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Climate Compatible Growth

CURRENT PRACTICES IN RESULTS-BASED FINANCING FOR ENERGY ACCESS

A CRITICAL ANALYSIS OF THE AVAILABLE LITERATURE

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1. Executive Summary

Results-based Financing (RBF) is an instrument that allows donors to fund the distribution of energy access products directly to end-users. It is often viewed as a cost-effective antidote to underachieving aid programmes, and, as of 2023, donors had invested $2.6bn in RBFs for energy access products across 20+ countries [1]. In advance of a tranche of new programmes pushing to meet the 2030 Sustainable Development Goal deadline for achieving universal access to energy, this report critically examines lessons learned across stand-alone solar and clean cooking RBF programmes, with an implicit focus on demand-side subsidies. This was achieved through a review of existing publications on relevant RBFs.

Most of the literature consisted of reports authored by donors which did not focus on the voices of end-users, local governments, and participating companies. These documents shared reflective and wide-ranging lessons learned from designing and implementing RBF programmes. The insights are immensely valuable and have been consolidated through this review. There was a notable absence of independent and publicly available evaluations, although this could be because many programmes are yet to complete. There were hints that more contentious aspects of programmes – such as the tensions between donors and governments – were largely omitted from the reports, and the consistent lack of post-programme evaluations lays bare the question of true success and long-term impact. Consequently, this review likely only provides a partial picture of the true status quo.

The findings of the literature review are presented in three categories: programme design, programme implementation, and programme completion. The programme design stage captures the array of considerations that feed into the design of an RBF instrument, including targeting of end-users and participating companies, setting of the subsidy level, packages of accompanying interventions, and product considerations. The programme implementation stage features the considerations feeding into the application process, financial barriers to participation, payment disbursements, programme flexibility, programme administration, and monitoring and verification. Lastly, the programme completion stage focuses on evaluation and post-programme sustainability. **Table 1** summarises the key findings of this report, and **Table 3** showcases challenges and gaps throughout the different stages.

The review highlighted that there are considerable opportunities for improvement throughout the RBF lifecycle. However, there are also difficulties, such as effectively targeting implementing partners and end-users, sizing of the subsidy, timely disbursements, monitoring and verification of results, balancing operational predictability and flexibility, and ensuring that programmes achieve sustained impacts. It highlighted that RBFs are not a one-stop solution for energy access and that they always need to be complemented by technical assistance and other forms of financial support. There is often tension in balancing the need to build markets, which often requires targeting local companies who generally need more support, versus distribution targets, which may be more efficiently met by engaging larger, international players.

The review also revealed technology-specific design considerations that need to be incorporated into energy-access RBFs. Digital measurement, reporting and verification is better suited to some products than others. Carbon credits pose an additionality risk for cookstoves. Clean cooking products requiring a fuel switch need to consider the long-term affordability and availability of fuel to end-users.

The report concludes with a series of seven recommendations to help future energy access RBFs reach their full potential: 1) improve the knowledge base through conducting and publishing independent programme evaluations; 2) create a set of RBF principles to promote best practices and to standardise aspects of programme design; 3) inter-donor adoption of common monitoring and verification platforms; 4–6) collaboration between donors to avoid duplication of efforts and the creation of forums for different types of stakeholder to input into RBF designs, solve outstanding challenges collaboratively, and share knowledge; and 7) conduct further research to capture real experiences and outcomes from programmes to date.

***Table 1:** Summary of key findings identified in the literature review by RBF programme stage*

		Rbf Stage	Key Findings
Programme Stage	Programme design	1a Design approach	▪ RBFs should be tailored to country contexts and be integrated with national energy plans. ▪ Targeted approaches regarded as preferable to blanket ones. ▪ RBFs tend to benefit larger, international companies over smaller local ones. ▪ The 'result' definition is critical – typically the number of systems distributed or the volume of energy produced/consumed – and can produce perverse incentives.
		1b End-user targeting	▪ Targeted approaches regarded as preferable to blanket ones. ▪ However, a programme's targeting ability depends on the availability of supporting data and systems.
		1c Company targeting	▪ RBFs tend to benefit larger, international companies over smaller local ones. ▪ The design and the structure of RBF influences the types of participating companies.
		1d Subsidy design	▪ The 'result' definition is critical – typically the number of systems distributed or the volume of energy produced/consumed – and can produce perverse incentives. ▪ Incentive levels should catalyse additional market activity without causing significant distortion. ▪ The mode of subsidy delivery (vouchers, payments to end-users, payments to subsidies) requires careful consideration.
		1e Accompanying interventions	▪ It is critical to provide additional financial support for participating companies such as bridge lending, co-financing, or upfront grants. ▪ Technical assistance is widely considered essential for success but there is a lack of evidence on how best to deliver it.
		1f Product selection	▪ Products should meet end-user needs and be appropriate for the local market and context. ▪ Ensuring sustained use beyond the RBF intervention requires consideration of the full product lifecycle.
		1g Additionality	▪ Additionality can be compromised if other grant or subsidy schemes operate in parallel. ▪ Carbon credits pose a particularly complex additionality challenge for cookstove RBFs.
		1h Stakeholder engagement	▪ Effective programme leadership can help mobilise and coordinate stakeholders. ▪ RBFs are currently seen as donor-driven initiatives that potentially fail to engage local government actors. ▪ All partners require clarity about their responsibilities prior to the programme launch, especially regarding the disbursement of funds.
	Programme implementation	2a Application	▪ Application processes typically have rigorous due diligence requirements that can be exclusionary. ▪ These processes could be better leveraged to promote inclusivity.
		2b Financial barriers to participation	▪ The time lag between upfront costs being incurred and results-based disbursements is a widely recognised issue, and one that particularly affects smaller, local companies. ▪ Financial risks at the company level can impact RBF outcomes.
		2c Payment disbursements	▪ Time delays to financial disbursements are a common problem. ▪ Digitisation could help speed up disbursements, reduce verification costs and improve data quality.
		2d Real-time adaptability & flexibility	▪ Flexibility is seen as key to the success of RBF programmes, especially regarding subsidy level adjustments. ▪ However, when changes are needed they should be made in consultation with partners and with adequate notice.
		2e Programme administration	▪ The fund manager plays a central role in effective administration and programme management. ▪ Customer support is a key but often overlooked administrative function.
		2f Monitoring & verification	▪ This is one of the most challenging aspects of RBFs due to cost, complexity, and time-intensity. ▪ Frameworks for monitoring and evaluation should be designed prior to implementation. ▪ Digitisation can provide an efficient solution. ▪ Current approaches are critiqued for only tracking distribution rather than long-term uptake.
	Programme evaluation	3a Evaluation	▪ There are very few independent, publicly available evaluations, and even fewer that openly report on cost-effectiveness. ▪ The output-based targets of RBFs do not equate to achieving impact.
		3b Post-programme sustainability	▪ There are recurrent issues with the sustainability of interventions after the end of the programme.

