Giving RBF a voice

17 projects · 14 countries · 7 years

A summary of 17 project closing stories featuring entrepreneurs who benefitted from the EnDev Results-based Financing (RBF) Facility financed by UK Aid

endev

RBF

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Acronyms and Abbreviations

CLASP	Collaborative Labeling and Appliance Standard Program
FCDO	UK Foreign, Commonwealth & Development Office
DGIS	Directorate General for International Cooperation
EnDev	Energising Development
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HIVOS	Humanistisch Instituut voor Ontwikkelingssamenwerking
NORAD	Norwegian Ministry of Foreign Affairs
RBF	Results-based Financing
RVO	Netherlands Entreprise Agency
SDC	Swiss Agency for Development and Cooperation
SNV	Netherlands Development Organisation

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Results-based Financing for energy access

EnDev at a glance

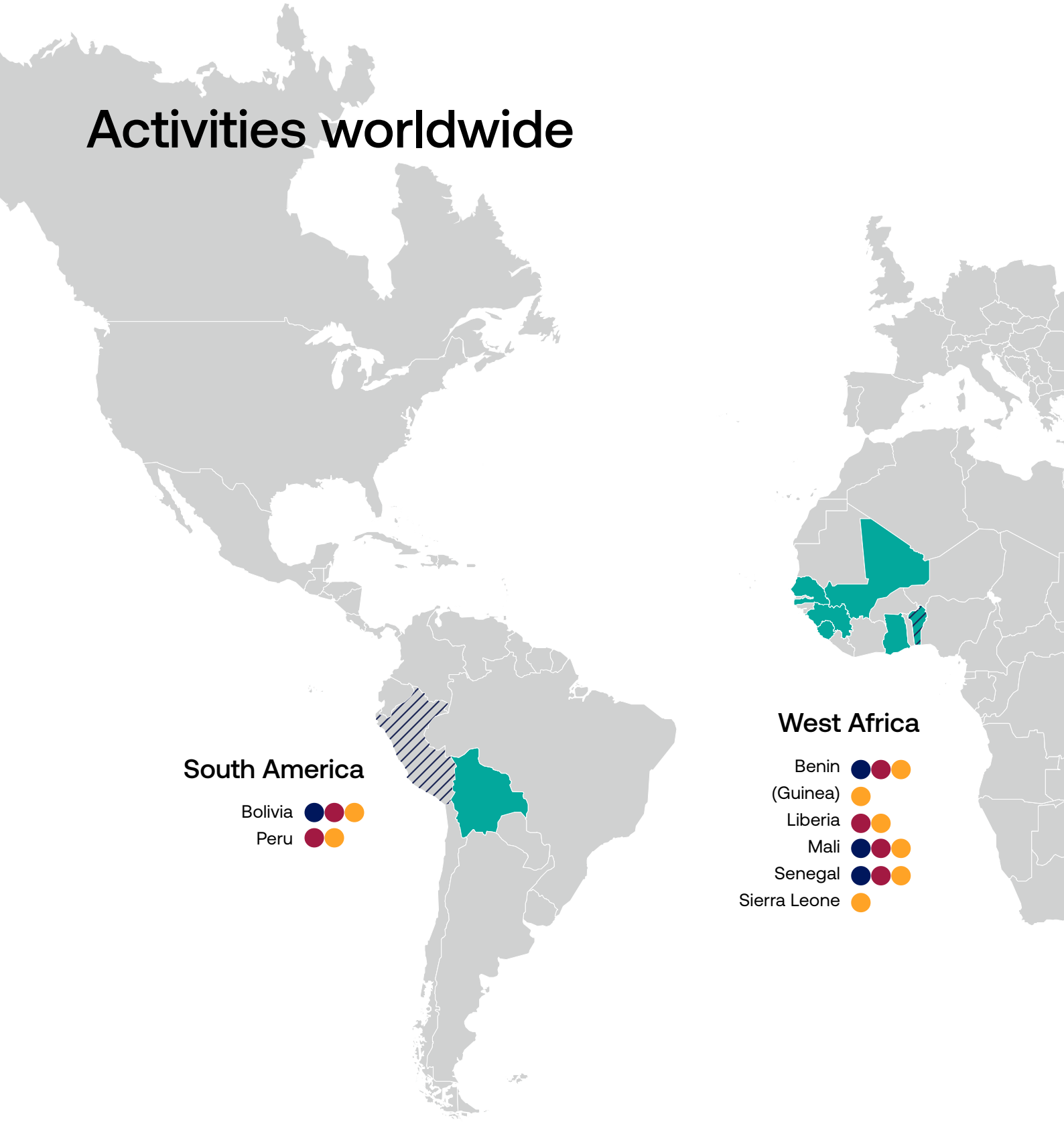
Approximately 3,6 billion people have no access to electricity or improved cooking technologies. This has a dramatic impact on quality of life, environment, health, education and income opportunities.

