressure to provide evidence of value for money spent, RBF has become an increasingly attractive financing option. In short, one of the main drivers for the application of RBF is the fact that it ensures cost-effective use of development funds by the recipient and supports increased agent ownership of the RBF's design.

Thus, from an economic perspective, RBF primarily focuses on shifting the financial risk of nondelivery (of results) from the funder to the recipient (Klingebiel 2012). This particular focus on the delivery of results and the transfer of risk to the agent—who in return gets greater control over the way in which results will be delivered—is what distinguishes RBF from other approaches for providing financing.

2.1.2 “Structural change” theory

The second rationale draws on the theory of change logic and extols the idea that RBF triggers structural changes. For the purposes of this report, we refer to this literature as “structural change”⁹ literature. This literature (Holland 2015; Mumssen, Johannes, and Kumar 2010; Oxman and Fretheim 2009) argues that the principal-agent logic *wrongly* assumes that the agent does not inherently value the result, or at least not to the same extent as the principal does. The experience with RBF in education and health, they argue, has revealed something different: If the objectives of the donor and country involved or pursued within the country system itself are not aligned from the outset, a successful outcome is unlikely, especially in the long term. By way of illustration, boxes 2-2 and 2-3 present the views of expert RBF practitioners from the education and health sectors.

⁹ Not to be confused with the structural change theory underlying the so-called Lewis model, which dominated the development theory in the 1960s and 1970s.

Box 2-2. Excerpt – Perspectives from the Health Sector

All Results-Based Financing (RBF) designs explicitly link financing to results. Contracts or agreements govern this link, clearly specifying roles and responsibilities, and defining tangible results. A systematic verification mechanism further formalizes this link, ensuring the accuracy of results prior to the disbursement of RBF payments, and provides “real-time” data for informed decision making and enhanced results. RBF designs also emphasize autonomy: they empower frontline health workers and decision makers to set priorities that respond to local needs. This autonomy is facilitated by RBF payments, as they provide health facilities with resources to strengthen service delivery and incentivize health workers to improve their performance.

The experience so far with the Health Results Innovations Trust Fund (HRITF) portfolio of 38 RBF programs in 32 countries provides strong evidence of how this approach can help achieve better health outcomes, increased and more equitable access to better-quality services, and greater efficiency. Several robust impact evaluations and a large amount of independently verified operational data show that RBF strengthens accountability and empowers frontline providers, making remarkable results possible, even in countries with the greatest need.

Dinesh Nair, Senior Health Specialist, HNP Global Practice, World Bank

The value of RBF does not lie purely in the fact that cost-effective funding is only made available if specific results are delivered, as the principal-agent theory suggests, but also in the fact that it shifts the focus of attention and effort from procedures to results. This, in turn, makes it easier to resolve existing system bottlenecks that hinder the achievement of results. By using *results* as the starting point of policy efforts and by using *financing* to sustain that focus over time, successful RBF can clarify, support, and strengthen result-delivery processes and institutional frameworks.

Moreover, experience has shown that the recipient’s increased autonomy in determining how to attain the results pursued encourages innovation to achieve the best possible intervention. It is these characteristics that lead to fundamental differences between RBF and conventional ways of funding projects or interventions in different areas. For instance, the recipient’s autonomy may encourage the use and improvement of existing infrastructure, which in turn ensures that any extra capacity required is built *within the existing institutions*, leading to programs and activities that are more likely to be sustainable in the long run. This could result in higher efficiency gains compared with other types of funding instruments geared to milestones or the disbursement of upfront loans and grants, without reference to specific targeted outcomes.

Box 2-3. Excerpt – Perspectives from the Education Sector

The Education sector approach to RBF serves to strengthen education systems. This implies envisioning how the future will be different, and working backwards to figure out how to get there. Historically, conversations under traditional financing would generally start with often disparate *inputs*—for example, the Ministry of Education highlighting the need to pay for teacher training, classrooms computers, and school grants—while RBF immediately starts the conversation around *results*. The versatility of the RBF approach means that it can address a wide set of issues to facilitate improvements in equal access to education, the quality of education, and improved delivery of education (by addressing system inefficiencies, lack of competition between service providers, etc.). For example, RBF can be provided as performance-based grants to schools seeking to improve access to education (particularly for disadvantaged groups); retention and completion rates; and learning outcomes. The results-based approach has therefore taken different forms in different countries. In Jamaica, the process was termed “critical pathways,” with Disbursement-Linked Indicators defined to remove the obstacles that hindered the achievement of results the country pursues in early childhood development. By putting desired results first and working backward to determine how to get there, governments together with World Bank teams identify the stumbling blocks, and seek to remove those through incentives.

Jessica Lee & Peter Anthony Holland, Education Global Practice, World Bank.

Those who support this structural change perspective also point out that the impact of RBF is not always proportional to the value of the financing provided for an activity (Holland 2015). What matters in economic terms is that the results monitored are clearly under the control of the individuals or agencies targeted by the financial incentive (Holland 2017). Proponents of the structural change rationale also tend to view RBF as an approach that can be used—in combination with upfront grants, loans, equity, or risk guarantees—to design innovative business models for delivering “results.”

2.2 Challenges and Opportunities for RBCF

The opportunities and challenges associated with RBF are assessed somewhat differently depending on the reason for selecting it—the principal-agent or structural change rationale. However, the rationales are not fully mutually exclusive and share some ideas regarding opportunities and challenges. Both recognize as a plus that RBF (i) increases transparency because results have to be more visible and are independently verified; and (ii) can be used to strengthen MRV capacity and infrastructure. Common challenges recognized in the literature from both perspectives relate to data availability for MRV, the capacity of the recipient, and the availability of upfront financing. Both perspectives also acknowledge the importance of ensuring policy alignment to avoid perverse incentives. However, considerable differences between both perspectives do exist.

The literature that embraces the principal-agent logic notes that in countries with sufficient capacity to take ownership of delivering results, RBF is likely to provide guaranteed delivery of results in a cost-effective way for the principal. Provided the financial flows are designed to target the appropriate stakeholder, risks, and barriers, RBF is likely to result in greater agent ownership and has the potential to engage the private sector. One of the key challenges is that many countries have insufficient capacity to take on the additional risk associated with RBF. Moreover, principals may not be able to withhold financial transfers because of their own internal budget commitments—having to spend specific amounts in each calendar year. In general, RBF is deemed useful for middle-income countries with sufficient capacity to design and implement procedures to deliver predefined results. As to the most suitable sectors, RBF tends to be biased toward short-term and noncapital-intensive activities and sectors.

Authors who support the structural change logic emphasize the opportunity RBF gives the recipient to take greater ownership, resulting in more innovation to overcome barriers. The recipient is likely to experiment with alternative interventions that might otherwise not have been considered. There is always a tension in the implementation of RBF between ambitious targets/results and operational realities. However, despite this tension, the use of RBF clarifies and organizes existing objectives and sends strong signals about what really matters. This, in turn, can result in a higher and more effective use of resources for the activities deemed most likely to achieve those results. Additionally, the structural change proponents tend to favor designs that package RBF with traditional upfront financing and believe it is the *combination* of RBF and the latter that guarantees the development of the structures needed to deliver the targeted results. RBF is therefore seen as a flexible approach that can be used to pursue multiple objectives.

The most often cited challenges and opportunities presented by RBF are listed in table 2-1.

Table 2-1. Key Challenges and Opportunities of RBF Identified in the Literature

<i>Perspective</i>	<i>Key challenges</i>	<i>Key opportunities</i>
Principal-agent perspective	<ul style="list-style-type: none"> ▪ Limited <i>institutional</i> capacity of recipients and limited <i>technical</i> capacity of service providers will limit the effectiveness of RBF, reducing its applicability in many countries; ▪ Bias toward short-term and/or noncapital-intensive activities; ▪ Implementation of results-based approach can delay actions because of transfer of risk to recipient; ▪ Difficult for principals <i>not</i> to transfer funds, even if there is underdelivery of results, because of internal budgetary expenditure requirements. 	<ul style="list-style-type: none"> ▪ Funders have more certainty that all the financing provided will be spent on the achievement of results; ▪ RBF is generally perceived as cost-effective from the perspective of the principal because financing is only provided upon delivery and verification of results. Hard data are missing to confirm this at this point in time; ▪ If designed well, the results-based approach seems to be able to mobilize private sector financing; ▪ RBF can support market development.
Common to principal-agent and structural change perspective	<ul style="list-style-type: none"> ▪ Limited data availability will restrict the effectiveness of MRV; ▪ Perverse incentives can occur, particularly if the results chain is weak; ▪ Insufficient prefinancing capacity of the recipient will not be addressed by RBF. 	<ul style="list-style-type: none"> ▪ RBF increases transparency because results are more visible and independently verified; ▪ RBF strengthens MRV capacity and infrastructure, and can incentivize strengthening of technical implementation capacity.
Structural change perspective	<ul style="list-style-type: none"> ▪ <i>(see row above listing challenges common to both perspectives)</i> 	<ul style="list-style-type: none"> ▪ The incentives and autonomy of the recipient encourage innovation to overcome barriers (risks and knowledge or capacity gaps) to investment. The recipient is likely to experiment with alternative interventions that might otherwise not have been considered and address gaps, including both technical and financial gaps; ▪ RBF clarifies existing objectives, resulting in a higher and more effective use of resources toward the activities most likely to achieve those results; ▪ RBF is a flexible tool that can be used in pursuit of multiple objectives to address market failures; ▪ RBF is compatible with upfront financing approaches and can be used to deliver grants, loans, and other financial instruments. It can therefore support a wide range of technologies and result achievements.

Note: RBF = Results-Based Financing; MRV = Monitoring, Reporting, and Verification.

2.3 RBF in the Climate Context

As discussed above, results-based approaches are well-established and understood by international donors, domestic public finance providers, and even private entities in various climate-relevant sectors. However, the role and potential of RBCF is largely neglected in the climate finance literature, with the exception of projects based on Reducing Emissions from Deforestation and Forest Degradation Plus Conservation, Sustainable Management of Forests, and Enhancement of Forest Carbon Stocks (REDD+).

2.3.1 Experiences from REDD+

Results-Based *Climate* Finance started to receive increasing attention following the agreement at the Conference of Parties 16 (COP; Cancún Agreement) of decision 1/CP.16. This decision encouraged countries to develop work programs on results-based finance in 2013, to scale up the full implementation of REDD+ activities. RBCF was promoted further at COP 19 in the Warsaw Framework, through decision 9/CP.19, which encouraged national governments to “channel adequate and predictable results-based finance in a fair and balanced manner, taking into account different policy approaches, while working with a view to increasing the number of countries that are in a position to obtain and *receive payments for results-based actions*”¹⁰ related to REDD+ financing.

REDD+ therefore promoted the application of RBF at the *national* level. Through the Warsaw framework, REDD+ became an operational mechanism with formal rules for creating institutions, establishing reference levels, recognizing mitigation activities, ensuring safeguards, and implementing RBF mechanisms (UNFCCC 2014). Parties agreed on a phased approach for REDD+ to gradually build the capacities and infrastructure that are needed to implement results-based activities (UNFCCC 2011). The process envisaged the following phases: countries would begin by building technical and institutional capacity (Phase 1 or “Readiness Phase”); followed by policy reform and demonstration activities (Phase 2 or “Implementation Phase”); ramping up to implementation with full MRV (Phase 3 or “Results-Based Payments Phase”). These phases may partially or fully overlap.

Partly because of the top-down approach taken, REDD+ implementation has been relatively slow. This is because for REDD+ to be successful, incentives need to reach the actors responsible for addressing the drivers of deforestation and for shifting land use to a more sustainable and low-carbon model. These actors span multiple scales—from international commodity buyers to national governments to subnational governments to indigenous peoples and forest-dependent communities to individual landowners and land users. Consequently, negotiations regarding incentives at the government level have not been comprehensive enough to trigger swift reactions to the RBCF incentives provided.

As a result of these challenges, the principle of a “nested approach” has been introduced, whereby projects and/or subnational programs are integrated into higher-level accounting, allowing “countries to start REDD+ efforts through sub-national activities and gradually move to a national approach or for the coexistence of the two approaches” (Angelsen 2008). The term “nesting” is variously used to refer to state- and province-level accounting integrated into national-level systems, as well as for project-level activities sitting within broader national (or subnational) systems. It illustrates the flexibility of the RBF approach in targeting different stakeholders at multiple levels.

The experience to date with REDD+ has shown that it is important to use RBCF to target *all* key stakeholders involved in delivering the results required in order to trigger rapid responses. The nesting

¹⁰ Emphasizing “results-based action” in the context of REDD+ is important to avoid the misunderstanding that RBCF in forestry would just pay for the opportunity cost of not logging trees, that is, only reward *not* undertaking any activity that could be detrimental to the environment.

allows for regional or project actions, since broader policy reforms may take years to be implemented. Furthermore, the *project* level is a key entry point for private sector engagement and opens up options for direct, community-level engagement with REDD+, which would not be possible if RBCF were not used to target project activities as well. Additionally, the REDD+ experience confirms the usefulness of RBCF in terms of its capacity-building potential. It is only thanks to the subnational and project-level impetus that *national* frameworks for REDD+ management and accounting are emerging. Furthermore, the establishment of *local* investment mechanisms and MRV capacity in advance of national frameworks is providing valuable experience to inform broader architectures and capacity.

However, a nesting framework still faces important design challenges (Minang and van Noordwijk 2013), including the development of a consistent and credible framework of Reference Levels (RELS)¹¹ across all scales and of standardized MRV protocols to ensure consistency across space and time; the need for transparent bookkeeping to prevent double or multiple counting of emission reductions; and the need to address issues around project underperformance and permanence, as well as within-country leakage, especially during the interim phase in which countries are still developing their national RELs and MRV. Further clarification is also required to define property rights, benefit-distribution schemes (e.g., whether subnational REDD+ actions would be allowed to be credited directly and whether international incentives would be captured at the level of the national government), and revenue-sharing agreements (e.g., through a tax levied by the government on REDD+ project activities). **All of these are still at very early stages of development and therefore no definitive conclusions can be drawn yet about the successful use of RBCF in the context of REDD+.**

2.3.2 RBCF beyond REDD+

Although RBCF has its roots in REDD+, it has also drawn interest for possible application in other sectors, most notably the energy sector. Unlike the case in education, health, and REDD+, where activities targeted by RBCF are typically related to the provision of services, energy sector climate mitigation actions often require capital-intensive, upfront investments. The delivery of clean electricity, for example, requires upfront investments in RE installations. Ideally, lenders and/or equity investors would “prefinance” RBCF payments for capital-intensive activities, and investors would provide the necessary upfront financing, based on the expected future revenues. In reality, this is rarely the case, as both lenders and investors lack experience with concrete RBCF programs.

Other sectors such as transport and industry are also likely to require capital-intensive, upfront investments. However, RBCF programs can only provide proof of concept and generate evidence (a pipeline of investments incentivized and climate results delivered), which enable private finance providers to assess the associated risk(s) at a reasonable cost over time. Proof of concept provides investors with the confidence in both the effectiveness of a public incentive program and the robustness of its underlying policies. Therefore, addressing the challenge of prefinancing of RBCF payments is critical to successfully implementing and scaling up RBCF programs in the capital-intensive energy, transport, and industry sectors. A failure to address this challenge could result in the underperformance of RBCF programs and/or unnecessarily high risk premiums, which would result in less efficient deployment of public money in capital-intensive sectors.

Furthermore, it has been noted that in a carbon market context, a failure to address the prefinancing needs of carbon payments can also jeopardize the environmental integrity of the carbon market

¹¹ *Reference levels* are benchmarks for assessing performance. In the context of carbon accounting or reporting, they provide a qualitative way to measure the performance of a country, program, or project in reducing emissions or increasing removals.

mechanism itself.¹² From its inception, the Clean Development Mechanism (CDM)¹³ has suffered from being unable to mobilize investment financing, despite the fact that the underlying activities could reasonably predict future expected carbon revenues. As a consequence, the market became biased toward activities for which the potential contribution of carbon revenues to investment finance was less critical. Such activities can still be considered “additional,” in the sense that the carbon revenues secured under the CDM improve the profitability of the underlying mitigation activities to a point where it is possible for the investors to agree to invest.¹⁴ However, as the CDM failed to contribute to upfront financing, the full potential of the mechanism was never achieved because the financial contribution carbon revenues could make at prevailing prices was too small to trigger broader investment.

This problem was recognized by the administrators of the CDM, who became increasingly worried about the environmental integrity of the mechanism and therefore developed rules to determine whether the financing derived from carbon flows made a difference to the underlying investment, resulting in ever more complex requirements. The complexity of these requirements in turn increased transaction costs, which aggravated the problem further, since only activities that could afford to register and apply the complex requirements *ex ante* could seek carbon finance. In fact, this vicious cycle resulted in “costing out” many activities where carbon finance was significant but could not be accessed because the transaction costs associated with the CDM procedures were just too high.

If RBCF is to play a larger role in climate finance and if the shortcomings of the Kyoto carbon market and its market mechanisms are *not* to be repeated in a new future international carbon market, the issue of prefinancing of climate payments by private lenders and investors needs to be addressed. While this issue is not addressed in this report, as it focuses on the design and application of RBCF in practice, this aspect is definitely important when considering how to maximize the potential of RBCF in the future.

¹² For more information, see the 2016 report *A New Approach for Pre-Financing Emission Reduction Purchase Agreements for Household Energy Access Program*, prepared by Frankfurt School (FS)-UNEP Collaborating Centre for Climate & Sustainable Energy Finance under the guidance of a World Bank Ci-Dev team, available at <https://www.ci-dev.org/sites/cidev/files/documents/Prefinance.pdf>.

¹³ Clean Development Mechanism (CDM) is *defined* in Article 12 of the Kyoto Protocol. It is a mechanism that allows a country with an emission-reduction or emission-limitation commitment under the Kyoto Protocol (Annex B Party) to implement an emission reductions project in developing countries.

¹⁴ The CDM requires each approved project to be “additional,” which means that the CDM should only provide carbon credits to projects that could not be built *without* the extra financial support of the CDM.

3. THE RBCF LANDSCAPE

Although not prominent in the literature, RBCF is an approach already being used to deliver climate finance. This chapter provides an overview of the RBCF landscape, based on the RBCF programs reviewed yielding results-based incentives for mitigation and adaptation activities.

3.1 Profile of Programs Reviewed

The assessment of RBCF is based on the review of 74 programs selected on the basis of their volume, emission reduction potential, and innovative design at the time of writing. The choice of specific information collected on these programs was guided by a literature review and consultations with experts and the program administrators. Most of these programs are still active. The sample includes programs that meet the following criteria: (i) financing is provided for climate mitigation or adaptation results; (ii) payments are made ex post; (iii) payments are contingent on the achievement of pre-agreed results; and (iv) reported results are verified prior to any disbursement.

Each RBCF program is analyzed according to 25 mapping parameters. The key mapping parameters include sector, region, and duration; definition of pre-agreed results (i.e., outputs, outcomes, and impacts); relevant institutions (e.g., funding institution, implementing institution, and recipient); RBCF funding volume; and design of DLIs. Appendix D provides a list of all the key mapping parameters used.

The sample excludes activities that purchase carbon credits or other mitigation outcomes to comply with Kyoto targets before 2020 (Certified Emission Reductions or CERs) and instead focuses on RBCF activities likely to be eligible for climate finance support under the post-2020 climate regime. In the case of the energy sector, this report includes Feed-in Tariffs (FITs) only if international donors provide a “top-up.”

Table 3-1 lists the 74 programs covered for this report, by sector. More details on the individual activities within each program, including key features, are given in appendix C.

Table 3-1. RBCF Programs Reviewed

Forestry and land use sector (25 in total)	Energy sector (27 in total)
1. BioCarbon Fund (BCF)	1. Electricity Grid Strengthening – Sumatra Program
2. Forest Carbon Partnership Facility (FCPF)	2. Tanzania's Rural Electrification Expansion Program
3. Integrated Disaster Risk Management and Resilience Program (IDRMRP)	3. Bangladesh's Rural Electrification and Renewable Energy Development Program (RERED)
4. Norway's International Climate and Forest Initiative (NICFI)	4. Burkina Faso Biomass Energy NAMA Support Project
5. The German REDD for Early Movers (REM) Program	5. Indonesia Clean Stove Initiative (Indonesia CSI)
6. Amazon Fund	6. Energising Development (EnDev)
7. Guyana REDD+ Investment Fund (GRIF)	7. Energy and Environment Partnership with Mekong Region (EEP Mekong)
8. Norway-Indonesia REDD+ Partnership	8. Promotion of Solar Hybrid Mini-Grids Programme (ProSolar)
9. Germany-Norway-Peru Climate and Forest Partnership	9. Global Energy Transfer Feed-in Tariffs (GET FIT) Program
10. Norway-Tanzania REDD+ Partnership	10. Global LEAP
11. Norway-Liberia REDD+ Partnership	11. International Energy and Climate Initiative – Energy+
12. Althelia Climate Fund	12. Mumbai Slum Electrification Project
13. Moringa Fund	13. Power System Efficiency Improvement Project
14. Livelihoods Fund	

<ol style="list-style-type: none"> 15. CO₂OL Tropical Mix Reforestation project in Panama 16. Sodo Community Managed Reforestation, Ethiopia 17. ArBolivia II 18. Indigenous Reforestation in a Global Biodiversity Hotspot 19. Vegachi reforestation with native species in Colombia 20. Lower Zambezi Community Forest Conservation 21. Katingan Peatland Restoration and Conservation 22. Kariba REDD+ Project 23. Mai Ndombe REDD+ Project 24. Rimba Raya Biodiversity Reserve REDD Project 25. Sustainable Afforestation in Togo 	<ol style="list-style-type: none"> 14. Result-Based Financing for Sustainable Hood-Stoves Market 15. Rural Electrification with Renewable Energy in the Gambia 16. SNV Rural Solar Market Development of Pico-PV Solar in Lake Victoria, Tanzania (Pico-PV) 17. Carbon Initiative for Development (Ci-Dev) 18. The Stove Auction, Mekong (SA) 19. Ceará Renewable Energy Bundled Project 20. Clean and Efficient Cooking and Heating Project China 21. Proyecto Mirador Enhanced Distribution of Improved Cookstoves 22. Xinyang landfill gas recovery 23. Yuntdag Wind Power Project Turkey 24. Teesta - V Hydro Power project in Sikkim 25. Hydroelectric project Ituango 26. Grid-Connected Rooftop Solar Program (GRPV), India 27. Supported Extended Biogas Project (SREP), Nepal
<p>Non-combustion emissions sector (13 in total)</p> <ol style="list-style-type: none"> 1. NDRC HFC-23 Subsidy Program 2. N₂O Initiative (Nitric Acid Climate Action Group by the German government) 3. Pilot Auction Facility (PAF) 4. National Program for the Integral Management of Solid Waste (PNGIDS) 5. Urban Governance and Development Program – Emerging Towns Project (UGDP-ETP) 6. Southern West Bank Solid Waste Management Project (SWMP) 7. Ningbo Municipal Solid Waste Minimization and Recycling Project 8. CCAC Solid Waste Management in Penang, Malaysia 9. Solid Waste Management Improvement Project for Regional and Metropolitan Cities 10. Dar es Salaam Metropolitan Development Project (DMDP) 11. Integrated Community Development Project (ICDP) 12. Composting Project in Santa Catarina 13. Hebei Air Pollution Prevention and Control Program (HAP), China 	<p>Transport sector (3 in total)</p> <ol style="list-style-type: none"> 1. The Green Corridor, Cali, Colombia 2. High-Capacity Segregated Corridor (Cosac I) 3. BTR Rea Vaya in Johannesburg <p>Other sectors /multisector (6 in total)</p> <ol style="list-style-type: none"> 1. AAC blocks manufacturing unit based on an energy efficient brick/block manufacturing technology by Biltech Building Elements; Surrat 2. R4 Rural Resilience Initiative (R4) 3. REDD Project in Brazil Nut Concessions in Madre de Dios, Peru 4. Sustainable Sugarcane Initiative – AgSri 5. Nordic Climate Facility (NCF) 6. Facility for Performance Based Climate Finance in Latin America

3.2 Key Characteristics of Programs Reviewed

3.2.1 Assessment of RBCF programs by sector

Figure 3.1 shows the distribution of RBCF programs among five sectors: (i) forestry and land use; (ii) energy; (iii) non-combustion emissions (including waste); (iv) transport; and (v) other/multisector.

