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Transforming energy access markets with Results-based Financing

Lessons from 7 years of implementation
under EnDev's RBF Facility financed by UK Aid

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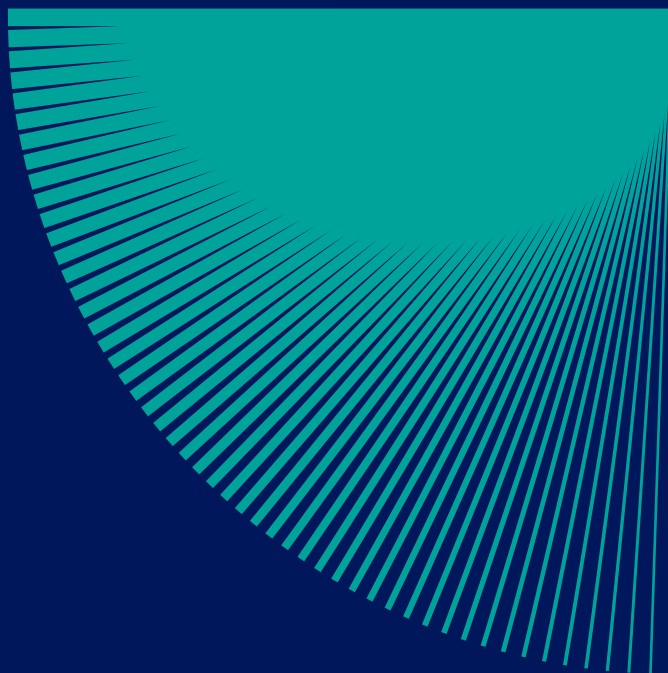
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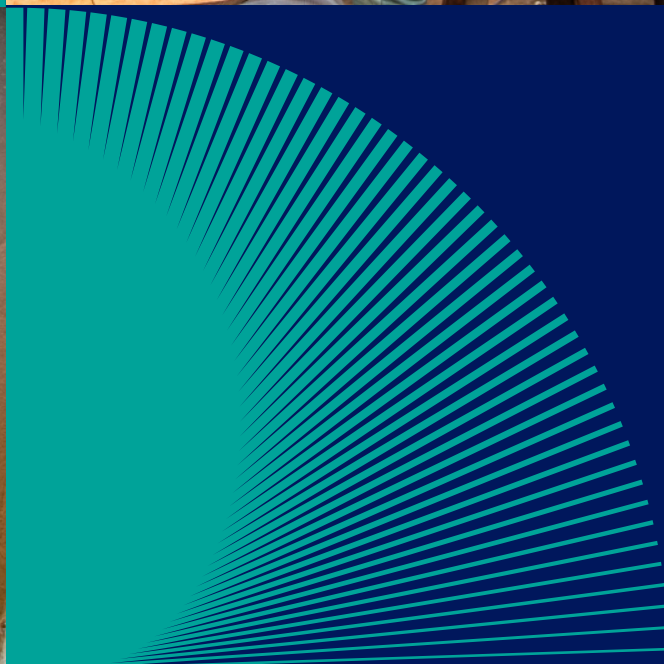
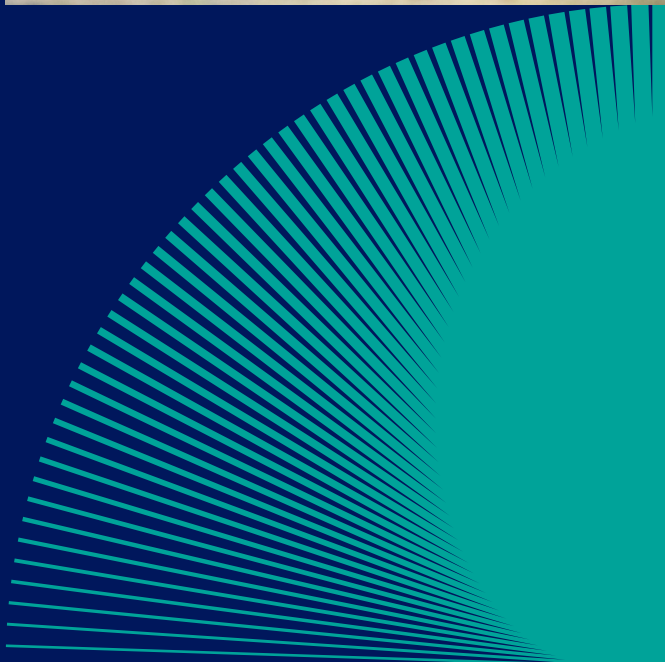
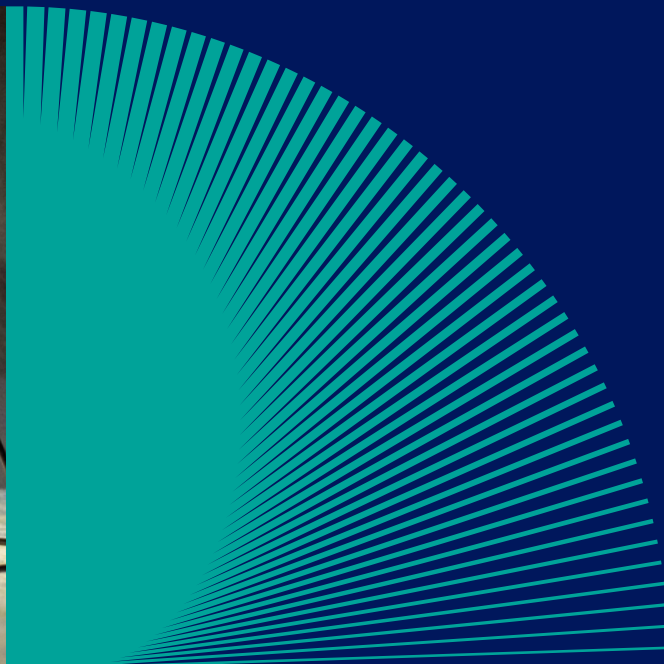
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Acronyms and Abbreviations

BMZ	German Federal Ministry for Economic Cooperation and Development
BoP	Bottom-of-the-Pyramid Customers
CLASP	Collaborative Labelling and Appliance Standard Program
DFID	(Former) UK Department for International Development
DGIS	Directorate General for International Cooperation
EnDev	Energising Development
ESMAP	Energy Sector Management Assistance Program
FCDO	UK Foreign, Commonwealth & Development Office
FI	Financial Institution
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GPRBA	Global Partnership for Results-based Aid
HIVOS	Humanistisch Instituut voor Ontwikkelingssamenwerking
ICF	International Climate Fund
ICS	Improved Cookstoves
IVA	Independent Verification Agent
MFI	Micro Finance Institution
NORAD	Norwegian Ministry of Foreign Affairs
PICS	Portable Improved Cookstoves
RBF	Results-based Financing
RVO	Netherlands Enterprise Agency
SACCO	Savings and Credit Cooperative Society
SDC	Swiss Agency for Development and Cooperation
SDG	Sustainable Development Goal
SHS	Solar Home System
SIDA	Swedish International Development Cooperation Agency
SIINC	Social Impact Incentives
SNV	Netherlands Development Organisation
SREP	Scaling-Up Renewable Energy Program
TA	Technical Assistance

Foreword

In May 2012 UK Aid asked us to embark on a journey: with £40 million of co-funding from the UK's International Climate Fund (ICF), the Energising Development (EnDev) programme piloted the first Results-based Financing (RBF) approaches aimed at enhancing energy access markets. The so-called RBF Facility set out to implement a great variety of pilot projects in partner countries all around the world. Although RBF as an approach was not new at the time, applying RBF as an instrument to transform energy access markets was ground-breaking. The key objective of EnDev's RBF Facility was to overcome market failures constraining the private sector's delivery of renewable energy systems—systems which are integral for providing modern energy services to the poor. Designed as a large-scale real time laboratory, diversity and learning were at the centre of the Facility's implementation. Diversity could be found in EnDev's RBF designs, technologies, geographic scope and target groups, among others. Working with the private sector, testing RBF in different market settings and observing our successes and failures contributed to programme learning. Against this backdrop, EnDev's RBF Facility quickly evolved into an incubator for new ideas, creativity and innovative types of RBF.

After seven years of working with a range of highly diverse RBF approaches implemented across 17 projects in 14 countries in Africa, Asia and Latin America, it is time to harvest the fruits of all the experiences made. EnDev welcomes the opportunity to share these lessons learnt in the following report. The RBF approach has proven to be a cost-efficient means of nudging the private sector to deliver energy access services to the base-of-the-pyramid in developing countries; Prompting it to do so at a larger scale, with better quality and in a more sustainable manner.

The Facility's implementation has been a journey which particularly at the beginning did not show the traction that some stakeholders hoped for—as a backloaded approach, RBF requires patience before results become visible. This patience paid off. At the end of our journey, we can proudly announce that the RBF Facility exceeded original targets and provided energy access for around 5.8 million people.

Today, RBF has become a broadly applied approach which complements more traditional instruments in EnDev's portfolio—even for very targeted interventions such as COVID-19 response measures. RBF has also found its way into the toolkit of development cooperation across the entire energy access sector. Along with other global initiatives such as GPRBA, ESMAP and Energy+, EnDev's RBF Facility has helped to deliver proof-of-concept of Results-based Financing in the energy access arena. While the RBF Facility is closing its doors, EnDev is and will remain a trailblazer when it comes to RBF approaches in the energy access sector. Our objective is to continue developing innovative and adaptive RBF designs. These next generation RBF approaches are looking into fine-tuning beneficiary targeting or incentivizing companies for the achievement of impacts.

As we continue our RBF journey, EnDev strives to share lessons learnt within and beyond the energy access community. Seeking further cooperation opportunities and fostering partnerships is a key aspect of this. With that in mind, we hope that this publication will be of added value—and will inspire others to take RBF approaches for energy access to the next level.



Barbara Richard
EnDev Team Leader



Daniel Busche
EnDev Programme Director

The background features a large teal circle on the right side, with numerous thin, dark blue lines radiating from its center towards the left edge of the frame. The word "Introduction" is written in white, bold, sans-serif font, positioned horizontally across the middle of the image, partially overlapping the teal circle and the radiating lines.

Introduction

1

Background

Approximately 789 million people worldwide lack access to electricity, and almost 3 billion people still cook daily on open fires.¹ This has a dramatic impact on people's quality of life, including education and income opportunities, as well as our climate and environment. EnDev's involvement focuses on providing access to the modern, renewable energy that is crucial to well-being and economic advancement.

EnDev improves the lives of people in low-income countries, including the most vulnerable—ensuring that no one is left behind. Economic opportunities and green jobs are created by building markets for modern, renewable energy that simultaneously reduce greenhouse gas emissions and protect the planet's climate. EnDev's approach is to empower

structural, self-sustaining change—kickstarting market and sector development that continues independently.

EnDev is a strategic partnership. Dedicated donors, partners and individuals work together to support social and economic development by providing access to modern, renewable energy in more than 20 low-income countries around the globe. The driving force behind EnDev is the strong partnership of like-minded donors that include the governments of Germany, the Netherlands, Norway, Switzerland, and the United Kingdom—donors who are committed to accelerating energy access and socio-economic development. The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and the Netherlands Enterprise Agency (RVO.nl) act as the principal agencies for programme coordination.

¹ IEA/IRENA/UNSD/World Bank/WHO (2020): Tracking SDG 7: The Energy Progress Report. Washington, D. C.: World Bank.

With funding provided by UK Aid through the Foreign, Commonwealth & Development Office (FCDO) (formerly DFID), EnDev's RBF Facility piloted 17 projects across 14 countries in Africa, Asia and Latin America from 2013 to 2020. Projects covered a wide range of modern energy technologies to enhance energy access markets. Implementing agencies were GIZ, CLASP, HIVOS, Practical Action, and SNV.

With many highs and lows throughout the process, implementing the RBF Facility provided a rich source of lessons learnt. This report is a compilation of EnDev's experiences from seven years of implementing a broad portfolio of RBF projects in energy access markets. It includes insights from working with the private sector in developing countries. The publication gives an overview of which RBF approaches and design features worked in which circumstances and why. The document builds on EnDev's 2018 report on lessons learnt², enriching it with experiences from the entire implementation period. In addition, it incorporates findings from the Final Evaluation of the RBF Facility conducted in 2020.³ This report also provides a summary of how to verify RBF results (see chapter 5), but readers interested in a more in-depth discussion of this topic

should also consult EnDev's specific publication on lessons learnt from RBF verification.⁴ A number of recommendations for RBF project design and implementation were developed for this publication and may serve as a guide for future RBF project implementers.

In this report you will find the following: Chapter 1 defines the scope of RBF and provides an overview of the EnDev RBF Facility portfolio and its results. Chapter 2 highlights the importance of doublechecking if RBF is the most suitable instrument in a given context. Chapter 3 describes the options for positioning the strategic focus and design of projects aiming to transform energy markets and reach vulnerable populations. This includes recommendations on how to set appropriate incentives and addresses issues such as the choice of implementation partners, budgeting and portfolio management. Chapter 5 shares EnDev's experience in running RBF projects. This chapter highlights lessons learnt when working with the private sector, the importance of adaptive management and the vital topic of planning for an exit. The last section is a summary of the most important success factors for designing and implementing RBF projects for energy access.



² EnDev 2018: Results-based Financing for Energy Access. How to design and implement projects: Lessons from the field. Eschborn: GIZ.

³ The final evaluation of the RBF Facility will become available online at: <https://endev.info>.

⁴ EnDev 2020: Rigorous Verification of Results: Value for Money or Waste of Time? Lessons from 7 years of applying Results-based Financing in Energy Access Markets. Eschborn: GIZ. Available online at: <https://endev.info/rigorous-verification-of-results-value-for-money-or-waste-of-time/>

What is RBF?

RBF is a mechanism whereby a donor (or implementer) disburses funds to a recipient once a pre-agreed set of results has been achieved. This approach involves three key principles: firstly, payments are made only after the results have been achieved; secondly, the recipient may independently choose how to achieve these results; and lastly, independent verification of results as the trigger for disbursement. RBF is therefore fundamentally different from more traditional upfront financing approaches in development cooperation where funding is provided in advance to finance inputs and activities. It allows for increased accountability of both the donor and the recipient by providing verifiable evidence that the agreed results have been achieved. It is also a hands-off approach, allowing the recipient to be in the driver's seat and craft their own strategy to achieve results.

In the last 10 years such approaches have become increasingly common in fields as diverse as health, education, forestry and energy. Results-based approaches can target governments or public institutions in the delivery of public goods (mostly referred to as results- or output-based aid—RBA or OBA). However, it can also target the private sector or civil society organisations. In such contexts, the term RBF is more commonly used.