EnDev's involvement focuses on providing access to modern, renewable energy. This is a pivotal factor in strengthening socio-economic development and combatting climate change.

EnDev's drive is to improve the lives of the most vulnerable people; ensuring no one is left behind. Economic opportunities and green jobs are created by building markets for modern, renewable energy. EnDev contributes to reducing greenhouse gas emissions to protect our planet's climate. Its approach is to empower structural, self-sustaining change; kickstarting market and sector development that evolves further without support from EnDev.

EnDev is a strategic partnership. Dedicated donors, partners and individuals work together to support social development and economic development by providing access to modern, renewable energy in more than 20 countries around the globe. The driving force behind EnDev is the partnership comprised 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.

Activities worldwide

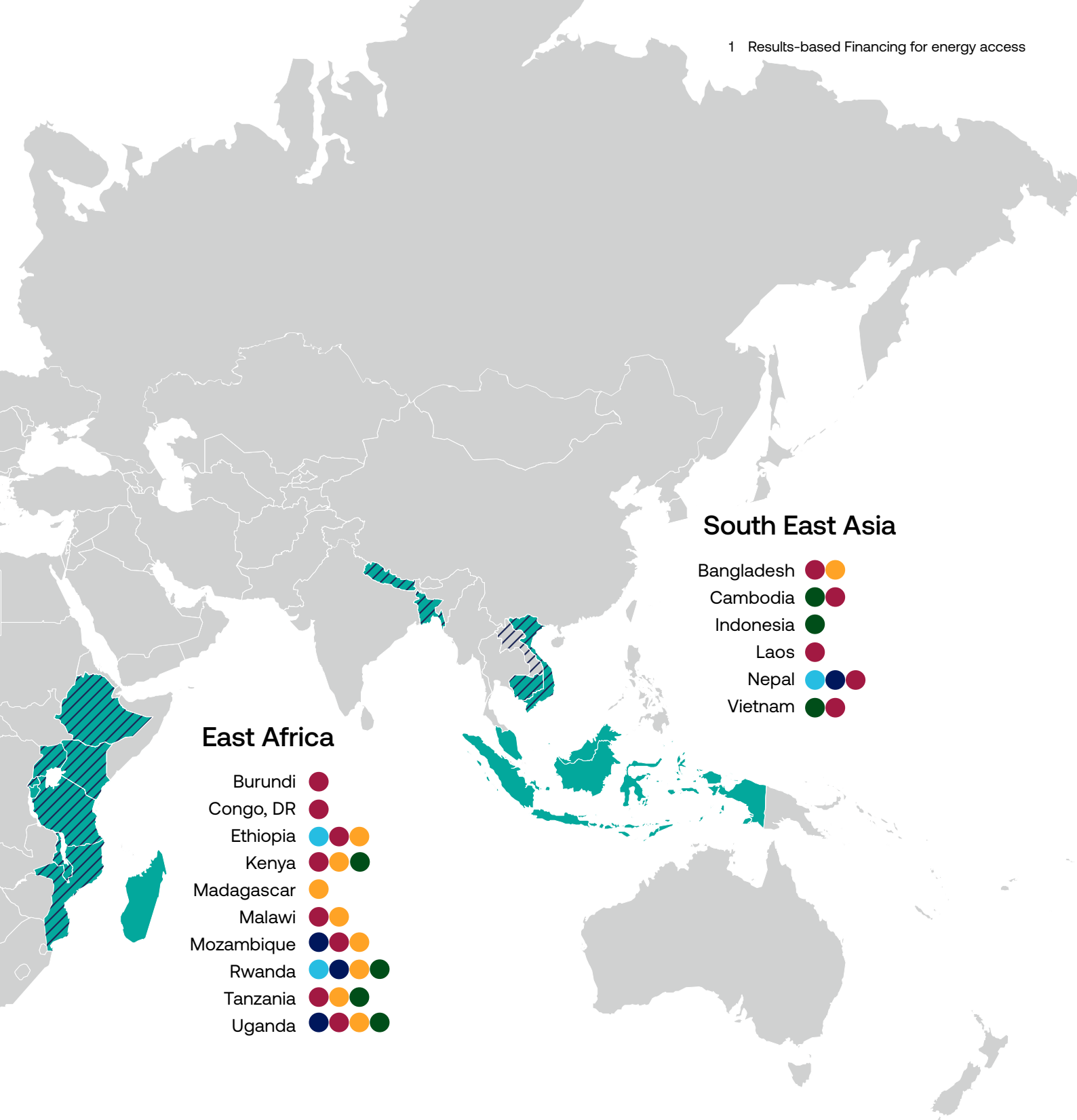


South America

Bolivia
Peru

West Africa

Benin
(Guinea)
Liberia
Mali
Senegal
Sierra Leone



Geographic portfolio