The sector with the largest number of RBCF programs (27) is the energy sector. On the whole, RBCF delivered to the energy sector focuses on providing energy access via sustainable energy sources (e.g., SHSs, energy efficient (EE) appliances, and cook stoves) and often supports rural electrification. As pointed out earlier, although multiple RBCF initiatives that derive revenues from compliance carbon markets are

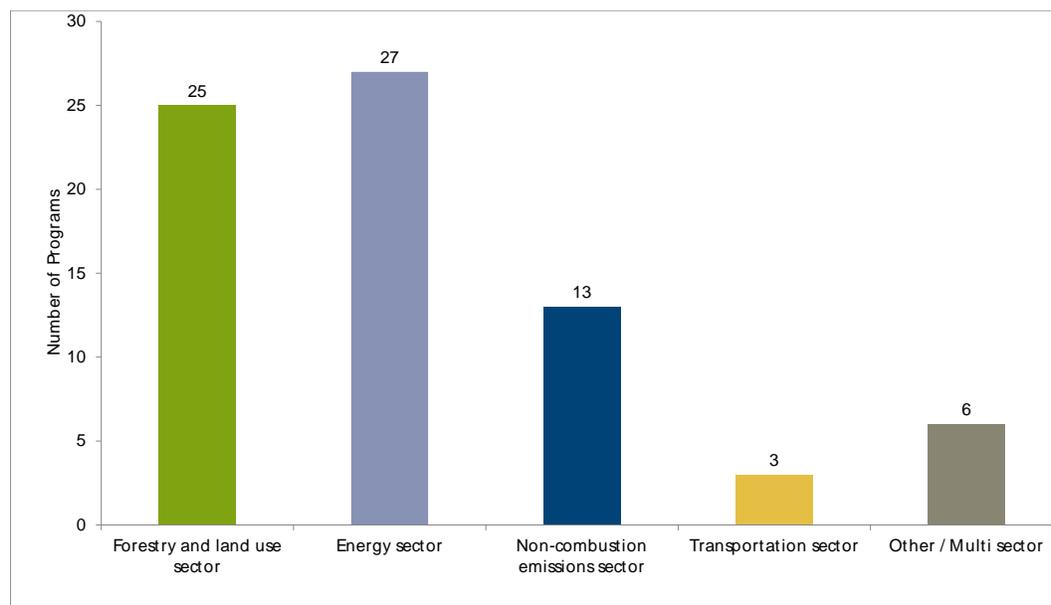
undertaken in the energy sector, these programs fall outside the scope of this study and are not included in the analysis.

The second largest sector is the forestry and land use sector (25 programs). The two largest programs in the sample are Norway’s commitments to Brazil, via the Amazon Fund, and to Indonesia, via the REDD+ Partnership. To date, the Norwegian International Climate and Forest Initiative (NICFI) has disbursed about \$1,105 million in RBCF in 2016 alone to the Amazon Fund, in addition to the previous million dollar pledge that was fulfilled in 2015. The Initiative has been operational since 2009. Norway’s partnership with Indonesia involves financing of up to \$1 billion, depending on Indonesia’s performance in reducing its forest- and peat-related greenhouse gas (GHG) emissions over the next 7 to 8 years. It is not surprising to see RBCF implemented via REDD+, as it was actively encouraged in the Warsaw Agreement (see chapter 2). Furthermore, the number of activities under REDD+ and other mechanisms that reduce emissions from deforestation and degradation has been growing (figure 3-1). The prevalence of REDD+ RBCF initiatives has, in turn, enhanced public knowledge about RBCF in practice.

The non-combustion emissions sector is the third largest (13 programs) in the sample. The non-combustion sector includes processes that result in methane (CH₄), nitrous oxide (N₂O) and fluorocarbon (HFC-23) emissions. Of the examples reviewed, the majority of activities focus on solid waste management.

The sample also includes three programs in the transport sector. In addition, the “other sectors / multisector” category includes six projects—three in the agricultural sector, one in the industrial process sector, and two cross-sectoral initiatives with energy and forestry & land use components.

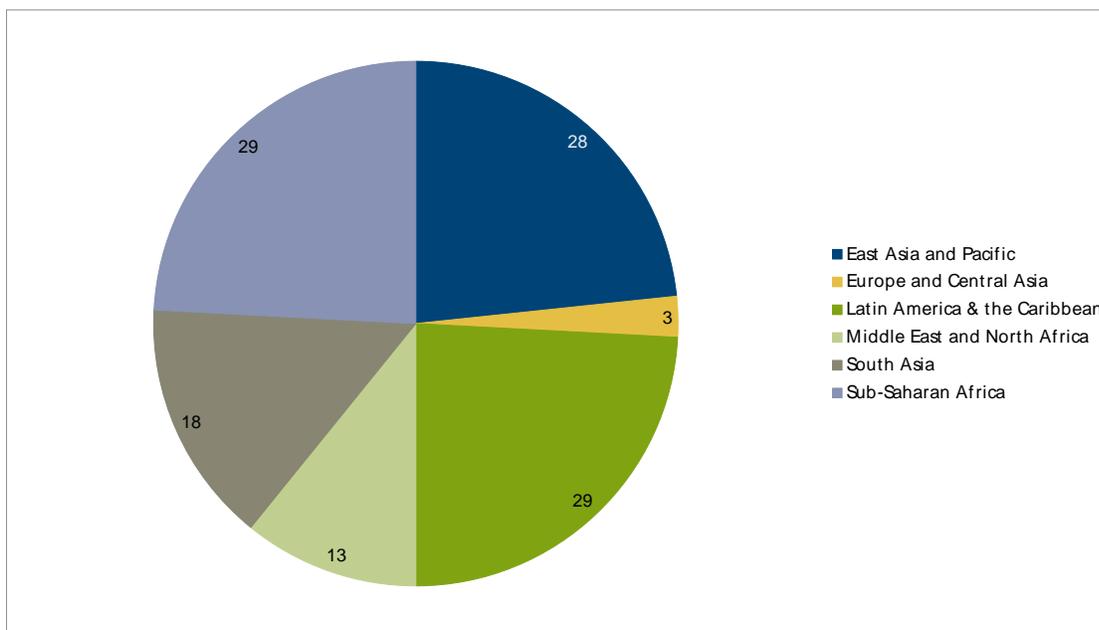
Figure 3-1. Number of RBCF Programs Reviewed, by Sector



3.2.2 Geographical distribution of RBCF programs

The review of RBCF indicates a broad geographical distribution.¹⁵ Figure 3.2 shows that RBCF occurs in both advanced economies and low-income countries. Moreover, many RBCF initiatives implement programs or projects in more than one Bank Region, and the activities are not concentrated in a specific Region or in the more advanced economies. Of the RBCF programs reviewed, 29 focus on the Sub-Saharan Africa Region, 29 on the Latin America and the Caribbean Region, 28 on the East Asia and Pacific Region, and 18 on South Asia.

Figure 3-2. Number of RBCF Programs by WB Region



Note: Many programs implement projects simultaneously in several regions.

3.2.3 RBCF programs according to their objectives and indicators

This section analyzes RBCF in terms of the objectives of each of the sample programs: mitigation, adaptation, development, or a combination of these. In figure 3-4, programs with two or three objectives are counted as multiple-objective programs. More than 80 percent of the RBCF programs reviewed in the forestry and land use sector (21 of 25) have multiple objectives. This partly reflects the fact that RBCF tends to be used to target policy implementation in addition to direct mitigation impacts.

One example of RBCF in the forestry and land use sector that targets multiple objectives is the BioCarbon Fund. In addition to pursuing emission reductions, this program aims to attain sustainable development

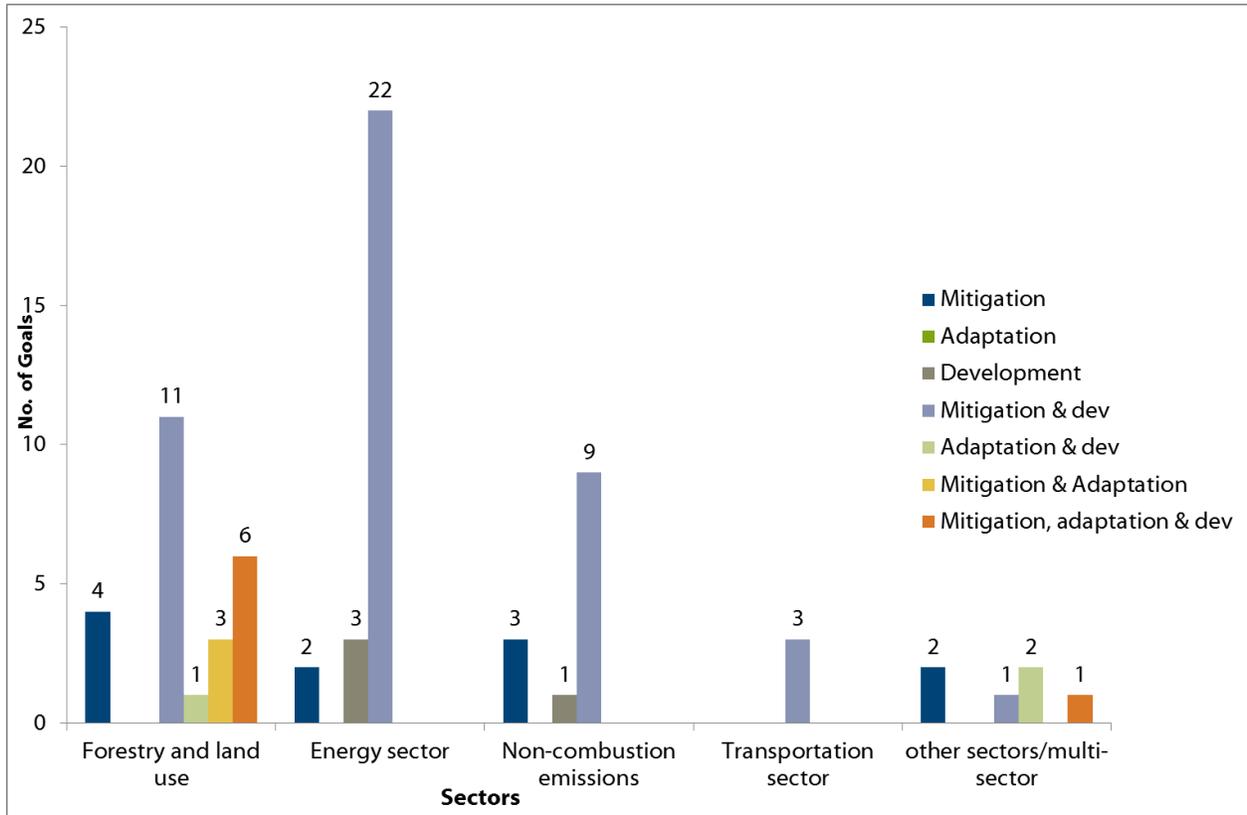
¹⁵ Geographic focus of implementation or, more specifically, Bank Region, was not a selection criterion. Moreover, we do not claim that the distribution of the 74 RBCF programs reviewed is representative of all existing RBCF programs.

benefits. It thus collects data on a range of indicators—including number of trees planted, total land area conserved, and number of farmers that have adopted sustainable land management practices. However, the BioCarbon Fund provides financing not on the basis of these sustainable development indicators, but rather on the basis of one *single* indicator: tons of carbon dioxide equivalent (tCO₂e) sequestered. On the other hand, Norway's International Climate and Forest Initiative (NICFI) aims to attain mitigation, adaptation, and development goals by formulating *multiple* DLIs that reflect different objectives.

RBCF programs in the energy, non-combustion, and transport sectors typically do not pursue adaptation objectives but only mitigation and development objectives. Like the BioCarbon Fund, programs that target the private sector (e.g., Gold Standard¹⁶ projects) emphasize a single goal such as emission reductions, although they often also require that co-benefits be generated. This is particularly relevant in the case of Gold Standard RBCF programs, where the certification of emission reductions is subject to certain requirements, such as compliance with environmental and social safeguards. Furthermore, climate change mitigation may be financed through the sale of water benefit certificates, which are certified by the Gold Standard. For example, in the Sustainable Sugarcane Initiative (AgSri), RBCF was provided for both achieving emission reductions (through the reduced use of fertilizers) and undertaking water management activities.

¹⁶ The *Gold Standard* is a standard for creating high-quality emission reduction projects in the Clean Development Mechanism (CDM), Joint Implementation (JI), and voluntary carbon market. It was designed to ensure that carbon credits are not only real and verifiable but also make measurable contributions to sustainable development worldwide.

Figure 3-3. Primary Objectives as Stated in RBCF Program Documentation



Note: RBCF = Results-Based Climate Financing. The categories in this figure are mutually exclusive. However, when the primary objective is to support development, this includes climate aspects as well.

Programs may use one or more indicators to measure the achievement of a specific goal (figure 3-4). For example, DLIs may refer to emission reductions, units of electricity sold, capacity installed, or the number of installations of a specific technology. Emissions in the non-combustion sector can be measured through material inputs or outputs, in combination with assumptions based on the selected technology. Similarly, emissions levels in the transport sector can be calculated on the basis of fuel use. The diversity of DLIs associated with the achievement of one or multiple goals is illustrated in figure 3-4.

Figure 3-4. Single or Multiple DLIs Associated with One or Multiple Objectives, by Sector

Forestry and land use			Energy sector			Non-combustion emissions		
No. of indicators	No. of goals		No. of indicators	No. of goals		No. of indicators	No. of goals	
	Single	Multiple		Single	Multiple		Single	Multiple
Single	2	6	Single	1	6	Single	3	4
Multiple	2	15	Multiple	3	16	Multiple	1	5
Transportation sector			Other sectors/multi-sector					
No. of indicators	No. of goals		No. of indicators	No. of goals				
	Single	Multiple		Single	Multiple			
Single	0	2	Single	2	2			
Multiple	0	1	Multiple	0	2			

Note: The single-goal indicators always track progress on mitigation. For one of the initiatives reviewed the data are not available.

3.2.4 RBCF programs – financial volume and financing source by sector

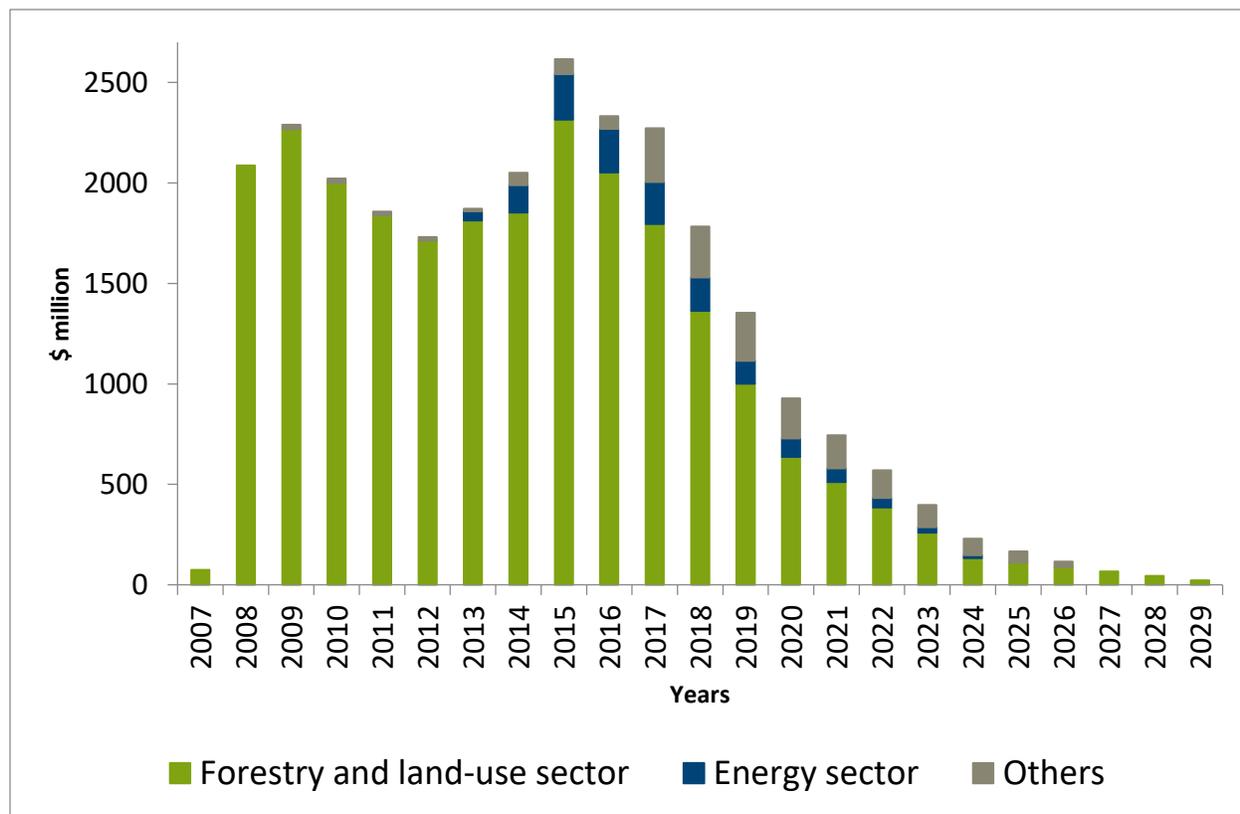
RBCF can be delivered through different financial instruments such as grants, loans, or voluntary carbon credit purchases. Most programs covered in this report deliver grants or provide finance through voluntary carbon credit purchases. This section only reviews RBCF grant programs or voluntary carbon market programs.¹⁷

The 12 largest programs providing international public RBCF to developing countries identified in this report reached an overall estimated capitalization of \$2.6 billion in 2015, as illustrated in figure 3-5.¹⁸ This number stood at only \$2 billion in 2010, reflecting the fact that many of these larger initiatives are part of the fast-track climate finance commitments made during 2008–15. However, capitalization is expected to rapidly decline over the next few years without an inflow of additional funds. About 90 percent of these funds are dedicated to the forestry and land use sector.

¹⁷ Seven programs within the sample provide results-based finance via loans (see appendix C). In total, the value of the loans paid on achievement of results exceeds \$2.4 billion over the *full duration* of the programs in question rather than representing an annual average, as in the case of the grant-based programs.

¹⁸ The methodology and assumptions underlying the calculation of these estimates are explained in appendix E.

Figure 3-5. Estimated Capitalization of the 12 Largest International Public RBCF Programs by Sector, 2007–29



Note: RBCF = Results-Based Climate Financing. The 12 RBCF programs involved are the Forest Carbon Partnership Facility (FCPF), the Bio Carbon Fund Initiative for Sustainable Forest Landscapes (ISFL), the Carbon Initiative for Development (Ci-Dev), the Pilot Auction Facility (PAF), the Transformative Carbon Asset Facility (TCAF), the Carbon Partnership Facility (CPF), at least, the funds in this facility dedicated to piloting new carbon market mechanisms, REDD Early Movers (REM), Norway's International Climate and Forest Initiative (NICFI), Energising Development (EnDev), the Global Energy Transfer Feed-in Tariffs (GET FIT) Program, the N₂O Initiative by the German government (Nitric Acid Climate Action Group), and the Nordic Climate Facility (NCF).

Private investors' commitments on the voluntary carbon market for purchases of carbon credits add to these public sector funds. The private finance engagement in RBCF is primarily a result of Emission Reduction Purchase Agreements (ERPA).¹⁹ In 2014 and 2015, \$0.3 billion was committed on the voluntary carbon market. In 2014 and 2015, most of these funds were dedicated to the forestry and land use sector, and the energy sector.

¹⁹ The voluntary carbon marketplace encompasses all transactions of carbon offsets that are not purchased with the intention to surrender into an active regulated carbon market. *Contract volume* is defined as "the point of contract between the buyer and the seller and may occur at any stage of the project development process, from before its carbon reduction impacts are verified (i.e., "investment" stage) to after it generates verified offsets" (Hamrick and Goldstein 2015).

Table 3-2. Contract Volume Voluntary Carbon Market

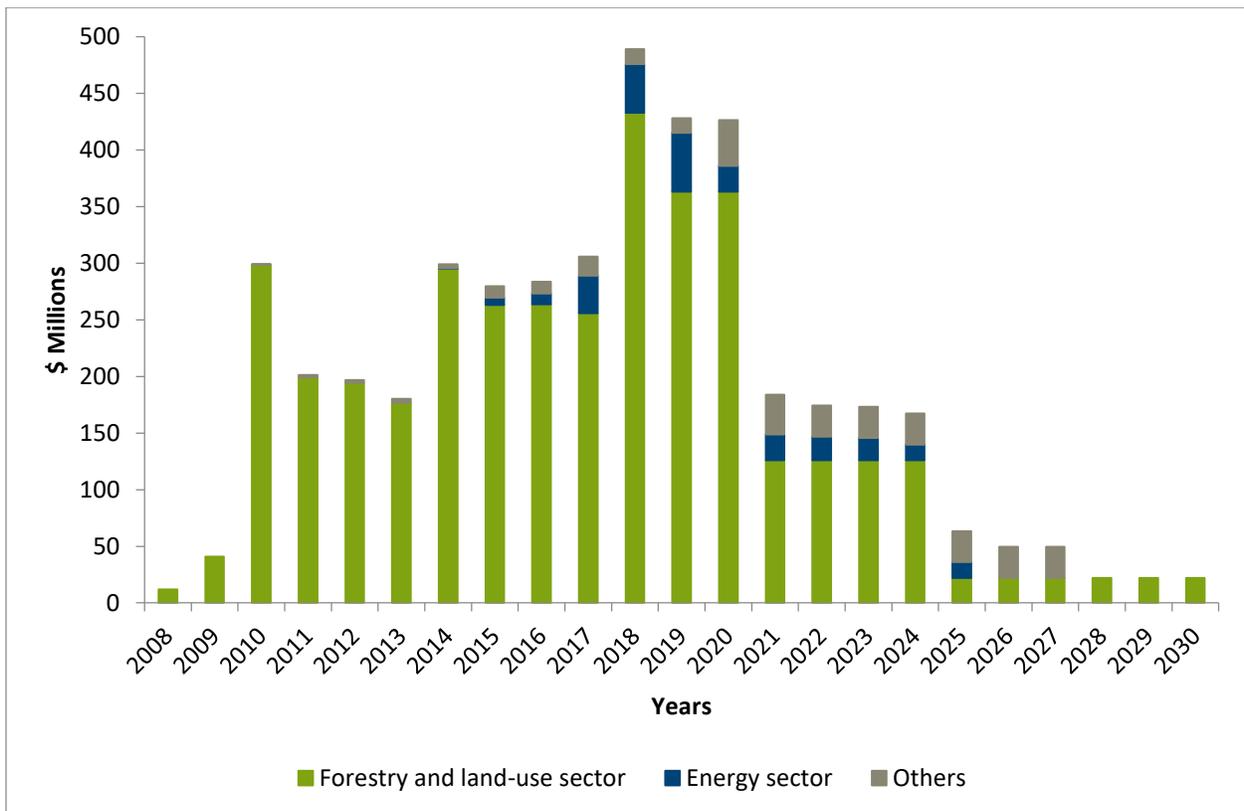
Contract volume (US\$, millions)	2014	2015
Forestry and land use sector	200	122
Energy sector	83	117
Others	15	42
Total	298	281

Source: Hamrick and Goldstein 2015, and Hamrick and Goldstein 2016.

Note: Because of a lack of data, the sectoral breakdown is based on a subset of the total volume of contracts, which covers 63 percent of the total volume in 2014, and 55 percent of the total volume in 2015.

Capitalization and commitment refer to the funds projected to be spent within the corresponding programs. To set RBCF in the context of overall climate finance flows to developing countries, it is helpful to estimate RBCF disbursements over time. Figure 3-6 provides the time profile of expected RBCF disbursements for the same 12 public sector programs that figure 3-5 shows the capitalization for over time.

Figure 3-6. Estimated Disbursements of the 12 Largest International Public RBCF Programs by Sector, 2008–30



Estimated annual disbursements stood at \$280 million in 2015 and 2016, and are expected to increase by a further \$200 million, and peak in the period 2018–20.

Figure 3-6 shows an increase in RBCF disbursements since 2015, despite the decrease in capitalization. This reflects the implementation lag of several of the fast-track climate programs. These numbers make up a very small proportion of the \$40 billion in overall international public climate finance provided to developing countries in 2014, as estimated by the OECD (OECD 2015). This is surprising, considering the versatility of the approach and its compatibility with supporting the achievement of some of the Sustainable Development Goals and with ensuring the successful achievement of the Paris Agreement. These numbers are also much smaller than the average annual payment flows for CERs under the CDMs in the first commitment period of the Kyoto Protocol (2008–12), which reached the figure of \$28 billion over this 5-year period (World Bank 2014)—a figure 20 times as large.

How to measure the total finance mobilized by RBCF presents a separate topic that lies beyond the scope of this report. The financial impact of RBCF flows may therefore be underestimated, as RBCF can mobilize additional investment. For example, GET FiT provided donor funding of \$102 million (of which \$92 million went toward the financing of a FiT top-up), which incentivized private investment of about \$400 million—a considerable mobilization factor.²⁰ Unfortunately, granular data to assess investment mobilization are currently not readily available, and comparable data were missing for most of the other programs reviewed for this report.

²⁰ More information may be found in the Get-Fit Uganda Annual Report 2016, available at <http://www.getfit-reports.com/2016/>.

4. RBCF DESIGN VARIATIONS

While previous chapters have established the theory and evolution of RBCF as well as the current landscape of RBCF application in practice, this chapter discusses the design elements of RBCF programs and addresses the following questions:

- **Financing structure:** How are RBCF programs structured and combined with other financial instruments?
- **Results definition:** How do RBCF programs define “results”? What are the results against which RBCF programs disburse funds?
- **Institutional structure:** How do funds flow from provider to recipient? Who are the main actors in an RBCF program, and which actors are held accountable for delivering results?

4.1 Financing Structure

By definition, RBCF is only disbursed after predefined results have been achieved and verified, meaning that RBCF never includes any upfront financing. The literature on RBCF considers this ex post payment a potential barrier or limiting factor, suggesting that RBCF may only be appropriate in contexts where recipients have sufficient access to financing. However, this assumes that RBCF-supported activities are not supported by other financing modalities, whereas closer examination of the 74 programs reviewed shows that RBCF and upfront concessional financing often complement each other.