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Abbreviations

A2EI	Access to Energy Institute
BGFZ	Beyond the Grid Fund for Zambia
CCA	Clean Cooking Alliance
CCG	Climate Compatible Growth programme
dMRV	Digital Measurement, Reporting, and Verification
EAQIP	Energy Access and Quality Improvement Project
EnDev	Energising Development
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Corporation for International Cooperation)
GOGLA	Global Off-Grid Lighting Association
GPA	Global Platform for Action
IDCOL	Infrastructure Development Company Limited
IoT	Internet of Things
KOSAP	Kenya Off-Grid Solar Project
LPG	Liquified Petroleum Gas
MCFA	The Modern Cooking Facility for Africa
PAYG	Pay As You Go
PMUY	Pradhan Mantri Ujjwala Yojana (Prime Minister's Lightening Scheme)
PV	Photovoltaic
RBF	Results-based finance
REACT	Renewable Energy and Climate Technologies
RVO	Rijksdienst voor Ondernemend (the Netherlands enterprise agency)
SDG	Sustainable Development Agency
STEER	Centre for Sustainable Transitions: Energy, Environment and Resilience (STEER)
TA	Technical Assistance

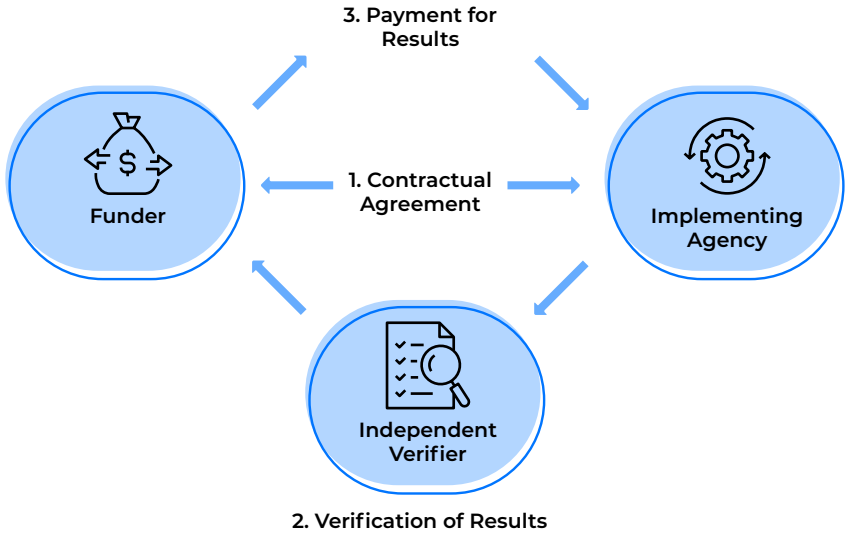
2. Introduction

A quarter of the world's population lack access to energy. According to the International Energy Agency, there are 685 million people in the world without electricity and 2.1 billion without access to clean cooking, meaning that they do not have sufficient electricity to power a basic bundle of energy services (ie multiple lightbulbs, phone charging, a radio), and cook their food on rudimentary stove and fuel combinations (such as firewood and dung over three stone fires) [2]. This severely limits social and economic progress, as access to energy underpins health, education, livelihoods, and the economy [3–4].

Sustainable Development Goal (SDG) 7 sets a target of universal access to affordable, reliable, sustainable, and modern energy by 2030 [5]. The past decade has seen a flurry of innovation in the technologies, business models, and supporting infrastructure associated with energy access alongside falling costs. However, substantial affordability gaps persist and prevent consumers from adopting modern energy technologies and services. Achieving SDG7 would require the current rate of progress to double and additional investments of $286 billion each year relative to 2023 levels [6–7]. There needs to be more finance channelled into the energy access space and careful targeting of expenditure to maximise benefits and to ensure that hard-to-reach and vulnerable communities are not left behind.

Results-based finance (RBF) has emerged as a mechanism that allows governments and development partners to deliver subsidised energy access products directly to consumers. Unlike other forms of development financing, RBFs only disburse funds to implementing partners upon the verification of an intended and pre-defined result. **Figure 1** depicts how RBF typically works. A funder will issue a call for proposals inviting eligible implementing partners (usually private sector companies) to apply. A portfolio of partners is then selected based on the merit of their applications. RBF programmes do not provide any upfront financing to partners; instead, payments of the subsidy are made in arrears upon independent verification of the achievement of the result. For example, this could be the delivery of an energy product, such as a solar home system, to an eligible end-user. Companies therefore typically seek inventory financing from elsewhere to participate.

Figure 1: *RBF process diagram (adapted from Figure ES1 [8])*



RBFs can take the form of supply-side subsidies, which target suppliers and aim to decrease the costs of providing services to end-users, or demand-side subsidies, which target end-users and aim to increase demand by lowering prices. Over time, energy access programmes have shifted their focus from supply-side subsidies to demand-side subsidies in an attempt to directly address a pervasive affordability gap.

The advantages of RBFs are multifaceted [9]. Their focus on the delivery of results helps drive efficiencies in aid flows. They reduce the risk of corruption as payments are only disbursed once results are verified. Further, they can help to foster a competitive and diverse private sector that can theoretically sustain operations after the programme has ended. However, RBFs have known disadvantages. They risk increasing the total cost of the programmes because of high borrowing costs for recipient companies. The monitoring and verification processes can be expensive and complex. And poorly designed RBFs may be less effective than conventional approaches such as grants.

These benefits and drawbacks of RBFs are widely acknowledged and reflected in a multitude of documents. However, there has been no critical analysis of this literature to date, and little open reflection on whether energy access RBFs are living up to their promise. Meanwhile, RBF programmes continue to proliferate. Sustainable Energy for All's RBF tracker estimates that $2.6 billion has been invested across 20+ countries to date [1]. The World Bank has recently announced substantial new tranches of RBF funding through its ASCENT and Mission 300 programmes[1].

This report was commissioned in advance of a workshop convened by the Access to Energy Institute (A2EI) in Kampala, April 2025, which brought together donors, policymakers, and private sector actors for an open discussion about energy access RBFs. This document draws on an extensive review of literature pertaining to RBF mechanisms in the energy access sector, specifically stand-alone solar products and clean/improved cookstoves. It aims to compile lessons learned across a wide variety of RBF programmes, to identify recurring themes and challenges, and to capture emerging best practices. Recommendations include that each RBF should be accompanied by an independent evaluation; RBFs should be designed with the context in mind; there should be more collaboration between donors and between different stakeholders involved in programmes; and that there is a need for further research to capture real outcomes and experiences from programmes to date. We hope to spark conversation, enhance practitioner knowledge, and inform donor strategy by distilling what has (and has not) worked to date.

3. Methodology

The literature was collated through a non-systematic but structured search of grey and academic sources, including programme summaries, donor reports, policy briefs, technical papers, and opinion pieces, published from 2015 onwards. This was supplemented by recommendations from experts in the field. A total of 59 documents were reviewed, spanning diverse geographies, energy technologies, and implementing agencies. The search encompassed both demand and supply-side subsidies delivered through RBFs; however, this report focuses on demand-side subsidies in line with the majority of programmes and literature.

[1] The Accelerating Sustainable and Clean Energy Access Transformation (ASCENT) Program was announced in 2023 and aims to provide life-transforming opportunities through the delivery of sustainable and clean energy access to 100 million people in 20 countries in Eastern and Southern Africa by 2030 [62]. Mission 300 was announced in 2025 and aims to connect 300 million people to electricity by 2030 [63].

Findings were organised into three broad programme phases: programme design, programme implementation and programme completion. Through a combination of author expertise and the structure emerging from the literature itself, these programme phases were further categorised into 16 discrete stages that cover key decision points across the RBF process. While no one stage is static or confined to a finite portion of the RBF lifecycle, this framing was found to be a useful structure for discussion and comparison.