EnDev country measure as of Dec. 2020

EnDev country measure with RBF Facility project

Energy access portfolio

Hydro power | Grid | Cooking energy | Solar energy | Biogas

Figure: Activities worldwide

EnDev's RBF Facility

From 2012 until 2020, EnDev's Results-based Financing Facility piloted 17 projects across 14 countries in Africa, Asia and Latin America covering a wide range of modern energy technologies to enhance energy access markets with funding provided by UK Aid through the Foreign, Commonwealth & Development Office (FCDO). Implementing agencies were GIZ, CLASP, HIVOS, Practical Action, and SNV.

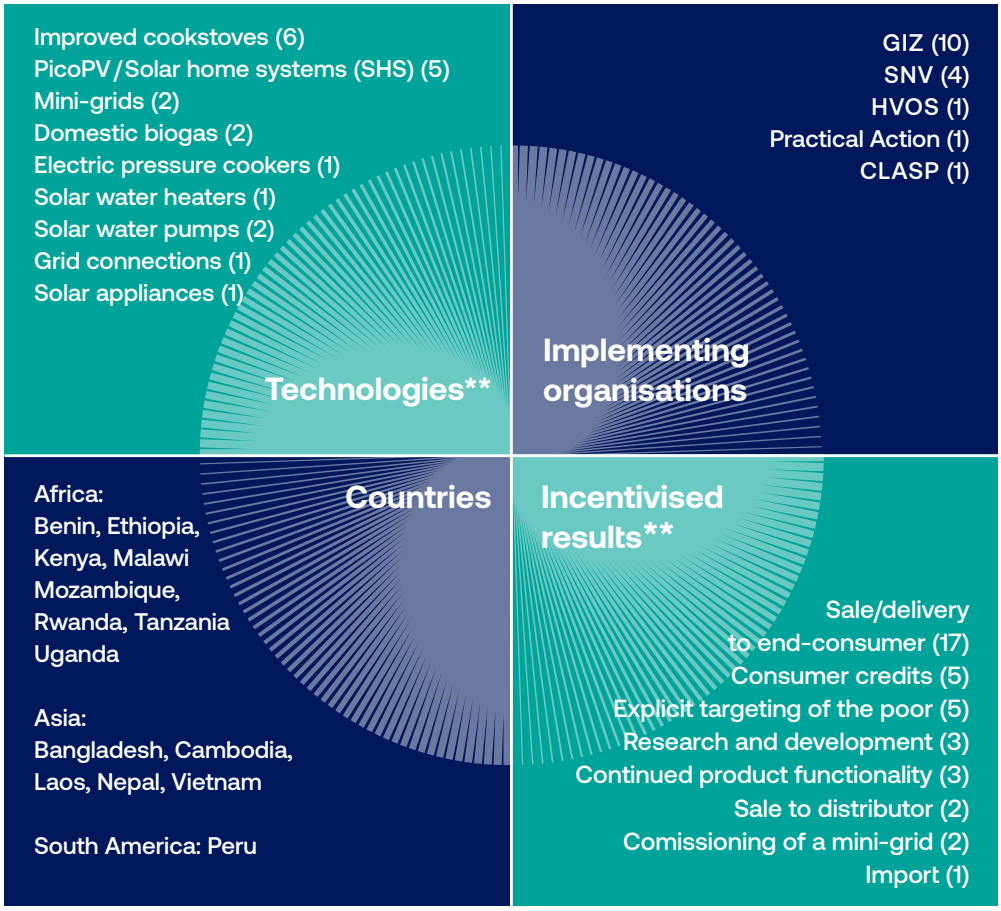
Results-based Financing (RBF) is a modality where a funder (this can be a donor, an implementing organisation, a national government or other institution) disburses funds to a recipient only once a pre-agreed set of results is achieved. This approach involves three key principles. Firstly, payments are made only after the results are achieved; secondly, the recipient may independently choose how to achieve these results; and lastly, independent verification of results is the trigger for disbursement.