The programs reviewed suggest two ways in which RBCF can be structured as a *complementary* financing modality. First, donors may pair RBCF with upfront TA. This approach is particularly common for publicly financed programs seeking to incentivize results while also strengthening institutions and market infrastructure. For example, in the forestry sector, REDD+ national-level programs typically contain a TA component focused on supporting countries in developing Reference Emission Levels (RELs) and institutional capacity. In the energy sector, the WB’s Supported Extended Biogas Project (SREP) in Nepal provided \$1 million in upfront TA to support the disbursement of \$7 million in results-based funds.

Upfront finance can also complement RBCF by integrating results-based disbursements into a larger financing package. For example, Uganda’s Global Energy Transfer Feed-in Tariffs Program (GET FIT) includes a results-based top-up on existing renewable energy FiTs. The RBCF component is able to catalyze upfront investment, typically financed by equity investors and accompanied by debt from commercial (or public) finance institutions. In addition, the program has a Partial Risk Guarantee (PRG) Facility that improves the investment climate for private sector actors (see appendix A for more details).

The WB’s Bangladesh Rural Electrification and Renewable Energy Development (RERED) Project takes a similar approach. It has several components—totaling \$400 million in financing for electricity access, household energy, energy-efficient lighting, and TA. The GPOBA, briefly discussed in section 2.1, disbursed a \$15 million results-based grant to support the purchase of SHSs, cook stoves, and Remote Area Power Supply (RAPS) systems supporting improved energy access.

While RBCF most commonly operates as a complementary element in a larger financing package, some programs, particularly those operating within the existing carbon market infrastructure, illustrate the use

of RBCF as a standalone approach. For example, the WB’s Pilot Auction Facility for Methane and Climate Change Mitigation (PAF) disburses results-based funds in the form of put options²¹ for carbon credits to reduce the risk associated with investing in mitigation. These options provide holders with the *right*, but not the obligation, to sell carbon credits to the PAF at a predetermined price. Option holders do not receive upfront financing from the PAF. The PAF requires option holders to pay an upfront premium, thereby ensuring that the latter are serious participants capable of delivering results. As of February 2017, the PAF had allocated \$53 million in options contracts for carbon credits from targeted sectors and geographies.

In practice, RBCF delivers grants, loans, or risk guarantees for initiatives that also receive TA or upfront financing. The combination of upfront financing and RBCF influences several other design elements of RBCF programs, among others, how results are defined and how funding flows from donor(s) or investor(s) to the recipient.

4.2 Definition of Results

RBCF is delivered on achieving a range of “results,” often referred to as Disbursement-Linked Indicators (DLIs), against which funds are disbursed. Among the 74 programs reviewed, the DLIs used include both *qualitative* indicators (e.g., the development of policy or MRV capacity) and *quantitative* indicators (e.g., megawatt hours (MWh) of installed renewable energy capacity), and vary by sector and type of indicator.

For example, in the energy sector, funds are disbursed based on the number of new grid connections or MWh of installed capacity. Multiple examples in the sample disburse funds in accordance with the number of units deployed, installed, or constructed (e.g., Bangladesh RERED II and Hebei Air Pollution Prevention and Control) or in response to government entities’ provision of loans or grants (e.g., the Morocco Disaster Risk Management and Resilience Program, and the Tanzania Rural Electrification Program). In the transport sector, indicators related to sustainable development objectives are often adopted. Appendix F provides a list of DLIs to illustrate the variety by sector and indicator type (milestone, threshold, or unit-based indicator). This list is, however, merely intended to illustrate the wide range of DLIs and is not comprehensive. Furthermore, several programs disburse RBCF against a combination of qualitative and quantitative indicators, rather than just one result. This section describes how the 74 RBCF examples reviewed define the “results” that determine whether funds will be disbursed.

4.2.1 Types of Disbursement Linked Indicators (DLIs)

DLIs can be classified in multiple ways and this section does not cover all types of DLIs but focuses instead on those that dominate in the sample programs underlying this report. One approach is to classify them as milestone, threshold, or unit-based indicators (figure 4-1). *Milestone indicators* are qualitative

²¹ A put option is an option contract giving the owner the right, *but not the obligation*, to sell a specified amount of an [underlying security](#) such as emission reductions at a specified price within a specified time.

achievements or results, often related to policy objectives or institution building. *Threshold indicators* are similar to milestone indicators, except that they involve quantitative targets. RBCF programs using milestone or threshold indicators disburse on an all-or-nothing basis—that is, if the defined milestone or threshold value is not reached, no disbursement of funds follows.

Unlike milestone and threshold indicators, *unit-based* indicators are scalable, which means that the disbursements increase proportionally to the number of units achieved. For example, in the Guyana REDD+ Investment Fund (GRIF) Program, the government of Norway increased payments for successful improvements in deforestation and forest degradation (see appendix A for more details on the GRIF program).

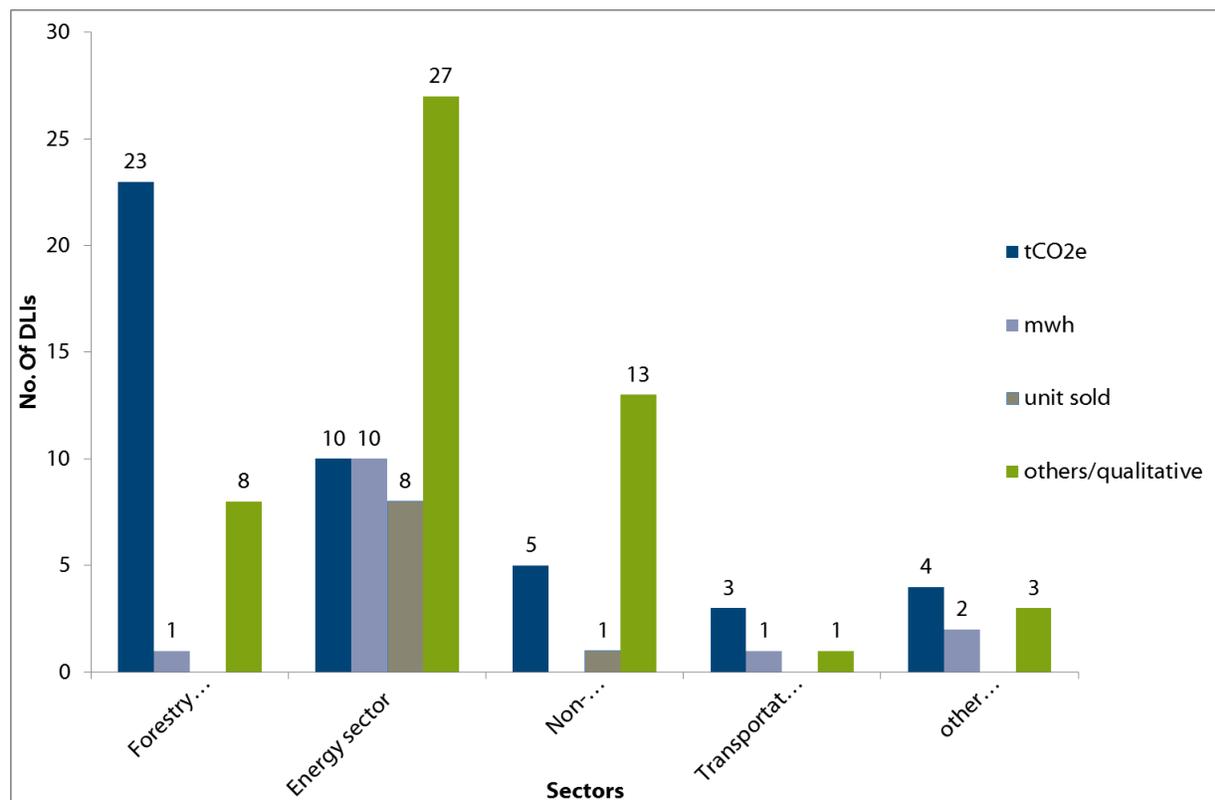
Figure 4-1. Three Types of Disbursement-Linked Indicators (DLIs)

	Quantitative	Qualitative
Binary	Threshold	Milestone
Continuous	Unit Based	

Within the sample of RBCF programs reviewed, there is a prevalence of *unit-based* indicators (figure 4-2). Across all sectors, these scalable indicators were the most prominent. Yet several programs also adopted *milestone* indicators, particularly in the energy sector. Importantly, just over half (51 percent) of the programs reviewed disbursed funds based on a combination of milestone, threshold, and unit-based indicators. A possible explanation for this surfaced during discussions with RBCF practitioners: due to the natural tension between ambitious targets/results in the implementation of RBCF and the need to retain some flexibility in the relations with the recipients of RBCF, a mix of *qualitative* DLIs (such as institutional reform) and *quantitative* DLIs (such as # of people insured) is often the most appropriate. A significant share (44 percent) disbursed funds exclusively against unit-based indicators, with most of these programs financing emission reductions measured in tCO₂e. Very few projects (4 percent) made payments solely against milestone or threshold indicators.

The WB’s Hebei Air Pollution Prevention and Control Program is an example of a program that disburses funds against both milestone and unit-based indicators. This program—which aims to reduce emissions from industrial and transport sectors, and improve air quality at the household level—uses seven DLIs: two *milestone* indicators (the approval of a 5-year air quality control plan and the implementation of an emissions inventory system) and five *unit-based* indicators (ranging from number of clean stoves installed, to hectares of land with increased nitrogen use efficiency, to the number of enterprises implementing an air pollution monitoring system). For each of the unit-based indicators, the WB predefined a fixed amount of financing per unit delivered, thus incentivizing recipients to deliver the maximum possible number of units.

Figure 4-2. Number of Disbursement-Linked Indicators (DLIs), by Type and Sector



Note: Data relate to the 74 sample programs; tCO_{2e} = tons of carbon dioxide equivalent; mwh = Megawatt hour. Non... = Non-combustion emissions sector.

Relatively few programs disburse funds against the achievement of threshold indicators. One program that does is the WB’s Morocco Integrated Disaster Risk Management and Resilience Program, which aims to improve the institutional framework to finance disaster risk reduction activities and strengthen resilience to natural disasters. This program uses eight DLIs, three of which are threshold *triggers*—among others, a minimum percentage of implementing entities must have received TA and/or relevant training for disbursements to be made. In addition, the Morocco Program uses two *unit-based* indicators and three *milestone* indicators.

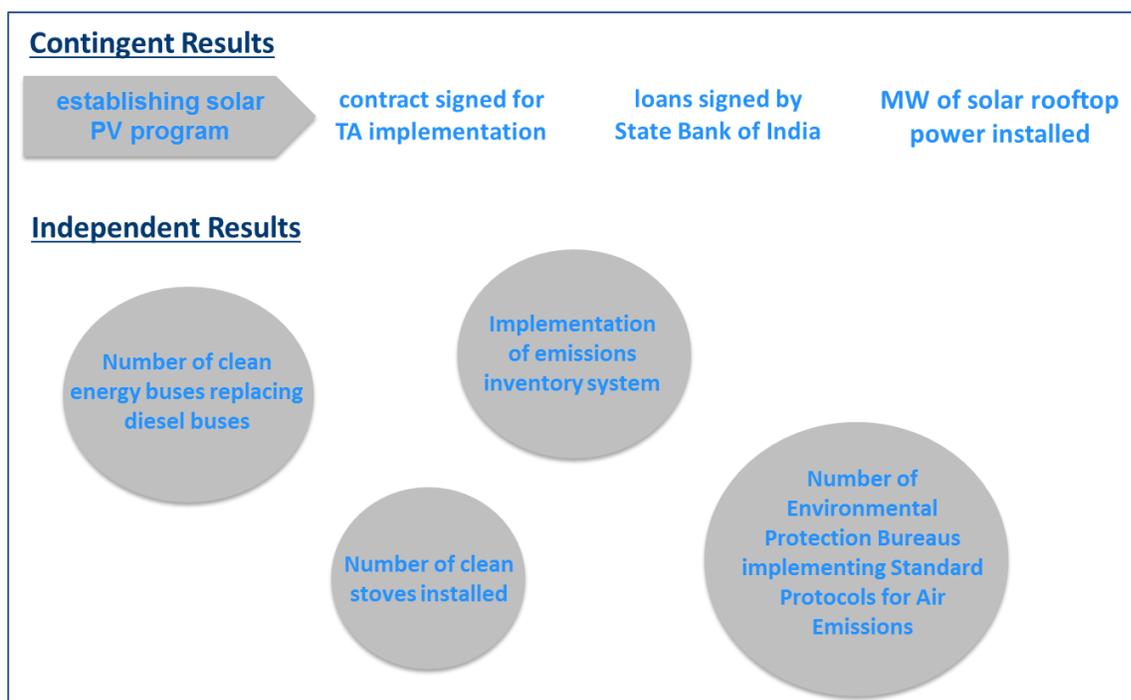
4.2.2 Single vs. multiple results

The decision to allocate RBCF for multiple DLIs is particularly common when RBCF is provided in combination with upfront finance. Disbursements made for reaching specific milestones often precede those for achieving predefined, unit-based indicators. Additionally, finance provided through RBCF often incentivizes the recipient to achieve *qualitative* results (e.g., the establishment of an MRV system) *prior* to achieving *quantitative* results (such as volume of tCO_{2e} reduction or Kwh of installed RE capacity).

When RBCF is designed to target multiple results, this report distinguishes between independent and contingent DLIs. In programs with *contingent* results, the achievement of any given result is dependent on the achievement of a prior result. Alternatively, if results are *independent* of each other, they can occur simultaneously or in any sequence. In figure 4-3, the WB’s Hebei Air Pollution Program illustrates independent results, and is contrasted with the WB’s India Solar PV project, which demonstrates contingent results.

The India Solar PV Program provides incentives for several contingent indicators, such as establishing a solar PV program and signing a contract for TA implementation; these indicators must be delivered in a certain order, with achievement of one indicator directly making possible the achievement of the next. On the other hand, the indicators used in the Hebei Air Pollution Program are independent—whether or not the program succeeds in replacing diesel buses with clean energy buses does not affect the ability to install clean stoves, implement an emissions inventory system, or establish air emission standards.

Figure 4-3. Contingent vs. Independent Results



Note: PV = photovoltaic; TA = Technical Assistance; MW = Megawatt. The contingent results are relevant for the India Solar PV project, while the independent results are relevant for the Hebei Air Pollution Program.

It should be noted that the distinction between contingent and independent results is currently not made in the RBCF literature, which focuses on RBCF payments for *predefined* outputs and outcomes. However, the review of RBCF programs suggests that a broader understanding of RBCF that does incorporate a distinction between contingent and independent results would be helpful, particularly in discussing cases where the recipient of RBCF is a government rather than private sector actor. This broader definition of RBCF would capture several key activities that normally are a government’s responsibility (e.g., capacity

building) but that may nevertheless not be covered by the *traditional*, upfront financing approach. For the private sector, which is more interested in providing the economic incentives to private sector actors that will deliver results, *qualitative* milestone results appear to be less relevant. The underlying assumption is that if the price is right, the private sector will quickly learn how to deliver results.

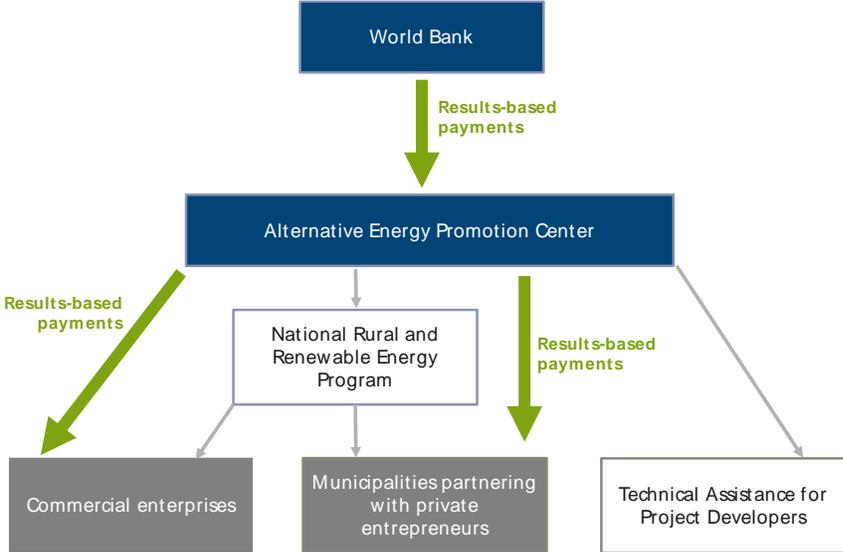
While the Hebei Air Pollution Program is an obvious example of RBCF, the India Solar PV Program shares several features with results targeted by an upfront concessional financing approach. In the latter case, the WB also disburses funds when a series of milestones have been reached. However, the India Solar PV Program design differs from upfront concessional financing in two ways: (i) it disburses funds only upon the achievement of predefined results, and (ii) the milestones of this program support the subsequent scalable, unit-based indicator of MWh of solar rooftop power installed. In fact, while the WB disburses some funds against the achievement of milestones, it disburses most funding (93 percent) based on progress made against unit-based indicators. Generally, the analysis of the RBCF programs in this report revealed that when RBCF is delivered on the achievement of several milestones occurring in close temporal proximity, the RBF approach is very similar to the upfront financing approach.

Furthermore, incorporating multiple milestones can limit the flexibility of the recipient to determine the most effective way of achieving results. On the other hand, a larger number of results can also be considered a way for the recipient to reduce risks. Thus, there are clearly trade-offs between the recipient's flexibility and the risk of nondelivery of results, which should be carefully weighed when deciding on the number of results to be incorporated in any RBCF program.

4.3 Institutional Structure

RBCF is not only defined by its financing structure and definition of results, but also by the way funding flows from provider to recipient. This variation reflects the ability of RBCF to incentivize specific, often several actors—among others, host country governments, implementing institutions/agencies, and project entities. What is the optimum institutional structure will depend on the specific market and policy environment, as well as on the stated objectives to be addressed by the RBCF program in question. The ability of RBCF to incentivize actors at different levels is illustrated in figure 4-4.

Figure 4-4. Schematic of a Multilevel RBCF Approach



The various actors involved in an RBCF program can be characterized as providers or recipients of RBF; providers are responsible for disbursing the funds, whereas recipients are responsible for delivering predefined results. Four possible RBCF scenarios for the promotion of SHSs (box 4-1) illustrate how the different roles of providers and recipients can affect the design of an RBCF program.

Box 4-1. Four Possible RBCF Scenarios for the Promotion of Solar Home Systems (SHSs)

Assume an RBCF program is designed to increase energy access and reduce CO₂ emissions by installing SHSs. The number of SHSs installed is the RBCF output and they contribute to “delivering” a measurable volume of CO₂ emission reductions (the RBCF *outcome*). In the long run, it is expected that this program will help combat climate change and reduce poverty by providing access to clean energy (the RBCF *impacts*).

The four alternative RBCF program designs that may be used in this hypothetical example illustrate the different ways funds can be disbursed to different actors. For the sake of comparability, each of the design options applies the same DLI, that is, “newly installed solar home systems,” meaning that the disbursement is made against the number of solar home systems (SHSs) installed:

- A donor provides funds to a **host government**: If the government gets no further specification, it would have a high degree of flexibility in designing the program and defining which relevant actors (private households or solar service providers) to incentivize. For this program to result in an increase in the number of SHSs installed, a certain infrastructure will be required, such as service providers willing to support the program, and a sufficiently high demand from private households (or other small customer segments). Even absent these two elements, the government may still be in a position to develop the necessary conditions for the creation of this infrastructure.
- A donor funds the **implementing agency**: The implementing agency is therefore incentivized to maximize the number of SHSs installed and could try to achieve this result by launching information and marketing campaigns, or designing individual subsidy schemes based on the expected donor cash flow. However, without government support, the implementing agency would find it hard to incentivize the actors who would have to create the infrastructure needed for the installation of SHSs.
- A donor (or implementing agency) provides funds to a **solar service provider**. Unlike in the previous two cases, the recipient is now a *commercial* institution that can benefit financially from delivering more SHSs. Solar service providers are part of the infrastructure needed for SHSs to thrive in the long term, and, thanks to the RBCF payments, they may be encouraged to take on additional investment and regulatory risks. This design is thus expected to directly boost the supply of SHSs.
- A donor (or implementing agency) provides funds to **private households** (or, from a development perspective, the final beneficiary). This scenario assumes that whoever is providing the financing under the RBCF program can verify the predefined results and provide the funds directly to households, which is likely to be challenging. This design stimulates demand for SHSs and services, as well as demand for *upfront* micro financing to support the households wanting to purchase an SHS—the kind of financing that may be challenging to secure.

The hypothetical example presented in box 4.1 illustrates the range of options for an RBCF program to increase the number of SHSs by targeting different steps in the “value chain” to produce solar electricity.²² Different incentives are generated for various key actors. Furthermore, what is the most suitable structure for the RBCF program also depends on the specific market and policy environment, as well as the program’s ultimate objective (e.g., service infrastructure, expansion of SHSs, or improved energy access).

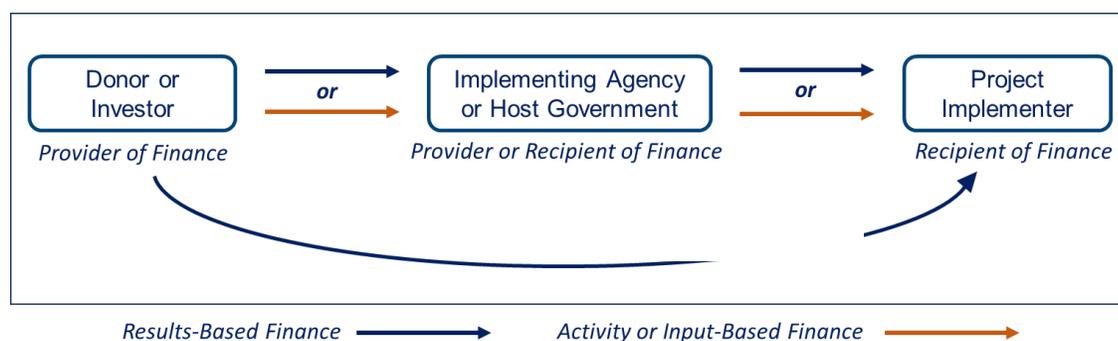
Understanding the financial flows is critical to understanding how the incentives from RBCF can be applied. Figure 4-5 illustrates the many options to establish incentives for relevant actors, depending on the way financing flows from provider to recipient. Donors and investors always act as fund *providers*, and

²² The four different scenarios could be interpreted as the different theories of change according to the specific actors involved.

project entities always act as *recipients*. Host government and implementing agencies, on the other hand, may play either role. Figure 4-5 illustrates five of the most common design variations in the path of RBCF flows from provider to recipient:

- Donor/investor disburses RBCF to the host government or implementing agency, which in turn disburses funds to the project entities; both the host government / implementing agency and the project entities must deliver results;
- Donor/investor disburses RBCF to the host government or implementing agency, which in turn provides *upfront* financing to project entities; only the host government or implementing agency must deliver results;
- Donor/investor disburses *upfront* financing to the host government or implementing agency, which in turn provides RBCF to project entities; only the project entities must produce results;
- Donor/investor disburses RBCF directly to the project entities; only the project entities must produce results;
- Host government disburses RBCF to project entities; the host government is the financing source and only the project entities must deliver results.

Figure 4-5. Financing Flows from RBCF Provider to Recipient



Note: The blue lines represent *Results-Based Financing* (RBF) flows, while the orange lines represent *upfront* financing.