Results-based approaches shift the financial risk associated with the non-delivery of results from the donor to the recipient. Depending on the degree of risk-sharing between donor and recipient, payments arrive at different times. The most common is payments made upon final or intermediate outcomes, while more innovative approaches are now pushing the intended results to the impact level. Most RBF approaches financially reward progress in an incremental way. For example, the number of electricity connections or tonnes of CO₂ saved

can be rewarded proportionally as progress is made.⁵ This approach to financing results means that RBF has the potential to create competition among recipients, i. e. by rewarding the fastest movers. It thereby increases efficiency and effectiveness compared to traditional development approaches. By tying funding to results, the focus of recipients shifts from processes towards results. This re-focus requires the recipient to address the bottlenecks and challenges that hinder the achievement of results, allowing structural change to emerge. In line with this logic, results-based approaches can help to address typical market failures such as externalities, information asymmetry, market power concentration, coordination failures and the failure to produce public goods.⁶

For example, RBF approaches can help to overcome the problem of information asymmetry between donor and recipient. If companies are the recipients, one can assume that they know their local markets much better than any donor or implementing agency. They typically know whom to sell what kind of product under which financial terms, and they are also familiar with the regulatory environment and its enforcement in practice. Instead of imposing business decisions, the RBF approach simply offers companies a reward for each result achieved without much interference into their business strategy. This flexibility encourages innovation. Recipient autonomy may also prompt them to improve their existing delivery infrastructure, which makes sustainable, long-term change more likely.⁷ EnDev's RBF Facility aimed to expand energy access markets by building on this approach.



5 SIDA 2015. Results Based Financing Approaches (RBFA)—what are they?

6 Vivid Economics. 2013. Results-based Financing in the Energy Sector: An Analytical Guide. Energy Management Assistance Program (ESMAP); Technical Report 004/13, World Bank, Washington D. C.

7 For more information, see: World Bank Group; Frankfurt School of Finance and Management. 2017. Results-Based Climate Finance in Practice: Delivering Climate Finance for Low-Carbon Development. World Bank, Washington D. C.

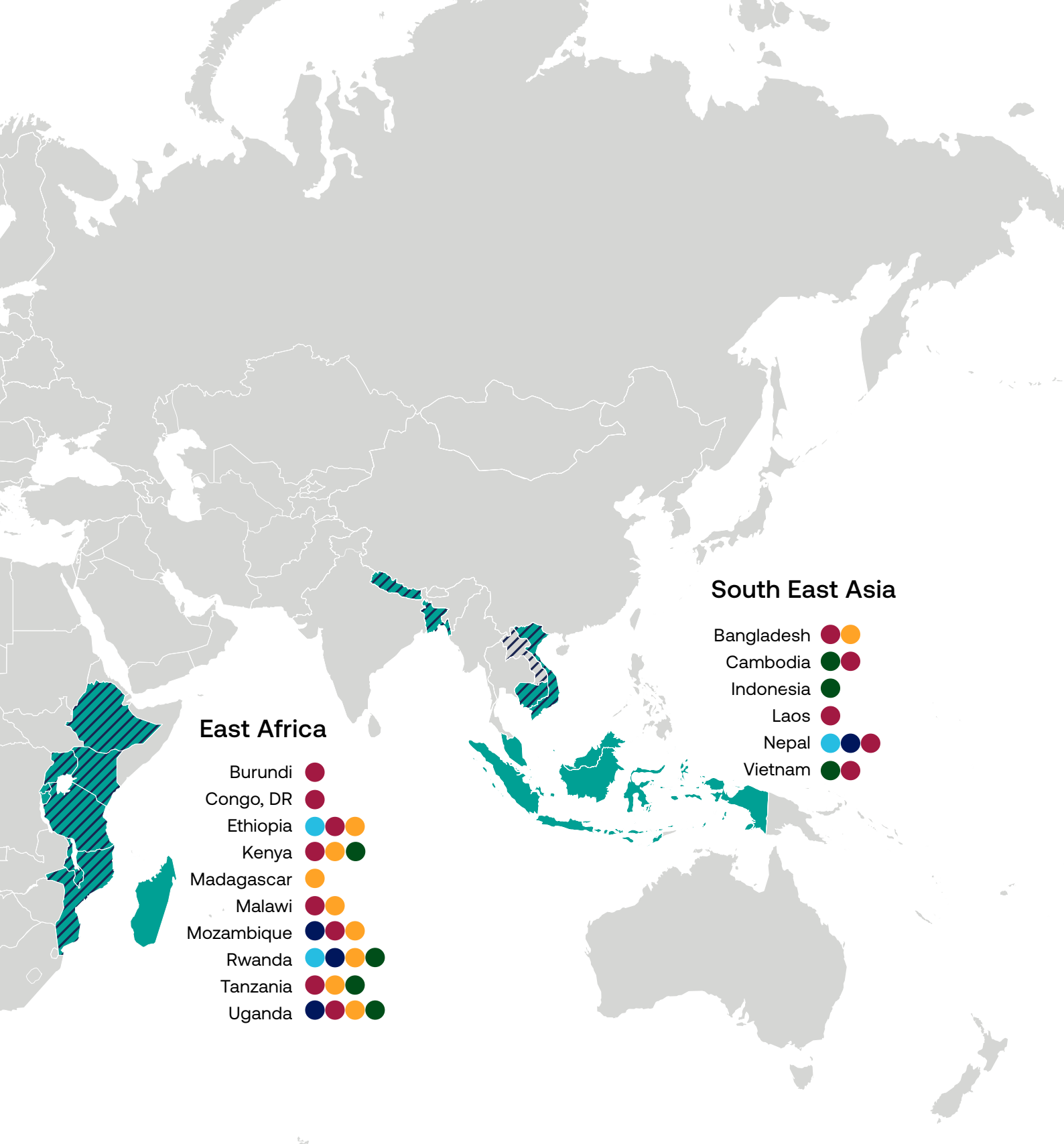
Activities worldwide

South America


Bolivia ●●●
Peru ●●

West Africa

Benin ●●●
(Guinea) ●
Liberia ●●
Mali ●●●
Senegal ●●●
Sierra Leone ●








Geographic portfolio

 EnDev country measure as of Dec. 2020

 EnDev RBF Facility project

Energy access portfolio

 Hydro power
  Grid
  Cooking energy
  Solar energy
  Biogas



The EnDev RBF Facility

EnDev's RBF Facility aimed to increase access to modern energy in low-income countries by providing financial incentives to private businesses active in the delivery of energy products and services. The key objective of the Facility was to overcome the market failures and barriers which constrain private sector from delivering modern renewable energy services to the poor. Through financial incentives, the RBF Facility increased returns for companies serving these markets. However, these increases profits only lasted for the fixed project period of the Facility. The underlying hypothesis of this approach was that the use of RBF will trigger in the medium to long-term private investment and improve access to finance for the private sector. RBF acts as a risk mitigation measure for the private sector when venturing into new business models, targeting poor client groups, introducing new products and services and/or expanding business operations into new areas. Once these new business segments have proven to be viable, private sector and investors can assess the potential to leverage economies of scale. The Facility's RBF approach is therefore fundamentally about speeding up market growth and triggering lasting market transformation.

Incentive recipients were companies that sell and operate modern energy products, services or systems. In line with the key principles of RBF approaches, the companies received payments contingent upon the achievement of agreed results. These results were defined as delivering modern energy technologies or services to customers. Recipients of incentives, i. e. companies, were free to choose how they achieve these results. Independent verification of companies' results functioned as the trigger for disbursement. The delivery risk in this approach rested with the companies and the approach foresaw the lion's share of the Facility's budget to be directly allocated to the recipients in form of financial incentives. It did not foresee significant project engagement in technical assistance (TA). Recipients, mostly private sector companies, were identified through competitive calls and usually benefited from the RBF incentives on a 'first come, first served' basis. Due to the strong focus on financial incentives, rather than TA measures, recipients were typically well-established companies with a good track record in the energy access sector.

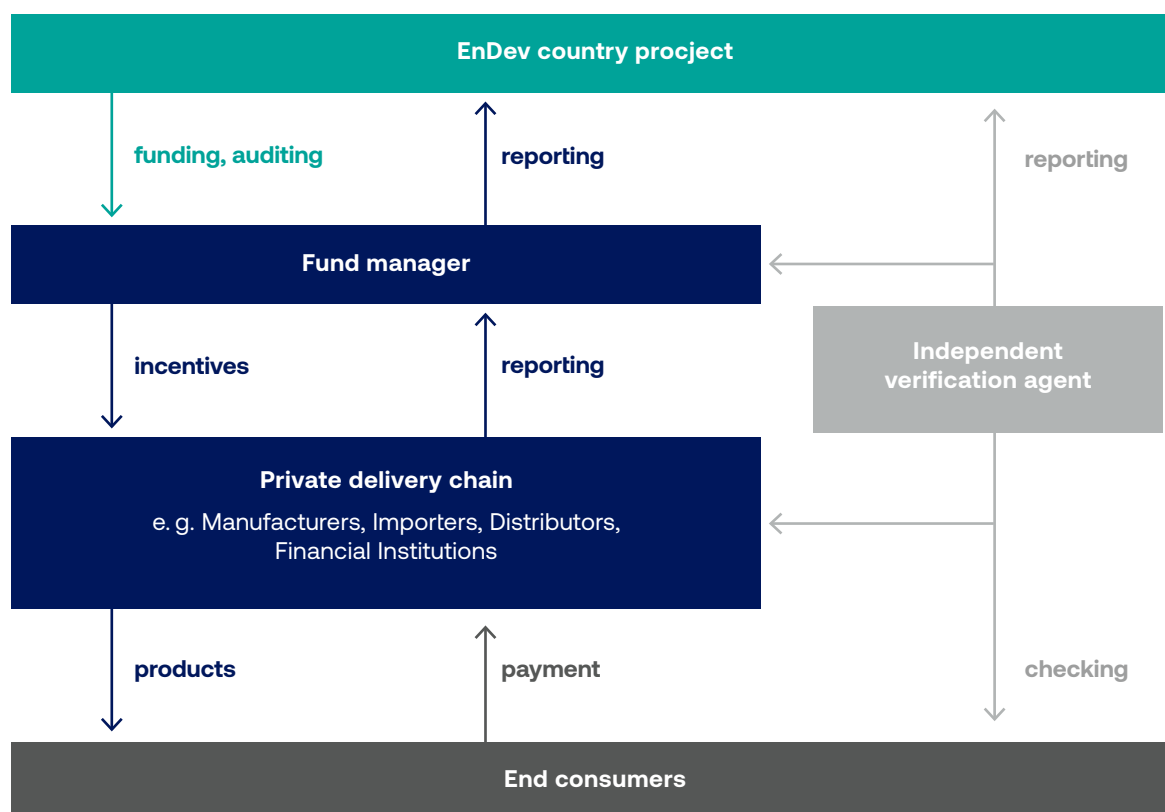


Figure 1: Typical set-up of an EnDev RBF Facility project

In terms of project management, it was either the implementing agencies themselves who acted as the RBF fund manager or this task was outsourced to a local financial institution (FI). The fund manager was in charge of selecting and contracting companies, supervising independent verification agents (IVAs) as well as disbursing incentives. A typical EnDev RBF project design is depicted in the graphic above.

The EnDev RBF Facility followed two overarching principles: diversity and learning. On the conceptual side, it sought to establish whether the RBF approach offers an efficient and ‘value-for-money’ approach for promoting low-carbon energy access in developing countries. The Facility aimed to analyse the strengths and weaknesses of different RBF approaches, to draw lessons learnt and to develop recommendations for future applications of RBF interventions in the field of energy access.

A strong learning agenda and strive for diversity thus drove the project selection process. The portfolio was designed to represent diverse RBF designs, target groups, technologies and geographic areas. With three consecutive calls for project proposals, the Facility encouraged implementing agencies to come up with innovative RBF interventions tailor-made to the market challenges of their partner countries. In the end, this competitive and bottom-up process resulted in 17 RBF projects in 14 countries with various design concepts. The following chart provides an overview of the RBF Facility’s project portfolio.

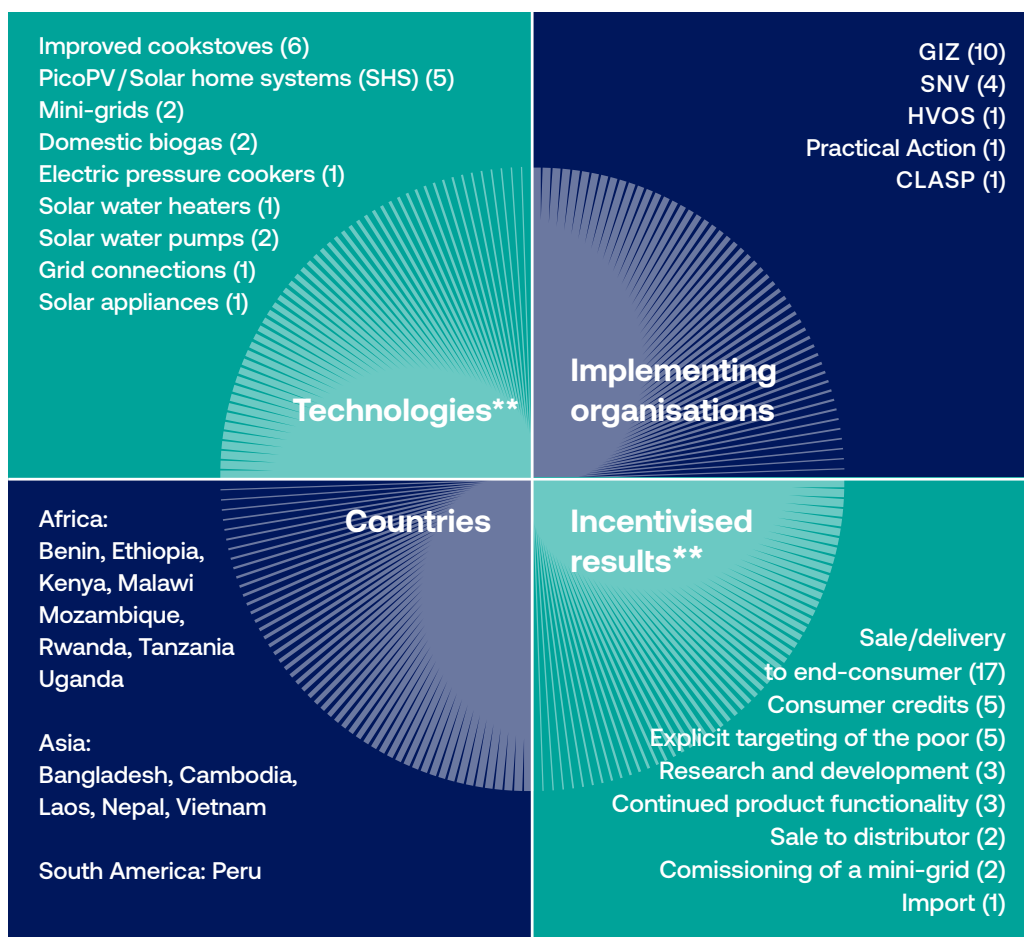
Total volume: GBP 40,000,000*

Overall duration: 07/2012–12/2020

Objective: To overcome market failures constraining private sector delivery of distributed renewable energy systems providing modern energy services to the poor

Portfolio: 17 RBF projects selected in three competitive calls

Projects:



* Total funding committed by UK Aid amounts to approximately EUR 46,000,000

** In some projects more than one technology / type of result has been incentivized

Figure 2: The EnDev RBF portfolio

The market dynamics on the ground required constant adjustments at the project level (see [section on adaptive management in chapter 4](#)), which further broadened the variety in RBF project design across the EnDev RBF Facility's portfolio. On the one hand, adaptive management enabled EnDev to work towards its broad set of key performance indicators of the RBF Facility on portfolio level. On the other hand, individual tailoring has resulted in a rising level of complexity, which also increased transaction costs. Nevertheless, the diversity of approaches of the EnDev RBF Facility was fruitful. It helped to generate a broad range of lessons learnt, of which the most important ones are captured in this report.