For each stage, the report consolidates the evidence base, summarises key points of alignment or disagreement across sources, and highlights critical gaps or silences. Particular attention was paid to:

- The extent of consensus in the literature regarding issues, barriers, and areas of concern.
- Whether solutions exist and have been implemented.
- How severe the challenges appear to be in practice.
- What issues are insufficiently discussed or overlooked altogether.
- The relevance of issues to different product types distributed under RBFs of interest (cash sales solar products, Pay As You Go (PAYG) solar products, improved cookstoves, clean cookstoves).

A high-level content analysis was subsequently conducted to assess broader patterns in the literature. Each document was categorised by content scope (eg case study, lessons learned, programme evaluation) and by the voices that it captured (eg donors, financial institutions, programme staff, end-users). This helped illuminate the perspectives that are most reflected across the literature – and those that are absent. Illustrative case studies from the literature are interspersed throughout the results section.

4. Results

Description of Literature

Most of the knowledge on energy access RBFs consists of reports written by donors and market institutions. The review identified 59 pieces of relevant articles, comprising 9 academic articles and book chapters, 9 media articles and blogs, and 41 reports. There were 15 pieces of literature focused on clean cooking; 11 specifically about electricity access; and the remaining 33 focused on energy access in general. However, papers in the 'general energy access' category tended to be skewed towards electrification projects, and the concrete knowledge based on cooking – especially modern tier 4+ solutions – was generally weaker.

There was a distinct absence of independent evaluations of energy access RBFs. Case studies and lessons learned reports (22) comprised the bulk of literature. There were also several white papers (9) offering thought leadership on RBFs. The validity of these articles was often questionable as it was unclear how firsthand experience or data fed into these pieces. Independent evaluations were largely absent (3 in total, consisting of one thorough programme evaluation and two reports on end-user impact studies).

The literature – and therefore the knowledge accrued through it – was dominated by donor voices. This was difficult to assess as the reports largely lacked transparent methodologies. However, there were a few articles clearly incorporating the perspectives of end-users (8), participating companies (5), governments (3), and NGOs (3). The dominance of donor voices, combined with a lack of direct engagement

with programme beneficiaries, raises questions about whose experiences and priorities shape RBF discourse and decision-making.

The sections that follow present RBF success and failure factors according to three main stages: programme design, programme implementation, and programme completion. The main findings of the review are summarised in **Table 1**, while **Table 2** summarises gaps and areas of divergence in the literature.

***Table 2:** Summary of challenges and gaps identified in the literature by RBF programme stage*

Rbf Stage	Gaps And Divergence In Discussion
1a Design approach	Lack of homogeneity in approaches to RBF design; little discussion on how to systematically incorporate end-user and company perspectives into design – the focus is on securing high-level political buy-in; diverging opinions over whether RBFs are best suited to mature or nascent markets; the long-term effectiveness of proposed exit strategies is unclear.
1b End-user targeting	Few evaluations assess whether targeted subsidies reach intended end-users; limited discussion on how targeting can intersect with broader social protection policies; no exploration of how targeting approaches vary between technologies (eg PAYG solar vs. improved cooking).
1c Company targeting	Limited discussion on how company selection criteria shape market power dynamics during and post-RBF; lack of clarity on how to balance efficiency vs. inclusion in company selection.
1d Subsidy design	Lack of discussion on whether end-users should co-contribute or receive full subsidies; limited analysis on how subsidy levels interact with post-RBF commercial viability; limited concrete guidance on how to set RBF incentive levels; no consideration of how subsidies can be designed to produce quantifiable outcomes (eg improvements in health) rather than outputs (eg number of stoves disbursed).
1e Accompanying interventions	Limited critical discussion on the role of technical assistance (TA), both to companies and governments, and how to evaluate it; absence of best practices for TA; minimal debate on whether RBFs should actively subsidise high operational costs like customer support or after-sales services.
1f Product selection	Limited discussion on the pros and cons of promoting lower-cost, incremental solutions versus high-tech, high-cost products; limited recognition and understanding of best practices about how different products necessitate different RBF designs; recognition of the challenges of ensuring sustained use after the end of the intervention but absence of offered solutions.
1g Additionality	Limited discussion on how RBFs could be designed to work alongside existing subsidy programmes rather than compete with them; acknowledgement of the risk of creating subsidy-reliant companies but no consensus on how to identify these companies or to address the problem; carbon credit interactions remain unresolved for clean cooking with no clear framework for managing 'double dipping'.
1h Stakeholder engagement	The tension between donor-driven priorities and national government ownership is acknowledged but rarely explored in depth; limited discussion on how to institutionalise stakeholder engagement beyond the lifespan of RBF to ensure lasting impact; passing references made to the importance of ensuring that all partners understand their roles and responsibilities without divulgence of the concrete issues that can arise here.
2a Application	The issue of conducting adequate due diligence that is not overly burdensome or exclusionary; no discussion of how exclusionary application processes impact post-programme sustainability; the intersection of gender, local ownership, and long-term market transformation is underexplored.
2b Financial barriers to participation	The potential risks of financial strain on smaller firms are not critically examined; Gendered financial barriers are largely overlooked – women-led businesses often face additional hurdles in accessing capital; the impacts of currency volatility are mentioned but rarely explored in depth; limited discussion of how financial burdens at the company level can affect the impact of the broader RBF programme.
2c Payment disbursements	Disbursement delays are widely acknowledged as an issue but never quantified; the trade-offs between rigorous verification processes and timely disbursements are often overlooked; the impact of unpredictability in disbursement schedules is under-discussed; no discussion of whether disbursement structures should be tiered, based on company size or financial resilience; no discussion of how to control RBF budgets during the programme to ensure that allocated funds are spent but not exceeded.
2d Real-time adaptability & flexibility	No mention of the trade-offs of frequent programme adjustments (eg in the subsidy level) and whether this creates uncertainty for companies; limited discussion of the role of end-users in adaptation (consultation is mentioned but not systematically embedded in design changes).
2e Administration	Limited discussion on administration; the actual cost-effectiveness of different administrative structures; trade-offs between third-party vs. government-led administration beyond corruption concerns.
2f Monitoring & verification	Potential trade-offs between rigorous verification and costs; verification typically tracks distribution rather than actual usage, limiting understanding of real impact; focus on technological solutions rather than addressing fundamental structural inefficiencies in verification systems and RBFs; digital Measurement, Reporting, and Verification (dMRV) has been posited as the solution to many of thee challenges, but there was not recognition that dMRV is not compatible with all products and populations
3a Evaluation	Lack of transparency – many evaluations are unpublished or inaccessible, limiting sector-wide learning; reluctance to critically assess failed programmes and structural flaws; donor influence on evaluation framing and reporting biases; absence of data on the cost efficiency of RBF programmes.
3b Post-programme sustainability	Sustainability is often framed as a company problem, rather than a structural challenge for subsidy design; limited discussion on how to integrate long-term financing mechanisms beyond donor funding; lack of accountability for ensuring continued service provision post-RBF.

RBF Success and Failure Factors

Stage 1: Programme Design

1a DESIGN APPROACH

RBFs should be tailored to a country's unique challenges and be integrated with national energy access plans [10–15]. Incorporating strong market intelligence into a programme's design can increase its chances of success by allowing it to target energy access barriers more effectively [11, 16–19], as can integrating RBFs with existing programmes and market development efforts [17–18]. Connected to this is the importance of engaging local stakeholders, such as policymakers, industry, and regulators, in the design process to foster alignment with national objectives [12, 20–21]. However, much of the discussion in the literature focuses on securing high-level political buy-in to programmes, with relatively little attention given to incorporating the needs and perspectives of end-users and companies.