When RBCF is delivered directly to a host government, the first design option (see bullet list above) is the one most commonly adopted, where both the host government and the project implementers are responsible for delivering results. The WB’s Nepal Extended Biogas Project illustrates this multilevel RBCF approach (figure 4-4). In this case, the WB provided RBF to Nepal’s Alternative Energy Promotion Center (AEPC) for promoting renewable and alternative energy technologies. The AEPC in turn provided these funds in the form of RBF to both the construction companies (for commercial plants) and project developers (for municipal plants). In this particular initiative, RBF flowed from the WB (as donor/investor) to the AEPC (as host government / implementing agency), and from the AEPC to commercial enterprises /municipalities (as project entities). The Guyana REDD+ Investment Fund (GRIF) follows a similar

approach—it receives funds on a results-basis from the government of Norway and disburses them on a results-basis.²³

Among the 74 RBCF programs reviewed, several adopted the third design option (see bullet list on previous page), where the donor or investor provides upfront financing to a host government or implementing agency, which in turn disburses the funds to the project implementers responsible for delivering results. The German government’s REDD for Early Movers (REM) Program provides funds to the KfW Development Bank (a German, government-owned development bank) and GIZ (the German agency for international cooperation). KfW disburses those funds to national or subnational governments on the basis of independently verified REDD emission reductions, that is, on the basis of results. The funds are then “implemented” by partner governments through an agreed benefit-sharing approach to a number of actors and programs.²⁴

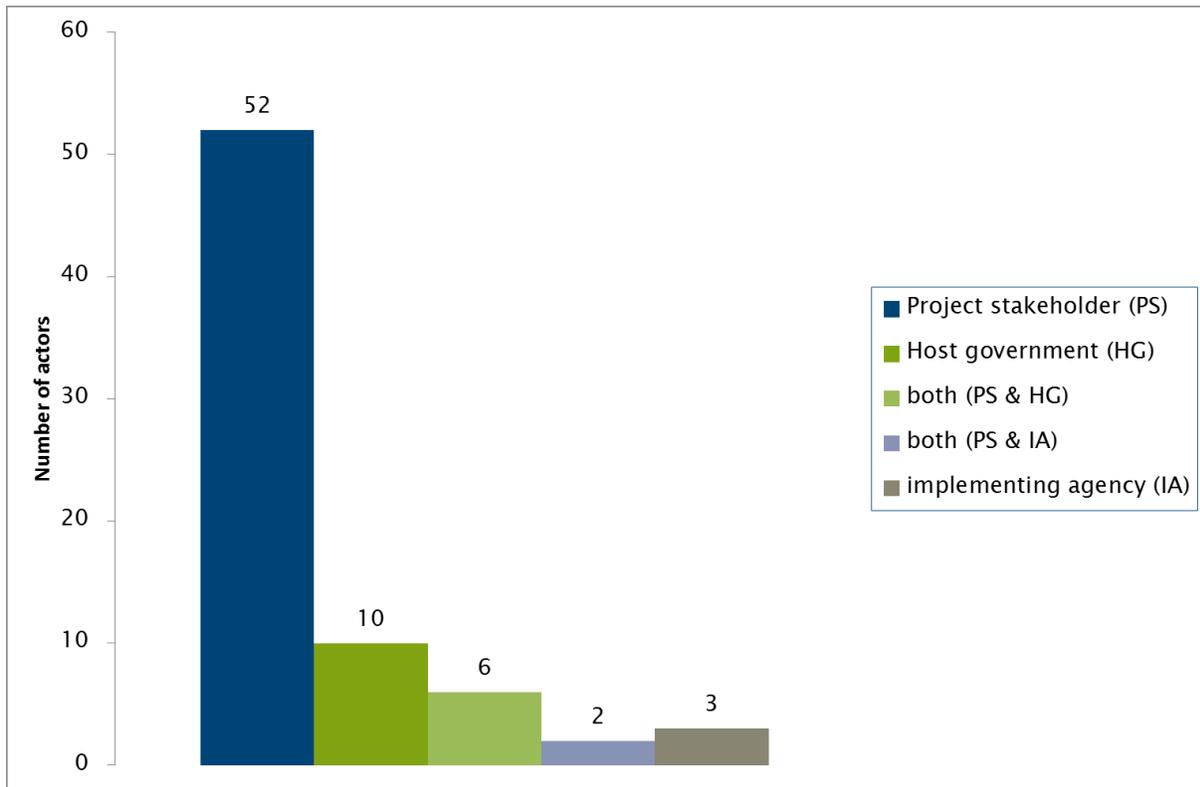
Figure 4-6 shows which actor(s) actually receive(s) the funds available under RBCF—provided the predefined results are achieved—in the case of the programs reviewed for this report.

Surprisingly, incentives for the implementing agency are only observed in very few cases, even though they play a key role in supporting the achievement of results. Given that the implementing agency is neither part of the host government, nor engaged at the project level in the host country, and therefore may need *separate* incentives, this was an unexpected finding. One example where the RBCF incentive is provided to the implementing agency is the R4 Rural Resilience Initiative (R4). The R4 Initiative aims to increase climate resilience, enhance food security, and increase the financial inclusion of rural communities in developing countries. Under this initiative, RBCF components operate at different levels and both the project stakeholder and the implementing agency are incentivized (see appendix A for more details on this initiative). At the project level, the farmers receive food coupons after “delivering” a verified amount of labor. At the implementing level, the volume of funds transferred to the insurance companies involved depends largely on the number of farmers enrolled in the program and the labor hours they have contributed to risk reduction projects. In addition, the implementing partner in charge of monitoring and verifying the quality of work is paid against verified deliverables (e.g., completion status of the assets).

²³ A fact sheet on the Guyana REDD+ Investment Fund (GRIF) is available at http://www.guyanareddfund.org/index.php?option=com_content&view=article&id=101&Itemid=116.

²⁴ More information on the REDD Early Movers Program can be found on the GIZ website, available at <https://www.giz.de/en/worldwide/33356.html>.

Figure 4-6. Types of Actors Receiving RBCF for Delivering Results



Note: RBCF programs for which data on the types of incentivized actor(s) are not available have been excluded from the figure.

The remaining design options, while not common among the programs reviewed, may also prove effective in delivering results and incentivizing specific actors to deliver results. For example, the option where the host government rather than an intermediary acts as the source of financing, thus directly incentivizing project entities to deliver results, may become increasingly important as countries work to achieve their NDCs under the Paris Agreement.

In general, all financing relationships (donor-government, donor-implementing agency, implementing agency-actor in host country, etc.) can be designed within the RBCF approach or modality. Moreover, each financing relationship may have elements of both upfront financing and RBF. Activities to be undertaken by the final recipients at the project level in the host country may also require additional public or commercial project investment. The RBF is, however, provided by the donor and managed by the implementing agency.

The review of RBCF programs indicates that RBCF can be tailored to provide the necessary incentives to specific and multiple actors, including both public and private sector recipients, to deliver results.

5. LESSONS FROM RBCF PROGRAMS: THEORY VERSUS PRACTICE

This section discusses whether the RBCF programs reviewed for this report can deliver on the following expectations regarding RBCF:

- Increasing MRV capacity
- Supporting domestic policy processes
- Drawing in private commercial actors
- Contributing to market creation²⁵
- Replicating and scaling up successful activities
- Successfully delivering climate mitigation and adaptation results.

5.1 Increasing Monitoring, Reporting, and Verification (MRV) Capacity

RBCF disbursements are contingent on the delivery of predefined results (i.e., outputs and outcomes) and therefore require reliable MRV systems. To secure RBCF, recipients are required to develop MRV systems for establishing baselines, tracking progress, and verifying the results. The central role of MRV systems for RBCF delivery has generated the expectation that RBCF will increase the capacity of both RBCF recipients and third-party institutions to monitor, report, and verify results—whether by catalyzing new institutions and infrastructure or by supporting existing systems (among others, Mumssen, Johannes, and Kumar 2010; Differ 2016).²⁶

The significance of this RBCF attribute in terms of supporting the transparent attainment of Sustainable Development Goals, the Paris Agreement, and NDC goals cannot be overstated. Since RBCF targets national, program, and project levels, it can also support the development of MRV systems at these levels. In the evolving framework of the Paris Agreement, it is clear that countries will require robust MRV systems at all levels in order to both formulate and track progress toward mitigation and adaptation targets. Furthermore, RBCF is not restricted by a single metrics but is flexible enough to incorporate metrics beyond tCO₂e emission reductions, making it very relevant for clarifying international, national, and local progress in reaching NDC and SDG targets.

The extensive RBCF program review conducted for this report revealed two ways in which RBCF strengthens MRV capacity: (i) by leveraging existing systems, and (ii) by pairing RBF with upfront TA. RBCF allows recipients to take advantage of their own infrastructure and resources, building context-specific MRV capacity and making a successful outcome more likely. In contexts with less or very limited capacity, donors and investors often combine RBCF with TA for developing new MRV systems or strengthening existing ones. In these cases, the MRV system and the results-based incentive complement each other—

²⁵ *Market creation* refers to the removal of barriers to trade and the assignment of well-defined property rights to create markets where environmental goods and services with privately appropriate values can be traded to realize their full potential values; it creates incentives for the sustainable use of resources.

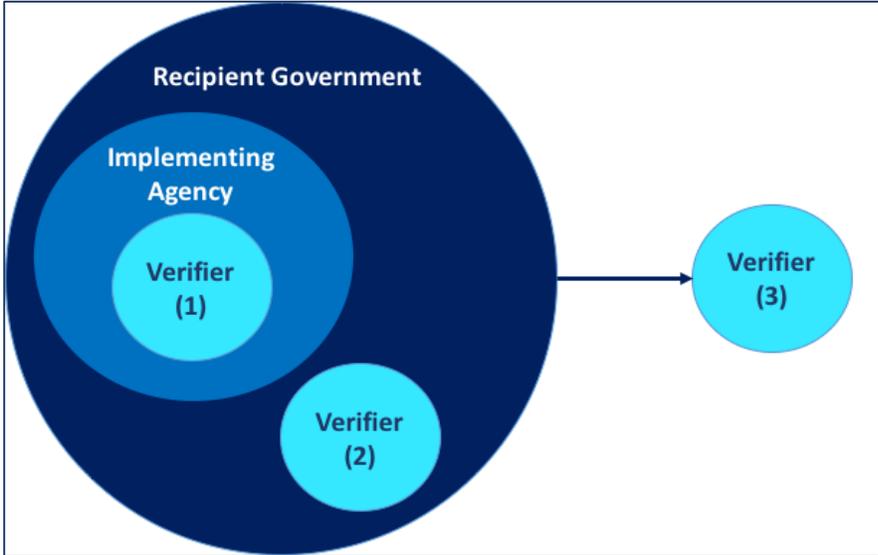
²⁶ Relevant information may also be found in the Review of Operational Policy Waivers 2011, published by the WB's Bank's Operations Policy and Country Services (OPCS).

the MRV system ensuring appropriate measurement of results and the results-based component providing an incentive to develop and use the MRV system.

5.1.1 Leveraging existing systems

In contexts with strong MRV capacity, RBCF often further strengthens or builds upon existing systems. In several of the sample programs, the design of the RBCF approach leveraged existing verification capacity within a recipient government or institution, avoiding the potentially high costs associated with MRV requirements (Warnecke et al. 2015). For example, where the government is the primary recipient of RBCF, it may choose among three options for verification of results: (i) leveraging the capacity of the implementing agency, (ii) working alongside another government agency specializing in verification or due diligence, or (iii) contracting independent, third-party verification agents (figure 5-1).

Figure 5-1. Recipient Government’s Three Options for Verification of Results



In the case of the WB programs reviewed, verification was rarely undertaken by a third-party entity (option 3) and mostly built on existing capacity within the government (options 1 and 2). This was not problematic and actually considered the best possible approach for reaching the results agreed in the most cost-effective way. The results were subsequently verified by the project implementer and the donor. An external third-party auditor was not required, but rather a process that applied checks to ensure the accuracy of the data collected to measure DLI achievements. Project managers identified three benefits of this approach: (i) avoiding the costs associated with independent third-party verification; (ii) enhancing the ability of implementers to evaluate progress and success in the early stages; and (iii) increasing ownership of the activity on the part of the recipient government. Of the 74 programs reviewed, the majority (about 60 percent) used existing systems and standards.

Furthermore, RBCF has the benefit of focusing on the quality of results through the application of the MRV infrastructure. The standards used for verification provide assurance that a result has indeed been

delivered and ensure the result meets predefined quality standards. The costs of the verification will be affected by multiple factors—including the scale of the RBCF program, the methodology used (e.g., sample size), geography of the country, and population density.

5.1.2 Pairing RBCF with Technical Assistance (TA)

While some recipients of RBCF leverage existing MRV capacity, others require more explicit support to develop new systems or strengthen existing ones. RBCF implemented in the context of REDD+ is relevant—upfront TA is provided to support the development of MRV capacity. REDD+ activities are grouped into three phases: (i) the “Readiness” Phase, in which countries build capacity for implementation of concrete activities; (ii) the Implementation Phase; and (iii) the RBF phase, in which countries are rewarded for verified emission reductions.²⁷ It should be noted that the Readiness Phase often includes TA for MRV systems as a precondition for the next two phases.

In the non-combustion sector, the National Program for the Integral Management of Solid Waste in Ecuador is another example that includes the provision of upfront TA. This program, aimed at reducing environmental pollution and promoting ecosystem conservation (Warnecke et al. 2015), incorporates capacity-building activities, including the design of an MRV mechanism as well as a system for emissions monitoring and verification. While these MRV-related activities receive upfront financing, the program also receives results-based payments (ex post) for achieved emission reductions (tCO₂e).

5.1.3 MRV capacity building in the forestry sector

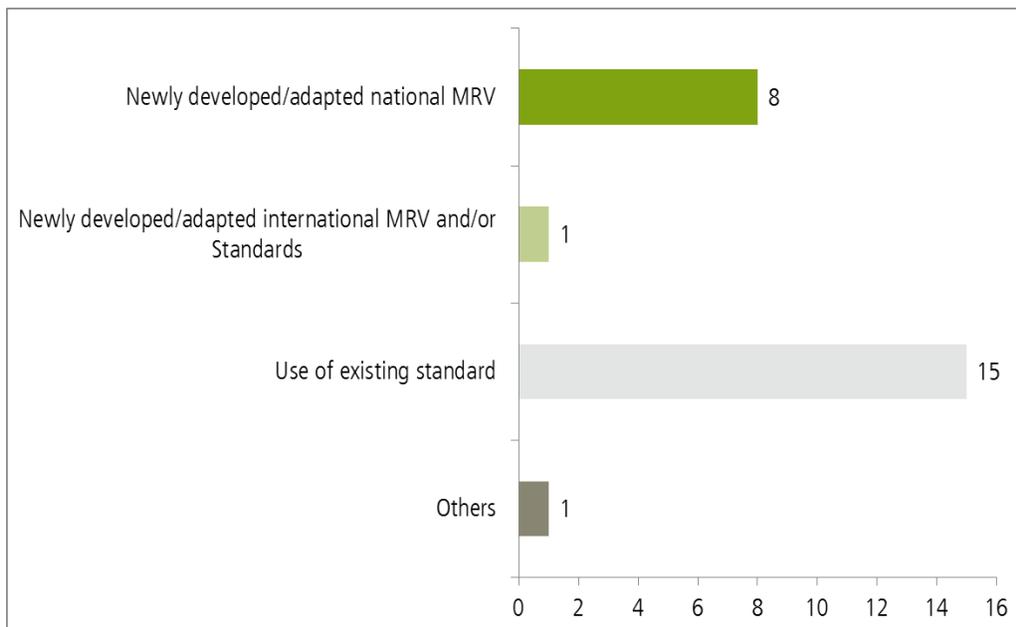
Of the 74 programs reviewed, those in the forestry and land use sector frequently incorporate support for MRV strengthening. The need for this kind of support reflects the complexity of MRV in this sector, which requires regionally adjusted monitoring of parameters—changes in the re/deforestation rates, the types of plants needed for sustainable planting, the sustainable management practices, as well as the level of CO₂ reductions. Furthermore, in the forestry and land use sector, MRV is also used to track illegal logging.

Forestry MRV systems in RBCF activities also benefit from being integrated with the overall REDD+ strategy for a country. For nested REDD+ programs, where REDD+ activities exist at both the site or state levels and national level, MRV will need to be coordinated *vertically*, to ensure that subnational MRV systems do not conflict with the national MRV system. In part because of the need to support this vertical coordination, 50 percent of the forestry RBCF programs reviewed have adopted *national* MRV processes.

MRV implementation is only possible if appropriate MRV *standards* are available. This can be a bottleneck for finance delivered as RBCF, since an adequate MRV system often requires the development of new MRV standards or the adaptation of existing ones, as illustrated in figure 5-2.

²⁷ For more information, refer to the *REDD+ Projecting Forests and Climate for Sustainable Development* report prepared by the Federal Ministry for Economic Cooperation and Development of Germany (BMZ), at https://www.bmz.de/en/publications/topics/countries_regions/Materialie250_redd.pdf.

Figure 5-2. MRV Capacity in the Forestry and Land Use Sector



Note: The numbers to the right of each bar represent the number of initiatives characterized by the respective MRV situations listed on the left.

By comparison, MRV capacity-building efforts in other sectors, particularly the energy sector, are less common. In the case of energy, MRV can often be linked to data that are either already monitored or easy to collect, such as installed RE capacity or number of cook stoves distributed. Furthermore, this sector benefits from building on available and reliable methodological approaches from the CDM and other international standards, which specify how to calculate and verify emission reductions.

5.2 Supporting Domestic Policy Processes

In order to achieve their NDC targets, governments must formulate national policies to mitigate domestic GHG emissions. Not surprisingly, there is consensus in the RBF literature that RBF approaches can strengthen and support domestic policy processes (Klingebiel and Janus 2014; Klingebiel 2012; Schneider et al. 2015). However, the RBCF programs reviewed support policy implementation in different ways—some by supporting institutional capacity and others by ensuring RBCF objectives are aligned with those of existing or new policies.

5.2.1 Programs that strengthen implementation capacity

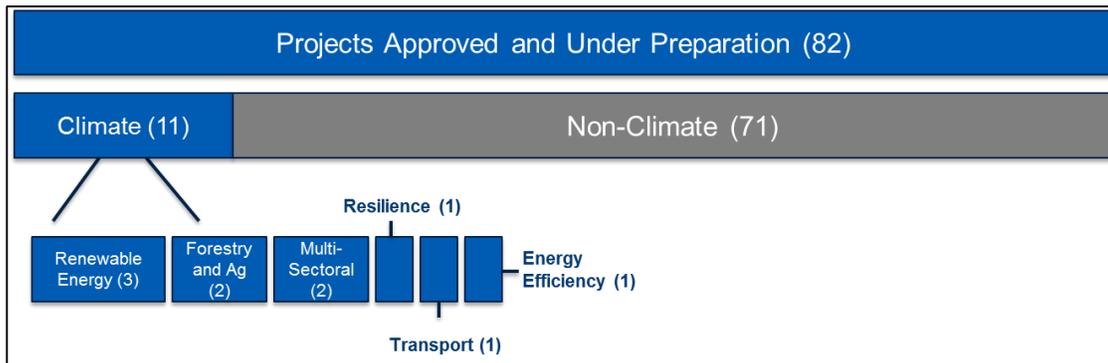
Some of the RBCF programs explicitly state capacity building as a key objective. For example, the WB’s Program-for-Results (PforR), a lending instrument that links the disbursement of funds to the achievement of predefined results, has the dual objective of building capacity within the country while enhancing the effectiveness and efficiency of financial support (box 5.1). In view of this, PforR has a high potential for delivering RBCF.

Box 5-1. Program-for-Results (PforR)

Introduced in 2012, the WB's Program-for-Results (PforR) instrument supports client countries in delivering priority results by working through country systems. PforR represents one of three WB financial instruments. The other two are: (i) Investment Project Financing (IPF), which supports specific investment operations whereby financing is disbursed mainly against inputs; and (ii) Development Policy Financing (DPF), which supports policy and institutional actions. Complementing IPF and DPF operations, PforR supports government programs and subprograms, and disburses funds only upon achievement of verified results.

PforR Portfolio

As of March 2016, the WB had approved 39 PforR operations, providing \$9.4 billion of financing to support \$49.9 billion in government programs. In addition, the PforR pipeline currently comprises 21 operations under preparation, totaling \$5.4 billion in expected financing. Since 2016, PforR operations span the WB's six Regions, with the Africa Region leading in number of operations. In its first four years, PforR financing as a percentage of total IBRD/IDA lending grew significantly, from 1.2 percent in 2012 to 14.5 percent in 2016. Of the total 82 PforR projects approved and under preparation as of November 2016, 11 projects were climate-related, meaning targeting forestry and agriculture, resilience and adaptation, EE, RE, waste, and/or transport sectors.



Key Features

PforR offers a number of unique features, including a focus on national systems, a high degree of flexibility and accountability, and increased predictability of disbursements. PforR responds to countries' demand to be allowed to rely on national fiduciary systems (both financial management and procurement) as well as environmental and social systems rather than WB processes. This feature supports the agendas of many countries and regions in building stronger institutions and delivering better services. As for flexibility and accountability, PforR recipients have noted that this approach offers a high level of accountability, scope, and flexibility, often stimulating the development of more innovative strategies. Finally, as financing is linked to predefined DLIs, the PforR often appeals to governments seeking greater predictability in disbursements.

PforR offers two options for early disbursement: (i) countries may receive up to 25 percent of Bank financing for "prior" results, achieved between the Project Concept Note and the approval stage, or results realized prior to the signing of a legal agreement (e.g., establishing a monitoring system, or establishing a baseline); and (ii) countries can receive rolling advances of up to 25 percent of total financing for the achievement of DLIs.

In addition to establishing disbursement procedures, PforR projects require clearly defined DLIs and verification procedures. DLIs can be defined as outcomes, intermediate outcomes, outputs, or process indicators, including financing indicators. DLIs may also be key actions meant to address specific risks or constraints to achieving results. These DLI achievements can be verified by a number of parties. Within the

sample of 29 PforR projects approved prior to March 2016, 63 percent of DLIs were verified by independent parties and 37 percent by government agencies.

Source: The World Bank 2016.

Note: a. More details may be found on the World Bank's PforR website, available at <http://www.worldbank.org/en/programs/program-for-results-financing>.

There are also examples of RBCF that build on and extend the capacities of existing institutional agencies and procedures within host countries. For instance, the Sumatra Program in Indonesia uses established institutions in Indonesia's State Electricity Corporation (PLN) for key management functions of the RBCF program. Another example is Tanzania's Rural Electrification Expansion Program. The Rural Energy Agency (REA), an autonomous body under the Ministry of Energy and Minerals, is responsible for the Monitoring and Evaluation (M&E) and for recruiting a third-party agency for verification of results.

5.2.2 Programs that align and enhance national sector policies

RBCF can be designed to target specific sector policies, particularly when it is directed at the national level. For instance, the Electricity Grid Strengthening – Sumatra Program in Indonesia aligns with the goal of increasing economic activity through the sustainable use of electricity in the Rencana Usaha Penyediaan Tenaga Listrik (Electricity Power Supply Business Plan).

Besides aligning with energy sector policies, some programs in the energy sector have a component to enhance the policy processes and MRV capacity in the host country institutions. In the Energy+ Partnership (Energy+), the program incentivizes the host governments to implement required policies and necessary sector reforms. In the Norway and Liberia Energy+ Partnership, Liberia is to take steps to implement a series of RE- and EE-related energy sector plans determined by the government. The host country should have enough capacity to implement the necessary sector reforms, develop and approve RE quality standards, and put in place the required necessary MRV processes, among others.

5.3 Crowding In Private Actors

Catalyzing private sector activity and leveraging or attracting private finance is an important objective of most RBCF programs.

5.3.1 How to measure private sector engagement?

To measure the success of public financing interventions in attracting private financing, lenders and public institutions could measure the additional cofinancing generated as a direct result of their investment by calculating the so-called leverage ratio. However, different methodologies are used for this purpose and no uniform definition exists for determining the leverage ratio.

Consequently, it is not always clear whether the RBCF itself is the catalyst for private sector engagement or rather the combination of RBCF with other factors such as legislative changes. How difficult it can be to attribute outcomes to a single approach when a program benefits from mutually reinforcing revenue flows is illustrated by the Global Energy Transfer Feed-in Tariffs (GET FiT) Program implemented in Uganda (see appendix A for more details). In this particular case, the successful private sector engagement was not purely a result of the RBCF flows. In fact, the GET FiT Program has two "layers" of subsidy components

for feeding electricity generated by RE technologies into the national grid. One is the usual FiT from the Electricity Regulatory Authority (ERA) in Uganda, and the second one is the top-up premium from GET FiT Uganda to incentivize commercial developers. This FiT top-up is financed by donors to incentivize project developers to realize some of the country's renewable resource potential. One condition for providing the top-up was that the government develop and offer *standardized* Power Purchase Agreements (PPAs), thereby eliminating a major barrier to private sector involvement. The standardization of the PPA facilitates access to financing and helps secure commercial financing, as it provides an extra layer of confidence to the lender.

It is therefore safe to conclude that the top-up by itself probably would not have mobilized the private sector to the extent it did in combination with the standardized PPAs. GET FiT illustrates how the impact of RBCF and other relevant factors on national policies and the private sector should be considered separately but also jointly.

From the RBF literature it is difficult to draw unequivocal conclusions about the potential of results-based approaches to attract private sector actors. However, the cursory analysis of the impact of the RBCF initiatives reviewed suggests that results-based approaches can lead to improved outcomes that in turn mobilize private sector financing, provided the RBCF is appropriately designed.

The next section illustrates how activities that were part of the programs reviewed have been able to involve the private sector.

5.3.2 How have the programs reviewed been able to engage the private sector?

RBCF can deliver incentives to engage the private sector in specific activities in different ways:

In some of the programs, public financing was used to support the mitigation process but private actors paid for results where they were able to secure a return. For example, they provided RBCF by purchasing mitigation outcomes—in the form of buying emission reductions in a (voluntary) carbon market or RE certificates. REDD+ is a good example in this context. Basing the payment for the reduced emissions measured on a standardized and credible certification procedure increases the credibility of these activities. Across sectors, the existence and acceptance of established standards for measuring emission reductions seems to be welcomed by private investors.

Other programs in the forestry sector were able to engage the private sector because the results defined were aligned with the business goals of certain private sector actors. For example, while climate mitigation and sustainable development goals are often considered the state's responsibility, the results required to achieve these objectives can be defined in terms of realizing value chain improvements and sustainable sourcing. This focus is easier for the private sector to align with their own expectations of return for participating in RBCF programs.

Many energy sector RBCF programs also explicitly target private actors as agents and seek to effectively align the objectives of these private sector actors with the objectives of the RBCF programs. A prominent example in this context is the RERED Program, under which the small power projects (up to 10 MW) are planned to be implemented by the private sector. The International Energy and Climate Initiative – Energy+ incentivizes private sector actors to increase investments in RE and EE technologies in developing countries by reducing some of the risks, and technology, capacity, and knowledge gaps hindering the expansion of the markets for RE and EE technologies. The Promotion of Solar Hybrid Mini-Grids (ProSolar)

Program aims to improve electrification in remote areas through private sector participation and rewards private companies for achieving results.