The diversity of projects was an asset, but it also created challenges. The Facility had to balance between tailoring interventions to local conditions on the one hand, and creating simple, transparent designs and processes on the other. For EnDev, managing an RBF Facility with 17 projects therefore called for flexibility not just at the project level, but also at the overall management level of the Facility. In this sense, the RBF Facility was at an advantage because it could draw on the EnDev program's long-term presence in partner countries. EnDev country teams could build on established local sector networks with partner governments, the private sector, civil society and other development partners. Another success factor was EnDev's established coordination, monitoring and support systems at headquarter level, which provided an effective portfolio management and backup for adaptive management at the project level.

Future RBF projects in the energy sector might want to place more focus on either specific RBF approaches (e.g. [the prototype approaches discussed in chapter 3](#)), one set of energy access technologies, or a particular geographic region. A more focused approach could also deepen the learning aspect. For example, comparing several projects of the same tech-

nology to each other (e.g. various SHS RBF projects) could generate a more detailed analysis of cause-effect relationships and add another layer to the lessons learnt. For proven RBF intervention concepts, the logical next step is to increase their scale, thereby improving efficiency, reaching higher absolute energy access results and making a greater contribution to the objectives of the Agenda 2030.

Key outcomes

Between 2012 and 2020 EnDev's RBF Facility achieved the following key outcomes:

- 5.8 million people have gained access to modern energy services at an efficient cost of under EUR 6.60 per person.⁸
- More than 1,388,000 devices—such as solar systems, solar appliances, improved cookstoves and biogas digesters—have been sold.
- The total installed renewable energy capacity of PicoPV, solar lighting and mini-grid projects combined is 2,750 kW.
- Reductions in emissions equivalent to 7.1 million tonnes CO₂ will be achieved over the lifetime of the sold products.
- 8,900 companies and entrepreneurs directly benefited from RBF projects either by receiving incentives or by gaining access to energy.
- On average, every euro spent by the EnDev RBF Facility leveraged EUR 5.1 of private investment.
- Altogether, 11,200 jobs have been created—nearly 3,800 of these were for women. These new jobs include, among others, entrepreneurs who sell solar systems and manufacturers of efficient cookstoves.



MW

-CO₂



⁸ Cost-efficiency is calculated by dividing total programme costs to date by beneficiaries reached with energy access.

Figure 3 below summarises the RBF Facility's achievements in terms of people provided with energy access over time. The horizontal axis shows the accumulated contributions of the various RBF projects to the Facility's total number of people who gained energy access. For example, the RBF project in Kenya (in dark green) showed a constant growth of people who gained access to electricity thanks to the project's promotion of solar home systems (SHS). The long take-up phase of many RBF

projects highlights the significant time demand that planning and preparation of market acceleration programmes necessitates. Several RBF projects that were initially planned to last for 3 years were extended, enabling their full market transformation potential to develop. The RBF Facility's experience reveals two key takeaways: successful RBF schemes need (1) significant initial efforts to set up all structures; and (2) patience while waiting for the final results to materialize.

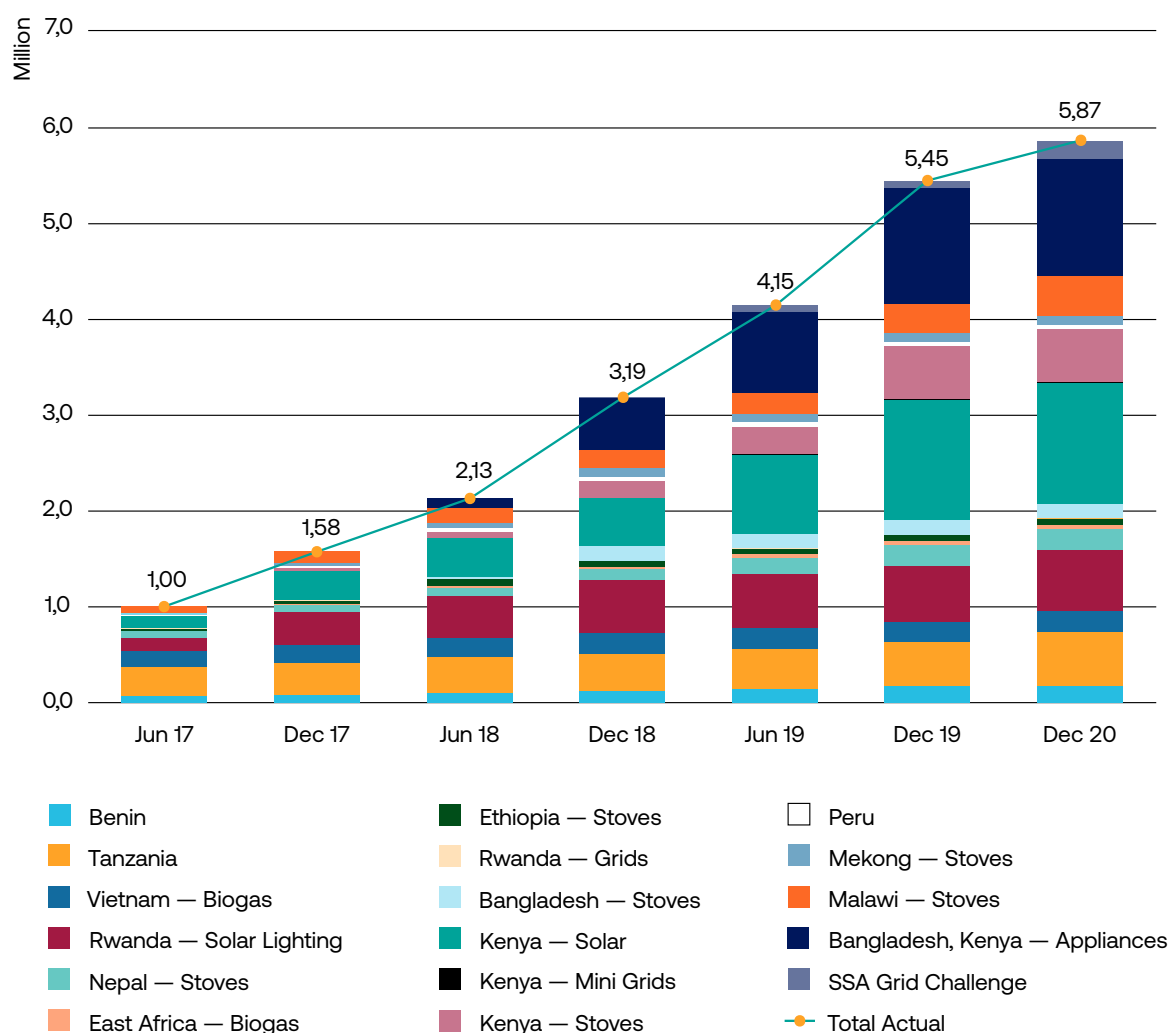


Figure 3: RBF Facility—Total number of people with access to energy—2014–2020



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Deciding on RBF



2

Know your market

As mentioned above, in the past couple of years there has been increased attention within development cooperation towards approaches that include “payment by results” modalities such as RBF and Output-based Aid (OBA). RBF concepts that engage the private sector have gained particular prominence. But is this always the best approach?

A thorough and comprehensive **market analysis** should be able to provide the answer. It should give a good understanding of the market of interests, its key stakeholders, and the

existing barriers that keep the market from reaching scale, reducing costs and improving services. EnDev’s experience has shown that a systematic and in-depth market and context analysis before the project start clearly correlates with successful project performance. Incomplete context analyses, or incorrect conclusions from the analyses, can quickly translate into delays or a slow or even non-uptake of the incentives during implementation. Other unintended results can be, for instance, inadvertently supporting better-off households instead of targeting the poor.



Understanding the rural stove market in Ethiopia

EnDev's RBF project in Ethiopia aimed to enhance the market for improved cookstoves (ICS) in rural areas. Due to the absence of retail channels for ICS in these areas, the product was inaccessible for the majority of rural households. At the same time, transportation costs made the stoves both unaffordable for rural households and unattractive for enterprises who would otherwise wish to enter this market.

The RBF project aimed to overcome these key market barriers by offering incentives to rural-based energy and agricultural cooperatives which were well established in Ethiopia and had a broad rural network. The incentives, which the cooperatives could receive for the sale of stoves to rural households, were calculated to cover transportation costs, other overheads, and a modest profit. The assumption was that cooperatives would buy stoves from existing urban production centres and sell them to rural households. Through this approach, EnDev anticipated that the number of stoves in rural areas would increase and lead to higher consumer awareness in the medium-term. This would provide a strong foundation for the eventual establishment of more profitable market structures. However, just as the project was about to start it became clear that most cooperatives were overwhelmed by the project's requirements. Completing the application process, especially the documentation and reporting procedures for the verification of results, was one common challenge. Familiarising all involved stakeholders with the RBF concept and procedures to enable their participation required considerable time and technical assistance. Despite expectations, the cooperatives did not pro-

actively search for reliable and quality urban-based stove providers, but instead relied on the project to do the matchmaking. All of these aspects led to an intensive project preparation phase and delays in implementation. In hindsight, a comprehensive market and stakeholder analysis that considered these factors might have led to a different project design and better targeted relevant barriers in the rural ICS market. After two years—based on the learnings and experiences described above—the approach was adjusted accordingly. By shifting from working directly with the rural cooperatives to working with the stove producers, more than 25,000 stoves were sold in the last 18 months of the project to rural households. Producers themselves could now decide how and where to sell their stoves, while at the same time directly benefitting from the incentives and optimally investing them in the growth of their businesses.

In conclusion, this example highlights the importance of knowing and incentivising the right actors in the supply chain. Additionally, it demonstrates that the success of an RBF project is often dependent on its ability to deploy adaptive management.



Developing markets are, by their very nature, complex. It can be challenging to identify and predict all the internal and external factors that influence how a specific market will develop. The objective of a market analysis is to **identify barriers** that prevent the private sector from delivering products and services to populations that are underserved or not reached at all. It is important to identify and assess the most relevant aspects—and check them for existing challenges—when conducting a market analysis in preparation for an RBF project. These include:

- Product availability and accessibility;
- The extent of existing distribution and retail channels for the product, especially for ‘last mile’ communities;
- Consumer demand for and awareness of modern energy technologies;
- Access to finance for companies and consumers;
- Legal and regulatory framework conditions;
- Existing and potential sector stakeholders (companies, NGOs as well as national or donor funded programmes and initiatives), their market interventions and sector coordination;

- Specific cultural factors and level of market experience of the partners that may affect distribution or consumer uptake.

A thorough assessment of these aspects will allow RBF project developers to effectively design their projects.

Stakeholder mapping and the analysis of **ongoing sector support programmes** are at the heart of promising RBF designs and their successful implementation. Experience reveals that other programmes represent both an opportunity and a threat to RBF projects. While an RBF project is limited to the payment of financial incentives, programmes focusing on technical assistance (TA) can often complement its work. However, when a ‘competing’ programme offers up-front grants for the same products or services, the RBF approach will be less attractive for companies. Even if RBF appears to be an effective and appropriate mechanism for a specific context, other existing programmes and policies may already sufficiently address the barriers identified by the RBF project. In such cases, the RBF project would not be effective and would only provide limited additional impact to ongoing efforts.

The activities of existing programmes should therefore be factored into the project design and management must be flexible enough to react to emerging programmes and policy changes during the course of implementation (see [chapter 4 on management](#)). This conclusion also underscores the fact that market analysis and observation are not one-off tasks—they should be carried out regularly for a project to stay abreast of market dynamics. Other implementing organisations' previous experiences in the country and knowledge of the sector can be utilised by RBF projects to help facilitate a better understanding of the context. However, not all risks and context changes can be anticipated. Like any intervention adopting a market-based approach, RBF projects always remain exposed to external effects and changing political priorities and market regulations.



Is RBF the right tool?

As discussed in the previous section, deciding whether RBF is the right tool depends on a variety of factors, including market conditions. RBF is not a silver bullet—in some cases a thorough market analysis may reveal that RBF is not the missing link in the overall support landscape and might lead to the decision NOT to introduce an RBF.

Once barriers have been clearly identified in the market analysis, project developers should reflect honestly on to what extent RBF is the most appropriate instrument to overcome key barriers. As a flexible financing instrument, there are some typical **market barriers which can be addressed with RBF**:

- On the supply side, there may be bottlenecks in importing energy access products on a scale that allows for price reductions. Appropriate products are available from international manufacturers, but local distributors might only order small volumes and thus face high prices. An RBF payment on every successful import can motivate companies to order in bulk and receive better pricing due to economies of scale, eventually increasing their turnover.
- On the demand side, a low ability and/or willingness to pay is the major challenge. This is especially true for rural households that tend to have lower incomes. In addition, a lack of rural distribution channels, consumer financing options, and specific business models for remote and poor customer may keep local companies from serving last-mile and BoP (Bottom-of-the-Pyramid) customers. An RBF incentive targeting lower-income customers and remote areas can help to overcome the risk adversity of suppliers.
- Even if products are available, there may be a mismatch between the products on offer and customer demand: available products may not match demand due to quality issues, inappropriateness of design, or non-conformance with national standards. Local manufacturers may avoid the necessary innovation to combat this gap due to the high risk of return on investments in

R&D. RBF can help to mitigate these risks by offering payments upon successful product innovations.

The market analysis and barrier assessment will likely reveal that an RBF intervention alone is not sufficient. There are usually some **market barriers which require complementary measures and cannot be overcome by RBF alone**:

- Access to finance is an important topic as RBF requires companies to be able to finance all their interventions upfront until the RBF incentives are paid. If companies do not yet have access to finance (e.g. via investors or parent companies), it is essential to bring in or set-up complementary loan facilities of national financial institutions, development banks or other donor financed programmes to close that gap. An early consideration of how the RBF project can fit into the existing financing landscape is therefore crucial.
- Improving the enabling environment is another typical challenge which cannot be tackled by RBF alone. Technical assistance (TA) is the conventional approach for fostering stakeholder dialogues and supporting private sector associations, but is also used to advise national ministries, regulation authorities and other governmental stakeholders in the design and implementation of sector policies, market regulations, and product standards. Thereby, TA also facilitates the long-term funding for a conducive enabling env of energy access markets.

Mini-grid development is a sample sub-sector for which the pros and cons of using an RBF mechanism need to be well appraised. In general, applying RBF to infrastructure projects such as mini-grids requires overcoming a broad range of challenges and barriers. RBF can make a difference for mini-grid developers, but only if several preconditions are fulfilled. The following section summarises typical mini-grid barriers and then discusses which barriers can, and cannot, be tackled with the help of RBF.