Supportive technical, institutional, macroeconomic, legal, supply chain, and political conditions within a country increases the likelihood of achieving results [12], 18–19, 22–23]. This fact was widely agreed upon but spawned two distinct philosophies about what this means for RBFs. Some articles argued that RBFs are better suited to more mature markets, where the enabling conditions are already established and strong [24–25]. Others believed that RBFs should target more nascent markets where there is greater impact potential, and that programmes should aim to strengthen the enabling environment [26].

There is a lack of standardisation in RBF design processes. Strategies vary significantly depending on the sector, region, and implementing agency. This lack of standardisation is compounded by the constantly evolving landscape of technologies and business models, particularly in clean cooking [27]. As one report notes: 'There is not yet consensus on how subsidies...should be designed to achieve scalable and long-lasting results' [22, p.13]. Such uncertainty makes the design phase especially critical and requires careful consideration of factors that affect the full project lifecycle, such as the total available funding, who the subsidy should go to, and the metrics for programme success [11–12, 19, 25, 28]. It is also important to build in adaptive capacity at this stage.

An exit strategy should be designed at the outset of RBF to prevent market collapse once subsidies have been dispersed [17–18, 22–23, 29–30]. Proposed solutions include transitioning to self-sustaining models through cross-subsidisation or commercial financing [22, 31]; gradually reducing RBF payments over time so they are phased out by the programme end [11, 17], 23, 32–33]; and establishing revolving funds that reinvest a portion of revenues into new beneficiaries [12]. However, the effectiveness of these approaches is unclear.

1b END-USER TARGETING

The literature favours targeted approaches over blanket distribution to ensure equitable RBF outcomes. Targeted subsidies are generally considered more efficient than blanket ones as they are delivered only to those who need them [11–12, 20]. Blanket subsidies, by contrast, are quicker and easier to deploy, but often fail to reach vulnerable communities that are financially unattractive for companies to service [34–36]. RBFs are unlikely to reach marginalised groups in significant numbers unless they have an explicit focus on doing so, and thus risk reinforcing existing market inequalities [11, 37–38].

The ability of RBF to reach specific groups depends on the availability of supporting data and systems. One approach is to merge RBF with existing structures. For example, RBFs in Malawi and Kenya have tied into existing cash transfer programmes [11, 39], and Case Study 1 details how a programme

in Rwanda drew upon state classifications. Some programmes have opted for a geographical approach where they direct funds to districts with rural areas or certain sociodemographic characteristic [40]. However, such classifications risk being overly simplistic; remote communities are far from homogenous, and some are far more marginalised than others [41].

CASE STUDY 1: EnDev Solar Home System RBF in Rwanda [52]

In response to the affordability constraints of energy access for the Rwanda's low-income population, EnDev piloted an RBF project targeting marginalised communities from January 2020 to March 2021, in collaboration with the Rwanda Energy Group, the Government of Rwanda, local financial institutions, and development partners. Rwanda's existing official socio-economic classifications, so-called 'Ubudehe' categories, were utilised to enable end-user targeting of the poorest populations, with the RBF focusing on the lowest Ubudehe tiers. The solar home system subsidy level was also tailored to each Ubudehe to encourage participation, with higher subsidies for lower tiers. Ultimately, six companies participated in the RBF and reached over 22,000 households, of which 71% were categorised in Ubudehe 1.

1c COMPANY TARGETING

To date, RBFs have tended to benefit larger, international companies over those that are smaller and based locally [32, 41–42]. The latter are likely to need more support to achieve given milestones [11, 38, 41], and providing this assistance increases programme costs. Some reports argue that RBFs should only engage with more established companies to improve cost-efficiency and likelihood of success [25, 38, 41]. Others view RBFs as an opportunity to support local businesses and engage in long-term market development. SNV Netherlands Development Organisation, for example, cautions that 'if RBF only rewards well-established commercial players for business activities they would anyhow have done, it loses its purpose' [23, p. 4]. Prioritising the localisation of programmes also avoids excess benefits flowing to the Global North [23, 41]. Several potential solutions have been proposed for promoting the inclusion of smaller businesses. One such approach is to design RBFs to cater to different company segments. Smaller firms could be incentivised to operate in more established markets, while larger companies could be encouraged to expand into more difficult, underserved regions [37]. Another approach is to categorise firms by capacity and tailor the application process accordingly. Under this model, smaller companies would face less stringent application requirements and shorter funding cycles, while larger companies would undergo a more comprehensive assessment [25, 32, 37].

The design and structure of RBF influences the types of participating companies. Smaller ticket sizes may encourage local companies to expand, while larger grants may incentivise international players to enter new markets [12]. One report suggests designing differentiated incentives that allow smaller companies to operate in lower-risk market segments while restricting larger firms to harder-to-reach populations [11]. Experience suggests that subsidies should be targeted at distributing companies rather than financial institutions, as distributors drive energy access markets more effectively [21, 24, 26].

1d SUBSIDY DESIGN

Arguably the most foundational decision in RBF design is defining the result being financed. In energy access programmes, this typically consists of the number of systems distributed (triggering a one-off payment per end-user) or the volume of energy produced or consumed (leading to recurring payments per

beneficiary) [10]. This choice has significant implications for budgets, success indicators, verification systems, and even the type of beneficiaries reached. It also has the potential to produce perverse or unintended consequences. RBFs that issue payments purely upon installation risk compromising system sustainability by providing no incentive to fix broken systems, and those that focus on volume of energy consumed push companies towards serving higher-income households with more ability to pay for energy [11]. Notably, there is a lack of evidence about which approach is most effective.

The literature acknowledges the importance of setting incentive levels that catalyse additional market activity without over-subsidising or distorting the market [10, 20, 29, 41, 43]. However, there was limited methodological advice about how to do this. The most common recommendation is to size the subsidy to bridge the affordability gap [12, 43]; although how is unclear. One approach, used by SNV, is a Vulnerability Access Index, which assesses needs-based subsidy levels [23]. One RBF project found that imposing variable county-specific incentives based on factors such as poverty rate and rurality were more effective than a flat rate [37]. The literature does not directly address whether products should be entirely or partially subsidised.

Another critical consideration is the mode of subsidy delivery. Options include direct payments to end-users – via hard cash, mobile money, bank transfers, and vouchers – or payments to companies upon verification of product disbursements [10, 12, 21]. If subsidies are directed to end-users, programmes must ensure that recipients can effectively participate; previous RBFs had to provide mobile money training to beneficiaries to ensure smooth transactions [39].

1e ACCOMPANYING INTERVENTIONS

RBFs rarely succeed unless they incorporate other financial mechanisms into their design [16, 19, 23, 27, 41, 44]. Combining RBFs with bridge lending and upfront grants can greatly enhance results, as further explored in Section 2b. Furthermore, combining supply-side subsidies alongside demand-side RBFs can help companies to scale and provide services to marginalised communities [18, 29, 31, 41]. Co-financing can further enhance the impact of programmes by attracting additional finance from commercial investors, who see RBFs as a way to de-risk their investments in the energy access sector [34].