The Ceará Renewable Energy Bundled Project is a Gold Standard project in Brazil that replaces nonrenewable biomass with renewable biomass for energy generation. The project monitoring report records that the investors “have considered the income from the commercialization of the carbon credits to make the project activity viable.”²⁸ This is an example of the voluntary market enhancing the project attractiveness for investors by providing additional revenues derived from carbon credits.

Public financing should gradually be phased out so that eventually commercial financiers will be providing cofinancing or simply invest directly in a project according to its mitigation or adaptation potential, thereby increasing the profitability of the project on account of the RBCF flow. Cofinancing seems easier in the case of upfront financing, where the private actor is typically not driving the investment but rather benefiting from activities driven by public actors. If long-term engagement of commercial actors is envisaged, offering commercial actors incentives that give them more freedom and creativity in implementing desired results appears promising.

It must be remembered, however, that engaging the private sector is based on specific assumptions about the capital market. Among others, whenever risk is transferred from one actor to another, the actors facing higher risks will require compensation for assuming that risk, and capital markets have to be able to adapt to such risk transfers by transforming “risky” *ex post* cash flows into *upfront* financing.

RBCF used to provide price guarantees for mitigation to reduce the risks for private investors

The WBG’s Pilot Auction Facility for Methane and Climate Change Mitigation (PAF) is an RBCF pay-for-performance mechanism designed to stimulate private investment in projects that reduce GHG emissions (box 5.2). It is a model that could be applied domestically and internationally.

²⁸ More information on this project may be found in the *Ceará Renewable Energy Bundled Project Monitoring Report Form (version 05.1)*. https://mer.markit.com/br-reg/public/project.jsp?project_id=10300000001888.

Box 5-2. The Pilot Auction Facility (PAF) for Methane and Climate Change Mitigation

The PAF allocates RBF in the form of price guarantees for emission reductions achieved by projects. The PAF's tradable *put options* for emission reductions provide option holders with the right, not the obligation, to sell future emission reductions to the PAF at a predetermined price. The PAF only disburses funds for emission reductions that have been verified by a third party. To determine the price per emission reduction, the PAF uses an online *auction platform*. By encouraging both competition and transparency, the auction process maximizes the climate benefit per dollar.

The PAF's put options are supported by funding from the PAF Contributors—Germany, Sweden, Switzerland, and the United States. The PAF's put options are designed to be tradable, enabling holders to transfer ownership and maximize the likelihood that the PAF will achieve emission reductions. Furthermore, the PAF requires auction winners to purchase the options at their “premium price” (= the cost of purchase of a put option, expressed as the price in U.S. dollars per ton of CERs); auction winners must invest up front in order to receive the guaranteed price in the future. As of January 2017, the PAF had allocated over \$53 million in climate finance for methane and nitrous oxide emission reductions, and raised \$12 million through the sale of put options.

The PAF differs from traditional RBCF in several ways. First, the PAF's put options ensure that the public sector only pays for verified results, and furthermore only pays when market prices remain low; if carbon prices rise, option holders can sell their credits to other buyers in the carbon market at a higher price. Second, the PAF auctions generate real-time marginal abatement cost curves, uncovering the cost of mitigation for companies that can reduce emissions. And finally, from the perspective of project developers, the PAF addresses the challenge of volatile carbon prices and thus risky investments by offering a guaranteed price for future emission reductions.

As a pilot facility, the PAF aims to promote learning, replication, and scale. While the PAF has to date tested its model in the methane and nitrous oxide sector, this model could be replicated to incentivize emission reductions across a range of sectors, from forestry to energy-efficient buildings to oil and gas. Additionally, the model may be replicated at the country level by governments that need to meet commitments under the Paris Agreement. At the global level, the auction format could be scaled with increased funding to larger, multicountry climate auctions.

Source: World Bank 2017.

5.4 Contribution to Market Creation

The creation of new markets can be supported through upfront financing as well as RBCF. Yet the advantage of RBCF is that upfront financing is often only able to target just one component of the market (i.e., supply, demand, or institutions) while RBCF will typically stimulate an entire market (Differ 2016).

In some cases, upfront financing may be more appropriate in the initial phase of market creation, whereas fostering the creativity of potential market participants could be more useful at a later stage, for instance, when weak or thin markets have to be stabilized or made more robust. After all, at the heart of the RBCF approach is the use of one important market function: to transfer risks. The idea is to transfer the risk of nondelivery to those agents whose effort is most critical to the success of the project.²⁹ Those agents are

²⁹ The Differ Report 2016 suggests that RBCF can support markets by providing *predictable* price signals.

thus presented with an opportunity to “experiment”—by taking on these new risks—and are eventually rewarded for daring to operate in a relatively new market.

The program review undertaken for this report made it possible to identify different ways that RBCF was used to foster the development of markets.

Experiences on sustaining markets after exit of public funding are more limited due to the relative novelty of RBCF. In general, markets can be sustained through policy action and regulation—for instance, by creating carbon markets, or achieving commercial viability of clean technology and service solutions through cost reductions over time and enabling learning effect and business model innovations to reduce risks.

5.4.1 RBCF’s impact on carbon market development

Many of the RBCF programs in the energy sector generate income from the commercialization of carbon credits on the voluntary market. These are projects such as the Xinyang landfill gas recovery,³⁰ which generate voluntary CERs and implicitly support the development of a carbon market by sending a carbon price signal. Voluntary markets can support activities that were started under the Kyoto Mechanisms (CDM and JI) and for which there is currently no demand. RBCF programs can also ensure that activities started under the old Kyoto Framework can continue to deliver emission reductions under the new Paris climate framework. The PAF, for instance, has recently completed an industrial gas auction to ensure the continuation of GHG emission reductions from nitric acid production by addressing the current barrier of low prices in the carbon market due to lack of demand. The benefit of this is that existing resources and capacities (MRV, auditing, etc.) can be maintained and potentially transferred to new schemes without significant delays, once needed.

Furthermore, several RBCF initiatives aim to establish a self-sustaining carbon market by increasing the demand for a certain technology or the number of actors in the market, and gradually phasing out the need for donor support once the markets have been firmly established. Relevant in this context is the WB’s Transformative Carbon Asset Facility (TCAF),³¹ a new initiative that will support developing countries in raising their mitigation ambition (box 5-3).

³⁰ More information on the Xinyang Landfill Gas Recovery Project is available at Gold Standard’s website: <http://www.goldstandard.org/projects/xinyang-landfill-gas-recovery-project>.

³¹ TCAF was deliberately excluded from the RBCF set of programs reviewed because the initiative was considered insufficiently established to provide meaningful insights before the report was finalized.

Box 5-3. The Transformative Carbon Asset Facility (TCAF)

TCAF became operational in March 2017, with contributions from the Climate Cent Foundation, Germany, Norway, Sweden, Switzerland, and the United Kingdom. These countries are contributing to TCAF in order to obtain carbon assets for potential use for international compliance, build the international architecture for the transfer of units, support the development of domestic carbon pricing, and help transform targeted GHG-emitting sectors in the host countries. The work of TCAF supports countries moving from carbon pricing readiness to implementation, and builds on the work done by the World Bank's Partnership for Market Readiness (PMR) and other readiness initiatives.

TCAF will support different types of direct and indirect carbon pricing efforts by paying for verified carbon assets that result from these actions in pilot programs. These results-based payments can support the implementing country government in enhancing sectoral planning, strengthening low-carbon policy coordination and implementation, and advancing approaches for monitoring sector performance on GHG emissions. All these are necessary conditions to create an environment conducive to higher private sector investment in low-carbon technologies essential for achieving lasting transformational impacts. TCAF will also support MRV of NDCs by developing baselines and monitoring performance of the programs.

More specifically, TCAF will:

- Develop innovative carbon accounting methodologies to attribute emission reductions to the implementation of policies, as well as economy- and sector-wide programs, beyond project-by-project mitigation activities;
- Support mechanisms that account for carbon credits from various carbon pricing schemes, allowing for flexibility in market-based climate mitigation approaches and for countries to implement more ambitious carbon pricing instruments;
- Generate carbon assets (or carbon credits as measured in tCO₂e), through TCAF programs, that have strong environmental integrity and a high likelihood of being compliant under a future international regime, using conservative baselines and stringent monitoring and accounting practices;
- Purchase a portion of the carbon assets (mitigation outcomes) from the programs, leaving the remainder available for host country use for reaching their NDC targets. Contributors to TCAF may use these assets for their own compliance, to contribute toward their climate financing objectives (i.e., through cancellation), or allow the host country to use them toward their NDC targets.

Source: World Bank.

5.4.2 RBCF's impact on markets for energy and forestry products

RBCF programs in the forestry and land use sector often aim to develop new markets. The most obvious potential market creation is that of a forest carbon market—which has materialized to some extent—where the projects often generate CERs for the voluntary market. However, the sector's complexity, due to the fact that many initiatives are focused on a national and subnational level, has resulted in the market's relatively slow development. The major issues relate to land tenure, non-permanence,³² and leakage, all of which need to be satisfactorily addressed at broader subnational and national scales in order to develop a well-functioning carbon market.

Progress has been made, as illustrated by some initiatives that use RBCF to support agroforestry products. The Sustainable Afforestation Project in Togo, for instance, contributes to the strengthening of agroforestry product sectors by working with local stakeholders in all project stages. The project involves the establishment of nurseries, the growing of native tree species, and the supervision and management of forest and arable farmland to achieve long-term results in terms of economic growth and sustainable land use.³³

Energy markets have also been supported through RBCF. For example, energy shortage is considered the most critical infrastructure constraint to Bangladesh's economic growth and is caused by the lack of diversification in energy supply and slow progress on cross-border energy cooperation. In the absence of private sector interest, the Power System Efficiency Improvement Project Bangladesh (PSEI) has been designed. PSEI contributes to market creation by requiring a reform of the power sector³⁴ based on a financial restructuring of relevant sector entities.³⁵ The project aims to improve the electric power industry in Bangladesh, which suffers from acute power shortages, by: (i) replacing energy-inefficient thermal power plants; and (ii) expanding RE through financial support. Certain key policy actions—such as financial settlements and unbundling of key government power sector entities into state-owned enterprises—were included as processing conditions and undertaken before loan approval. RCBF in the energy sector also pursues improvements in the quality of energy provision at the national level, among others, by addressing energy shortages or improving the power grid. For example, the Sumatra Program in Indonesia (EGS) aims to strengthen the power grid in Sumatra at the regional level, while Tanzania's Rural Electrification Expansion (REE) Program aims to increase access to electricity in rural areas and scale up renewable electricity generation.

³² *Non-permanence* refers to the phenomenon that carbon sequestered in a forest restoration project, or carbon “protected” (= kept in the soil) by avoiding deforestation, is released into the atmosphere at a future date due to natural or anthropogenic disturbance.

³³ Gold Standard website: <http://www.goldstandard.org/projects/sustainable-afforestation-togo>.

³⁴ A summary assessment of the Bangladesh power sector assessment is available on the ADB's website at: <https://www.adb.org/sites/default/files/linked-documents/37113-013-ban-ssa.pdf>.

³⁵ More details may be found in the Periodic Financing Request Report for the PSEI project, available on the ADB website at: <https://www.adb.org/sites/default/files/project-document/177562/42378-017-pfrr.pdf>.

5.4.3 RBCF's impact on financial markets

RBCF can be used to deliver grants and loans to improve the commercial attractiveness of programs and projects, and support the stabilization of rural financial markets. For example, Energising Development (EnDev) is a grant-based energy access partnership aimed at strengthening the supply and demand side of the market chain by addressing bottlenecks that prevent entrepreneurs from supplying affordable devices/services and keep consumers from purchasing them.³⁶ Bangladesh's Rural Electrification and Renewable Energy Development (RERED) Project provides financing through grants and refinancing instruments to boost rural electrification and RE development, and to “overcome market barriers for the use of Renewable Energy.”³⁷

RBCF is also emerging as a successful approach to increase the supply of and/or demand for new technologies. Under the RERED program in Bangladesh, the project partner Grameen Shakti used RBCF to advance SHSs. The program has encouraged the establishment of more than 50 SHS service providers who compete in the market for RBCF. Similar developments, be it on a smaller scale, can be observed in projects certified by the Gold Standard: the Proyecto Mirador Enhanced Distribution of Improved Cookstoves in Latin America project created 17 microenterprises³⁸

5.5 Replicating and Scaling Up Successful Activities

RBCF activities are said to be relatively easy to replicate or scale up in a comparatively short period of time (i.e., Differ 2016). To assess this potential, the following aspects of the programs reviewed were considered: Which of the important elements of a program can be scaled up with minimum additional financial support? For example, if the delivery of results relies on existing or new institutions, will these institutions be able to scale up their activities? Has the program been designed bearing in mind the possibility of replication and sharing knowledge? As many of the programs reviewed have not yet been closed, only tentative conclusions can be drawn.

5.5.1 Scaling up existing RBCF programs

In theory, scaling up an existing RBCF program is relatively simple—if more results are delivered, the financing flow will expand. By this logic, simply increasing the financing volume should lead to the scale-up of an existing RBCF program, provided the relevant project potential is there. This means interventions in the context of a local program could be lifted to a regional or national level.

However, this argument is overly simplistic because not all interventions are cost-effective at all scales. Whether or not they are at a specific level must be carefully assessed, based on the relationship between

³⁶ EnDev. 2016. *Annual Planning 2016: Energising Development – Phase 2, 2016*.

http://endev.info/images/a/a1/EnDev_Annual_Planning_2016_short_version.pdf.

³⁷ For more details, see the WB's 2014 report *Project Performance Assessment Report: The Peoples' Republic of Bangladesh Rural Electrification and Renewable Energy Development Project*, available at

<http://documents.worldbank.org/curated/en/669251468212073331/pdf/885460PPAR0P070C0disclosed060240140.pdf>.

³⁸ Gold Standard. 2016. “Proyecto Mirador Enhanced Distribution of Improved Cookstoves in Latin America.”

<http://www.goldstandard.org/projects/proyecto-mirador-enhanced-distribution-improved-cookstoves-latin-america>.

economic returns and scale of operation.³⁹ Increasing economic returns to scale may be expected if the fixed costs of the intervention are very high—the larger the scale of the intervention, the lower the cost per output delivered. Monitoring and verification costs, in particular, usually drop significantly as an intervention is scaled up. In fact, if a separate monitoring system had to be developed for each project, the cost of doing so would in many cases be prohibitive. Another area where increasing economic returns to scale may be expected is the negotiation of contracts with service providers (to deliver the desired results). Negotiating such contracts with a large number of *individual* service providers operating in relatively small areas would be very costly. On the other hand, doing so at an *aggregate* level (possibly even using standardized service contracts) would be much more economical. REDD+ supports jurisdictional and national-level RBCF initiatives and tries to take advantage of these potential economies of scale—planning for currently nested activities at the local or regional (subnational) level to be incorporated into a national program in the long term.

Assuming the desired outputs can be increased by scaling up an intervention, a wider geographic scope can make it easier to manage the risk associated with the possible nondelivery of results. For example, a renewables project limited to a particular technology or location may be more or less successful in any given year due to favorable or inclement weather. An individual service provider may not be able to do much to mitigate this risk. By contrast, national governments managing a nationwide renewables program and applying multiple technologies (thereby spreading their risk) may be much less vulnerable to weather risks. In this particular scenario, shifting the responsibility from the service provider, at the *local* level, to a government entity, at the *national* level, could be highly cost-effective.

The RERED program, implemented in Bangladesh between 2012 and 2014, is an example of a successfully scaled-up RBCF program. In view of the good results it attained (>650,000 new connections to the power grid in Bangladesh and >2 million SHSs installed in remote rural areas), RERED II was approved and its implementation started in 2012, with an expected closing date of December 31, 2018. The success of the RERED program was, however, only possible because of context-specific conditions, including the following:

- A vibrant microfinance environment in which a pre-existing network of competitive microfinance institutions had well established relationships with clients in rural areas whom they could offer an additional service.
- The presence of a competent implementing agency that was a strong promoter of off-grid solutions and an effective implementer with the capacity to manage an off-grid program.
- Bangladesh's high population density meant that economies of scale could be achieved that brought down unit costs. It also promoted competition in the market, which resulted in consumers being offered attractive credit packages.

³⁹ In economics, *increasing* returns to scale refer to a situation where the output increases by a larger proportion than the increase in inputs during the production process or specific intervention. Such economies of scale may occur because moving from small- to large-scale operations may entail greater efficiency. *Decreasing* returns to scale refer to a situation where an increase in all inputs leads to a less than proportional increase in output. One possible reason for this is that a production process (for instance, a specific energy generation process) sometimes becomes less efficient as production (energy generation) is expanded.

As such favorable conditions are not always in place, whether RBCF programs can be successfully scaled up will depend entirely on the concrete country and sector context. So far, examples of successful scaling-up are limited to the forestry and energy sector.

5.5.2 Boosting demand for climate-friendly technologies supports scaling up

Higher demand for certain low-carbon or climate-resilient technologies may also offer opportunities for scaling up and replication. EnDev promotes sustainable access to modern energy services that meet the needs of the poor—long-lasting, affordable, and appreciated by users. The program demonstrates and disseminates innovative technologies, which vary from country to country. These technologies include PV systems, micro hydro power plants, improved cook stoves, biogas, and the like. EnDev also supports decentralized or mini-grid energy solutions for wider geographic regions. Under EnDev’s results-based financing facility, cook stove projects were implemented in Ethiopia, Kenya, Mozambique, Malawi, Nepal, Peru, Cambodia, Laos, and Vietnam, and solar PV projects in Benin, Rwanda, Tanzania, Kenya, and Bangladesh.

EnDev encourages competition between projects and technologies, so that it can identify the most cost-effective projects and mark those for possible scaling up. The experience of EnDev shows that market-based approaches are important in ensuring cost-effectiveness when scaling up.

5.6 Successful Delivery of Results

By definition, RBCF is only disbursed once predefined results have been achieved and verified. From the perspective of the financing provider, the risk of losing money—that is, spending without reaping any benefits—is therefore lower than it is in the case of upfront financing.

The more relevant question from the perspective of ensuring longevity and quality is whether RBCF is more likely to deliver high-quality, sustainable results than upfront financing. It is a question that cannot be answered conclusively based on the sample of RBCF programs reviewed for this report because most of these programs are still active. Moreover, from a *methodological* point of view, a direct comparison of the two approaches would be challenging, given the obvious difficulties to establish the right control groups.

What the review did reveal is the *key success factors* for RBCF and possible strategies to lower the risk of nondelivery of results. First and foremost, the key priority is program design: Successful RBCF programs and projects were able to provide sufficient incentives to those actors that are most critical to achieving the intended results. A second success factor is correctly defining DLIs and ensuring they can be measured and (if necessary) monitored. When climate change mitigation is the primary objective, the DLIs are more easily defined for the relevant sectors than in the case of other objectives. Why? Because carbon emission reduction is the key to addressing climate change and carbon emissions are consistently expressed in tCO₂e, and thus easy to measure. Being able to measure requires that the right methodologies be available and, even more critical, sufficient MRV capacity. In fact, strengthening MRV capacity directly reduces the risk of nondelivery.

A third success factor is access to upfront financing. Packaging RBCF with upfront financing clearly helps project entities overcome the barriers to securing investment funds. Furthermore, prefinancing RBCF

disbursements through commercial lenders and investors can be facilitated by standardizing and simplifying RBCF programs and the underlying MRV processes.

Finally, the risk of nondelivery can be managed on a portfolio level by allowing support for less successful or failing activities to be shifted to the more successful ones. The PAF is an example of such a built-in flexibility mechanism at the portfolio level—by offering tradeable put options. Given the fact that GHG emissions are *global* externalities, climate mitigation is particularly well-suited to the incorporation of such performance-enhancing elements in RBCF program design.

5.7 Key Findings

RBCF has substantial potential to increase the MRV capacity in host countries. Overall, RBCF programs are deemed able to develop credible processes for determining whether results have been delivered, and improve the process of verification and overall transparency.⁴⁰

RBCF can and does support domestic policies; it does this by strengthening domestic institutions and facilitating the alignment of various domestic policies.

It seems that RBCF has the potential to act as a catalyst for private sector engagement; however, further advancements in developing a methodology to assess RBCF leverage would enhance this assessment. Moreover, successful private sector engagement will require a certain degree of sophistication in the capital markets. To what extent RBCF is particularly suitable for involving the private sector seems to depend strongly on each specific context.

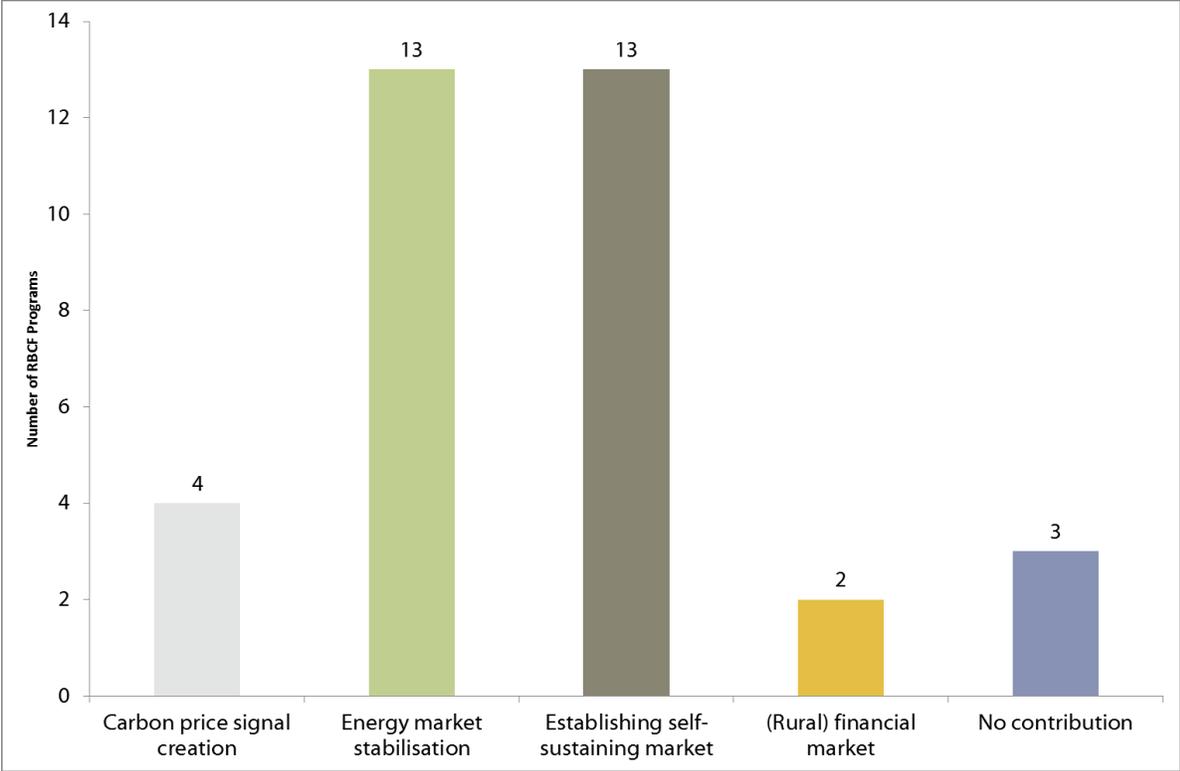
Among all sectors, market creation seems to be most prominent in the energy sector. The stated goal of many of the energy programs reviewed is to contribute to market creation by creating a price signal for carbon, stabilizing energy markets, establishing self-sustaining markets for specific technologies, or strengthening rural financial markets to support low-carbon product supply and purchase (figure 5-3).

The analysis in this report suggests that RBCF is able to contribute to market creation because it provides market signals, advancing understanding of markets, and supports capacity building that catalyzes market-like behavior. While such markets can be sustained in various ways once RBCF is phased out, relevant experiences from RBCF programs included in this report are not yet available.

Under certain circumstances, RBCF programs may lend themselves to replication and scaling up. However, the local context and experiences with RBCF as well as the returns to scale for the RBCF program in question will affect the likelihood of a successful scaling-up. Moreover, not all RBCF programs can be scaled up, as some are region-specific or activity-specific and in other cases the target market is saturated.

⁴⁰ For a discussion of the importance of credibility and transparency for RBF, see Mumssen, Johannes, and Kumar 2010; Vivid Economics 2013; and Warnecke et al. 2015.

Figure 5-3. Number of Energy Sector Programs Aiming to Contribute to Market Creation



6. CONCLUSIONS

The previous chapters have presented a snapshot of the growing body of RBCF experience and shown how RBCF programs are already contributing to climate finance flows. Estimated annual disbursements stood at \$280 million in 2015 and 2016, and are expected to increase by a further \$200 million, and peak in the period 2018–20. RBCF was found to typically complement other financial instruments such as upfront grants and upfront concessional loans. In fact, RBCF is rarely used in isolation, except when specific procurement inefficiencies are targeted.

The review revealed the diversity and flexibility of RBCF among the 74 RBCF programs being implemented in both low-income countries and more advanced economies, across various sectors. RBCF is delivering grants, loans, or payments for noncompliance carbon credits at a market price.