Applying RBF to promote mini-grids in Kenya and Rwanda

EnDev's RBF projects in Kenya and Rwanda incentivised mini-grid project developers in two steps: a first incentive was paid upon the commission of a mini-grid, while the second incentive was paid for each connected household and business. With many different development actors supporting the sector in both countries, close coordination among them was essential to provide required capacity building, policy advice and financing for successful mini-grid development.

In Rwanda, the RBF project was introduced at a time when mini-grid development was still in its infancy. International companies new to the country were sceptical about the reliability of the regulatory environment while local companies were all together new to the mini-grid field. Both kinds of companies welcomed EnDev's support in advancing their business. The first stage of the RBF project was thus to provide targeted technical assistance (TA); for example, EnDev—in collaboration with other development partners—assisted the Rwandese government to improve investment conditions for mini-grids. EnDev also supported—in close collaboration with the NGO Energy4Impact—some of the local companies in conducting proper demand estimations and tariff modelling. RBF only came in for the second stage, where the mini-grids that were accepted by the EnDev project received an RBF incentive upon successful commissioning. The incentive covered the viability gap, up to 70% of capital expenditure. However, companies still needed to bridge the time until RBF disbursement with their own capital. A collaboration with the World Bank's Scaling Renewable Energy Program (SREP) eventually offered loans to mini-grid developers at better lending conditions than those of commercial banks, thereby overcoming the access to finance challenge. In total, 3 mini-grids

(1 hydropower and 2 solar PV) and 22 solar PV DC pico-grids were completed, while a further 3 mini-grids are under construction and a pipeline of 16 projects has been handed-over to the SREP programme.

In Kenya, the RBF project was embedded in a GIZ programme which already supported the sector with policy advisory and capacity development measures. As in many other RBF projects, the primary challenge during the inception phase was the identification of a suitable financial institution as fund manager. Shortly before diving into the implementation phase, the development partner landscape supporting the mini-grid sector changed drastically: two new programmes supported by substantial donor funds came into the picture. In light of the higher subsidy levels offered by these programmes, it became clear that the RBF project's offer to mini-grid developers could appear economically less attractive. The RBF project had to pursue dialogue with all stakeholders, re-position itself, and adjust its approach. After a re-consideration of the pre-selected mini-grid sites, the project was able to support the construction and operation of 10 solar PV mini-grids.

While the two EnDev RBF projects in Rwanda and Kenya eventually demonstrated impressive outcomes, both projects required more preparation time, project steering and management effort than initially anticipated. These two project examples showcase that RBF for infrastructure projects such as mini-grids only works if combined with upfront financing facilities, TA to improve the regulatory environment, and a well harmonised and coordinated approach of all development partners.



- First and foremost, mini-grid development—in opposite to markets for over-the-counter products like PicoPV systems—requires clear policies (e. g. national grid extension plans) and legally enforceable regulations (licences, technical standards, regulation on chargeable fees/tariffs and future grid connection options) that reduce investment risks. Advising the national regulator on these aspects is a classic TA policy intervention. While there may be an assumption that these aspects are a precondition to start RBF approaches in a country, EnDev's RBF experience has also shown a reciprocal relationship with regulators. The prospect of attracting RBF to the sector can in fact raise a regulator's interest in quickly establishing required regulations. EnDev's experience also emphasises the importance of harmonising and partnering with key actors in the sector. A joint approach by several development partners can help making use of synergies with existing technical advice supporting public authorities on improving the policy and regulatory framework. In addition, partnerships can help mini-grid development to take advantage of significantly larger investments. An example of this can be seen in Rwanda, where EnDev contributed to the setup of a larger financing facility for mini-grids in the context of the World Bank's Scaling-Up Renewable Energy Program (SREP) ([see details on the left](#)).
- Secondly, mini-grids are characterised by high upfront investments that reap benefits over a decade rather than the 1–2 year payback period of Solar Home Systems. Investors therefore need to rely on sound business plans and cashflow projections to recover the substantial upfront investment. EnDev's RBF projects were able to mitigate this challenge in two ways. On the one hand, EnDev supported private mini-grid developers with technical assistance—allowing them to undertake thorough demand assessments and develop appropriate mini-grid designs. This improved the reliability of their business plans and cash-flow projections. On the other hand, the model of RBF itself—with reliable payments upon confirmation of pre-defined results—helped to strengthen the overall business case of mini-grid projects.

- Thirdly, even with a sound business plan, access to finance remains a significant challenge to mini-grid development. This can be attributed to the private sector's limited experience with operating mini-grids and the high risk perception of investors and private banks. Again, EnDev RBF projects were able to help mini-grid developers in two ways. On the one hand, the mini-grid developers' needs to fully pre-finance all capital and operational expenses were eased by staged disbursements. RBF payments were sent after the achievement of key milestones such as the procurement of equipment, the commissioning of the mini-grid, and effective operation over the first year. On the other hand, EnDev was able to facilitate developers' access to credit from local banks by assisting in the credit application process. While not all banks were convinced by the RBF approach, in some cases the RBF receivables reduced their concerns about financial risk. Several banks welcomed the existence of an RBF contract between the developer and EnDev as a form of risk mitigation; one bank in Rwanda even negotiated for a preferential payback contract, which specified that any RBF disbursement would be directly paid to the bank as a loan repayment.

These brief examples demonstrate the inherent complexity of mini-grid projects that any RBF design needs to take into consideration. If opting for an RBF approach in the mini-grid sector, a realistic time horizon and coordinated technical assistance with national governments and other development partners and their programmes is the key to success. Last but not least, a close relationship with national authorities such as responsible ministries and their agencies is conducive to improving the enabling environment.

The experience gathered by EnDev so far has shown that **RBF rarely functions as a stand-alone development tool** in energy access markets. RBF can—and should—be considered as one element of a toolbox. Additionally,

our experience suggests it may work best if embedded in a broader market development programme with other technical assistance (TA) activities to improve supply, demand and enabling environment conditions. As described above, market analysis, stakeholder mapping, the partner government's priorities, and other development partners' planning should inform the choice of the most appropriate approach and combination of instruments to overcome barriers to energy access market development. This may be RBF, but it may also be other financing approaches and technical assistance. Depending on resource availability and the political setting, this intervention package may be provided by one implementing organisation alone or by several partners in a joint approach.

Finally, projects should realistically judge what role the RBF mechanism can play in a complex and developing market setting ([see the following chapter for an in-depth discussion](#)). In close-to-mature markets, an RBF project may overcome market barriers in a relatively short timeframe of three to four years without much additional support. However, in immature markets it might be unrealistic to expect large changes in market development in such a short period—instead the approach might require more time, resources and accompanying TA. In most situations, RBF works best in combination with other interventions. When seen as a market acceleration tool, **RBF can be regarded as one of the many stepping stones that help to bring the market to a new level**. Before and after an RBF project there are other instruments (e. g. TA as discussed above, awareness campaigns, quality standard setting, etc.) which can support market development. One also needs to keep in mind that markets are embedded in the global economy—exchange rate fluctuations, recessions, or even natural catastrophes and pandemics can have a significant influence on whether your RBF project can deliver as expected.





RBF project design and planning



3

Transforming markets

Once the decision in favour of an RBF approach has been made, the design process should start with a clarification of the project's core objective. In the field of energy access, the immediate and most obvious desired outcome of any intervention is usually new or improved access to modern energy products and services for households, businesses or social institutions. That means offering access to modern cooking technologies and/or electricity with the ultimate objective of improving people's living conditions and economic opportunities. However, project designers are faced with many different options when it comes to determining their focus.

For EnDev's RBF Facility, the focus was on developing energy access markets. In the calls for project proposals EnDev asked implementers to apply RBF as a tool to accelerate market development through private sector engagement. In an early market stage, supporting many companies with RBF and accompanying TA may lead to competition and expansion. At a later market stage, a consolidation process may take place that can be steered by RBF incentives towards higher quality products and services as well as diversified growth strategies. While the 17 RBF projects were free to design their interventions according to their individual country situation, retrospectively



Fostering research and development through RBF in Peru

Improved cookstoves (made of brick, adobe, etc.) are now a common feature of rural households in Peru. However, these stoves are heavy and fixed in place—therefore not fully covering the demands of highly-mobile populations in remote areas. Several barriers hinder the industrial-scale production and broad commercialisation of these stoves. These include the high investment required to train builders in the installation of cookstoves, the unreliable quality of individual cookstoves and logistical challenges in reaching rural clients. The RBF project in Peru therefore set up a development contest for product innovation of portable improved cookstoves (PICS) that do not require any installation. The aim was to motivate small and medium enterprises to invest in research and development of PICS that satisfy the needs of rural customers, can be adapted for production at scale and offered at a competi-

tive price. The project disbursed incentives to stove manufacturers in three phases: (1) development of prototypes, which were evaluated by an independent testing institute; (2) elaboration of business plans and product certification; and (3) commercialisation of the stoves.

Within four years, six companies qualified and successfully progressed through the entire process, selling 5,400 portable cookstoves to rural Peruvian families and more than 17,400 stoves to social institutions such as schools. Ten new portable cookstove models are now available in Peru, including four additional models that emerged in the market during the commercialisation phase without direct project support. The project demonstrated the applicability of RBF to trigger innovation and commercialisation in the improved cookstove sector.



their design choices can clearly be clustered into four different RBF prototype approaches for market development ([see more detailed explanation below](#)):

- the incubator RBF that targets manufacturers to refine their initial product model;
- the import RBF, which aims at increasing the volume of products brought into a country;
- the sales RBF for scaling up distribution structures and sales to customers; and
- the targeted customer RBF, which pays only for reaching specific customer groups.

In theory, each prototype RBF fits a certain market phase ([see figure 4](#)). But in practice, most RBF projects instead went for a mixed approach or complementary combination of these approaches to tackle their country-specific market barriers—with a focus on several barriers at a time. In addition, projects often combined these RBF approaches with various technical assistance measures. For a programme with a clear objective to provide access to energy—like the EnDev partnership—it is crucial to keep an eye on this overarching objective for all types of RBF approaches. Wherever the RBF targeted the market along the value chain, the results directly linked to the number of people gaining access to modern energy ([see also section on setting appropriate incentives in this chapter, p 41](#)).

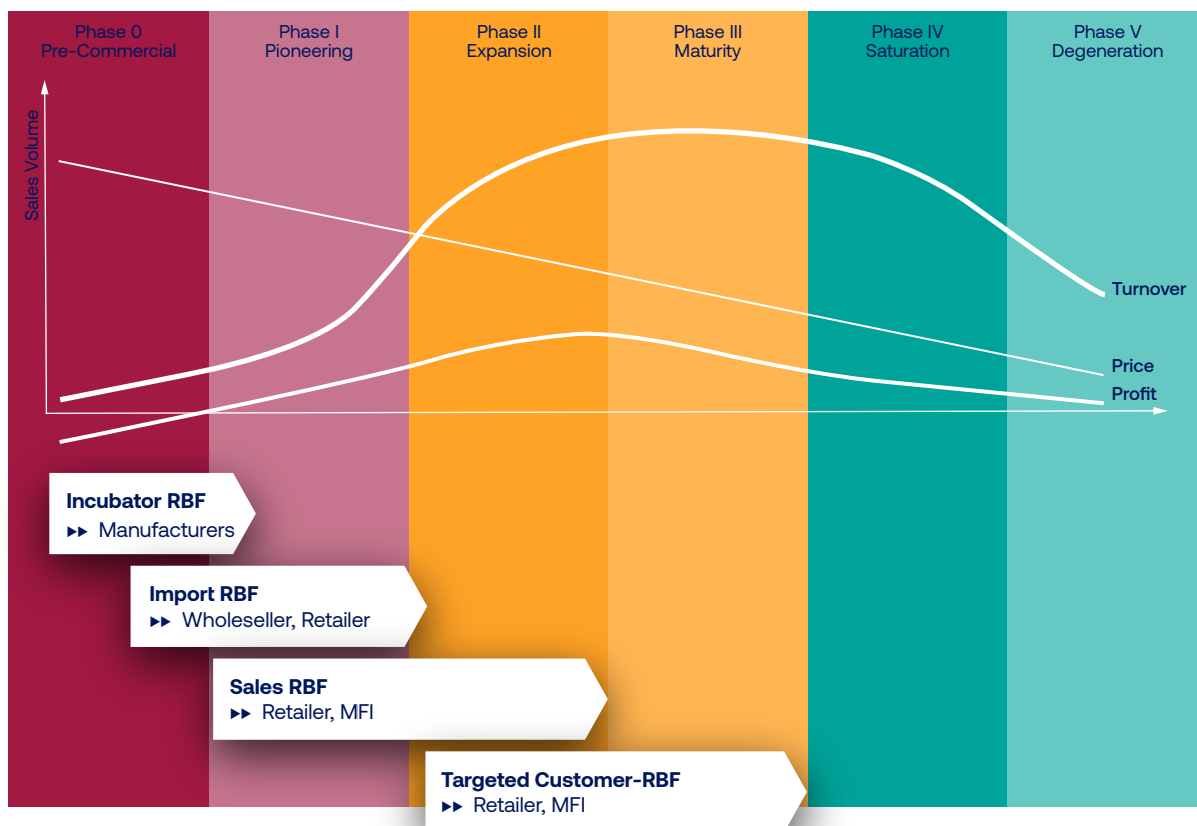


Figure 4: An retrospective clustering of RBF prototype approaches and respective market phases



Geographic targeting and impact measurement in phase 2 of the RBF project in Tanzania

The Tanzania RBF project aimed to improve access to small solar PV systems for households in rural areas of Tanzania's Lake Zone. The project specifically encouraged suppliers to become active in the comparatively underserved rural areas, which are less populated and have higher poverty levels. While the incentives offered in phase 1 of the project already made companies increase sales in these regions, they still avoided entering the most remote areas. The project thus introduced an adapted incentive structure for phase 2, which was tied to a newly created vulnerability access index. This index is based on regional socio-economic data, such as population density, energy and water access, and gender equity. In addition, it considers the market penetration in the region by taking into account the number of years solar products have been available and the number of active solar companies. In phase 2, the incentive paid was linked to: (a) the vulnerability access index calculated per region; and (b) to the lumen performance⁹ of the SHS product itself. This new incentive structure has persuaded

companies to go the extra mile to sell to customers who were previously considered too remote and too poor. In line with its focus on poverty alleviation, the project also refined its approach of measuring impacts. In addition to the obligatory verification of sales, a sample of customers was called 6–12 months after the purchase and interviewed about their overall experience, their happiness with the product and the companies' after-sale services. These insights into customers' medium-term experiences were valuable feedback for the solar companies and helped them to further improve their services. For EnDev, it generated data on the sustainability of the intervention and even allowed for impact benchmarking. The benchmarking exercise involved comparing the impact achievements of the different RBF recipients in the Lake Zone of Tanzania with those delivered by solar companies without RBF support. Results clearly demonstrated the important role EnDev's RBF intervention played in companies' ability to broaden or deepen their impact.

⁹ Lumen refers to the total quantity of visible light emitted by a source per unit of time.