Technical assistance (TA) is widely considered essential for RBF success [11, 16–17, 23, 32, 41–42, 44–45]. TA encompasses a wide range of activities, including business advisory services to companies, market awareness campaigns, institutional support, policy support to governments, and regulatory reform (eg tax exemptions and quality standards). Market awareness campaigns are seen as particularly important for clean cookstove programmes, where limited consumer awareness of the health, cost, and environmental benefits of clean cooking can hinder uptake [11, 25, 38, 47–48]. Centralising educational campaigns can be an efficient way of generating product demand and improving results across the RBF portfolio [11, 13, 18, 25, 39] , as illustrated by **Case Study 2**. Despite the proclaimed centrality of TA, the literature does not provide guidance on best practices regarding delivery or evaluation. Interestingly, the only identified piece of such literature, an evaluation of Beyond the Grid Fund for Zambia (BGFZ) by NEFCO (the Nordic Green Bank), concludes that 'business advisory and technical assistance was not highlighted as a major contributor to outcomes' [34 p. 18], raising questions about the assumed importance of TA in RBF programming.

CASE STUDY 2: EnDev Clean Cookstoves RBF in Nepal [11]

From 2014 to 2019, Energising Development (EnDev), an international programme for providing energy access, oversaw a clean cooking RBF in Nepal that resulted in the distribution of 46,000 improved cookstoves – a combination of portable and fixed stoves that reached roughly 220,000 people. Finding that partner companies were reluctant to invest in such awareness campaigns, the programme instead absorbed this responsibility. EnDev held meetings with local governments and community groups, conducted radio interviews, and distributed leaflets, posters, and text messages for large-scale impact. This created an environment in which companies could successfully market their improved cookstove products.

1f PRODUCT SELECTION

RBFs vary in their product specificity. For example, the Modern Cooking Facility for Africa, covers the full spectrum of Tier 4+ clean cooking technologies (eg electric appliances, LPG, biogas, ethanol), thus leaving product selection to applicants [49]. Others impose stricter requirements, like the Rwanda Energy Access and Quality Improvement Project (EAQIP) solar home system programme, which capped panel size to 350 Watts [50]. Additional eligibility criteria include requirements to meet quality standards [33, 36], to provide warranties and after-sales services [33, 36, 51], and to enable remote monitoring for verification purposes [36].

Products distributed under RBF should meet end-user needs and be rooted in market data [12, 42, 47, 51]. This is particularly important for cookstove programmes, where failure to account for cultural preferences can undermine programme impact [47], as demonstrated by **Case Study 3**.

CASE STUDY 3: GIZ 'Cooking Stoves' RBF in Ethiopia [56]

An academic study was conducted to understand end-user satisfaction with an RBF project for improved *Tikikil* cookstoves (portable, biomass, 'rocket' stoves), focusing on a predominantly rural district in southwest Ethiopia. 191 households were surveyed, of which 109 adopted cookstoves during the RBF. Only 49% of respondents felt the programme was 'moderately effective', and a key point of discussion was the small size of the programme's chosen cookstoves. Roughly 40% of dissatisfied end-users complained that their traditional, large pots could not be utilised with the *Tikikil* – indicating a failure of the RBF to understand the lived experiences and needs of their target users.

Ensuring sustained use beyond the RBF intervention requires consideration of the product's full lifecycle, including fuel supply chains, long-term affordability, and access to repair services. This is particularly critical in clean cooking RBFs seeking to foster changes in cooking fuels. Ensuring a reliable and affordable fuel supply chain is therefore equally critical as the provision of a new stove [27, 29, 46–47]. This is illustrated by India's Pradhan Mantri Ujjwala Yojana (PMUY: trans. Prime Minister's Lightening Scheme) programme, which successfully distributed 80 million new LPG kits. However, many stoves remain unused as households cannot afford cylinder refills [22].

1g ADDITIONALITY

The additionality of RBFs can be impaired if other comparable grant or subsidy schemes are operating in parallel [18, 34, 47]. The proliferation of RBFs risks creating a generation of companies chasing grants rather than commercial viability, which could impede long-term market development [10, 34]. This is not just a theoretical risk; one article describes how, in 2020, three different off-grid solar RBFs operated simultaneously in the same Kenyan county [39],

while the high concentration of international organisations providing cookstoves in Nepal during an RBF programme led to similar technologies being sold for vastly different prices [47]. Such overlaps can result in duplication of efforts and market distortions, demonstrating the fragmented nature of programming and the need for better coordination among funders and implementers to build sustainable, commercial energy markets [31].

Carbon credits pose a particularly complex additionality risk for cookstove RBFs as they offer significant and ongoing results-based revenues. The Clean Cooking Alliance (CCA) acknowledges the potential for 'double dipping' and notes that funders are 'uneasy' about how to address this issue [25]. The CCA suggests integrating clawback clauses into RBF contracts, whereby payments are withheld or revoked if carbon prices rise above a specific threshold [25]. At the same time, there is potential for carbon revenues to aid the sustainability of RBFs. For example, the World Bank's EAQIP RBF in Rwanda requires participating companies to waive their carbon rights, allowing the World Bank to use the revenues to replenish the RBF fund. However, this approach has not proved popular with companies, who may prefer to keep their carbon revenues than sign up to the RBF programme.

1h STAKEHOLDER ENGAGEMENT

Effective programme leadership is vital to mobilise and coordinate between stakeholders [19, 33, 39]. Some RBFs have managed this by establishing Technical Working Groups or coordination units to convene stakeholders on a regular basis and streamline activities [21, 34, 39]. In the case of the BGFZ in Zambia, the working group even led to additional benefits outside of the programme by facilitating policy and regulatory reforms [34].

RBFs are currently seen as donor-driven initiatives [38, 45]. The Global Off-Grid Lighting Association (GOGLA) advocates for local ownership of programmes and a shift towards national governments taking the lead [45]. However, this would involve the donor relinquishing control. The absence of locally embedded leadership could cause tension between development organisations and governments. However, this was only alluded to in the BGFZ evaluation, which lightly observed that the programme most strongly reflected the donor's objectives rather than that of the Government of Zambia [34]. The very political nature of this topic may result in underreporting and a reluctance to openly share experiences. There is a lack of clarity regarding under what conditions could donors provide funding while putting programme design and implementation into the hands of national and local governments.

All partners require clarity about their responsibilities prior to the programme launch, especially regarding the disbursement of funds [18, 39–40]. All partners need to clearly understand what is expected of them, what the application process is, pre-financing requirements, potential extra costs, their risk exposure, conditions of disbursement, and their administrative duties regarding monitoring and evaluation [18]. These sentiments hint that the lack of understanding of these aspects has caused problems in previous programmes.

Stage 2: Programme Implementation

2a APPLICATION

The application process typically requires companies to undergo rigorous due diligence. This can include an assessment of financial health, operational capacity, past sales performance, product pricing, business plans, and regulatory compliance [12, 18, 29, 52]. The rationale behind such scrutiny is to ensure that programme partners can achieve the intended results without excessive risk of failure. However, the process

often favours larger, well-established firms while sidelining smaller, local enterprises. For instance, the Clean Cooking Fund Rwanda initially required applicants to submit three years of audited financial statements, effectively barring many start-ups and smaller firms unable to pay for auditing [21, 25]. The complexity and administrative burden of applications can be overwhelming for firms with limited resources, particularly women-led businesses and grassroots organisations operating in marginalised communities [18, 25, 44].