RBCF is a flexible approach that can be targeted at multiple actors, including governments, implementing agencies, and project entities. However, the RBCF programs reviewed rarely incentivize the implementing agency directly. This is not surprising since the implementing agency often is neither part of the host government nor engaged at the project level in the host country. It may therefore need separate incentives.

By its very nature, funding based on results that target existing barriers or gaps will catalyze market-like behavior, as it provides price signals, knowledge, and costs coverage to increase the viability of activities to which commercial investors react. Among the RBCF programs reviewed, the objective of market creation is the most prominent in the energy sector-related programs. RBCF in this sector aims to either establish a new, self-sustaining carbon market or stabilize an existing energy market. Furthermore, RBCF is particularly suitable for preparing and establishing the infrastructure needed for carbon markets across all relevant sectors, at different levels (i.e., national, program, or project levels), in combination with the development of any related national policy.

It is relatively easy to scale up successful RBCF programs if the corresponding market potential exists. It is clear that RBCF can advance MRV capacity and implementation by supporting the development of domestic accounting frameworks. Often, existing MRV schemes are used, and TA can be tapped to develop new schemes or improve existing ones.

Practitioners on the ground have overcome several barriers to RBCF identified in the literature, for example, tackling the barrier of upfront financing by integrating RBCF components into a larger program that can also use other financial instruments; reducing the costs of MRV by leveraging the existing institutional capacity of recipient entities; and including flexibility mechanisms on a portfolio level, thereby reducing the risk of nondelivery of results.

Overall, the report's main conclusion is that RBCF is well-suited to climate mitigation because reducing carbon emissions focuses on a well-defined and measurable global externality. Additionally, RBCF facilitates carbon pricing and market building, supports host countries' policy processes to achieve their NDCs, and leverages private sector activity and private financing. RBCF has also shown potential in adaptation, albeit through fewer programs than in mitigation so far.

Appendix A. FIVE RBCF PROGRAMS EXAMINED IN DETAIL

More details are given on five of the programs reviewed to provide a “deeper dive” into a few, representative RBCF programs. The reason for selecting these particular programs is that they illustrate the breadth of design options for the application of RBCF and highlight how different financial scales of RBCF can be used to support climate actions across different sectors.

The five programs examined in more detail are the following:

- The Pilot Auction Facility (PAF), which targets the waste, and industrial gas sectors;
- The Guyana REDD+ Investment Fund (GRIF), which targets the forestry sector;
- The Energy+ Partnership (Energy+), which targets energy access;
- The Global Energy Transfer Feed-in Tariffs Program (GET FIT), which targets the energy sector; and
- The R4 Rural Resilience Initiative (R4), which targets adaptation.

Each of these programs is first described in general—its key objectives are summarized and the RBCF design is outlined. Next information on key elements of the RBCF program (scope, DLIs, financial volumes, MRV, etc.) is presented, and finally lessons drawn from the program are briefly discussed.

Pilot Auction Facility for Methane and Climate Change Mitigation (PAF)

The Pilot Auction Facility for Methane and Climate Change Mitigation (PAF)⁴¹ is a facility of the World Bank Group that is supported by the United States, Germany, Sweden, and Switzerland.⁴² The program was launched in 2014. **The primary goal of the PAF is to “stimulate investment in projects that reduce Greenhouse Gas (GHG) emissions while maximizing the impact of public funds and leveraging private sector financing.”**⁴³

The PAF sets a floor price for future carbon credits by auctioning put options. The put option is embedded in bonds that are issued by the WB (obligations are backed by the PAF). In a scenario where carbon market prices for carbon credits are higher than the strike price of the put options, participants may decide not to redeem the option and instead sell the carbon credits on the market at the higher price. If, however, the carbon price is lower than the strike price, the option owners have the right, but not the obligation, to sell the carbon credits to the PAF at the strike price. The PAF makes payments once the emission reductions have been verified. The PAF is a pure RBCF mechanism: it provides RBCF against reductions achieved, by applying a per-unit DLI (tCO₂e). This arrangement secures a minimum return for any volume of successful GHG mitigation action.

The PAF has held three auctions to date. The first two auctions targeted projects that reduce methane emissions generated at landfill, animal waste, and wastewater sites. Only emission reductions certified

⁴¹ This section draws mainly on the PAF’s official project website (<https://www.pilotauctionfacility.org/>).

⁴² PAF, Pilot Auction Facility, 2016, <http://www.pilotauctionfacility.org/content/about-paf>.

⁴³ Ibid.

under the CDM were eligible for the first auction, which was held in July 2015. The price guarantees cleared at \$2.4 per credit for 8.7 million tons of CO₂ emission reductions.⁴⁴ The second auction was held in May 2016, and expanded the eligibility of emission reductions to also include voluntary carbon projects (that is, Verified Carbon Standard and Gold Standard projects). The auction cleared at \$3.5 per credit for 5.7 million tons of CO₂ emission reductions. On January 10, 2017, the PAF held its third auction, allocating \$13 million of climate funds to reduce emissions from the nitric acid production sector by 6.2 million tons of carbon dioxide. The auction cleared price guarantees at \$2.1 per credit. The net price guarantee was almost equivalent for the first two auctions and a little bit lower for the third auction, as the premium (i.e., the cost of purchasing the price guarantee) was \$0.30 per credit for the first and third auction, and \$1.41 per credit for the second auction.⁴⁵

Table A-1. Key Elements of the PAF

Scope	
Country	Developing countries
Sector	Non-combustion emissions
Timeframe	2014–present
Volume	\$53 million
Donor(s)	United States, Germany, Sweden, and Switzerland fund the program
Implementer(s)	World Bank
Final RBCF beneficiary	Project/activity implementers
On what level is RBCF used?	At the project level
Disbursement-Linked Indicator(s)	tCO ₂ e measuring outputs
Purpose / Goal	
Outputs	Allocation of climate finance via price guarantees determined through an auctioning approach.
Outcomes	Maximize the achievement of GHG emission (CH ₄) reductions and also maximize the impact of public funds in efficient ways.
Impacts	Combat climate change.
Support Instrument	

⁴⁴ A conversion rate of 1 metric ton of methane reduction: 25 tCO₂e of CERs was used to convert methane to CO₂e; <http://www.pilotauctionfacility.org/content/a%EF%BB%BF-eligible-emission-reductions>.

⁴⁵ <http://www.pilotauctionfacility.org/content/a%EF%BB%BF-eligible-emission-reductions>.

Type of support given	A guaranteed floor price on carbon reduction credits delivered through the auctioning of put options supported by donor funding.
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Monitoring, Reporting and Verification

Type of MRV:	Emission reductions are generated using existing CDM standards, the Gold Standard, and the Verified Carbon Standard.
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Lessons learned: Building the MRV on existing standards resulted in considerable savings in terms of time and money, while also ensuring that qualifying projects met the objectives of the PAF. The PAF has also shown that fast disbursement of funds is possible under RBCF and that flexibility mechanisms can be used at the portfolio level to reduce the risk of nondelivery. The PAF could also be used for other sectors than the energy, industrial gas, and methane abatement sectors if different metrics could be applied. For example, work is underway to explore the application of the PAF to support improved EE in buildings. In principle, future applications of the PAF model can be based on any existing or newly created MRV framework that is suitable for RBCF. It would be vital to ensure that central functions currently performed by the current emission reduction certification standards can also be fulfilled by other MRV frameworks or standards. Critical for RBCF is assessing whether the PAF model can help overcome barriers in decision making on investments and contribute to raising financing for capital expenditures in low carbon development technologies. Upfront payments (e.g., in the form of grants or concessional loans) derived from climate finance could be made available in conjunction with price guarantees to reduce funding gaps for project implementation and assist with financial closure. Linking auctioned price guarantees to credit guarantees or insurance products could be another form of support.

Guyana REDD+ Investment Fund (GRIF)

Established in October 2010, the Guyana REDD+ Investment Fund (GRIF) aims to reduce deforestation and forest degradation in Guyana by financing the related REDD+ capacity building and implementation activities.⁴⁶ GRIF is intended to finance the implementation of Guyana's national policy framework "Low Carbon Development Strategy (LCDS)" and capacity building activities. The LCDS was developed after Norway and Guyana had signed the Memorandum of Understanding (MoU) and Joint Concept Note (JCN) to establish GRIF. Furthermore, the program supports Guyana in implementing REDD+ activities, including the REDD+ governance development plan and the MRV roadmap, which have been incorporated into the LCDS.⁴⁷

RBCF payments are based on an independent verification of Guyana's implementation of REDD+ enabling activities.⁴⁸ For deforestation activities, the reference measure is a deforestation rate of 0.275

⁴⁶ This section draws mainly on the GRIF's official project website (<http://www.guyanareddfund.org/>).

⁴⁷ GRIF. 2011. Guyana REDD+ Investment Fund: Fact Sheet. <http://www.guyanareddfund.org/index.php/about-the-grif/fact-sheet>.

⁴⁸ Government of Norway. 2015. "Verification of Interim REDD+ Performance Indicators under the Guyana-Norway REDD+ Partnership (Year 4)." <https://www.regjeringen.no/contentassets/6a81714468874be7bf210dd4d09cfa33/verifikasjon-av-guynas-avskogingstall-2013.pdf>.

percent (the average of Guyana’s historical deforestation rates and the global average deforestation rates over the years 2005–10). If the deforestation rate increases above 0.1 percent, no payment will be made; if the rate increases beyond 0.056 percent (= benchmark rate for year 1), the payment will be reduced. For degradation activities, benchmarks can also be defined, for instance, a degradation area of 4,368 ha is used to assess indicator 2.3 (Carbon loss as indirect effect of new infrastructure (ha)) (table A-2). For other activities, the methodology for verification of results is less well-defined, requiring manual inspections and/or interviews with forest authorities to establish defaults. A default factor of 15 percent is used, for instance, in illegal logging activities, given the absence of detailed, reliable data. The activities financed by GRIF target the government, which in turn uses RBCF to incentivize activities at the local level through the purchase of VERs. The DLIs in GRIF are a mix of unit-based and threshold indicators. The RBCF payments are components of a larger program that also includes TA.

Table A-2. Elements of GRIF

Scope	
Country	Guyana
Sector	Forestry and land use
Time frame	2010–15 (original plan); a 5-year extension has been decided
Volume	The fund was to receive up to \$250 million from Norway, depending on the achievement of defined results, by 2015.
Donor(s)	Norway will be the first contributor; however, there is flexibility to allow other contributors to participate.
Implementers	United Nations Development Program (UNDP)
Final beneficiary of RBCF	Local communities, land owners, and small business enterprises
On what level is RBCF used?	RBCF is provided to the fund and can be accessed through the formulation of project proposals by entities accredited to do so.
Disbursement-Linked Indicators	The indicators applied at the fund level, and not at the level of individual project activities, measure results and include: <i>Indicator 1:</i> Gross Deforestation rate (%) <i>Indicator 2.1:</i> Loss of intact forest landscapes (ha loss) <i>Indicator 2.2:</i> Forest Management (tCO ₂) <i>Indicator 2.3:</i> Carbon loss as indirect effect of new infrastructure (ha) <i>Indicator 2.4:</i> Emissions resulting from subsistence forestry, land use and shifting cultivation lands (i.e., slash and burn agriculture) (ha/yr.) <i>Indicator 2.5:</i> Emissions resulting from illegal logging activities (tCO ₂ e) <i>Indicator 2.6:</i> Emissions resulting from anthropogenic forest fires in ha/year
Purpose / Goal	

Outputs	<ul style="list-style-type: none"> • Strategies for implementation of low-carbon activities developed; • Appropriate national level MRV system built; • <i>Deforestation</i> aspect: Certain amount of forestland preserved— not converted to non-forest use; • <i>Degradation</i> aspect, for instance, certain measures adopted to prevent forest fire and certain actions undertaken to ban illegal logging activities.
Outcomes	<ul style="list-style-type: none"> • Enhanced national capacity to adopt and implement REDD+ MRV activities; • Improved situation with regard to deforestation and degradation in Guyana.
Impacts	<ul style="list-style-type: none"> • Combat climate change by attracting low-carbon investments; • Promote economic growth and development for indigenous people through conservation of forests.

Support Instrument

Type of support given	<ul style="list-style-type: none"> • GRIF and implementing agencies offer policy advice; • Initial grants are offered for capacity-building activities; • RBCF payments are made against verified results.
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Monitoring, Reporting and Verification

Type of MRV	Emission reductions are generated using REDD+ MRV standards
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Lessons learned: The GRIF is one of several building blocks in the national REDD+ system. It is a channel for REDD+ results-based payments from Norway to Guyana. It specifically aims to “provide a scalable, replicable model for REDD+.” From its earliest inception, it was designed as a testbed for broader international efforts to create a REDD+ mechanism as part of an international climate agreement.

The first lesson learned is that jurisdiction-wide/national REDD+ mechanisms can work. The Guyana-Norway partnership is the only functioning “jurisdiction-wide” REDD+ mechanism in the world, and is demonstrating that large areas of forest can be effectively maintained without blocking long-term social and economic development.

Second, GRIF showed the value of a clear and stable economic incentive for supporting governments’ shift to a low-carbon development trajectory. The up to \$250 million fund provided Guyana with a dependable source of capital to invest in social and economic low-carbon priorities.

Third, GRIF showed the importance of taking not only a narrow forestry scope, but also a focused, low-carbon development scope. GRIF created capital to invest in Guyana’s Low Carbon Development Strategy (LCDS), and aimed to support clean energy by addressing some of the causes of deforestation (among others, the lack of affordable energy), thereby securing public support.

Fourth, a REDD+ strategy can be implemented while an MRV system is being further developed and strengthened. The dominant view internationally is that REDD+ can only be implemented after a period of “REDD+ readiness,” during which all enabling capabilities are put in place. However, in Guyana, both readiness and implementation proceeded in parallel—where payments were made based on “good enough,” proxy MRV measurements using conservative assumptions in results calculation as well as specified noncarbon performance until a full-fledged MRV system was in place. Fifth, REDD+ finance must be accessible, flexible, and timely. GRIF was originally built using traditional approaches used in

Official Development Assistance (ODA). In the first few years, the mechanism's lack of agility led to a situation where REDD+ was merely perceived as a cost factor, from which no benefits were derived. Guyana and Norway quickly recognized the need for GRIF reform and acted accordingly.

This experience highlights the importance of deploying the right mix of financial instruments, and aligning administrative practices to make RBCF attractive.

Energy+ Partnership (Energy+)

Energy+ Partnership (Energy+) was launched in October 2011, with the primary goal to “increase access to sustainable energy services and reduce greenhouse gas emissions” by scaling up access to RE and enhancement in EE.⁴⁹ Energy+ adopts a sectoral rather than project-based approach to energy access. It supports the reduction of GHG emissions in developing countries through the use of RBCF and phased interventions.

Energy+ activities have three different intervention phases:

- In Phase 1, the *Readiness Phase*, Energy+ assists governments in developing comprehensive energy sector and low-emission plans, and works to strengthen their technical and institutional capacity to support commercial investment in the energy sector.
- In Phase 2, the *Implementation Phase*, Energy+ applies RBCF to the delivery of results that ensure the establishment of MRV systems, ensure transparent and efficient regulatory regimes, and enable the functioning of incentive mechanisms for business and investments. The DLIs in this phase are usually qualitative milestones, among others, for the achievement of a predefined national or sectorial GHG baseline (in tCO₂e). Upfront financing is also available in this phase to support the process of building an enabling framework.
- In Phase 3, the *Performance Phase*, Energy+ purchases VERs measured using “unit-based” DLIs such as kWhs of electricity generated from RE sources/households or number of mini-grid connections installed. Partner countries that have joined the program include Kenya, Bhutan, Liberia, Ethiopia, Maldives, Senegal, Morocco, Tanzania, Nepal, Mali, Grenada, and Mozambique.⁵⁰

⁴⁹ Energy+. 2012. "Results Based Financing Energy+ Partnership between Ethiopia and Norway." Presentation given in Istanbul, Turkey, October 30. https://www-cif.climateinvestmentfunds.org/sites/default/files/meeting-documents/results_based_financing_0.pdf.

⁵⁰ Norwegian Government. n.d. "International Energy and Climate Initiative – Energy+." <http://www.umb.no/statisk/energiseminar/Presentasjoner/Lindeman-EnergyPlus.pdf>.

Table A-3. Key Elements of Energy+

Scope	
Country	Developing countries
Sector	Energy sector
Timeframe	2011–15 ^a
Volume	Results-based support of up to \$56.5 for Ethiopia, \$28.3 million for Kenya, \$11.3 million for Liberia over 5 years, and \$11.3 million for Bhutan ^b
Final beneficiary	Households, poor people who didn't have access to energy
Donor partners	France, Germany, Italy, UK, Spain, USA, and the Netherlands
International Organization partners	United Nations Environment Program (UNEP), United Nations Development Program (UNDP), World Bank Group, Asian Development Bank, African Development Bank
On which level are RBCFs used?	At program/sectoral level, payment (Phase III only) based on access to sustainable energy services and emission reductions
Disbursement-Linked Indicators	tCO ₂ e and kWh/MWh
Purpose/Goal	
Outputs	<ul style="list-style-type: none"> • Number of households with access to modern energy services • Emission reductions in tCO₂e achieved • Increase in renewable energy capacity installed
Outcomes	Improvement in energy access and abatement of GHG emissions.
Impacts	<ul style="list-style-type: none"> • Poverty reduction • Combat climate change
Support Instrument	
Type of support given	<ul style="list-style-type: none"> • Upfront grant funding to government for implementation of Phase I activities • Payments against verified GHG emission reductions
Monitoring, Reporting and Verification	
Type of MRV	Monitoring through third-party auditors.

Note: a. The Norwegian Minister of Foreign Affairs decided to close down Energy+ as of the end of 2015.

b. Norwegian government. 2012. "Energy+: Partnering for a Transformational Energy Finance. Presentation. <http://norwegianafrikan.no/wp-content/uploads/2012/05/Ambassador-Ole-Lindeman-Energy+-Partnering-for-a-Transformational-Energy-Future1.pdf>. The respective total amounts in Norwegian Kroner were converted to U.S. dollar amounts using the NOK/USD 0.11306 exchange rate on December 31, 2015.

Lessons learned: Energy+ has a design component that aligns climate policy, energy efficiency enhancement, and GHG reduction with energy policy (better energy access) and development goals (poverty reduction through enhanced energy access). This was central to creating a holistic and sustainable model that considers all aspects of financing, technology, community interaction, and current policy necessary for transformational change. This holistic approach allows the RBCF program to operate at a national or regional level, rather than at the *project* level. A side benefit of the activities was that the capacity building conducted for recipient countries through Energy+ contributed to recipient country readiness for tapping other climate funds and providing data that were used in preparing NDC implementation.

Global Energy Transfer Feed-in Tariffs Program (GET FiT)

The main objective of GET FiT is to enable East African nations to take a climate-resilient, low-carbon development path resulting in growth, poverty reduction, and climate change mitigation. ⁵¹ For now, GET FiT has only been rolled out in Uganda (starting in May 2013); roll-out plans for other countries are still under preparation. The program is designed to address the investment barriers in small RE projects by providing project owners additional cash flow during the early debt repayment periods. The program is expected to result in the commissioning of up to 170 MW of RE capacity (by 2018).

The Feed-in Tariff (FiT) in Uganda is not high enough to cover the electricity generation costs. The GET FiT Program, therefore, offers a top-up payment on top of the FiT in Uganda at the following rates: \$0.014/kWh for hydropower, \$0.01/kWh for biomass, and \$0.005/kWh for bagasse. This creates two “layers” of subsidy components for feeding electricity generated by RE technologies into the national grid. One is the usual FiT from the Electricity Regulatory Authority (ERA) in Uganda and the other is the top-up premium from the GET FiT Program. However, it is important to note that while the regular FiT is paid out against actual delivery of electricity to the grids, GET FiT uses a different pay-out mechanism: 50 percent of the GET FiT premium is paid out on Commercial Operations Date (COD) and the other 50 percent is disbursed during the first 5 years of operation.⁵²

In addition, the program has a Partial Risk Guarantee (PRG) Facility, which provides \$160 million to be deployed in three complementary risk-mitigating components: (i) the provision of short-term liquidity support to allow the Uganda Energy Transmission Company Limited (UETCL) to meet its Power Purchase Agreement (PPA) obligations; (ii) termination compensation for events of governmental/utility default under the PPA/IA (Interconnection Agreement); and (iii) a commercial debt guarantee.

The RBCF components in GET FiT projects operate at two levels. By feeding electricity into the national grid, the project owners are paid FiTs; this is the first level. In addition, GET FiT premium (top-up) payment is triggered by the COD. GET FiT has incorporated multiple development goals into one program. By providing additional cash, project developers could potentially benefit from improved

⁵¹ This section draws mainly on the program’s annual report: *GET FiT Uganda: Annual Report 2015*. http://www.era.or.ug/index.php/2013-12-14-14-58-04/sector-reports/doc_download/327-get-fit-uganda-annual-report-2015.

⁵² GET FiT. 2015. *GET FiT Uganda: Annual Report 2015*. http://www.era.or.ug/index.php/2013-12-14-14-58-04/sector-reports/doc_download/327-get-fit-uganda-annual-report-2015.

financing conditions; by granting energy access through the use of RE, it targets both energy access challenges and CO₂ reduction challenges. The unit of DLIs is kWh.

Table A-4. Key Elements of GET FiT

Scope	
Country	Uganda
Sector	Energy sector
Time frame	GET FiT Uganda Program, formally launched in 2013
Volume	\$102.6 million ^a
Final beneficiary	Project stakeholders, households in the country
Donors	Funding from Norway, Germany, the United Kingdom, and the EU
Implementers	Uganda’s Electricity Regulatory Authority (ERA), the government of Uganda, and the German development bank KfW
On which level is RBCF used?	At the project level
Disbursement-Linked Indicator	kWh
Purpose / Goal	
Outputs	<ul style="list-style-type: none"> • Increase in small-scale RE and capacity generation; • Increase in number of jobs in Uganda; • Finance mobilized for GET FiT portfolio.
Outcomes	<ul style="list-style-type: none"> • Improved private sector investment environment for RE; • Mitigation of energy shortage and reduction of CO₂ emissions; • Improved local grid facility.
Impacts	Country pursues a low carbon development path resulting in low-carbon growth, poverty reduction and climate change mitigation.
Support Instrument	
Type of support given	TA supports the development of an enabling environment, including enhancement of skills for Renewable Energy Feed-In-Tariff (REFIT) modelling, least-cost development planning, Solar PV tender / reverse auctioning, project due diligence expertise, strategic communication and negotiation, and Power Purchasing Agreement (PPA) standardization.

GET FiT Premium Payment Mechanism (GFPPM) uses RBCF payments to top up the FiT on delivery of electricity to the grid. Total RBCF support is frontloaded by discounting the total support over 20 years and allowing a 50 percent disbursement of these funds during the first 5 years of operation.

World Bank IDA Partial Risk Guarantee Facility to support small-scale renewable projects. \$160 million provided.

Monitoring, Reporting and Verification

Type of MRV: Monitoring through third-party auditors.

Note: a. Taken from GET FiT. 2015. *GET FiT Uganda: Annual Report 2015*. 2015.

(http://www.era.or.ug/index.php/2013-12-14-14-58-04/sector-reports/doc_download/327-get-fit-uganda-annual-report-2015). U.S. dollar amount based on exchange rate of EUR/USD 1.08573 on Dec 31, 2015.

Lessons learned: GET FiT can help overcome some of the major barriers to private sector investments in RE projects—the lack of transparency, the (perceived) risk of retroactive changes to the FT scheme, and the limited creditworthiness of a single offtaker.⁵³ It is able to do this by combining RBCF with additional support instruments (TA and partial risk guarantees). Significant time was spent with public sector stakeholders in Uganda to increase awareness of the private sector requirements. The review and standardization of the necessary legal documentation (PPA) have increased transparency for project sponsors and will significantly reduce transaction costs for lenders. The top-up of the existing FiT, which is fixed per technology (hydro, solar PV, wind, etc.), closes the remaining gap between current FiT and the levelized cost of electricity after mitigation of regulatory/offtaker risk. Analysis by Frankfurt School⁵⁴ has shown that the required donor payments would have been close to zero if carbon markets and the CDM had put an appropriate price on carbon emissions. If carbon markets in the future are able to price carbon right, investment grants could be phased out.

⁵³ An *offtake* agreement is an agreement between a producer of a resource and a buyer of a resource to purchase or sell portions of the producer's future production.