The primary aim of the RBF Facility was to boost energy access market development. Based on an assessment of market potentials and barriers, financial incentives were designed to help strategic market actors to scale innovative business models offering quality energy access products and services at a competitive price. Where necessary and feasible, complementary technical assistance was provided ranging from market research and awareness raising to the provision of business development services.

The RBF Facility was designed right from the beginning with an accompanying learning agenda. The objective was to gather and analyse experiences from this large-scale pilot and share valuable insights into the success factors and challenges with implementers, practitioners and donors considering working with RBF approaches in the energy access sector.

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: The EnDev RBF portfolio

The market dynamics on the ground required constant adjustments at the project level (see chapter 4 of the EnDev RBF Lessons Learnt Report), 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. chapter 3 of the EnDev RBF Lessons Learnt Report), 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 technology 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.*
- 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 CO_2 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.

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

Figure 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.

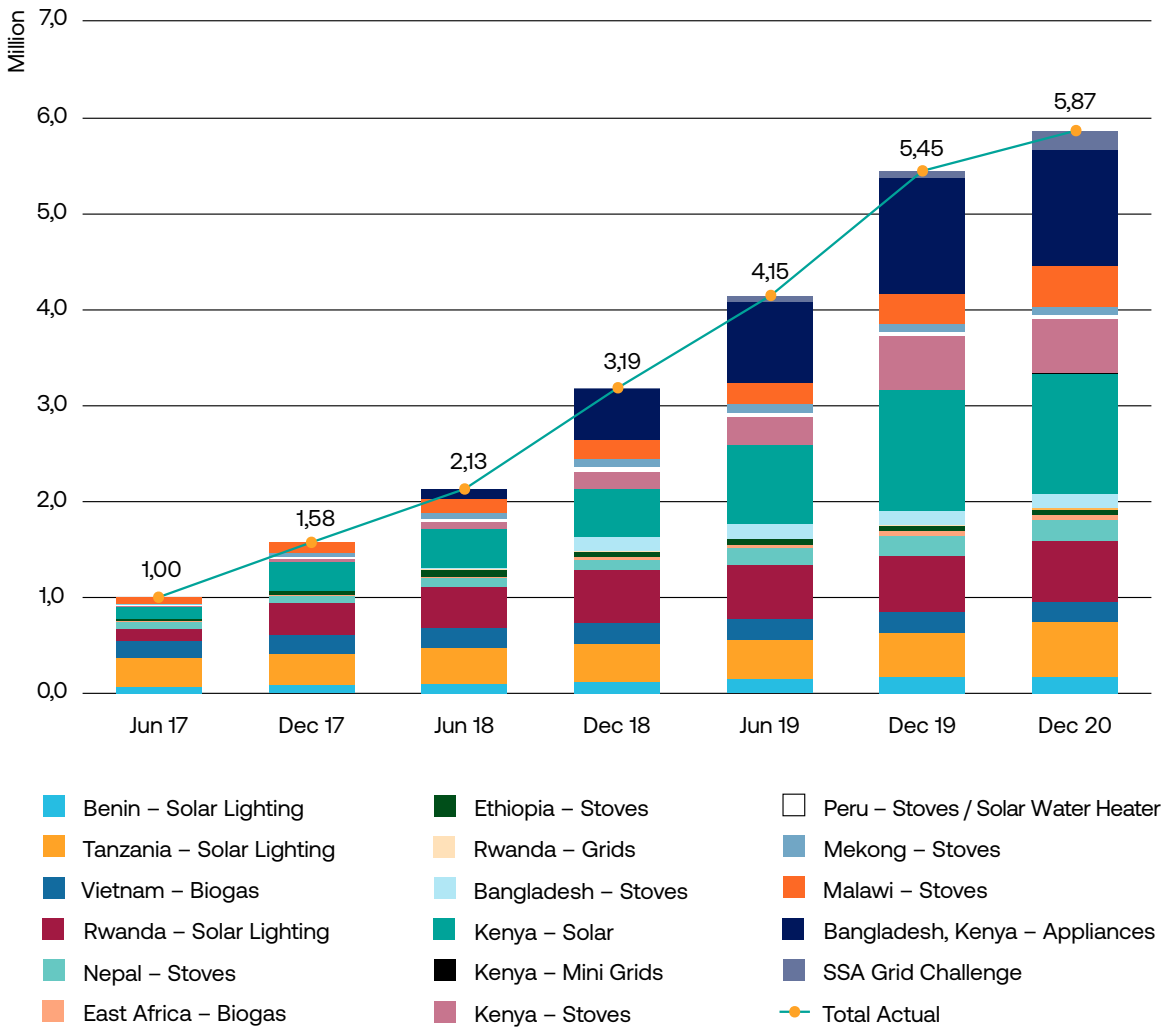


Figure: RBF Facility—Total number of people with access to energy—2014–2020

EnDev's RBF approach