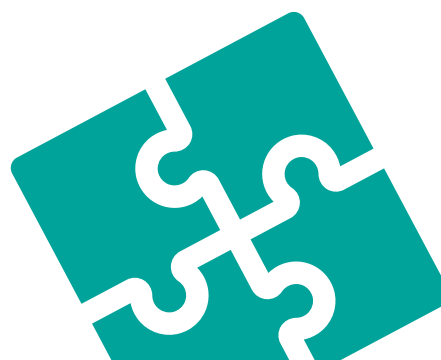


The **incubator RBF** approach is typically applied in the pre-commercial phase of energy access markets or to push market development from a macro-economic perspective, such as when market forces alone do not lead to the desired development. Markets usually start around a new or improved product or service which satisfies needs better or even for the first time. In some cases those products and services do not exist yet—and hence it is impossible to introduce them to the market—but support in an earlier market development stage is necessary. This can be done by incentivising research and development for product innovation to meet a currently unsatisfied demand. A good example can be seen in EnDev’s RBF project in Peru, which set up a research and development contest for portable improved cookstoves (see p. 32).

If these high-quality products are available from international manufacturers, but they are not yet well-known in the country and distributors are hesitant to start bulk orders, an **import RBF approach** may help to overcome this risk aversion. An incentive paid for each imported over-the-counter product—such as a SHS, portable ICS or energy efficient appliance—can raise import volumes and eventually lower prices due to economies of scale. It is crucial that energy access programmes ensure a direct link between imported products and genuine energy access achievements for the target group. Programmes could consider combining import RBF approaches with incentivizing actual sales to end-customers or even usage by end-customers. In this manner, the project can ensure that imported goods do not sit unused in their warehouse. A good example for combining import RBF approaches with other strategies is the project in Cambodia. RBF incentives were used to enable local distributors to first try out small amounts of high-quality international products at lower prices. Over time, they developed business models based on this first experience and increasingly made larger orders based on growing demand and willingness-to-pay from customers (see p. 48).

The majority of EnDev’s RBF projects used the **sales RBF approach**—this works well when a market is at a more advanced stage, but still requires a push to really take-off and move larger volumes. In the pioneering and expansion phase of markets, a significant number of companies are already familiar with the product or service. However, the market is far from mature. It often has a limited supply of diverse and high-quality products combined with relatively low consumer awareness. In such settings, an RBF approach that incentivises each sale to the end-customer can make a significant contribution to overall market development and business expansion. It pushes companies to go for scale and increase customer outreach. If the private sector is given full flexibility on the decision of who to sell to, companies usually follow basic business principles and pick the ‘low-hanging fruit’ first: they sell to those customers who are easiest to reach in order to maximise the profits from the RBF incentive (for a typical ‘sales RBF’ approach, see phase 1 of the **Tanzania solar RBF project** on p. 34).

A **targeted-customer RBF approach** can also be used to increase access to energy for a specific population group. Poor, vulnerable or otherwise marginalised groups do not usually benefit from the intervention scenario described above, as they are not viewed as commercially attractive customers. Products remain unaffordable or otherwise out of reach for them even in markets that are well-developed. Therefore, if the aim of the project is to improve energy access for vulnerable groups, it should not leave the decision of who to serve entirely up to the participating companies. Instead, the project can guide companies towards its target groups by defining the rewarded results more specifically. The following section will discuss some strategies for a targeted-customer RBF approach.



Reaching the poor

Targeting the poor does not necessarily contradict the objective of market development, but it may be prudent for market players to first focus on establishing a solid business base before aiming for the poorest or most vulnerable customers. Usually poor and remote households are the least attractive customer segment and are served by suppliers last or not at all. Offering RBF for targeted customers allows companies to gain experience with this customer segment and adapt their business models and payment schemes accordingly. RBF can thus help companies to validate which customer groups can be served with a market-based approach. However, some groups will remain dependent on public support and welfare programmes. Since building self-sustaining mar-

kets in a poor and remote environment is not always feasible, it is already crucial at the design stage to consider how these pro-poor interventions can be continued or even upscaled by governments or other stakeholders after the RBF project's closure. Whether poor people are best served by a market-based approach or a social programme depends on many interconnected conditions. As these conditions may vary by country, for example in the available social support structures or the political ambition, solutions must be tailor-made and avoid a one-size-fits-all approach.

Based on the experience of the EnDev RBF Facility, the following strategies for targeting poor and vulnerable groups were identified:

Differentiating incentives depending on the socio-economic characteristics



Differentiating incentives depending on the socio-economic characteristics of the end-customers, e. g. poverty criteria or indices. In using such an approach, project designers should check whether a poverty classification, e. g. defined by a social support government programme, already exists within a country and if the project can build upon it (see project examples from Malawi and Rwanda, p. 38). In coordination with the partner government, the RBF project may then focus on a specific group of eligible beneficiaries. This approach can be more precise than targeting by region alone, but the accuracy of targeting hinges on the data quality and the reliability of the existing national household categorisation system.

Geographic targeting



Explicitly target only poor or remote regions. This targeting is only successful if entire regions are considered relatively poor. In this case, the incentive paid per product sale can be topped up with an additional incentive for sales in regions with high percentages of poor people. This attracted companies to establish business in these regions, which they would otherwise not have done or would only have become involved in at a much later stage (c. f. phase 2 of the Tanzania project example, p. 34). Again, the accuracy of targeting hinges on the data quality. Triangulating national income statistics with other data sources and/or proxy indicators can improve reliability.

Incentivising consumer financing schemes



If affordability is the main barrier preventing poor people from purchasing a product or service, RBF projects can choose to only provide incentives to products sold by companies offering financing solutions, such as PAYGO or other comparable business models. Alternatively, projects can offer results-based incentives to financial intermediaries, such as micro-finance institutions, which grant consumer loans specifically for the purchase of the energy product (find lessons learnt on this specific approach on page 43 et seq.).



Pro-poor targeting in Malawi and Rwanda

In Malawi, EnDev implemented an RBF project for improved cookstoves in collaboration with the Government's Social Cash Transfer Programme (SCTP). Malawi's SCTP targets the most vulnerable 10% of households—the so-called ultra poor—by giving them a direct unconditional cash payment on a monthly basis. The RBF project distributed vouchers to 130,000 of these households, which they could redeem to get free improved cookstoves that they could otherwise not afford.

A secondary objective of the project was to catalyse a market for improved cookstoves for non-SCTP households in areas where markets for stoves were nascent and retail structures very thinly spread. The stoves were manufactured by local producer groups who both supplied stoves for the SCTP cookstove roll-out and produced stoves to sell to non-SCTP recipients. An international NGO implementing the project on behalf of EnDev received incentives for each distributed stove. The incentive for the SCTP cookstoves covered all costs whereas the incentive for the commercially sold stoves was much lower and only covered the viability gap (i. e. the high logistical costs for stove transport in rural areas). Using the SCTP as a mechanism to increase access to improved cooking technologies allowed the project to reach households which are often left out of energy access interventions. The cooperation with the SCTP had an impressive effect on consumer awareness. The most vulnerable became trailblazers for a new technology and allowed other members of the community to gain direct experience with the advantages of these cookstoves. The project thus enabled spill-over benefits into commercial sales. However, this market approach has limits in a socio-economic context such as Malawi. Although the market price of the stove is comparably low, the willingness to pay is

often even lower. When firewood is still freely available in rural areas (though its availability is rapidly declining), fuel-efficient stoves do not result in real monetary savings for consumers. These difficult market conditions do not only demand smart and sustainable private sector initiatives, but also alternatives to market-based approaches that embrace the principles of 'leave-no-one-behind'.

In Rwanda, EnDev supported the development of the solar PV market from 2014 until September 2020 by providing RBF incentives to 10 companies. For its second phase, EnDev—in collaboration with the public Energy Development Corporation Limited (EDCL) and with additional co-funding from USAID—pioneered a pro-poor solar RBF project using the 'Ubudehe' household categorisation. Ubudehe is a system used by the Rwandan government to cluster households into four categories according to their socio-economic welfare status.

The objective was to target poor and vulnerable households in districts with low electricity access who would not have been able to purchase a solar product without a subsidy. Companies were incentivised for each sale to a household belonging to the three lowest Ubudehe categories, but had to use the distributed funds to partially lower the retail price for the end-customers. The poorest households, the ones belonging to Ubudehe 1, received the highest subsidy (up to 87% of the sales price). Participating companies were able to check customers' eligibility for a subsidy using a web-based eligibility tool developed by EnDev. For eligible customers the tool provided information on the subsidy level, depending on the Ubudehe category, as well as the subsidized end-price for the selected product. The web-based eligibility tool allowed for real-time data collection and monitoring. In



addition, the system reduced the reporting and claiming burden for companies, thereby accelerating the claiming process.

This case study shows that a public pro-poor energy access programme can also benefit from a market-based approach. Thanks to the programme and the eligibility tool, poor households were able to purchase top quality products, choose between various models, and profit from warranties and after-sales services that companies participating in the RBF programme provided. Companies, on the other hand, were able to tap into lower-income households as a new customers segment. This helped them to increase their turnover in rural areas, gain experience in catering to the poor, and raise their prospects of keeping these customers—even without further public support—by offering attractive PAYGO solutions.



Pushing stove quality through RBF in Kenya

The EnDev RBF project for cookstoves in Kenya promoted market acceleration for high quality cookstoves that meet rigorous efficiency, emission and safety parameters. Incentives were offered to companies for the sale of these stoves to consumers. The stoves could either be imported or locally produced and had to be tested locally before admission to the project to ensure the stove's compliance with set quality parameters.

The RBF project worked in partnership with the Kenya Industrial and Research Development Institute (KIRDI), a national institute under the Ministry of Trade and Industry. If stoves that companies submitted did not meet the RBF quality parameters (e. g. in terms of

efficiency or emissions), they had to return to the drawing board and re-design, adapt and improve their stoves to eventually meet the RBF quality criteria. The process of testing and approving cost the project some time at the beginning but successes did eventually materialise: more than ten new stove types, new in the EnDev portfolio, were sold on the Kenyan market. In parallel, EnDev provided technical assistance to the Global Alliance for Clean Cookstoves and the Clean Cookstoves Association of Kenya to initialise a process for establishing national standards for stoves. The standard set by the EnDev RBF also inspired the stoves component of the newly launched Kenya Off-grid Solar Access Project (KOSAP) funded by the World Bank.



Setting appropriate incentives

There is no one-size-fits-all incentive. What works in terms of the incentive structure for a project in one country may not work for another and what works in one stage of the project might be unfeasible at a later one. The development of a project's incentive structure therefore plays a significant role in its outcome and chance of success. Which results projects should incentivise to achieve the envisaged

market transformation, and who they should target to do this, are pivotal strategic choices. Determining the incentive level itself is also crucial: if set too high, the project could be inefficient; if set too low, the intervention may not be effective. Therefore, a project needs to carefully think through its incentive structure. This includes answering the following three core questions:

What ... is the exact definition of the result to be incentivised?



Quality



Service



Type of customer

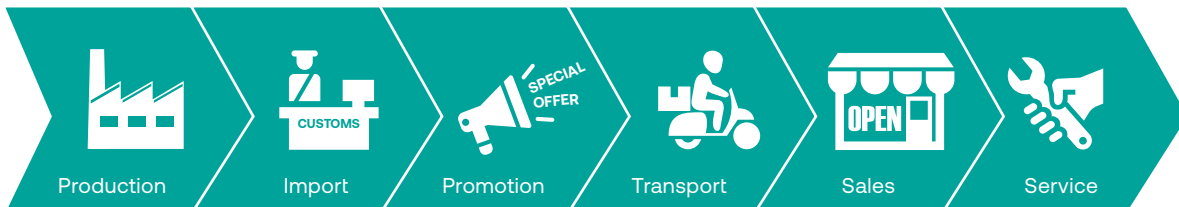


Size

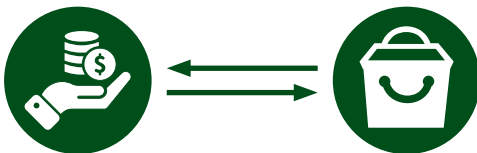


Rural location

Who ... are the recipients of the incentive?



How much ... is the incentive level paid per result?



What is the result? Defining the result you want to incentivise may be very straightforward (e.g. every SHS sold) or the result may be multi-dimensional or staggered over time to support market development. EnDev's experience has shown that 'the closer the

result to the actual outcome envisaged, the better'. For example, incentives for sales to end-customers have proven to be more effective than incentives offered for credit schemes that enable a product purchase.



Staggered incentives for energy efficient appliances in Bangladesh and East Africa

High quality and energy efficient off-grid appliances like televisions, fans and refrigerators can accelerate markets for modern off-grid energy systems. In addition, they can improve livelihoods and enable productive use of electricity. The global market for these appliances, however, is still in its infancy. Both SHS companies and appliance manufacturers experience challenges related to the price sensitivity of consumers, lack of information about appliances, and competing low-quality products. Local solar companies also struggled to secure sufficiently large down payments on orders from new customers to mitigate their up-front financial risks.

The RBF project in Bangladesh and East Africa thus offered different incentives in three stages: (i) to international off-grid appliance manufacturers once a purchase by a local

solar distributor was finalised; (ii) for every product imported and stored; and (iii) to local off-grid solar companies upon verification of sales to final customers. Through this mechanism, sales of over 265,500 TVs, fans, and refrigerators were supported in Bangladesh and East Africa. In the initial RBF round, the first part of the incentive was quickly disbursed to the manufacturers, but local solar companies moved at a slower pace and some were unable to deliver the documentation required for verification of sales. For following rounds, the project therefore adjusted its incentive structure to more strongly link the incentive disbursement to the manufacturer to the performance of the local distributor ensuring that products were not only produced for the warehouse, but actually sold to the end-consumers.



When defining the result to be delivered, a balance needs to be struck between requirements on product/service quality and the existing capacities of market actors to deliver this quality. In some cases, companies initially found it difficult to provide products to a required standard (e. g. Lighting Global certification for SHS [now called VeraSol], or performance standards for cookstoves). Some companies went back and adjusted their products to meet the project's criteria (see [Kenya project example, p. 44](#)). The improvement of product quality levels in the market has been an important achievement of the EnDev RBF projects, contributing to market development and capacity building of the sector. At the same time, it resulted in a longer and more intensive project preparation phase to reach the envisaged results.

A clear definition of the result is important to avoid any misunderstanding and failures to comply. For example, the following should be clarified: if sales to households in peri-urban areas are eligible; if a sale counts when someone has bought a SHS as a back-up for grid blackouts; or, if someone who has bought five SHSs is considered an eligible end-customer or a non-eligible retailer. Another important aspect to keep in mind when defining the results the project hopes to incentivise is that each requirement needs to be clearly verifiable. Only with sufficient evidence, and a clear methodology which outlines that a result was achieved, can a disbursement be tied to it. On the other hand, verification of results must also stay manageable and within cost limits.