⁵⁴ Kreibiehl, S. 2013. "GET FiT in Uganda, Observations & Open Issues from a Financial Perspective." Deutsch Bank Research. Policy Paper. https://www.dbresearch.com/PROD/DBR_INTERNET_EN-PROD/PROD000000000323835/GET+FiT+in+Uganda%3A+Observations+%26+open+issues+from+a+financial+perspective.pdf

R4 Rural Resilience Initiative (R4)

The R4 Rural Resilience Initiative (R4)⁵⁵ aims to increase climate resilience, enhance food security, and increase financial inclusion of rural communities in developing countries. This program was originally called the Horn of Africa Risk Transfer for Adaptation (HARITA; 2009–11) Program but, since 2011 it has been referred to as the R4 Rural Resilience Initiative (R4). R4 has expanded its existing activities in Ethiopia and begun operations in other African countries as part of the R4 Rural Resilience Initiative led by Oxfam America and WFP.⁵⁶

R4 has four key components:

- **Risk Transfer:** Farmers can access weather index insurance by paying with their labor through Insurance-for-Assets (IFA) schemes. Thanks to this scheme, when a drought hits, the compensation for weather-related losses prevents farmers from selling productive assets and leads to faster recovery. IFA schemes are built into existing social safety nets, disaster risk reduction schemes, and WFP's Food Assistance for Assets Program.
- **Risk Reduction:** Assets built through risk reduction activities promote resilience by steadily decreasing vulnerability to disaster risks over time. By protecting farmers' investments during a bad season, R4 enables households to invest in riskier but more remunerative enterprises, as well as in seeds, fertilizers, and new technologies to increase their agricultural productivity.
- **Risk Reserves:** Participants establish small-scale savings, which are used to build up "risk reserves." These reserves may be held individually or by a community of farmers. While savings help build a stronger financial base for investing, they also act as a buffer against short-term needs and idiosyncratic shocks, such as illness and death.
- **Prudent Risk-Taking:** To ensure long-term sustainability, R4 contributes to the creation of rural financial markets by encouraging farmers to prudently assume investment risks. Since they have insurance coverage and are part of the IFA scheme, it is easier for them to access equity. The program also supports farmers with training, gives advice to local insurance companies and micro-finance institutions, and works to gradually transition farmers to pay for insurance in cash rather than with their labor.

The risk transfer and risk reduction parts of the program are structured as follows. In the first year of enrollment, the farmers can pay 100 percent of the insurance premium with work. From the second year onward, the farmers are required to first pay 10 percent and later 15 percent in cash and the rest of the premium in labor (the cash equivalent of the labor is paid by the implementers to the insurance companies). Farmers earn coupons for food and insurance contracts by working on risk reduction projects—Insurance-for-Work (IFW)—for instance, building soil and water conservation structures, as well as tree planting to increase the local community's resilience.

The RBCF payments are made at the project and program levels. At the *program* level, to the *insurance companies*—RBCF is directly proportional to the number of farmers enrolled and the number of hours spent working on climate resilience activities—and, through the insurance companies, to the two implementing agencies: the Relief Society of Tigray (REST), in the Tigray region, and the Organization for Rehabilitation and Development in Amhara (ORDA), in the Amhara region, once they have

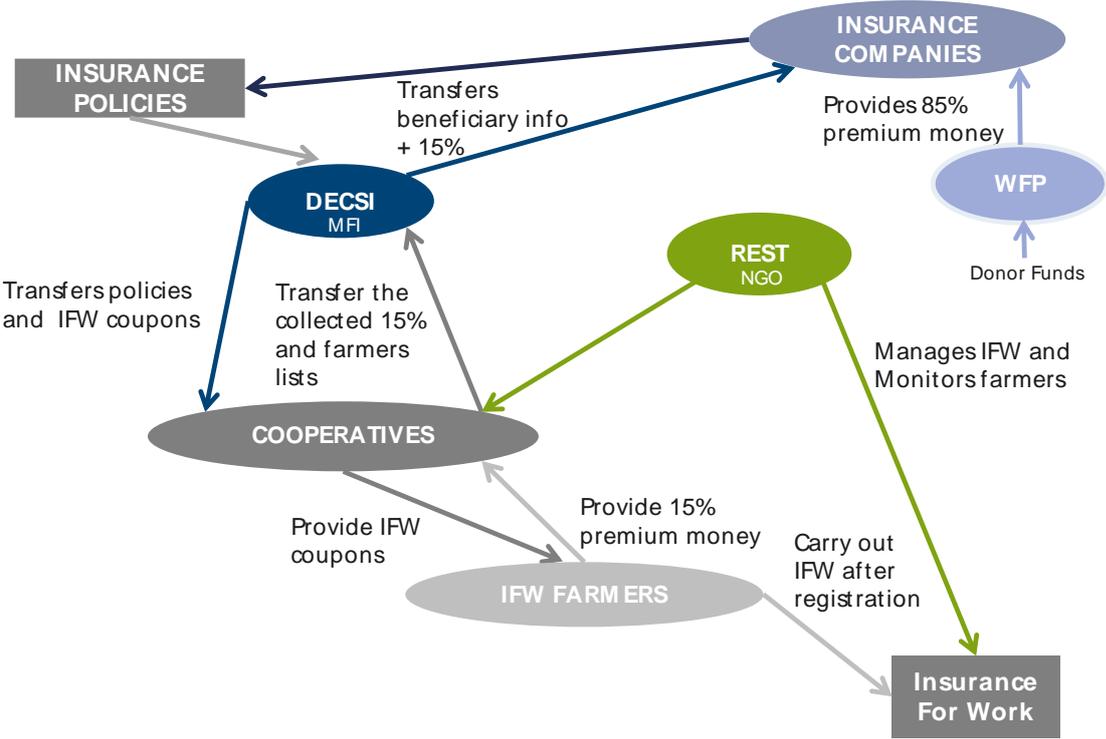
⁵⁵ This section draws mainly on an interview with Azzurra Massimino (Program Policy Officer for Climate and Disaster Risk Reduction Program in World Food Programme) and the official program report: *R4 Rural Resilience Initiative Annual Report 2015*. <https://www.wfp.org/content/r4-rural-resilience-initiative-2015-annual-report>.

⁵⁶ UNFCCC. 2012. "Horn of Africa Risk Transfer for Adaptation – Rural Resilience Initiative." October. http://unfccc.int/secretariat/momentum_for_change/items/6636.php.

successfully completed their monitoring and verification activities. Both NGOs face financial consequences in case of nonperformance. And at the project level, to the *farmers*, in the form of coupons or cash payments for labor according to number of days worked.

RBCF has been coupled with upfront financing that delivers TA to help farmers access agricultural insurance and financial training sessions. The poorest farmers (those who are in the governmental Productive Safety Net Program (PSNP) can also pay their insurance premium in full with labor or pay an increasing percentage of the premium, based on their cash reserves (figure A-1).

Figure A-1. Program Design of the R4 Initiative



Source: Simplified schematic of the R4 Initiative in Ethiopia, based on the WFP’s Index Design to Payout – Tigray flowcharts.

Note: DECSI =; Dedebit Credit and Savings Institution; IFW = Insurance-for-Work; MFI = Microfinance Institution; NGO = Nongovernmental Organization; WFP = World Food Programme.

Table A-5. Key Elements of R4

Scope	
Country	Pilots conducted in Ethiopia, Senegal, Malawi, and Zambia
Sector	Agriculture, climate adaptation, financial inclusion
Timeframe	2011–present
Volume (2012–16)	\$26.05 million (including upfront and results-based payments) ^a
Donors	Oxfam: Swiss Re, Rockefeller Foundation; Margaret Carghill Foundation; for WFP: USAID, the French government, the Cartier Foundation, Swiss Cooperation, the Norwegian Ministry of Foreign Affairs
Implementers	World Food Programme (WFP) and Oxfam America
Final beneficiary	The farmers in the targeted region
On which level is RBCF used?	At the project and program level: (i) the implementing partners (insurance companies and two NGOs responsible for the MRV process) and (ii) the farmers, who receive food coupons and insurance contracts after delivering a verified amount of labor on risk reduction community projects.
Disbursement-Linked Indicator	Days of work
Purpose / Goal	
Outputs	<ul style="list-style-type: none"> • Number of risk reduction activities, for instance, building soil and water conservation structures as well as tree planting; • Number of farmers subscribing to insurance; • Number of farmers participating in financial training sessions.
Outcomes	<ul style="list-style-type: none"> • Farmers benefit from insurance products, gain financial literacy; • Increased financial inclusion.
Impacts	Increased climate resilience and enhanced food security.
Support Instrument	
Type of support given	The program uses multiple instruments, among others, (i) provide funding to facilitate farmers’ access to agricultural insurances; (ii) incentivize farmers to save in individual or communal reserves; (iii) encourage prudent investments; and (iv) organize financial literacy training sessions.
Monitoring, Reporting and Verification	
Type of MRV:	The projects are monitored by NGOs acting as implementing agencies. The NGOs use dashboards for outputs (e.g., completion status of the assets) and outcomes with measurable indexes.

Note: a. Taken from R4, *R4 Rural Resilience Initiative Annual Report 2015*. 2015. (https://policy-practice.oxfamamerica.org/static/media/files/R4_AR_2015_WEB.pdf).

Lessons learned: An effective comprehensive risk management approach has to be flexible. While smallholders in Sub-Saharan Africa face similar risks, they also struggle with different challenges, depending on each-country's specific context. This is highlighted by R4's experience in Zambia, where one of the initiative's building blocks is the Food and Agriculture Organization's (FAO) Conservation Agriculture Program rather than R4's typical public works program. While it has attained considerable improvements, the program's effectiveness could be enhanced by incorporating additional risk management tools. For example, climate services could help farmers deal with the risks by providing them with accurate information and advisory services to adapt to the changing climate. It is vital that participants understand the basis of risk calculation, and that the program work to strengthen the risk reserves needed as buffers, and improve farmers' understanding of indexes and trade-offs in insurance projects. Finally, in the process of expanding the program, it became clear how critical effective data management tools are. It is particularly important to collect data on households as they are essential to monitoring.

Conclusion

The cursory analysis of these five programs highlighted the following key characteristics of RBCF:

- RBCF is flexible. It can be used for different types of activities—to achieve adaptation or mitigation results in different sectors of the economy and through different actors within a sector. It can be applied as a standalone modality, as in the PAF, but is more commonly used alongside other financial instruments; partial risk mitigation measures and/or grants that support upfront investments are particularly common.
- RBCF is effective when it builds on existing infrastructure—that is, MRV standards and procedures as well as institutional frameworks already available.
- RBCF can help overcome major barriers to private sector investments in RE projects deriving from the lack of transparency in or the (perceived) risk of retroactive changes to existing regulations as well as the limited creditworthiness of a single offtaker.
- RBCF can be made even more effective by embedding the RBCF program in longer-term policies (as laid down, for instance, in low-carbon development plans), as this helps to ensure that the program is aligned with national climate and energy policies. Such a holistic approach is absolutely essential if RBCF is meant to support transformational low-carbon change at scale.

The analysis also shows that optimizing the programs in their specific contexts can be challenging. While the flexibility inherent in the approach can help address these issues, design is still critical. Additionally, the processes in place for delivering traditional international development have to be redesigned so that the incentive provided by RBCF is timely. This requires that international aid agencies and donors be willing and able to withhold financial transfers, or increase transfers. This kind of flexibility may just not be realistic, given the traditional, fixed internal budget commitments specifying how much money should be spent in each calendar year. Furthermore, MRV activities can entail additional costs, although they may also present an opportunity for collecting data that will strengthen a country's capacity for future monitoring and reporting.

Appendix B. RBF IN PRACTICE IN THE HEALTH AND EDUCATION SECTORS

Box B-1. RBF in the Health Sector

Globally, steady progress has been made in improving maternal and child health outcomes, with a notable halving of maternal and child mortality rates between 1990 and 2013. However, despite decades of focused programmatic interventions and investments in health systems, the daily toll of preventable loss of life—16,000 under-5 deaths and approximately 830 maternal deaths per day^a remains too high, results in a call for change in the way business is carried out in the health sector. Since 2008, the multi-donor Health Results Innovation Trust Fund (HRITF) and the WB's International Development Association have been supporting results-based financing approaches to instigate such change and accelerate maternal and health outcomes.

Results-based financing is an umbrella term for financing mechanisms where a cash payment or non-monetary transfer is made to a national or sub-national government, manager, provider, payer or consumer of health services after pre-agreed results are achieved and independently verified. The results-based financing approach shifts the focus of governments and health systems from inputs to results. It often also facilitates a level of community involvement, which acts as an accountability mechanism. In RBF programs, various types of interventions work at different levels of the health system. For example, conditional cash transfers target the demand-side through beneficiaries, performance-based financing targets the supply-side through service providers, and cash on-delivery intervenes at the national level by targeting governments.

While RBF designs have been devised in many shapes and forms to respond to context-specific needs, they all explicitly link financing to results. Contracts or agreements govern this link, clarifying roles and responsibilities, and defining tangible results. A systematic verification mechanism further formalizes this link, ensuring the accuracy of results prior to the disbursement of results-based financing payments, and provides “real-time” data for informed decision-making and enhanced results. Results-based financing designs also emphasize autonomy: they empower frontline health workers and decision makers to set priorities that respond to local needs. This autonomy is facilitated by results-based financing payments, providing health facilities with resources to strengthen service delivery and incentivize health workers for improved performance.

The experience so far with the HRITF portfolio of 38 RBF programs in 32 countries provides strong evidence of how this approach can help achieve improved health outcomes, increased and more equitable access to better quality services, and greater efficiency. Several robust impact evaluations and a large amount of independently verified operational data show that results-based financing, strengthening accountability, and empowering frontline providers, can enable remarkable results, even in countries with the greatest need.

- In Argentina, *Plan Nacer* made an ambitious effort to extend maternal and child health services to the poor and underserved—it reduced low birth weight by 19 percent, reduced the probability of neonatal mortality by 74 percent, and reduced the probability of stillbirths by 30 percent.
- In Burundi, a recent impact evaluation of the nationwide program showed that results-based approach increased the probability of women delivering in an institution by 21 percent, the probability of using antenatal care by 7 percent, and the use of modern family planning services by 5 percent.^b
- In Cameroon: Key findings from the midline qualitative survey shows that there has been increased collaboration among the various stakeholders, including between regional and district supervision

teams and between health facilities and the community members they serve. Preliminary results from the impact evaluation show significant increases in coverage of the children vaccinations (including the polio 3 vaccine) and maternal immunization against tetanus as well as the coverage of modern methods of family planning, but no significant changes for timely Antenatal care (ANC) and in-facility deliveries. In terms of structural quality, the results-based financing arm saw increases in the average availability of necessary equipment, particularly materials for delivery and neonatal care and improvements in process quality, with more qualified health workers present on site than in the other arms.

- In Zambia: The Zambia RBF program, launched in 2012, contracts in different structures in the public health system, and uses a fee-for-service approach to pay facilities in 11 districts based on the quantity of nine Maternal and Child Health (MCH) services delivered. Results from the impact evaluation indicate that RBF significantly increased utilization of MCH services and early health seeking behaviour when the results-based financing districts are compared to the districts operating as “business as usual.” Further results-based financing districts showed improvements in structural quality and health workers in results-based financing facilities also spent significantly more time during consultations with their patients as compared to both controls.

Source: D. Nair, Senior Health Specialist, HNP Global Practice, World Bank.

Note: a. World Health Organization. 2016. Maternal mortality.

<http://www.who.int/mediacentre/factsheets/fs348/en/>. November. b. Bonfrer, I., Soeters, R., van de Poel, E., Basenya, O., Longin, G., van de Looij, F., & van Doorslaer, E. (2013). The Effects of Performance-based Financing on the Use and Quality of Health Care in Burundi: An Impact Evaluation. *The Lancet*, p. 19.

Box B-2. The Experience of RBF in Education

What does results-based financing in education look like?

The Education approach to results-based financing serves to strengthen education systems. This implies envisioning how the future will be different, and working backwards to figure out how to get there. Historically, conversations under traditional financing generally start with often disparate inputs (e.g., the Ministry of Education needs to pay for teacher training, computers for classrooms and school grants), while results-based financing immediately starts the conversation around results. The versatility of the results-based financing approach means that it can address a wide set of issues to facilitate improvements in equal access to education, the quality of the education and improved delivery of education (i.e., system efficiencies, address competition between service providers etc.). For example, it can be used as performance-based grants to schools seeking to improve access (particularly for disadvantaged groups); retention and completion; and learning outcomes. The results-based approach has therefore taken various forms in a number of countries. In Jamaica, the process was termed “critical pathways,” with DLIs identified to remove the blockages that impeded the results the country seeks on early childhood development. By putting results first, and then working backwards on how to get there, Government counterparts together with Bank teams identify the stumbling blocks, and seek to resolve them through incentives.

What is the rationale/strategy for results-based financing in education?

There are four theories of change that outline why we believe in results-based approach. First, it flips the policy dialogue, with external partners and internally within ministries, to focus more intentionally on what elements in the education system can be improved upon to generate results. Second, it attracts and retains much needed attention—from policy makers to parents—to the ultimate results that are sought. Third, it serves to galvanize and align important (yet often uninvolved) actors in the pursuit of results, notably ministries of finance. Finally, paying upon the achievement of verifiable results instills a culture of measurement, which can eventually be institutionalized and thereby strengthens the country’s systems.

What are key lessons learned?

Top 10 lessons learned thus far are:

1. A results-based approach means different things to different people. It’s important to define the rationale upfront. In some instances, results-based financing is viewed as a way to make recipients more accountable or financially responsible for donor money whereas we like to see it as a way to strengthen country systems.
2. A results-based approach can serve as a nudge toward common objectives, but not as an incentive for supplanting prior objectives. Its success in achieving structural change has resulted in its rapid uptake at the Bank. For example, in 2010, only 1 of the 36 new education projects approved by the WBG Board used results-based financing elements. By 2015, this had grown to 9 (out of 38), representing an increase in proportion of the portfolio from less than 3 percent to more than 20 percent in 6 years) reflecting the commitment of the Bank to double the share of RBF (in education) in its portfolio over 2015–20, as compared to 2010–15.^a
3. Discretionary action is unlikely to drive solutions. RBF does not work well if full autonomy is given to recipient governments or if governments provide incentives but remain hands-off with schools or teachers. It is rare for schools or teachers to be able to improve their students’ learning simply by being left to their own devices and given the autonomy to act as they see fit. Rather, improvements require mutual support from the funder and all stakeholders involved in achieving the results targeted by the RBF.

4. Discretion over spending, however, does hold promise for making education finance more efficient. The freedom to choose when and how to spend the resources to achieve results—is a desirable feature of RBF.

5. RBF requires more than the usual level of client ownership. When governments are recipients in RBF modalities, they also take on greater risk, since non-performance could translate into not receiving project proceeds in their entirety. As such, client ownership of an RBF scheme becomes an essential precondition for any RBF initiative.

6. The relationship between incentives and performance is not linear. In other words, the Principal-Agent rationale for RBF assumes that, if properly applied, incentives will enhance performance. However, it has been shown that incentives often work better when the tasks conducted are mechanical in nature, not cognitive. Research has indicated that for some complex tasks requiring high cognitive reasoning or creativity, the higher the bonus, the worse the performance. For instance, perhaps enrolling previously out of school students is more mechanical than teaching kids to read, in which case, incentives that involve financial stakes might work better for increasing access than for improving learning.

7. To achieve more learning, aim for conditions that are conducive to it, rather than improvement in test scores alone. You will often find that if you condition incentives on test scores, test scores will always go up (whether or not children are actually learning).

8. RBF tools that work to increase access may not also buy learning. Just because kids are in physically sitting in school doesn't mean that they are gaining more skills.

9. Invest in open data. RBF needs good indicators. But good indicators do not appear overnight. Rather, they require a significant investment of time and resources in order to build up the requisite robust monitoring systems.

10. The WBG's support for results-based financing is a good way to introduce the concept to clients, such that not only international resources but eventually domestic resources could also flow in a results-based financing way.

Source: Jessica Lee & P. Holland, Education Global Practice, World Bank.

Note: a. See World Bank 2015b.

Appendix C. RBCF PROGRAMS REVIEWED

RBCF GRANT PROGRAMS

	Name	"Metrics" (revenue generation unit)	Region	Funding source	Goal target	Incentives
Forestry and land use sector	Bio-Carbon Fund (BCF)	Tons of CO2e sequestered	Africa, Asia, Europe, and Latin America and the Caribbean	Public international	Mitigation, Development	Project stakeholders
	Forest Carbon Partnership Facility (FCPF)	Tons of CO2e sequestered	Africa, Latin America and the Caribbean, Asia, Oceania	Public international	Mitigation; Adaptation; Development	Countries
	Norway's International Climate and Forest Initiative (NICFI)	Qualitative assessment based on interviews by implementing agencies	Africa, Asia-Pacific and Latin America	Public international	Mitigation; Adaptation; Development	Countries
	The German REDD for Early Movers Programme (REM)	Deforestation and degradation rate against baseline; Tons of CO2e sequestered.	Latin America, Asia and Africa	Public international	Mitigation; Development	Countries
	Amazon Fund (Amazon)	Deforestation and degradation rate against baseline; Tons of CO2e sequestered.	Latin America and the Caribbean	Public international	Mitigation; Adaptation; Development	Project stakeholders
	Guyana REDD+ Investment Fund (GRIF)	Deforestation and degradation rate against baseline; Tons of CO2e sequestered.	Latin America and the Caribbean	Public international	Mitigation; Adaptation; Development	Countries
	Norway-Indonesia REDD+ Partnership (NI-P)	Deforestation and degradation rate against baseline; Tons of CO2e sequestered.	East Asia and Pacific	Public international	Mitigation; Adaptation; Development	Countries; Project stakeholder
	Germany, Norway-Peru Climate and Forest Partnership (GNP-P)	Deforestation and degradation rate against baseline; Tons of CO2e sequestered.	Latin America and the Caribbean	Public international	Mitigation; Adaptation; Development	Countries; Project stakeholder
	Norway-Tanzania REDD+ Partnership (NT-P)	Deforestation and degradation rate against baseline; Tons of CO2e sequestered.	Sub-saharan Africa	Public international	Mitigation	Countries; Project stakeholder
	Norway-Liberia REDD+ Partnership (NL-P)	Deforestation and degradation rate against baseline; Tons of CO2e sequestered.	Sub-saharan Africa	Public international	Mitigation; Adaptation; Development	Countries; Project stakeholder
	Althelia Climate Fund (Althelia)	Tons of CO2e sequestered	Africa, Asia and Latin America and the Caribbean	Private	Mitigation; Adaptation; Development	Project stakeholders
	Moringa Fund (Moringa)	Tons of CO2e sequestered	Latin America and the Caribbean, Africa	Private	Mitigation, Development	Project stakeholders
	Livelihoods Fund	Tons of CO2e sequestered	Africa, Asia, Latin America and the Caribbean	Private	Mitigation, Development	Project stakeholders
	CO2OL Tropical Mix Reforestation Project in Panama (CO2OL)	Tons of CO2e sequestered	Latin America and the Caribbean	Private	Mitigation; Development	Project stakeholders
	Soddo Community Managed Reforestation, Ethiopia (SRP)	Tons of CO2e sequestered	Sub-saharan Africa	Private	Mitigation; Adaptation; Development	Project stakeholders
	ArBolivia II	Tons of CO2e sequestered	Latin America and Caribbean	Private	Mitigation; Adaptation; Development	Project stakeholders
	Indigenous Reforestation in a Global Biodiversity Hotspot - Australian Yarra Yarra Biodiversity Project (IRGBH)	Tons of CO2e sequestered	East Asia and Pacific	Private	Mitigation; Adaptation	Project stakeholders
	Vegachi Reforestation with native species in Colombia (Vegachi)	Tons of CO2e sequestered	Latin America and the Caribbean	Private	Mitigation; Adaptation; Development	Project stakeholders
	Lower Zambezi Community Forest Conservation	Tons of CO2e sequestered	Sub-saharan Africa	Private	Mitigation; Development	Project stakeholders
	Katingan Peatland Restoration and Conservation Project	Tons of CO2e sequestered	East Asia and Pacific	Private	Mitigation; Development	Project stakeholders
KARIBA REDD+ PROJECT	Tons of CO2e sequestered	Sub-saharan Africa	Private	Mitigation; Development	Project stakeholders	
Mai Ndombe REDD+ Project	Tons of CO2e sequestered	Sub-saharan Africa	Private	Mitigation; Development	Project stakeholders	
Rimba Raya Biodiversity Reserve REDD Project	Tons of CO2e sequestered	East Asia and Pacific	Private	Mitigation; Development	Project stakeholders	
Sustainable Afforestation in Togo (Togo)	Tons of CO2e sequestered	Sub-saharan Africa	Private	Mitigation; Development	Project stakeholders	