There is scope for the application process to be leveraged to promote inclusivity. Some programmes are beginning to incorporate criteria that prioritise reaching underserved populations. For example, Kenya's Renewable Energy and Climate Technologies (REACT) RBF requires applicants to outline how their business model will expand energy access to unserved or marginalised communities [12]. Several reports highlight gender equality as an overlooked opportunity in RBF partner targeting. Having gender-based employment milestones within RBF contracts could help increase women's participation in the workforce and promote best practice for inclusive hiring [34, 45, 53].

2b FINANCIAL BARRIERS TO PARTICIPATION

The time lag between upfront costs being incurred and results-based disbursements is a widely recognised challenge for RBFs. However, specifics were omitted from reports, and the characteristics of acceptable disbursements (in terms of both delay and frequency) to companies are unclear. Distributors often require significant capital to purchase inventory and establish the necessary infrastructure for supply, sales, and monitoring [10–12, 16, 19, 26, 29, 32, 38, 47, 53]. Yet, without access to sufficient working capital, many companies – particularly smaller, local firms – face financial bottlenecks that hinder their participation [10–12, 27, 38, 41]. Currency volatility further complicates matters; companies are particularly vulnerable when receiving payments in local tender if their RBF funding is in hard currency [34]. These structural flaws have been critiqued for years, yet solutions remain limited. Loans are frequently utilised as a stop-gap measure, but access to capital in emerging markets is often constrained by high interest rates and limited financial infrastructure [25, 27, 38, 41]. Some businesses have had to resort to personal collateral for financing [41]. That said, participation in RBFs can sometimes facilitate access to debt lending, as the RBF contract is viewed as a guarantee [23, 26].

Earlier discussions on RBF design largely dismissed the upfront capital barrier as a non-issue, arguing that only mature companies with sufficient inventory financing should participate [16, 25, 27]. More recent perspectives, however, acknowledge that this exclusionary approach limits market development while favouring larger, international companies; it has been proposed that RBFs be restructured to offer partial upfront funding [11–12, 25, 27, 29, 32, 37–38, 53]. Some programmes have already started to do this, such as the Kenya Off-Grid Solar Project (KOSAP), Indonesia's Clean Stove Initiative and NEFCO's The Modern Cooking Facility for Africa (MCFA) programme [32, 40, 54]. Other proposed solutions include leveraging RBF contracts to enable access to lower-interest bridge lending or establishing parallel debt facilities at the local or government level [12, 25, 27, 38, 41]. Some suggest that RBF fund managers themselves could act as lenders and offer short-term credit lines to participating firms [26].

There is a broader risk to RBF programme outcomes if financing constraints are ignored. The lack of access to adequate working capital can lead to unmet distribution targets. Excessive debt burdens, exacerbated by high interest rates for loans in many low-income countries, can destabilise participating businesses, leading to market exits before results are achieved [25].

These issues are compounded by the way that participating companies bear the financial risk if predefined targets are not met, while having little say in programme design [35].

2c PAYMENT DISBURSEMENTS

One of the most frequently cited inefficiencies in RBF programmes is the delay in disbursements, which can slow the development of a competitive and sustainable energy sector [20, 31, 37–39, 41, 43, 55]. While some level of delay is inherent to the RBF model, there are reports of payments taking up to a year to process [25, 41, 52, 55]. Companies without sufficient reserves to absorb delays (often smaller firms) struggle to maintain operations; more established firms with the capacity to withstand the disbursement process will sometimes opt out of RBF programmes altogether, viewing the administrative burden and financial strain as unappealing [11–12, 20, 23, 25, 37]. The unpredictability of disbursements is also a significant barrier that makes financial planning and cashflow management difficult for participating companies [37].

Digitisation is often presented as a solution to speed up disbursements as it enables real-time monitoring, reducing manual verification costs and improving data quality [25, 38]. However, digital verification comes with its own costs, as seen in Mozambique's BRILHO RBF, where the required digital hardware increased product costs and created additional financial burdens for companies [25].

2d REAL-TIME ADAPTABILITY AND FLEXIBILITY

Flexibility is key to the success of RBF programmes, which must be able to adapt to inevitable shifts over time in markets, consumer preferences, and regulatory landscapes [24, 28, 34, 40, 56]. **Case Study 4** shows how flexibility enabled EnDev's pico-PV programme in Kenya to enhance inclusivity. One of the core advantages of RBFs is their ability to evolve without external donor approval, rendering them more responsive than traditional funding mechanisms [19–21, 28, 53, 57]. Adaptability works best when systemised and changes are communicated to companies with plenty of notice. Best practice includes embedding regular feedback mechanisms and annual reviews to guide real-time adjustments [11, 17–18, 29, 34, 44].

CASE STUDY 4: EnDev Pico-PV RBF in Kenya [37]

Between 2016 and 2019, EnDev ran a seemingly successful Pico-PV RBF in Kenya, surpassing their original target by 181% for a final distribution of 272,128 solar systems. However, only 23% of these sales were attributed to marginalised counties, linked to the logistical difficulties, and resultant higher costs, for partner companies operating in such rural communities. The RBF project benefited from a structure of biannual programme modifications; upon realisation that significant target populations were being underserved, they responded by introducing capping measures and reserving at least 30% of remaining funds for distribution to marginalised counties. However, the equity of the programme would have been even better served by targeting end-users as part of the design process, evidenced by Rwanda's Pro-Poor RBF.

A core aspect of requisite programme adaptation is the ability to adjust subsidy amounts. As discussed in Section 1c, setting the right incentive level is foundational to RBF performance. However, even well-designed subsidies may need to respond to currency fluctuations, regulatory changes, and evolving consumer demand [11, 17–18, 24, 29, 38, 40, 44]. Subsidy adjustments can also serve equity objectives. As further noted in Section 1c, the structure of subsidies directly impacts beneficiary types; course corrections can help address participation gaps [11, 36–38, 53]. For example, during one of EnDev Kenya's biannual

modifications, they identified that significant target populations were being underserved by RBF and responded by reserving at least 30% of remaining funds for distribution in marginalised counties (see **Case Study 4**) [37].

However, mid-programme adaptations are not without risks. In Rwanda, structural shifts between the pilot and scale-up phases of an EnDev RBF for solar home systems and mini-grids (transitioning from single to staggered disbursements) led to 'growing pains' as the programme had to restructure [52]. To mitigate such issues, it is recommended to design adaptation frameworks as part of the research design process, engaging not just with implementing partners but also with end-users. This will help ensure changes align with on-the-ground realities and that adequate notice of changes are provided to implementing partners [17–18, 29, 34].

2e PROGRAMME ADMINISTRATION

There was limited discussion about RBF administration, though it is acknowledged that effective programme management is critical to success. While specifics on best practice remain sparse, Bangladesh's Infrastructure Development Company Limited (IDCOL) Solar Home Systems Program was often cited as best practice: its administrative team held monthly meetings with partners to monitor progress, address challenges, and share lessons learned [21]. It is also essential for RBF funders to commit credibly to non-disbursement if programme conditions are unmet in order to maintain the incentive structure [34].

The fund manager plays a central role in overseeing implementation, ensuring transparency, and maintaining accountability [12]. Selecting an experienced and local fund manager with a genuine interest in the energy sector is critical. Beyond ensuring disbursements, they serve as a critical bridge between RBF, vulnerable consumers, and a post-programme sustainable market [17–18, 23]. There is therefore the potential for administration to serve a broader market-building function. Engaging local financial institutions in fund management can help develop domestic interest and build buy-in for renewable energy markets [17–18, 26]. Additionally, well-structured administration can support complementary financing mechanisms and ease financial constraints for participating companies [26]. Administrative costs are rarely divulged but likely significant. As such, it is important to prevent any potential systems of abuse; transparent third-party administrators are generally considered preferable to government-led oversight, reducing the risk of corruption or mismanagement while also improving programme efficiency and trust in the system [12, 41, 43].