Who receives the incentive? If the ultimate goal of a project is to increase access to modern energy through market development, incentivising companies that deliver modern energy products or services directly to consumers may seem like the most obvious way to achieve this. However, barriers to energy access can often be traced to market failures along the supply chain, rather than companies. The preliminary market study can identify these barriers (see [chapter 2, p. 25](#)). Based on their initial market analysis and market barrier

identification, the 17 RBF projects reached different conclusions on target recipients (compare [chapter 2, p. 21 et seq.](#)). RBF recipients may be (but not exclusively):

- **Manufacturers:** Some RBF projects (mainly the ones promoting locally produced improved cookstoves and biogas digesters) targeted manufacturers directly. This was necessary for product development and certification when product innovation was required in a pre-commercial market phase (see [Peru project example, p. 32 & section on “Incubator RBF”](#)).
- **Importers and wholesalers:** In newer markets, incentives for product imports might be an option to mitigate companies' financing barriers—allowing them to build inventory in the pioneering market phase (see [section on “Import RBF”](#)).
- **Distributors and retailers:** The majority of RBF projects provided incentives for sales/installations of energy access products and services directly to the companies selling to end-customers; this was primarily done in the pioneering and expansion phase of markets (see [section on “Sales RBF”](#)).
- **MFIs:** As affordability is one major barrier to increased access, several RBF projects opted to provide incentives to local FIs (mostly MFIs, as well as saving groups) for each loan provided for the purchase of an energy access product. Consumer financing is a condition for sales increases when affordability is an issue. Thus, an incentive paid for each loan provided is usually coupled with an incentive for sales.

In cases in which various market barriers needed to be overcome and no other complementary interventions were available, RBF projects introduced ‘staggered’ incentive structures. These structures disbursed incentives to various recipients along the supply chain (e. g. first to the international manufacturer, then to the importer, and last to the distributor). Staggered incentives may be necessary to address several barriers along the value chain at once rather than incentives that only target one single gap (see [Bangladesh project](#)



Why MFIs shied away from offering solar credits in Kenya

The Solar RBF project in Kenya offered incentives for sales of solar lanterns and SHS that included consumer financing. Eligible RBF recipients included companies and NGOs, but also banks, MFIs and Savings and Credit Cooperative Organisations (SACCOs). Despite initial interest, only 3 of the 12 contracted banks and MFIs managed to facilitate sales. Only one of them was a real success case: the MFI Juhudi Kilimo (JKL). With some initial experience in providing credit for solar products, they were keen to expand their operations. Stimulated by the RBF, they launched a digital loan assessment system, partnered with solar companies, and strongly mobilised their local loan officers to promote solar products. Over the project period, JKL disbursed thousands of modern energy loans (60% solar)—proving that there is a strong business case. Despite the vivid consumer financing landscape in Kenya, other (M)FIs did not buy in; RBF incentives did not match their expectations as receiving capital is usually not their main concern. Instead, these institutions were asking for guarantees. In their eyes, concrete assur-

ances were necessary to compensate them for venturing into lower income customer segments or more remote locations they considered to be high-risk and low profit. Despite this rebuff, the RBF project still managed to support more than 270,000 sales with the help of PAYGO-companies. While they have dominated the solar credit market for quite some time, since recently also in Kenya several MFIs are now considering entering the solar business by purchasing receivables from capital-scarce PAYGO companies. They therefore might play an important role in the solar market after all—though a different one than originally anticipated when designing the RBF project.

EnDev is also benefitting from the RBF learning curve and is piloting a new RBF for productive use equipment, with the hope that MFIs show more interest when cash-flow improvements for clients are more tangible. This example once again shows that adaptive management is crucial for reacting to dynamic markets and changing stakeholder constellations.



example on p. 42). Most EnDev RBF projects have focused on incentivising the supply chain for energy products. However, important market barriers can also be on the **demand side**.

Probably the most frequently voiced concern by customers about high-quality energy access products is that they are ‘nice, but too expensive’. Tackling the affordability issue is thus one of the core challenges for any energy access project. Retailers might opt to use the RBF payment to lower the retail price, but this may undermine market development. It can also hurt their own future business prospects if subsidies are not phased out in the short to medium term. A more long-term solution for closing the affordability gap is tailor-made **consumer financing** options. An example of this is the engagement of MFIs. As they are often mandated to serve the poor, are well-rooted in rural areas, and already have an established client base, they appear to be a well-suited match to tackle affordability. Some RBF projects thus wanted to make the energy access business palatable to MFIs by providing incentives to every sale that comes with a consumer financing arrangement. Unfortunately, that strategy has rarely worked out (see **Kenya project example on p. 44**). With some notable exceptions, MFIs were not convinced of the business opportunity. Instead, PAYGO-companies stepped in and used their digital customer management systems, flexible re-payment plans, and technical expertise to go for scale and benefit from RBF support. While this is EnDev’s lesson-learned vis-à-vis MFI involvement in solar products and improved cookstoves, this may not be the situation in other circumstances. MFIs might be more interested in lending for productive use equipment—they have higher loan values, which are embedded in existing loan products, and are considered to be a lower default risk.

How much to pay? RBF incentives should be set at a level that is attractive enough for companies to take more risk, but windfall profits should be avoided. The incentives must be high enough to ensure companies want to collaborate in an RBF project: they should be higher than the necessary costs of participation and also allow for a decent profit. The risk that the incentive is too high has proven to be negligible and corrective action during the implementation phase can mitigate this concern. It is also important to inform companies right from the beginning that incentive levels will be lowered over the course of the project. This can encourage fast-moving enterprises as they can benefit from the initial high incentives. Projects should consider defining caps for the overall amount of incentives disbursed to an individual company to ensure participation of many market players and promote their competition.

EnDev has successfully experimented with **two price-finding mechanisms** to set incentive levels. The first mechanism required projects to use market analysis and stakeholder consultation to estimate the viability gap, i. e. how much additional funding will make the business case profitable and therefore trigger a company to enter and build a sustainable business operation to stay in the targeted market. The **viability gap** can be calculated based on the cost structure that is required to deliver a product or service. This gap can be bridged by public funding. The RBF incentive is one option of public funding, as a public grant that is paid after results have been achieved.

How RBF incentives can turn “reaching the poor” into a business opportunity

In a business-as-usual situation, a company’s marginal profit tends to be higher for large products with a high retail price than for smaller products with relatively lower retail prices. This is particularly true when a company needs to factor in additional costs due to specific RBF requirements (e.g. transportation costs to service remote villages; staff costs for improved after-sales services; capital costs to offer better consumer financing schemes). The RBF incentive level is determined by making the RBF business case attractive to the private sector by closing this viability gap. For example, if an energy access programme like EnDev follows the leave-no-one-behind principle, the RBF incentive should be set in a way that keeps this objective of serving the poor in mind. An incentive structure in line with this goal would be give smaller-sized products a proportionally higher incentive than larger-sized products. In many nascent markets this caters

to the needs of poorer households who initially have to opt for smaller, more affordable products, while larger products are only accessible for wealthier households. In addition to gradually reducing incentives, setting a cap can also help to steer the bulk of RBF financing to smaller products. This incentive cap can either be defined as a monetary threshold (e.g. maximum incentive paid for a SHS is EUR 50) or as an eligibility criterion (e.g. only SHSs with a panel of up to 50 Wp are allowed in the RBF scheme). Focusing the development support on smaller, more affordable products is only the first step towards reaching universal access to modern energy services and needs to be complemented by strategies and approaches which go beyond overcoming basic energy poverty. Striking a balance between leaving no one behind and creating opportunities for economic and social development lies at the heart of the EnDev program.



All images: @ FX Studio TZ

The method of setting the incentive based on the viability gap plus an appropriate profit requires the implementing agency to undertake data collection on prices and costs. Available market intelligence from international sector associations (e.g. Global Off-grid GOGLA, Clean Cooking Alliance, Efficiency for Access Coalition), data from comparable interventions elsewhere, and a thorough in-country market analysis with project-led data collection exercises can support this estimation. Although it is relatively easy to learn retail prices of products, linking the incentive to the retail price of a product is not advisable. First, more expensive products are not necessarily the better ones. Second, tying the incentive to retail prices may induce retailers to increase the latter to gain more incentives. Instead, the incentive should be tied to product performance and should encourage cost efficiency in service delivery.

Once incentive levels are set, they may be either published as an incentive list together with the call for proposals or the formula for calculating the incentive (e.g. EUR-amount per lumen-hour of product) can be shared so that interested companies know what they can expect from participation in the RBF project.

A **second price-finding mechanism** involves market-driven mechanisms, such as **auctions or reverse auctions**, to determine incentive levels. When using auctions in an RBF setting, it is the companies who should determine the incentive level where supply and demand overlap. With their internal knowledge of local cost structures, they are better placed to do this than the implementing agency. This approach helps avoid windfall profits, which can occur if the incentive set by the implementer is initially too high. Auctions also may prevent incentives which are set too low and do not encourage the private sector to expand their business. Auctions can additionally be used to adapt the incentive levels over time to account for market developments. However, auctioning works only if (1) the stakeholders have a sufficient understanding of underlying costs and can therefore submit viable bids; and (2) if the market is competitive enough to avoid collusion among bidders.

The majority of RBF projects in EnDev's Facility have opted to use the viability gap calculation as a mechanism for incentive setting, since most projects were able to rely on already-available market intelligence. A notable exception was the stove market acceleration project in Cambodia ([see next page](#)), where they used



Auction-based price finding mechanisms in Cambodia

In Cambodia, the EnDev RBF project aimed to build sustainable markets for modern gasifier cookstoves to replace traditional biomass cookstoves. EnDev offered staggered incentives, paying the first instalment to companies for the import of high-quality stoves and the additional funds to distributors selling the products to consumers. An auction was used as a dynamic market-based price finding mechanism and as a market aggregation platform.

The RBF project fostered business relationships between international gasifier manufacturers and local distributors in an effort to bring together enough local distributors to make bulk purchases. This approach prevented stove manufacturers from having to build these relationships individually, thereby reducing their entry risk into a new, unknown market. The international manufacturers received a guaranteed price for their products, which were sold through bi-weekly SMS-based stove auctions. Here, local distributors bid for small quantities of stoves with the 'lot' going to the highest bidder. The difference between the auction bid price and guaranteed price was covered by the RBF incentive. In total, 58 bi-weekly auctions were conducted with a cumulative total of nearly 13,000 stoves sold to local distributors. Over time distributors finetuned their business models, allowing them to both sell stoves at higher retail prices and bid at higher prices for more stoves. Eventually, the gap between bid prices and

guarantee prices shrank, reducing the level of RBF incentives necessary to bridge that gap. Although highly experimental in its conceptual set-up, the stove auction proved their ability to kick-start a market for a technology that was previously unknown in Cambodia. The growing confidence and experience in the business with modern biomass cookstoves led to a self-sustaining market by the end of the project. For example, some of the international manufacturers entered into partnerships for local manufacturing or assembly in Cambodia, committing to this market for the long-run.

While significant market development on the supply side took place, demand activation for these new products should not be underestimated or neglected. Accompanying technical assistance interventions, such as awareness raising campaigns, end-user trainings, and the promotion of consumer payment modalities will play a crucial role in further developing the market for advanced cookstoves in Cambodia.



auctioning to set the amount of RBF incentive necessary for local distributors to purchase high quality stoves from international manufacturers. While this approach included steep learning curve for all stakeholders involved, the bidding process enabled the continuous decreasing of the incentive level until incentives were ultimately phased out.

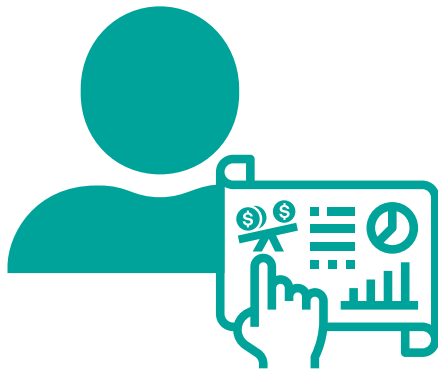
It is also crucial to note that setting incentives is **not a one-off activity** in either the viability gap or auction approach. A fundamental expectation of RBF approaches is that with increasing market maturity the incentive level will decrease over time and eventually be phased out. RBF projects will ideally bridge the market from a 'situation A' to a desired 'situation B'. Therefore, a project's incentive structure should include an appropriate **phasing out strategy**. RBF projects that aim at market development should strive to achieve a self-sustaining market, with higher levels of sales and turnover than prior to the RBF interventions. These markets will thus have to function without RBF incentives eventually. Therefore, incentive levels should be reduced over time as the market matures. This phasing-out should be planned at the design phase already. Projects should also present

the phasing-out process to participants right from the beginning, so they can adequately prepare for it. For example, some of the EnDev projects decreased the incentive level annually over the course of the project.

One should also bear in mind that energy markets are part of larger political, social and economic systems and subject to influence outside a project's control. If the economy booms, purchasing power grows along with demand and incentives could become superfluous. However, if, for example, the price of raw materials like cement or steel goes up, incentives set at the start of an infrastructure project, such as a mini-grid or biogas project, could become inadequate. RBF projects must therefore constantly track how the market develops, analyse trends and respond accordingly. Such changes will probably affect most projects sooner or later, so the project design should allow for the adjustment of incentives. Regular revisions also offer learning opportunities. However, it is crucial that projects keep their commitments once made (especially the contractual ones) and communicate any changes in incentive structures and procedures to participating companies in a transparent and timely manner.

Choice of an RBF fund manager

For the benefit of market development and institutional sustainability, it is advisable to look for a local fund manager to manage the day-to-day operations of an RBF project, especially for the incentive disbursement transactions, financial accounting and record-keeping. In a best case scenario, the project selects a local partner as fund manager who has an intrinsic interest and motivation in continuing to support the energy access market, even after the end of the RBF project. Local financial institutions (FI) can be a natural choice as an RBF fund manager, as it is their business to handle financial transactions, they have established local structures and networks, and they are also often providing capital loans to the private sector.



Another benefit of contracting a local FI as the RBF fund manager is that by being exposed to the energy sector, FIs may become more familiar with the sector. They may gain trust in energy companies and feel encouraged to offer them financial services or even develop tailor-made financial products that foster their growth. The challenge, however, as the RBF Facility showed, was finding a FI that is interested in doing both major tasks: the day-to-day RBF fund management (against a fee) and expanding their lending operations in the energy access sector (as a business opportunity).

Eight of the 17 EnDev RBF projects partnered with local or regional FIs as fund managers. Their experience reveals a mixed picture, with significant advantages and challenges to take into consideration. The RBF Facility's experience shows that engaging FIs as fund managers and outsourcing tasks, such as contracting incentive recipients and verifying and disbursing incentives, can be an asset. Moreover, FIs have the advantage of established customer networks. They might be interested in sharing those with the energy enterprises in order to combine the sales of financial services, such as consumer loans, with those of energy products.

There are also potential drawbacks to working with an FI as a fund manager that must be considered. Identifying an appropriate FI can take time and not every country will have suitable FIs or their fees might be prohibitively high. Just as with the private sector, for the FIs the topic of RBF and their role in such projects was new, creating a need in some cases to offer significant technical support to selected FIs before they were able to fully take up their roles. This once again exemplifies the front-load work intensity of most RBF projects.