	Name	"Metrics" (revenue generation unit)	Region	Funding source	Goal target	Incentives
Energy Sector	Bangladesh's Rural Electrification and Renewable Energy Development & Rural Electrification and Renewable Energy Development II (RERED & RERED II)	Number of SHS sold or installed	South-Asia	Public international	Mitigation; Development	Project stakeholders
	Biomass Energy NAMA Support Project (Bio-NAMA)	Increase in biomass based market	Sub-saharan Africa	Public international	Mitigation; Development	Project stakeholders
	Indonesia Clean Stove Initiative (Indonesia CSI)	Number of cookstoves sold	East Asia and Pacific	Public international	Mitigation; Development	Project stakeholders
	Energising Development (EnDev)	Measurement of amount of electricity consumed in KWh; Sales of low carbon appliances; Capacity building in KW or MW	Africa, Asia and Latin America	Public international	Mitigation; Development	Project stakeholders
	Energy and Environment Partnership with Mekong Region (EEP Mekong)	Number of households connected with grid supply; Capacity building in KW or MW	East Asia and Pacific	Public international	Mitigation; Development	Project stakeholders
	Promotion of Solar Hybrid Mini-Grids (ProSolar) Programme	Measurement of amount of electricity consumed in KWh; Capacity building in KW or MW	Sub-Saharan Africa	Public international	Mitigation; Development	Project stakeholders
	Global Energy Transfer Feed-in Tariffs Programme (GET FT)	Amount of electricity transferred to the grids in KWh	Sub-Saharan Africa	Public international	Mitigation; Development	Project stakeholders
	Global LEAP (LEAP)	Number of eligible appliances (e.g. SHS) sold; Quality aspect: Only the Global LEAP Award winners are eligible to participate	South-Asia	Public international	Mitigation; Development	Project stakeholders
	International Energy and Climate Initiative – Energy+ (Energy+)	Tons of CO2e reduced; Amount of electricity consumed or transferred in KWh; Capacity building in KW or MW.	Global	Public international	Mitigation; Development	Country
	Mumbai Slum Electrification Project (MSE)	Number of connection activated; Number of bills generated	South-Asia	Public international	Mitigation; Development	Host country
	Result-based Financing for Sustainable Hood-stoves Market, Nepal (SHM)	Number of Hood stoves sold.	South-Asia	Public international	Development	Project stakeholders
	Rural Electrification with Renewable Energy, Gambia (RERE)	Amount of electricity in Kw and Mw generated and transferred to the grids. Number of people and communities connected with power supply.	Sub-saharan Africa	Public international	Mitigation; Development	Project stakeholders
	SNV Rural Solar Market Development of Pico-PV Solar in Lake Victoria, Tanzania (Pico-PV)	Number of Solar product sold taking into consideration of quality of product	Sub-saharan Africa	Public international	Mitigation; Development	Project stakeholders
	The Carbon Initiative for Development (CI-Dev)	Tons of CO2e reduced	Sub-Saharan Africa	Public international	Mitigation; Development	Project stakeholders
	The Stove Auction, Mekong (SA)	Number of cookstoves sold	East Asia and Pacific	Public international	Mitigation; Development	Project stakeholders
	Ceará Renewable Energy Bundled Project Brazil (Ceará)	Tons of CO2e reduced	Latin America and the Caribbean	Private	Mitigation; Development	Project stakeholders
	Clean and Efficient Cooking and Heating Project China (CECH)	Tons of CO2e reduced	East Asia Pacific	Private	Mitigation; Development	Project stakeholders
	Proyecto Mirador Enhanced Distribution of Improved Cookstoves (Proyecto Mirador)	Tons of CO2e reduced	Latin America and the Caribbean	Private	Mitigation; Development	Project stakeholders
	Xinyang landfill gas recovery (Xinyang)	Tons of CO2e reduced	East Asia Pacific	Private	Mitigation; Development	Project stakeholders
	Yuntdag Wind Power Project Turkey (Yuntdag)	Tons of CO2e reduced	Europe and Central Asia	Private	Mitigation; Development	Project stakeholders
Teesta- V Hydro Power project in Sikkim	Estimated Annual Emission Reductions 2,044,442	East Asia and Pacific	Private	Mitigation	Project stakeholders	
Hydroelectric Project Ituango	Estimated Annual Emission Reductions 4,383,088	Latin America and Caribbean	Private	Mitigation	Project stakeholders	
SREP-Supported Extended Biogas Project (SREP)	A series of qualitative and quantitative DLIs	South-Asia	Public international	Mitigation	Implementing agency Project stakeholders	

	Name	"Metrics" (revenue generation unit)	Region	Funding source	Goal target	Incentives
	NDRC HFC-23 Subsidy Program (NDRC)	Tons of CO2e reduced	Latin America & the Caribbean	Public international domestic	Mitigation	Project stakeholders
	N2O Initiative by the German Government (N2O)	Tons of CO2e reduced	Global	Public international	Mitigation	Project stakeholders
	Pilot Auction Facility (PAF)	Tons of CO2e reduced	Global	Public international	Mitigation	Project stakeholders
	National Programme for the Integral Management of Solid Waste (PHGIDS, for its acronym in Spanish)	Tons of CO2e reduced	Latin America & the Caribbean	Public international	Mitigation; Development	Project stakeholders
	Urban Governance and Development Program - Emerging Towns Project, Nepal (UGDP-ETP)	Waste collection service	South-Asia	Public international	Mitigation; Development	Government
	Southern West Bank Solid Waste Management Project (SWMP)	Waste collection service	Middle East and North Africa	Public international	Mitigation; Development	Government
	Ningbo Municipal Solid Waste Minimization and Recycling Project (MSWNR)	Waste collection service	East Asia Pacific	Public international	Mitigation; Development	Project stakeholders
	CCAC- RBF in Solid Waste in Penang, Malaysia (SW-Penang)	Waste separation service	East Asia Pacific	Public international	Mitigation; Development	Project stakeholders
	Solid Waste Management Improvement Project for Regional and Metropolitan Cities, Indonesia (SMEC)	Waste collection service	East Asia Pacific	Public international	Mitigation; Development	Government; Project stakeholders
	Dar es Salaam Metropolitan Development Project – Waste, Tanzania (DMDP)	Waste separation service	Sub-saharan Africa	Public international	Mitigation; Development	Primary waste collection provider and secondary waste collection provider
	The Integrated Community Development Project - SWM, Jamaica (ICDP)	Urban infrastructure and waste collection services	Latin America and the Caribbean	Public international	Development	Government
tation	Composting Project in Santa Catarina	Tons of CO2e reduced	Latin America & the Caribbean	Private	mitigation development	Project stakeholders
	The Green Corridor, Cali, Colombia (Green Corridor)	Reduce emissions of CO, nitrogen oxide and volatile organic compounds	Latin America & the Caribbean	Private	Mitigation; Development	Projects under goldstandard: Project stakeholder
	High Capacity Segregated Corridor (COSAC I)	Tons of CO2e GHG reduced	Latin America & the Caribbean	Private	Mitigation; Development	Project stakeholders
	BTR Ilea Yaya in Johannesburg	Tons of CO2e GHG reduced	Sub-saharan Africa	Private	Mitigation; Development	Project stakeholders
	AAC blocks manufacturing unit based on an energy efficient brick/block manufacturing technology by Biltech Building Elements (DMIK)	Tons of CO2e GHG reduced	East Asia and Pacific	Private	Mitigation	Project stakeholders
	Facility for Performance Based Climate (PBC) Finance in Latin America	Tons of CO2e GHG reduced	Latin America & the Caribbean	Public international	Mitigation	Project stakeholders
	RA Ethiopia (RA)	Labor in unit of days; Number of farmers enrolled in "insurance for work" programme	Sub-Saharan Africa	Public international	Adaptation; Development	Project stakeholders; Implementing agency
	REDD Project in Brazil Mut Concessions	Tons of CO2e GHG reduced	Latin America and Caribbean	Public international	Mitigation; Development	Project stakeholders
	Sustainable Sugarcane Initiative – AgSri (AgSri)	Approximate average estimated water benefits certificates	East Asia and Pacific	Private	Adaptation; Development	Project stakeholders
	Nordic Climate Facility (NCF)	Tons of CO2e reduced or sequestered	Africa, Asia and Latin America	Public International with Private	Mitigation; Adaptation; Development	Project stakeholders

RBCF LOAN PROGRAMS

	Name	"Metrics" (revenue generation unit)	Region	Total Volume (US\$ million)	Funding source	Goal target	Incentives
	Integrated Disaster Risk Management and Resilience Program (IDRMRF)	A series of quantitative DJIs	Middle East and North Africa	200	Public international	Adaptation; Development	Countries
	Electricity Grid Strengthening—Sumatra Program, Indonesia (EGS)	Measurement of amount of electricity consumed in kWh; Capacity building in kW or MW	East Asia and Pacific	600	Public international	Development	Project stakeholders
	Tanzania's Rural Electrification Expansion Programme (REE)	Number of connections; Capacity building in kW or MW; Number of loans disbursed	Sub-saharan Africa	209	Public international	Development	Project stakeholders
	Bangladesh's Rural Electrification and Renewable Energy Development & Rural Electrification and Renewable Energy Development II (RERED & RERED II)	Number of SHS sold or installed	South-Asia	378	Public international	Mitigation; Development	Project stakeholders
	Power System Efficiency Improvement Project Bangladesh (PSEI)	Number of loans approved	South-Asia	300	Public international	Mitigation; Development	Project stakeholders
	Grid-Connected Rooftop Solar Program (GRPV)	A series of qualitative and quantitative DJIs	East Asia and Pacific	620	Public international	Mitigation Development	Implementing agency
	Hebei Air Pollution Prevention and Control Program (HAP)	A series of qualitative and quantitative DJIs	East Asia Pacific	500	Public international domestic	Mitigation Development	Implementing agency; Project stakeholders

Note: 1. The table provides program information on 6 selected mapping parameters. 2. RERED & RERED II have both a grant component and a loan component. Only the loan component is recorded in the table.

Appendix D. THE 25 MAPPING PARAMETERS USED TO COLLECT DATA ON RBCF PROGRAMS REVIEWED

The 25 mapping parameters used in the program review are the following:

1. Project/program name
2. Metrics (unit of the DLIs used)
3. Country where the project/program is implemented
4. Region(s) where the project/program is implemented
5. Sector (energy, forestry and land use, non-combustion emissions, transport, and other sectors / multisector)
6. Time frame (project duration: start year – foreseeable end year)
7. Volume of RBCF (explained in detail in appendix E)
8. Who funds the project/program? (that is, entities that provide funding for the project/program)
9. Who manages funds for the project/program? (that is, the entities that manage the funds for the project/program)
10. Who receives the RBCF funds? (that is, the entities that directly receive the RBF)
11. Final beneficiary of the project/program (the entities that ultimately benefit from the results-based funding)
12. Inputs (as defined in the text)
13. Activities (as defined in the text)
14. At which level is RBCF used? (e.g., when linked to the actors, RBCF is directed at the project level—payments are made against verified emission reductions)
15. RBCF as a *whole* or RBCF as merely an *element* of the project/program (“as a whole,” if all of the payments in the project/program are based on results, “as an element” otherwise)
16. Outputs (as defined in the text)
17. Outcomes (as defined in the text)
18. Impacts (as defined in the text)
19. Levels at which measurable indicators are defined (whether the DLI is output, outcome, or impact)
20. Target objective/goal (mitigation, adaptation, development, or a combination of these three)
21. Type of support given for the RBCF flow (loan, grant, private investment)
22. Indicators (DLIs that are clearly defined, measurable indicators against which payments are made)
23. Trigger of payment—linking indicators to actual disbursement of funds (The size of payment linked with each DLI)
24. Incentives (which actors are incentivized through the RBCF flow).
25. Monitoring & Evaluation (M&E) and/or MRV)

Appendix E. ASSUMPTIONS IN ESTIMATION OF EXPECTED RBCF DISBURSEMENTS AND CAPITALIZATION OF INTERNATIONAL PUBLIC RBCF PROGRAMS

In this report, the expected RBCF disbursements were estimated only for a subset of 12 larger international public RBCF programs within the full sample. The reason for limiting this estimation to a subset is mainly that the information necessary to estimate (expected) disbursements is often not publicly available. This is partly rooted in the very nature of RBCF, since it is by definition not clear *when* results will be achieved. Based on the initial capitalization and expected disbursements, a capitalization time profile has been estimated.

Expected disbursements for the following programs that provide RBCF have been estimated:

- The Forest Carbon Partnership Facility (FCPF)
- The Bio Carbon Fund Initiative for Sustainable Forest Landscapes (BioCF ISFL)
- The Carbon Initiative for Development (Ci-Dev)
- The Pilot Auction Facility (PAF)
- The Transformative Carbon Asset Facility (TCAF)
- The Carbon Partnership Facility (CPF), only those funds dedicated to piloting new market mechanisms⁵⁷
- The REDD Early Movers (REM) Program
- Norway's International Climate and Forest Initiative (NICFI)
- Energising Development (EnDev)
- The Global Energy Transfer Feed-in Tariffs (GET FiT) Program
- The N₂O Initiative by the German government (Nitric Acid Climate Action Group)
- The Nordic Climate Facility (NCF) Project.

To estimate disbursements over time, a two-step approach was taken. First, the start and end date of the program were identified. Secondly, the expected RBCF disbursement periods were determined. In some cases, historical disbursements until 2016 could be established based on the available documentation and individual phone interviews with the respective program managers. In these particular cases, historical disbursements were extrapolated over the full expected disbursement period. For programs where only the initial capitalizations were known, it was assumed that the expected disbursements would be uniformly distributed over the expected disbursement period.

It should be noted that only the results-based part of the grants was considered. Many programs also provide upfront financing and, in many cases, a TA component is implemented or scheduled for implementation with the RBCF component.

Figure 3-6 in the main text shows the sum of estimated disbursements of the 12 largest international RBCF programs by sector over time. The graph shows rising expected disbursements as RBCF programs are moving into their disbursement phase. At a later stage—as the disbursement phases come to an end—those programs' disbursements show a decline. This decline is driven by the fact that the 12 programs in

⁵⁷ While the CPF was *not* included in the original sample of 74 programs, it is included in this context because it is a major provider of RBCF.

question come to an end and the assumption that no new programs will be added and the existing ones will neither be extended nor capitalized beyond what was originally planned.

The estimation of expected disbursements is based on significant assumptions and the results should therefore be taken as rough estimates only.

The capitalization time profile of all 12 programs was estimated in a way that is consistent with the known initial capitalization and the disbursements as they had been estimated earlier. For some of the programs it was known when the funds were actually made available, while for others it was assumed that they were made available one year before the start of the disbursement period. This is not necessarily a realistic assumption, and in the time profile of the capitalization it may manifest itself as a sudden upward jump in the year before a large program starts to disburse.

Additionally, the currency conversion rates used were the closing exchange rates on December 31, 2015,⁵⁸ as posted on www.xe.com, unless a different conversion rate was reported by the managing organization of the program concerned.

⁵⁸ More specifically: EUR/USD: 1.08573 and GBP/USD: 1.4736.

Appendix F. EXAMPLES OF DISBURSEMENT-LINKED INDICATORS (DLIs), BY SECTOR

Sector	Indicator type	Indicator	Metric
Energy	Milestone	Commercial operation date	
		Completion and commission of mini-grid power plant	
		Completion of capacity building and project preparation activities according to approved plan	
		Establishment of a Rooftop Solar PV program in the organization	
		Contract signed with consulting firm for TA	
		Completion of a commissioning test	
	Threshold	Customer base ^a	Percentage of customer increase
		Energy sales ^a	Percentage of energy sales growth
	Unit-Based	Emission reductions	tCO ₂ e
		Installed renewable energy capacity	Megawatt hour
		Renewable energy generated	Megawatts
Connections to renewable energy grid		Number of connections	
Cook stoves distributed		Number of stoves	
Forestry	Milestone	Establishment of a risk management office	
		Completion of implementation milestones	
		Establishment of data management system	
	Threshold	Deforestation rate ^b	Percentage drop in deforestation rate
	Unit-Based	Emission reductions	tCO ₂ e sequestered
Area of protected land (hectares)		Hectares	
Non-Combustion	Milestone	Implementation of a Emissions Inventory System	
		Approval of a cost-effective plan on air quality control	
	Threshold	Overall score based on quality and quantity measures on organic waste separation ^c	(Unit of the scoring system)
		Reaching the minimum score on regular and sufficient waste collection services ^d	(Unit of the scoring system)
	Unit-Based	Emission reductions	tCO ₂ e
		Replacing diesel buses with clean energy buses	Number of clean energy buses
Integration of state-controlled lists and municipal-controlled lists enterprises in the Improved CEM and Enforcement Systems for Air Pollutants		Percentage of enterprises integrated	
Transport	Milestone	—	
	Threshold	—	

	Unit-Based	Emission reductions	tCO ₂ e
Other Sectors	Milestone	—	
	Threshold	—	
	Unit-Based	Emission reductions	tCO ₂ e
		Water conserved ^e	m ³ of water conserved
Labor (IFW) ^f		hours	
Cross Sector	Milestone	—	
	Threshold	—	
	Unit-Based	Emission reductions	tCO ₂ e
		Loans signed or disbursed	Local currency

Note: IFW = Insurance-for-Work; CEM = Continuous Emission Monitoring; PV = photovoltaic; TA = Technical Assistance; tCO₂e = metric tons of carbon dioxide equivalent; — = not available.

- a. Project/Program information: Electricity Grid Strengthening – Sumatra Program, Indonesia (EGS): (i) Number of PLN customers in Sumatra increase by at least 3% each year (Baseline 11.18 million customers in Sumatra (2014)); (ii) Residential energy sales grow by at least 3% each year from the preceding year (Baseline: 15,850 GWh (2014)); etc.
- b. Project/Program information: Guyana REDD+ Investment Fund (GRIF): For deforestation activities, the reference measure is a deforestation rate of 0.275% (the average of Guyana historical deforestation rates + global average deforestation rates 2005-2010). If the rate increases above 0.1%, no payment will be made; if the rate increases beyond 0.056%, the payment will be reduced.
- c. Project/Program information: CCAC- RBF in Solid Waste in Penang, Malaysia (SW-Penang): Incentive payments^g (i.e., cash awards) are given to participating high-rise communities if they successfully separate organic waste from all other wastes. Separated organic waste will be evaluated on pre-determined quality and quantity measures, such that communities will receive a final overall score.
- d. Project/Program information: The Integrated Community Development Project - SWM, Jamaica (ICDP): The minimum score they must achieve is 80/100, which requires NSWMA to provide regular and sufficient waste collection services 80 percent of the time. The first truck will be provided at the end of the second year if NSWMA meets the minimum score until that point. The second truck will be provided at the end of the fifth year, again provided that NSWMA meets the minimum score.
- e. Project/Program information: Sustainable Sugarcane Initiative – AgSri (AgSri): Water Conserved in the Germination Stage through Seedling Production and Water Conserved by Reducing Wasted Seed Cane.
- f. Project/Program information: R4 Ethiopia (R4): one day work is valued at x dollar from the information of a receipt - coupon for insurance for work.

Appendix G. GLOSSARY

Expected annualized RBCF disbursements	Refer to the division of available funds to be disbursed as RBCF by RBCF disbursement duration, which indicates the amount of RBCF expected to be disbursed each year to a program.
Capacity building	In the context of climate change, the process of developing the technical skills and institutional capability in developing countries and economies in transition to enable them to address effectively the causes and results of climate change.
Carbon credit	A generic term for any tradable certificate or permit representing the right to emit one metric ton of carbon dioxide or the mass of another GHG with a carbon dioxide equivalent to one metric ton of carbon dioxide (= 1 tCO ₂ e).
Carbon market	A term for a trading system through which countries may buy or sell units of GHG emissions in an effort to meet their national limits on emissions, under the Kyoto Protocol or other agreements, such as the system among all member states of the European Union (the EU Emissions Trading System).
Certified Emission Reduction (CER)	A (certificate for a) type of emissions unit (or carbon credits) issued by the Clean Development Mechanism (CDM) every time a verified volume of tCO ₂ e is prevented from being released into the atmosphere, through carbon projects registered with the Clean Development Mechanism (CDM); the reduction has to be verified under the rules of the Kyoto Protocol. CERs can be purchased from the primary market (purchased from an original party that makes the reduction) or secondary market (resold from a marketplace).
Clean Development Mechanism (CDM)	A mechanism under the Kyoto Protocol through which developed countries may finance GHG emission reduction or removal projects in developing countries, and receive credits for doing so; these credits may be applied toward meeting mandatory limits on their own emissions.
Conference of the Parties (COP)	The supreme body of the UNFCCC. It currently meets once a year to review the UNFCCC's progress. The word "conference" is not used here in the sense of "meeting" but rather of "association."
Compliance Carbon Markets	Also known as regulatory carbon markets, compliance carbon markets are markets in which buyers and sellers are required to participate in order to comply with regulatory limits on climate change mitigation.
Committed finance	Financing that has been legally committed to an activity through a contractual arrangement.
Disbursement-Linked Indicators (DLIs)	RBCF programs contain a range of "results" for which they disburse funds against a broad range of results, often referred to as DLIs.

Emission reduction	The measurable reduction of release of GHG into the atmosphere from a specified activity, in a specified period.
Feed-in Tariff	A policy mechanism designed to accelerate investment in renewable electricity technologies by providing long-term, typically fixed-price payments to producers per unit of renewable electricity supplied to the grid (based on the cost of generation of each technology).
Grant	Non-repayable funds or products disbursed by one party, often a government department, corporation, foundation, or trust, to a recipient, often (but not always) another government, nonprofit entity, educational institution, business, or individual.
Greenhouse gas (GHG)	Both natural and anthropogenic, GHGs trap heat in the Earth's atmosphere, causing the greenhouse effect. Carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF ₆), and nitrogen trifluoride (NF ₃) are the primary GHGs. The emission of GHGs through human activities (such as fossil fuel combustion or deforestation) and their accumulation in the atmosphere are responsible for reinforcing the greenhouse effect, contributing to climate change.
Loan	The act of giving money, property, or other material goods to another party in exchange for future repayment of the principal amount along with interest or other finance charges. A loan may be for a specific, one-time amount, or can be available as an open-ended line of credit up to a specified limit or ceiling amount. The terms of a loan are agreed to by each party in the transaction before any money or property changes hands. If the lender requires collateral, that is outlined in the loan documents. Most loans also have provisions regarding the maximum amount of interest, as well as other covenants such as the length of time before repayment is required.
Monitoring, Reporting and Verification (MRV)	A term used to describe all measures taken by actors to collect data on emissions, mitigation actions, and support; to compile this information in reports and inventories; and to subject these to some form of review or analysis.
Nationally Determined Contribution (NDC)	The contribution that a Party intends to achieve under the Paris Agreement, covering mitigation and adaptation. Each Party shall communicate an updated NDC every five years. They will be governed by Article 4 of the Agreement. Each Party to the UNFCCC that wishes to become a Party to the Agreement will have an obligation to communicate an NDC. The level of prescription attached to these will be determined by the negotiations on the operative elements of Article 4, which mainly take place under the Ad Hoc Working Group on the Paris Agreement (APA).
Nested approach	The term has been introduced into REDD+, where projects and/or subnational programs are integrated into higher-level accounting, thereby allowing "countries to start REDD+ efforts through sub-national activities and gradually

move to a national approach or for the coexistence of the two approaches” (Angelsen 2008). The term “nesting” is variously used to refer to state- and province-level accounting integrated into national-level systems, as well as for project-level activities sitting within broader national (or subnational) systems, and illustrates the flexibility of the RBF approach in targeting different stakeholders at multiple levels.

Paris Agreement

The Paris Agreement was adopted at the 21st Conference of the Parties to the UNFCCC, held in Paris, France, in December 2015. The Paris Agreement for the first time brings all nations together to undertake ambitious efforts to combat climate change and adapt to its effects. Its central aim is to strengthen the global response to the threat of climate change by keeping the global temperature rise this century well below 2°C above preindustrial levels and to pursue efforts to limit the temperature increase even further to 1.5°C. Additionally, the agreement aims to strengthen the ability of countries to deal with the impacts of climate change. The Paris Agreement requires all Parties to put forward their best efforts through NDCs and to strengthen these efforts in the years ahead. This includes requirements that all Parties report regularly on their emissions and on their implementation efforts.

Principal-Agent Theory

RBCF is considered an effective approach for overcoming the classical principal-agent problem in economic theory. The problem relates to asymmetric information in a contract relationship, where the agent receiving funding is better informed about a task or project or the product to be sold than the principal. The agent uses this information advantage to further his own interest at the expense of the interests of the principal. RBCF aligns the goals of the principal with the agent by setting a monetary incentive for the agent to pursue the goal of the principal.

REDD

Reducing Emissions from Deforestation and Forest Degradation

REDD Plus (REDD+)

All activities that reduce emissions from deforestation and forest degradation and contribute to conservation, sustainable management of forests, and enhancement of forest carbon stocks.

**Results-Based
Climate Finance
(RBCF)**

While there is no common definition for RBCF, the literature generally indicates that RBCF must meet the following four criteria: (i) payments are made for climate mitigation or adaptation; (ii) payments are made ex post; (iii) payments are made for achieving predefined results; and (iv) there is a process for independent verification of results.

Structural change theory

A term to describe the literature that draws on the theory of change logic and extols the idea that RBCF is an approach that can be used to trigger structural change by aligning policy objectives at the start of activities.

**United Nations
Framework
Convention on Climate**

The international legal framework adopted in June 1992 at the Rio Earth Summit to address climate change. It commits the Parties to the UNFCCC to stabilize human-induced GHG emissions at levels that would prevent

Change (UNFCCC)	dangerous, man-made interference with the climate system, following “common but differentiated responsibilities” based on “respective capabilities.”
Upfront financing	Funds disbursed before an activity is started, a good is produced, or a service is performed.
Verified Emission Reduction (VER)	A unit of GHG emission reductions that has been verified by an independent auditor. Most often, a VER designates emission reduction units that are traded on the voluntary carbon market.
Voluntary Carbon Market	Voluntary markets are markets in which buyers and sellers engage in transactions on a voluntary basis (i.e., not because they have compliance obligations by regulation). In the <i>voluntary</i> carbon market, businesses and individuals seeking to reduce GHG emissions for reasons other than statutory compliance can purchase verified emission reductions (VERs). While maturing quickly, the voluntary market remains small, fragmented, and multilayered. Generally, businesses and/or individual consumers engage in voluntary markets for reasons of philanthropy, risk management, and/or in preparation for participation in a regulatory market.

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