Customer support is a key but often overlooked function of administration. Many beneficiaries face difficulties using newly acquired technologies, and effective issue resolution is crucial for long-term adoption and sustainability [58–59]. However, RBFs frequently lack adequate assistance structures for customers, leading to poor product uptake. Some sources recommend integrating training for local technicians into the programme design to ensure that beneficiaries receive quality ongoing support [18, 59].

2f MONITORING AND VERIFICATION

Monitoring and verification is widely recognised as one of the most challenging aspects of RBFs due to its cost, complexity, and time-intensity [20, 24–25, 27, 29, 32, 37, 41, 43–44, 59]. Rigorous verification is essential for accountability but also poses a major operational burden for participating companies. This reinforces the broader trend of RBFs favouring well-established market players [11, 16, 20, 25, 37, 38, 60]. Independent verifying agents are commonly used to maintain credibility, but concerns remain about data quality issues such as duplicated records and incomplete datasets [26, 37, 44]. Despite general agreement that verification

processes need to be improved, structural solutions remain limited, and efforts tend to focus on making existing methods more efficient rather than rethinking their fundamental design.

Monitoring and verification frameworks should be designed before implementation to help assess realistic costs, ensure adequate partner capacity, and reduce administrative burdens, linking to Section 1a [12, 16, 18, 20, 56, 60]. All verification methods come with trade-offs, though some are worse than others. Phone verification is less resource-intensive than field visits but may not work in rural areas with low phone ownership or unreliable networks [17, 61]. In-person verification is regarded as the most reliable method but is only viable for small-scale programmes due to logistical and cost constraints [12, 33, 60–61]. Even with technological improvements, verification remains inherently expensive and time-consuming, and some argue that 100% verification is not necessary for disbursements. A growing perspective suggests that programmes should be pragmatic, such as by accepting a small percentage of unverifiable claims or by adapting requirements for harder-to-reach markets [11, 16, 18].

Digitisation is widely seen as the best way to streamline monitoring and verification, promising to speed up processing times, reduce administrative overheads, and improve data quality [12, 17, 23, 27, 29, 36, 42–43, 52, 55]. Some point to hybrid models, where digital verification is complemented by selective field checks or technical support visits, as balancing efficiency with accuracy [11, 17]. Others highlight the potential for digital monitoring systems to attract additional RBF donors by demonstrating greater transparency and real-time tracking capabilities [12, 25]. However, digital verification presents its own challenges, particularly in clean cooking, where tracking usage is particularly difficult [27]. There is also concern that increased reliance on digital tools could inadvertently exclude certain populations, as illustrated in Case Study 5. Ensuring that digital systems align with local infrastructure, regulatory requirements, and device compatibility is essential for successful implementation [52].

CASE STUDY 5: EnDev Biogas RBF in Vietnam [11]

Between 2013 and 2018, EnDev conducted a biodigester RBF in Vietnam, which sold 43,800 units. An innovative strength of the programme was its introduction of a mobile app, for use by its more than 200 partner companies, to streamline reporting and verification. While easily adopted by younger generations, many older adults struggled to use this digital tool and some did not even own a smartphone, requisite to participate in the programme. Addressing this barrier involved active intervention and additional training by EnDev in order to avoid excluding this population from partnerships.

A key critique of current monitoring practices is that they typically only track distribution, not long-term uptake post-RBF, a truer barometer of impact [41]. Indonesia's Clean Cookstove Initiative was an RBF pilot that attempted to address this by splitting disbursements, distributing 70% upon sale and 30% after verifying continued use. However, difficulties in reliably collecting follow-up data made this approach impractical beyond the pilot stage [40]. There is interest in tying RBFs to social impact metrics such as gender and energy access outcomes; however, these indicators are difficult to verify compared to simple sales figures [45, 53, 60].

Stage 3: Programme Completion

3a EVALUATION

The literature search found very few independent, publicly available RBF evaluations. There are calls to share data and lessons learned for fine-tuning future interventions [17] alongside accusations that the sector is failing to do this

[22, 56]. Tearfund write, 'even the latest wave of results-based financing (RBF) schemes do not appear to take on board the lessons from earlier subsidy schemes that have failed to achieve sustained results. Systems have fallen into disrepair and service providers have exited the market' [22, pp.2–3].

There is an inherent disconnect in that the result being financed, generally an output-based target such as number of lanterns distributed, does not equate to achieving impact [22–23, 27, 41]. A potential quantitative solution has been proposed by 60 Decibels, an impact measurement company, whose tools have been used to examine end-user impacts for multiple RBF programmes [58–59]. However, these are usually performed at the end of the programme and do not give any insight into what happens post-completion. Several articles propose shifting RBFs away from their traditional indicators (units dispersed or energy produced/consumed) to outcome-based rewards (eg health, economic, or gender impacts) as an alternative [22–23, 42], but without suggestions about how this could be implemented in practice.

One of the primary motivators for RBFs is to reduce transaction costs, but there were surprisingly few mentions of cost-effectiveness. An SNV report on biogas programming in Vietnam found that RBF was more cost-effective than previous comparable initiatives but did not provide any numbers [11]. The EnDev RBF facility states a goal of limiting delivery costs (including management, TA, and verification) to 20% of the total budget, but has not yet reported on whether this was met [26]. The BGFZ evaluation reported programme management costs at 28% of funds dispersed, which compared favourably against other non-RBF energy access initiatives but exceeds the EnDev target [34].

One notable gap in the literature is the lack of discussion on what happens to unspent funds. The BGFZ evaluation is one of the few sources that mentions this issue, admitting that the programme only disbursed 60% of the available budget [34]. However, there is little exploration on the broader implications of whether these unspent funds are reallocated, returned to donors, or used to extend programme timelines. This lack of transparency raises questions about efficiency and financial planning within RBF programmes.

3b POST-PROGRAMME SUSTAINABILITY

RBFs have helped to kickstart and scale commercial energy markets [11, 23], but the literature frequently reports recurrent problems with sustainability after the end of the programme. This often consisted of providers retreating from the target post-RBF due to their inability to sustain their operations without further subsidisation or support, and in doing so retracting access to warranty and repair infrastructure [22, 31, 34, 41, 47]. Another common threat to long-term sustainability is the affordability of fuels, especially if they were subsidised during the programme, as explored in Sections 1e and 1f. For clean cooking projects, challenges with sustained adoption are pertinent and can occur for a multitude of reasons. An evaluation of an improved firewood stove programme in Rwanda found that 70% of recipients continued using their traditional stove alongside the improved stove, severely limiting the project's intended climate and health outcomes [60].

Programme design implications of different product types

The results described in the sections above point towards differing programme design considerations for cash sales solar products (which do not incorporate Internet of Things monitoring), PAYG solar products, improved cookstoves (which do not require a fuel switch), and clean cookstoves (which involve a change of fuel). These are listed in **Table 3** and can help practitioners tailor their RBFs to the specific technology.