As RBF was a new concept to everyone, there was a considerable learning curve. EnDev identified the following strategies on how to best support local FIs as RBF fund managers ([see infobox on next page](#)):

Four strategies to identify a suitable local fund manager

Make sure the FI knows exactly what you expect. Develop clear terms of reference that ideally include an operational manual detailing all the required steps, procedures and documents.

1

Only ask the FI to do things that are part of its core business. FIs are comfortable with performing transactions, managing clients and compliance activities. Build on these strengths and do not push FIs to take up tasks such as technical verification, which is better done by the respective technology experts.

2

When selecting FIs as fund managers, consider whether the FI has sufficient (human) resources and access to the target group. A network of rural branches could be a good fit if the mid- to long-term objective of the project is to trigger the FI's interest in lending to end-customers.

3

Choose an FI with a proven interest in the energy sector. In addition to being the RBF fund manager, they are more likely to set-up required structures and procedures and will be more interested in developing new products and services for the sector. It is also conducive if the FI has a mission – or even performance indicators – which explicitly serve the poor, as this makes them more willing to engage with low-income customers.

4

The example from the RBF project in Rwanda shows that considerable capacity development efforts paid off: the local FI is now the institutional knowledge hub for RBF and an active player in the energy sector (see p. 52). In general, access to finance is a precondition to providing affordable high-quality energy products and services. The importance of overcoming bottlenecks for companies should not be underestimated. Overall, the RBF Facility's experience has shown that much more emphasis needs to be placed on closely collaborating with the financial sector. FIs lacking experience in the energy access sector might be hesitant to venture into a new business segment and get involved in an RBF project initially. Therefore, investing in dialogue and institutional capacity development of the financial sector can increase access to finance and support the establishment of self-sustaining energy access markets.

Projects should also be open to a broader definition of who can be a fund manager and not feel restricted to only financial institutions. For instance, an umbrella body for the private sector or another sector stakeholder, even a local NGO, could take up the role of day-to-day administrative management of an RBF project. Again, upfront investment in a thorough market/stakeholder analysis at the project design stage can help to identify potential partners. The fall-back option is to have the implementing agency do the fund management. While this seems like a quick, easy way forward for short-term success, it does not contribute to a more sustainable market development and institutionalisation of sector functions and knowledge in the partner country.



Building the capacities of a local financial institution as the RBF fund manager in Rwanda

The EnDev project in Rwanda used a tendering procedure to select a local FI as its fund manager for the solar and the mini-grid RBF component in 2013. The proposal of the selected FI, the Urwego Bank, was promising: it was a faith-based micro-finance bank with the mandate to serve the poor and marginalised in Rwanda with financial services. It had a strong rural branch structure, offered diverse loan products to rural customers, and had a strong interest in entering the energy sector. Building on these promising qualifications and the enthusiasm of the bank's staff, EnDev offered additional capacity development,

including a dedicated advisor to the bank and training for bank staff. Eventually, this investment paid-off and the coin has flipped: instead of EnDev staff giving inputs, Urwego Bank sits on steering committees, advises EnDev on how to set-up new RBF schemes, and provides consumer loans for SHS products and solar irrigation systems. The bank has now established itself as a RBF knowledge broker, is well trusted by the private sector, and its dedicated RBF manager position—in charge of all energy-related loan applications—has become an integral part of the bank's set-up.



Portfolio management and budgeting

As stated in the introduction, donors and implementers often expect RBF approaches to be more cost-efficient than traditional development approaches. While a thorough and scientific analysis to confirm this assumption is yet to be done by the broader RBF community, the projects of the EnDev RBF Facility demonstrated a generally good cost efficiency: on average only EUR 6.50 per person gaining energy access was spent. In addition, every euro spent by the RBF facility leveraged EUR 5.1 of private investment.

The RBF Facility set a high ambition level right from the beginning to ensure that available funds were spent directly on incentivising results. In other words, the desired split between incentive payments and other project costs (e. g. accompanying technical assistance, monitoring and verification, project and fund management) strongly favoured the former. The underlying assumption was that non-incentive costs could naturally be kept low, since the larger share of the financial risks lay with the private sector participating in RBF projects—and hence not with the project implementer.

Upon reflection, seven years of implementation experience revealed that the underlying assumption had more nuance. While implementers put a lot of emphasis on a good cost-efficiency and ratio between incentives and other costs, the assumption that RBF approaches ought to be more ‘hands off’ than traditional technical assistance did not play out as expected. Many RBF projects came to the conclusion that such a ‘hands-off’ approach was actually not effective in reaching the set targets. In reality, the RBF projects

had to balance efficiency ambitions with providing the strong support in the form of complementary technical assistance and capacity building measures. Without these supporting measures, the facility’s would not have been able to effectively deliver results. ([see also discussion on necessary complementary measures in chapter 2 ‘Is RBF the right tool?’](#)).

It is therefore essential for future RBF projects to allocate a sufficient budget for technical assistance, especially in immature market settings. These are often characterized by participating companies, fund managers or other stakeholders that lack relevant knowledge and capacities, and an enabling environment that still needs to be set up. One success factor of the RBF Facility is the fact that the RBF projects were embedded in ongoing EnDev country interventions that were able to provide market intelligence, accompanying technical assistance, and established stakeholder networks. Many RBF projects also invested effort in closely aligning with other development partners who could support the market with complementary measures. On the one hand, this shows the advantages of piggy-backing RBF onto a pre-existing programme such as EnDev. However, it also shows that RBF project budgets should consider such efforts and their implications if the project is a stand-alone project.

Additionally, since the state of development and capacity constraints vary considerably between markets, there is no one-size-fits-all cost-efficiency ratio that should be imposed top-down. Individual market development contexts must take precedence in order to achieve RBF’s desired results.

Running RBF projects

A decorative graphic consisting of a teal-colored quarter-circle shape on the right side of the page. The interior of this shape is filled with numerous thin, parallel teal lines that radiate from the center of the circle towards the right edge, creating a sense of motion or a fan effect.



4

Working with companies

When **working with the private sector, keep it lean**. RBF projects with the private sector only succeed if companies are willing to commit. To make sure they do, projects should present a **clear business proposition, keep processes lean** and **avoid unnecessary hurdles to participation**. Avoid jargon specific to the field of development cooperation, like ‘theory of change’ or ‘market barriers’ and instead strive to speak the language of the private sector. In addition, demonstrate how you support their business aspirations. A project’s processes have a direct impact on companies’ commitment—companies might be discouraged from participation if project processes are too burdensome or time-consuming for

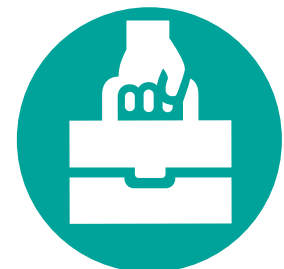
them. Projects should also aim for incentive structures to be simple with understandable requirements. Because RBF empowers participants to develop their own strategies for achieving results, companies need to be aware that RBF rewards this independent and innovative thinking. RBF is a way of helping the companies implement their own business and growth strategies, but it will not direct those strategies. Allowing partners to lead will boost their confidence and willingness to learn. However, setting up regular feedback mechanisms between the project and the companies, e. g. on the findings of the verification, also paves the way for a successful partnership and helps keep the project flexible enough to

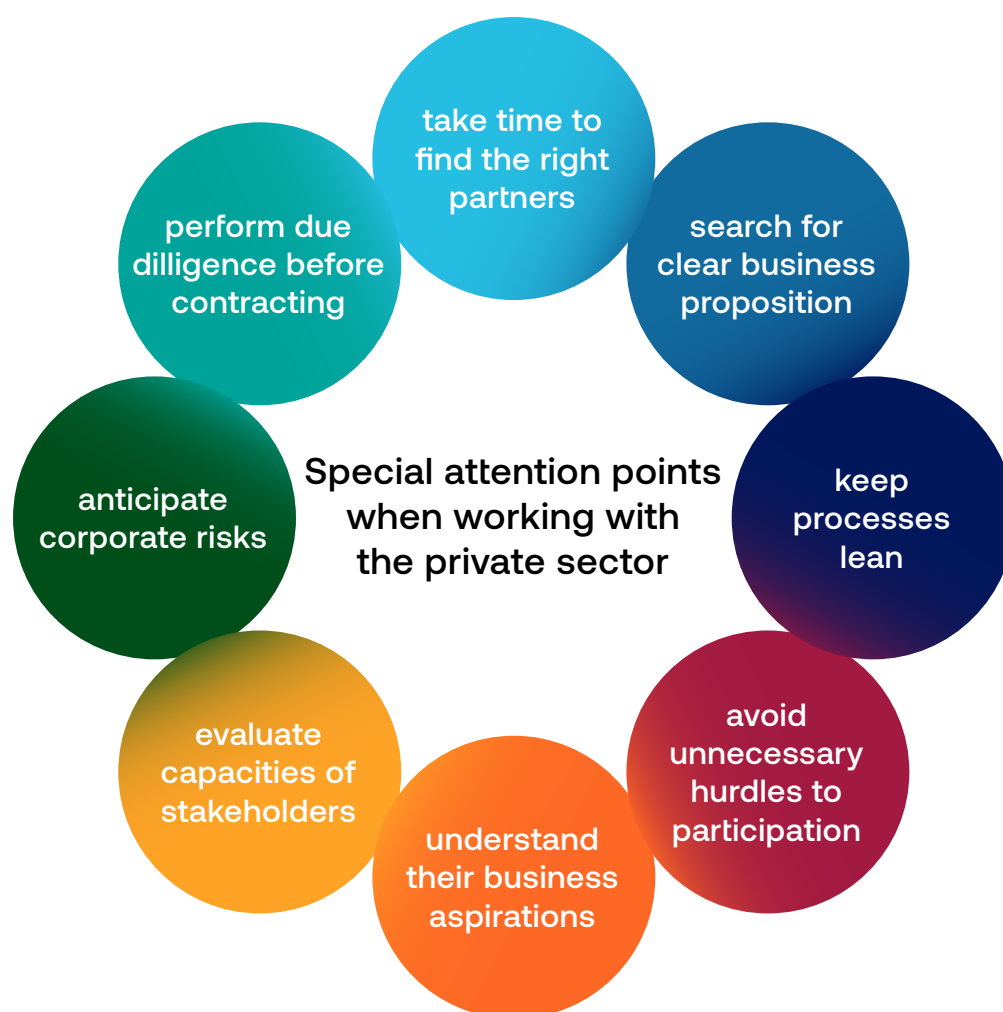
adapt to changing markets. A cooperative approach will go a long way in ensuring commitment. When deciding about the eligibility criteria for recipients, one needs to be aware that raising the bar too high may reduce buy-in or exclude certain companies altogether. Striking a balance is thus crucial to ensure a level playing field for all companies, international and local ones alike. Nevertheless, eligibility criteria may also favour companies which promise quick results (e.g. due to their good track records, access to working capital, or efficient data management systems).

Special attention should be given to the **capacities of stakeholders** to engage in the project during both the application and implementation stages. This refers to their technical as well as business skills. Some companies might not be ready yet to make use of an RBF scheme. One of the major challenges that EnDev's RBF projects faced related to overestimating capacity, especially those of small companies. This could constrain companies from submitting complete applications to participate in the project, or from adequately describing their own business strategy, especially among local companies and entrepreneurs (see [Ethiopia project example](#), p. 22). As a consequence of this, EnDev's RBF projects spent significantly more time and resources than initially expected to assist companies in participating. It is important to keep application processes lean and manageable for all types of applicants. In some cases, capacity issues persisted during the implementation phase when companies had, for instance, difficulties

providing accurate customer records for verification purposes. Despite these challenges, investing in the capacities of local businesses and providing the required technical assistance is important to help grow diverse and strong market stakeholders and the sound competition needed for markets to develop.

Projects need to **anticipate the risks** that companies take and flag them in an open dialogue. Companies often work in a very difficult environment, with unstable policy and regulatory circumstances, poor financing conditions and many demand- and supply-side challenges. In RBF projects, companies are encouraged to take on more risks but get rewarded for doing so only once results are delivered and verified. RBF therefore encourages companies to assume higher risks than usual—they have to factor in incentive payments into their business planning without the certainty that their final results will be verified. This, combined with difficult and changing framework conditions, can make it hard for companies to accurately predict risk. At the same time, project managers should be aware that RBF incentives represent a security for a company's decision to venture into new areas outside their comfort zone. Companies decide to take the risk, because of the prospect of receiving the announced incentive amounts upon verification of results. Early withdrawal or reduction of funds should therefore be carefully considered, as companies have already committed to the project and put their trust (and finances) into it.





In summary, the project must make clear to the companies the benefits, but also the costs, expectations and risks involved. The project should ensure that the companies have a clear understanding and access to information on:

- The application requirements and process;
- The fact that they have to pre-finance the project themselves;
- The results they need to achieve to qualify for RBF incentives;
- Possible reduction of incentives over time and their eventual phase-out;
- Potential extra costs due to stricter RBF requirements on service quality, targeted areas and customer groups;
- Their administrative duties during the project—particularly surrounding data collection for verification;
- Their exposure to risk if the project fails or if the market changes.

To achieve all of this, projects should invest time up-front to **find the right partners** and **understand their business aspirations**. Especially in nascent energy access markets, straightforward tendering processes often will not be enough to find the right private sector actors. The first step is to raise attention in the business community for the new support mechanism. This can be done through a RBF kick-off workshop and other kinds of information events where the RBF business opportunity is introduced and explained. Once companies submit proposals for participation, **proper due diligence and a thorough plausibility check on business plans** will help to assess whether companies can deliver the results the project is aiming for.

Verifying results

One key success factor for a RBF project is knowing if and when to pay incentives for the results the market actors claim they have achieved. The objective of verification is to ensure that incentives are only disbursed for real and sustainable improvements in energy access. The following section gives a summary of the lessons learnt and recommendations—which are discussed in more detail in EnDev’s 2020 publication [Rigorous Verification of Results—Value for Money or Waste of Time?](#)¹⁰

Although EnDev’s RBF Facility projects adapted their verification processes to individual country and project circumstances, the verification process always consisted of **three general steps**: (1) a desk-based check of the participating companies’ incentive claims and corresponding documents; (2) phone calls; and (3) field checks.

1. Paper trail check



During the paper trail check, the project team checked whether the submitted claim documents on customers, products/services delivered, and manufacturers’ invoices and import papers (if applicable) were complete, coherent and met all eligibility criteria.

2. Phone calls



Phone calls were made to a representative sample of customers, asking them about their product purchase and their customer satisfaction. This feedback from customers helped to verify companies’ claims on product sales, prices, and services.

3. Field checks



Field checks, in contrast, provided more accurate information as verifiers could see the product in the household for themselves, also enabling them to confirm quality of the installation or service as well as the product usage by customers.

¹⁰ EnDev 2020: Rigorous Verification of Results: Value for Money or Waste of Time? Lessons from 7 years of applying Results-based Financing in Energy Access Markets. Eschborn: GIZ. Available online at: <https://endev.info/rigorous-verification-of-results-value-for-money-or-waste-of-time/>



Although these three verification methods were used by all projects, the focus can adjust to the individual needs of a project. For small portable products (improved cookstoves, PicoPV, solar appliances) that underwent quality testing by third parties (e. g. by Lighting Global [now VeraSol] or CLASP), the technical field check on quality was less relevant. For fixed installations like biodigesters or even infrastructure projects such as mini-grids it was crucial to have a technical expert verification of quality standards in the field. On the other hand, phone verification was able to cater to a high number of customers and trained call centre staff could cost-efficiently inquire about customer satisfaction and long-term usage patterns. While a thorough paper trail check as an initial step of the verification process was mandatory for all technologies, the decision to prioritise phone or field verification depended on the technology type, intervention objective and country situation.

In the RBF Facility, the involvement of a third party in the verification process was set as a quality standard to ensure independency and transparency. So-called **independent verification agents (IVA)** were contracted to carry out the verification of all claimed results. IVAs can be individual consultants, consulting compa-

nies, research firms, audit firms, call centres or even a combination of these. In general, IVAs were used for phone and field verification, while the paper trail check was either done by the fund manager or the implementing agency.

The RBF Facility's experience in designing, planning and implementing verification systems in the energy access sector can be summarised in the following main lessons learnt (for details see EnDev's 2020 publication on verification mentioned in footnote 10).

Keep it simple. As with other RBF design issues, it is also important during verification to keep the requirements for participants simple. Companies need to be able to understand what they need to deliver to be eligible for an incentive, how to report on it, and which evidence to submit. They might need to be trained on data collection and data management. Ideally, the whole verification exercise should be seen not as a burden, but as a tool to improve their management and delivery practices.

Balance rigour and feasibility. On the one hand, reflect thoroughly on verification requirements by asking the question "What



Digital verification system in Vietnam

EnDev's RBF project in Vietnam built upon the work of an earlier Vietnamese Government programme. This programme had established a strong domestic demand for biogas, which was achieved through consumer subsidies and other means. The supply side was still highly dependent on government support: biogas companies lacked knowledge about marketing and sales, had limited experience of how to operate a commercial business and had never been exposed to a truly competitive business environment. In 2013, EnDev started the RBF project, which aimed to foster sector transformation by incentivising supply-side actions in order to close market barriers and phase-out consumer subsidies. Incentives were paid to biogas entrepreneurs based on the successful installation of biogas digesters that met specific quality criteria. The project's verification system hinged on a mobile GPS

data-collection tool. Enterprises used it alongside the construction and installation process to validate their work by providing data about the customer as well as the construction or installation progress. The data was linked to the spatial coordinates and was uploaded via a tablet or mobile phone to an online platform. During verification independent quality controllers used the app to upload information about the quality of the digesters. If required quality standards were met, the project transferred the incentive to the biogas entrepreneur's bank account. Challenges of the tool included the risk that it might exclude some entrepreneurs who lack digital know-how from participating in the project. A training for all entrepreneurs was therefore introduced and helped to improve app usage skills and raise its acceptance.



evidence do you need to see to tick off result achievement?” This can be done by defining SMART¹¹ indicators for each result, by identifying verification methods, data sources, and/or with a (digitalised) data reporting format. On the other hand, keep it feasible. Verification procedures can be kept lean by adapting claim size and frequency as well as sampling parameters. The optimal claim size and claim frequency depends on the technologies supported. However, to reduce administration costs and ensure a constant cycle of claims submitted and RBF incentives paid, a minimum claim size (e. g. 200 SHS sold) and submission of claims on a quarterly basis, for example, can help. With regards to sampling parameters, the RBF Facility projects, for example, aimed for scientific sampling standards, but also considered higher error margins (e. g. up to 10%) if time and cost effort were unfeasible in the local project context.

Identify synergies and co-benefits. On top of the core data required for result verification, a project can also make use of the verification exercise to collect additional information for impact evaluations and market surveys. The EnDev experience showed that feeding data back to the companies was very much appreciated: most were keen on learning about customer responses during phone calls and IVAs’ technical checks during field visits. As market intelligence in relatively new markets is usually not readily available, using the data collected during the verification process for market analysis and turning them into public knowledge products has proven to be another valuable side-effect of the verification exercise (e. g. EnDev Rwanda published annual off-grid sector status reports which were well appreciated by market and government stakeholders).

Support companies to comply. It is in your interest to make sure that companies understand the RBF’s verification system so that they can deliver satisfactory results. You should therefore communicate your verifica-

tion requirements clearly and transparently to all companies, give them an opportunity to comment on the implementation feasibility, explain quality standards and be clear on the consequences in cases of non-compliance. Establish a feedback mechanism for companies and consider providing capacity building before project kick-off and during implementation. Particularly for the first claim(s), make sure you do pre-checks or request that companies immediately resubmit incomplete data sets. Thereby you can trigger learning.

Streamline and digitalise data management.

The massive amount of data and paper trails involved in the verification process prompted RBF Facility projects to develop digital data management tools and systems. Some implemented online data interfaces to submit and manage claims, others used tablets or apps for phone and field verification. The EnDev RBF biogas project in Vietnam, for example, has introduced an online platform for claim submission (see project example on the left). Lastly, geocoding and geographic information systems (GIS) can be used to map relevant locations—such as beneficiary households—and link these with pictures of the products and their warranty numbers. While the set-up of such systems significantly adds to the frontload work intensity, it quickly pays back over time and can simplify and accelerate data management once sales reach hundreds or even thousands of customers.

If a project intends to use digital technology, it must consider whether participants or verifiers need training and capacity building before they are able to use the technology effectively. Moreover, access to hardware, as well as the reliability and stability of the internet connection, may influence the effective use of digital technology. Project teams should look at the circumstances in their country or region and decide which technologies are practical, offer benefits to the project and fit the country’s and their organisation’s data protection rules.

¹¹ SMART stands for indicators that are Specific, Measurable, Achievable, Relevant and Time-bound.

Adaptive management and exit strategy

Adaptive management is another critical factor for making a project successful. Markets change constantly. If an RBF project aims at market development, it is imperative to continuously adapt its strategy to the changing environment. A prerequisite for adaptive management is continuous market analysis and close knowledge of national policies and regulations, stakeholders, products and customer preferences. Direct and regular interaction with the national government, participating companies and stakeholders can provide important insights on the latest market developments—including the enabling environment. Project management should therefore pay attention to stakeholder relations and continuous monitoring and analysis.

Most of EnDev's RBF projects adapted their initial approaches over time based on gained implementation experience—mostly in terms of the incentive structure, recipients or verifica-

tion procedures. Some also needed to adjust to major changes in the enabling environment, or to the effects of crisis situations (natural disasters, health crisis or political unrest). Annual RBF review sessions, at which a steering committee reviews result achievements, market uptake and changes in framework conditions, have proven to be crucial for adapting the RBF design to new market realities. Projects should factor in the additional time and resources required for these adjustment processes—it will pay off and make the RBF more effective and efficient in the long term.

Finally, the ultimate objective for any market support intervention is to become redundant. RBF projects should begin to **plan their exit** in the design phase, encourage early movers, build local structures and capacities, and work towards sustainable retail prices which are embedded in clear communication about the gradual phase-out of incentives.







Adjusting project design following the earthquake in Nepal

The Nepal RBF project originally aimed to build a market for built-in stoves coming with an extractor hood—so-called hood stoves (see picture below). With the 2015 earthquake, however, many homes were destroyed, making the goal of expanding the number of hood stoves, which are built in houses, impossible to achieve. Next to the general devastation caused by the earthquake, the market was severely affected by the population's loss of purchasing power. Aid organisations and the government thankfully stepped in with free or highly subsidised cookstoves and house rebuilding programmes. This meant that the

project had to adapt in several ways: First, the focus of the project broadened from built-in hood stoves to including portable stoves, which not only had lower retail prices but could be used both inside and outside the house. Second, the project re-focused geographically on districts which didn't receive subsidised stoves from the government and/or other organisations in reaction to the natural disaster. Third, the RBF project provided additional support to stove producing companies to help them overcome the immediate financial impact of the earthquake and maintain their business.





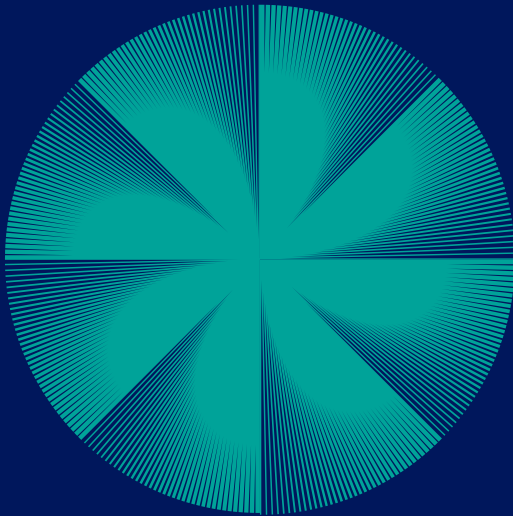
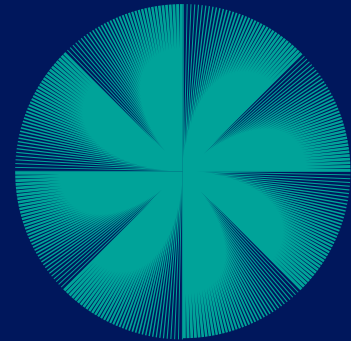
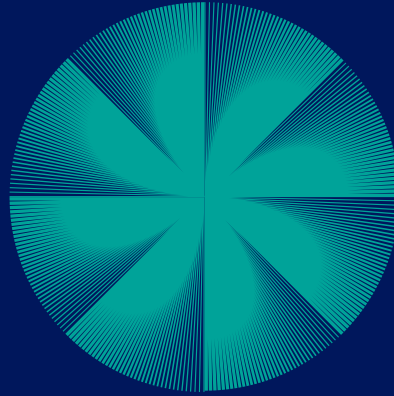
Adjusting incentive structures in Benin

The EnDev RBF project in Benin aimed to develop markets for different solar technologies. In the beginning, importing PicoPV systems was a long and cumbersome process for companies. EnDev wanted to address this by offering RBF incentives. The total incentive level for certified solar systems amounted to 50% of the product price before importation (excluding transportation cost), 20% paid after importation, and 30% paid after the product sale. Over time, as companies gained more experience and import processes became smoother, EnDev adapted the incentive structure and shifted to solely rewarding

the sale to final-customers. This allowed the project to target the remaining market barrier. 31 companies eventually signed up as RBF companies and in total 54,000 solar PV lamps, 3,600 SHS, 275 water pumps and 740 streetlights were supported from 2014 to 2019. Five companies sold SHS on such a large scale that they reached the incentive cap which the project had initially defined for each beneficiary. To further assist the promising solar market in Benin, EnDev continues to provide support for the market even after the closure of the RBF project.



Success factors



5

The 17 RBF projects implemented under the EnDev programme have produced valuable lessons. These cover each stage of a project, from designing, planning, and budgeting incentive structures to selecting companies, external support and verifying results. Energy access markets vary from country to country,

are influenced by their social, economic and policy context, face different challenges and present specific opportunities. There is no single 'blueprint' for a perfect project—but there are only ways to increase the likelihood of success.



Tune in to the market and the economy

The more a project understands the market and its context, the better it can anticipate market dynamics and the effect an RBF project might have on market transformation. That, in turn, makes it more likely that a project will offer the right incentives to the right stakeholders who can stimulate and sustain sector development.



Reflect whether RBF is the right tool

RBF is one tool in the development corporation toolbox. A thorough market analysis needs to confirm that RBF is the best available tool to overcome market failures—most often it must be used in combination with other interventions and capitalise on previous measures or other programmes. RBF is seldom a stand-alone tool.



Be clear about what you want to achieve

RBF project design will vary depending on a project's focus, i. e. whether you aim to support overall market development or to improve access to energy services and technologies for a very specific—and possibly vulnerable—customer group. While the two objectives are not exclusive nor contradict each other, the latter one requires special attention and targeting.



Join forces—coordinate, collaborate and harmonise approaches

It is not unlikely that the targeted sector is also supported by other development partners and national government programmes. A sound RBF project should complement these and identify which market barriers remain unaddressed, where to seek cooperation and leverage synergy effects.

Incentives: For ‘what,’ ‘whom’ and ‘how much’?

Setting the right incentives is one of the most crucial parts of RBF projects. Be clear about the bottlenecks you want to address and offer the incentives to the right actors (‘who’) for the right result in the supply chain (‘what’). Be thorough when setting the incentive value (‘how much’)—but know you can adjust it if needed. It is more important to capture companies’ interest through attractive incentives in the beginning and subsequently reduce them step-by-step than starting too low and discouraging the private sector from participating at all.



Be willing to invest in technical assistance if needed

Experience has shown that RBF projects rarely lead to success without accompanying technical assistance and capacity building. Building capacities and triggering a learning curve for all stakeholders involved is the key to actually achieving results and ensuring sustainability.



Take the time to find a fund manager

A good fund manager can be the bridge between the RBF project and a long-term, sustainable market. Finding one might not be easy, but it may be worth taking the time to search for a financial institution or other actor with a genuine interest in energy access markets. If the local financial sector becomes more active in the energy access sector, it can help to overcome the financing bottleneck—be it working capital for companies or attractive financing schemes for consumers.



Be pragmatic about verifying and clear about paying

Results matter. Projects—as much as companies—need to have a verification system that is reliable and cost efficient. This means balancing phone and field verification efforts and choosing an appropriate sample size. It is essential to make criteria unambiguous and to be straightforward about how and with which frequency companies will receive their payments. Using digital tools can greatly simplify the process by improving data management and quality.





Put your market intelligence to use

Each RBF project generates a lot of data (mainly due to verification requirements, [see chapter 4, p. 58 et seq.](#)) about products sold, service quality, typical customer profiles, etc. While complying with data protection rights, an aggregated, anonymised analysis and sharing of this market intelligence can help both the private and the public sector to further develop their insights into market dynamics. Companies usually appreciate any feedback on how to improve their business, and energy access data can help governments to finetune policies and regulations. Last but not least, sharing lessons on what works and what does not can contribute to further fine-tuning interventions for market developments.



Dynamic markets require adaptive management

Designing and steering RBF projects is like navigating a ship on the high sea. External events (such as natural catastrophes and pandemics), changes in the enabling environment and national policies, new donor initiatives, price fluctuations on global markets and changing consumer priorities (to mention but a few) require a constant re-assessment and—if necessary—a readjustment of initial strategies. Annual RBF review sessions, at which a steering committee reviews result achievements, market uptake and new framework conditions, have proven to be crucial for adapting the RBF design to new market realities.



Do not stay forever—plan for exit

RBF projects should already plan their exit in the design phase, encourage early movers, avoid unsustainable retail prices and communicate the gradual phase-out of incentives early on. Although markets continuously evolve, mature markets should be able to serve energy access needs by themselves (serving non-commercial customers being the exception to this rule as these require some form of public support). The ultimate objective for any market support intervention is thus to become redundant.

Once the RBF project closes, a new updated market analysis needs to reveal which market barriers have been overcome, which ones remain and whether there are new barriers to take into consideration. Local markets

develop dynamically: new technologies, business models, changing customer preferences and policy objectives are exposed to continuous evolution.



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