***Table 3:** Key RBF programme differences between product types*

	Cash Sales Solar Products	PAYG Solar Products	Improved Cookstoves	Clean Cookstoves
Key lessons for RBF design	▪ Digital Measurement, Reporting, and Verification (dMRV) is feasible but may not be cost-efficient.	▪ Make sure that the target population has access to mobile phones and sufficient signal to support PAYG model. ▪ Subsidising ongoing payments for energy-as-a-service models is not recommended. ▪ dMRV is recommended.	▪ dMRV is generally unfeasible. ▪ Carbon credits can interfere with RBF additionality.	▪ Affordability and availability of fuel is a prerequisite for intervention success. ▪ Fuel subsidies are not recommended. ▪ dMRV is feasible but can incur substantial extra costs. ▪ Carbon credits can interfere with RBF additionality.
Description	Generally cheaper and lower-tier solutions than PAYG counterparts.	Generally higher-cost and higher-tier solutions than non-PAYG counterparts. These products use regular mobile phone networks, thus requiring mobile data access.	Generally cheaper, lower-tier solutions than clean cooking counterpart (although this is not always the case with the advent of Tier 4+ gasifier stoves).	Generally higher-cost and higher-tier solutions, like electric cooking appliances, LPG, biogas, pellets, and ethanol. These often involve a fuel switch for the end-user, which has ongoing affordability implications.
Typical business models	From an end-user perspective, systems have a one-off cost that may be partially or fully covered by RBF.	There are two main business models: 1) energy-as-a-service, whereby users pay a subscription fee or a fee per unit of energy used but never own the system, and 2) payment-in-instalments, where users make regular payments, with a view to fully owning an unlocked system after a pre-defined period.	From an end-user perspective stoves typically have a one-off cost that may be partially or fully covered by RBF.	Full range of options: one-off cost partially or fully covered by RBF, Energy-as-a-service, and payment-in-instalments.
Typical target market	Low-income, 'bottom of the pyramid' type households lacking energy access. Likely to live in rural or peri-urban areas with limited grid access.	Higher-income so can afford higher-tier systems. Mobile phone ownership a prerequisite to make payments. Likely to live in rural or peri-urban areas with limited grid access.	Low-income, 'bottom of the pyramid' type households lacking energy access. Likely to live in rural or peri-urban areas.	Higher-income households looking to switch to higher-tier solutions. Likely to live in urban areas.
Specific TA requirements	N/A	N/A	Awareness raising particularly important for clean cooking where there can be low motivation to switch to alternative cooking methods.	
Fuel supply considerations	N/A	N/A	N/A	Importance of an adequate fuel supply chain to support the distributed stoves. If fuel is not available and affordable then the solutions will not be adopted in the long-term.
Subsidy design	Two main models: free distribution or partial subsidy.	RBFs are typically used to subsidise upfront payments or equipment payments. For energy-as-a-service models, long-term ongoing payments need to be affordable for end-users after RBF ends, else the systems will not be adopted.	Two main models: free distribution or partial subsidy. Some distributors of low-cost improved cookstoves argue that the costs and complexity of partial subsidy models make no sense.	Fuel payments need to be affordable to end-users after RBF ends, else the systems will not be adopted.
Additionality	N/A	N/A	Carbon credits can provide substantial revenues to clean cooking implementers. There is lack of understanding on how to integrate these credits into clean cooking RBFs to avoid oversubsidising cookstoves and ensure additionality of RBF.	
Verification	dMRV is feasible but may not be cost-efficient.	dMRV capabilities already built into the PAYG system.	dMRV is often unfeasible due to the high cost of sensors plus the lack of connectivity and power.	dMRV is feasible for many of these solutions but can incur substantial extra costs.

6. Conclusions

This report presented the most exhaustive review of lessons learned from results-based finance (RBF) for energy access to date. It aggregated best practices on RBF design across a range of geographies and donors, alongside highlighting important areas for improvement. The findings point to seven key recommendations to help RBFs maximise their full potential:

1) **We recommend that every RBF programme should be accompanied by an independent evaluation that is made publicly available.** Evaluations should cover a full spectrum of stakeholder perspectives and provide information about costs and programme outcomes. The cost of the evaluation itself could be managed by adopting a standardised procedure, which would come with the added benefit of facilitating comparison between programmes.
2) **A set of RBF principles that promote best practices across the sector could help raise the quality of programming over time, allowing faster and cheaper programme deployment.** It is unrealistic to create a universal template for RBF programmes due to the need for context specificity and differing donor priorities. However, there is considerable scope for standardisation, particularly across operational details (eg approach to verification, processes for real-time adaptability and flexibility, and establishment of working groups for stakeholder consultation throughout the fund window). Importantly, the principles should be used to promote inclusion in RBF design, implementation and completion, to ensure that a broad spectrum of stakeholder inputs are incorporated and to ensure robust processes for programme flexibility and adaptation.
3) **Inter-donor adoption of common monitoring and verification platforms could help to address some of the barriers to payment disbursements and enable real-time impact tracking.** This would improve transparency about programme achievements and help to quantify the contribution of RBFs to energy access goals. However, these platforms may not be appropriate for all technologies and contexts.
4) **Collaboration between donors could help to avoid duplication of their efforts, to prevent double-dipping of multiple schemes by companies and to eliminate unnecessary market distortions.**
5) **Further collaborations between different stakeholder types could help to ensure buy-in from companies and investors and have further-reaching benefits.** These include increased competition, the attraction of more private capital, and faster deployment of funds. This requires involving relevant actors for meaningful consultation at the design stage and close coordination thereafter. GOGLA's Policy Working Groups are already active and available for the off-grid solar sector; the clean cooking sector may benefit from a parallel initiative.
6) **Working groups could also provide platforms for solving outstanding challenges in the energy access RBF ecosystem.** These challenges include how to rigorously set subsidy levels; the role of RBFs in building local markets versus simply maximising distribution; how to monitor and verify performance of products that are not Internet of Things (IoT) enabled; improved and systematic methodologies for tracking impacts and course correcting on the go; and best practices for technical assistance.
7) **Finally, the opacity surrounding the achievements and failures of energy access RBFs is likely preventing the sector from being as efficient as it could be.** We therefore recommend a follow-up study to capture real experiences and outcomes from programmes to date. This could consist of two components: i) a review of relevant donor reports and evaluations that are currently not publicly available; and ii) qualitative interviews to capture the perspectives and experiences of stakeholders involved (donors, implementing companies, governments, end-users) in a range of successful and failed programmes.

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"The views expressed in this material do not necessarily reflect the UK government's official policies."

ACKNOWLEDGEMENTS

The authors would like to thank University College London, the Climate Compatible Growth (CCG) programme and A2EI for supporting this work. We would also like to thank the following people for taking time to share their valuable inputs on an earlier draft: Thomas Duveau (A2EI), Thomas Gottschalk (A2EI), Julia Tomei (University College London), Jim Watson (University College London), Mark O'Keefe (Sun King), Jean-Louis Racine (Clean Cooking Alliance), Drew Corbyn (GOGLA), Stefan Zelazny (A2EI), Federico Hinrichs (World Bank), Andrew Kent (World Bank), Sarah Melissa Leitner (GIZ), Eva-Maria Braendle (GIZ), Myrte van der Spek (RVO), Marcel Raats (RVO), Olivia de Vesci (GIZ) and Iwona Bisaga (GPA). Thank you to Sarel Greyling (Sarel Greyling Creative) for the design of this document.

This material has been produced with support from CCG, which brings together leading research organisations and is led out of the STEER centre, Loughborough University. CCG is funded by UK aid from the UK government. However, the views expressed herein do not necessarily reflect the UK government's official policies.

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