RBF contracts and disbursements with market actors were managed either by a financial institution or the EnDev country project itself, depending on interest and capacity of the financial sector. Market actors were manufacturers, importers, or distributers of energy access products or services as well as financial institutions. Each of the 17 EnDev RBF projects had its own design, but the following figure depicts a typical set-up of an EnDev RBF project.

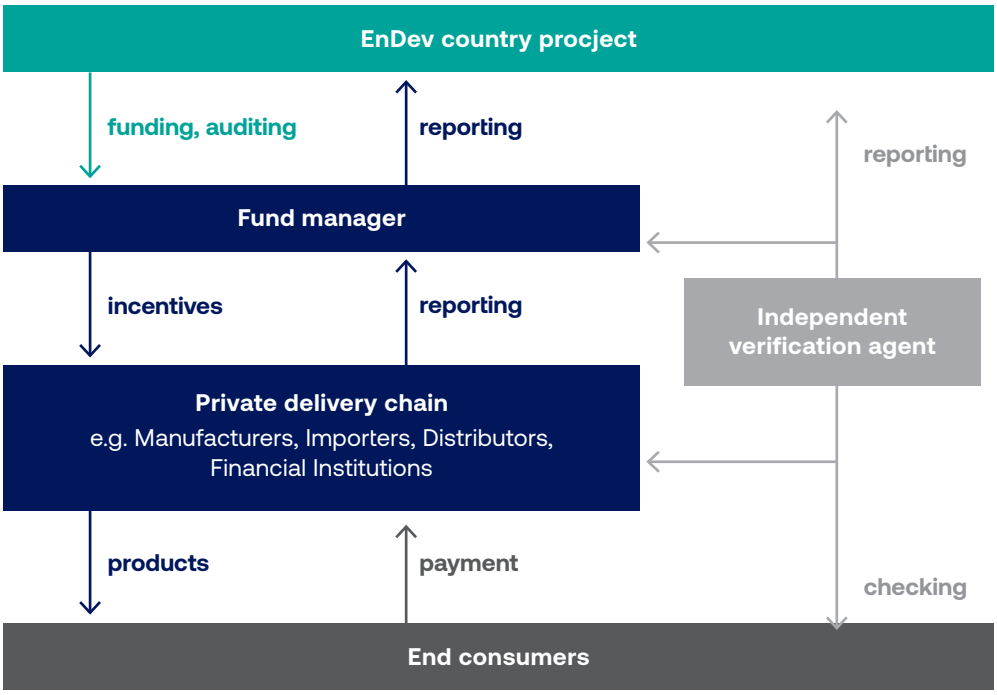


Figure: Typical set-up of an EnDev RBF Facility project

EnDev's RBF project closing stories

Various RBF approaches and incentive designs were piloted around the globe in different countries and in a diverse range of sub-sectors. At the heart of the RBF Facility lied an explicit learning agenda fostering knowledge exchange.

With this RBF project closing story brochure, EnDev wants to illustrate how different entrepreneurs benefitted from the respective RBF project in their country and summarise impacts as well as lessons learnt. It is important to highlight that the content solely builds on the experiences EnDev gathered under the RBF Facility. The individual RBF projects were given freedom to design and apply flexible approaches to address context-specific energy market viability gaps, which is why EnDev's lessons learnt may not necessarily apply universally.

The insights provided in this document are based on practical examples, learning curves, and experience in agile management gained in 7 years of implementation. After providing a short introduction in the first chapter, the second chapter provides a summary of all 17 RBF projects and their respective closing stories giving the RBF Facility's final beneficiaries a voice.

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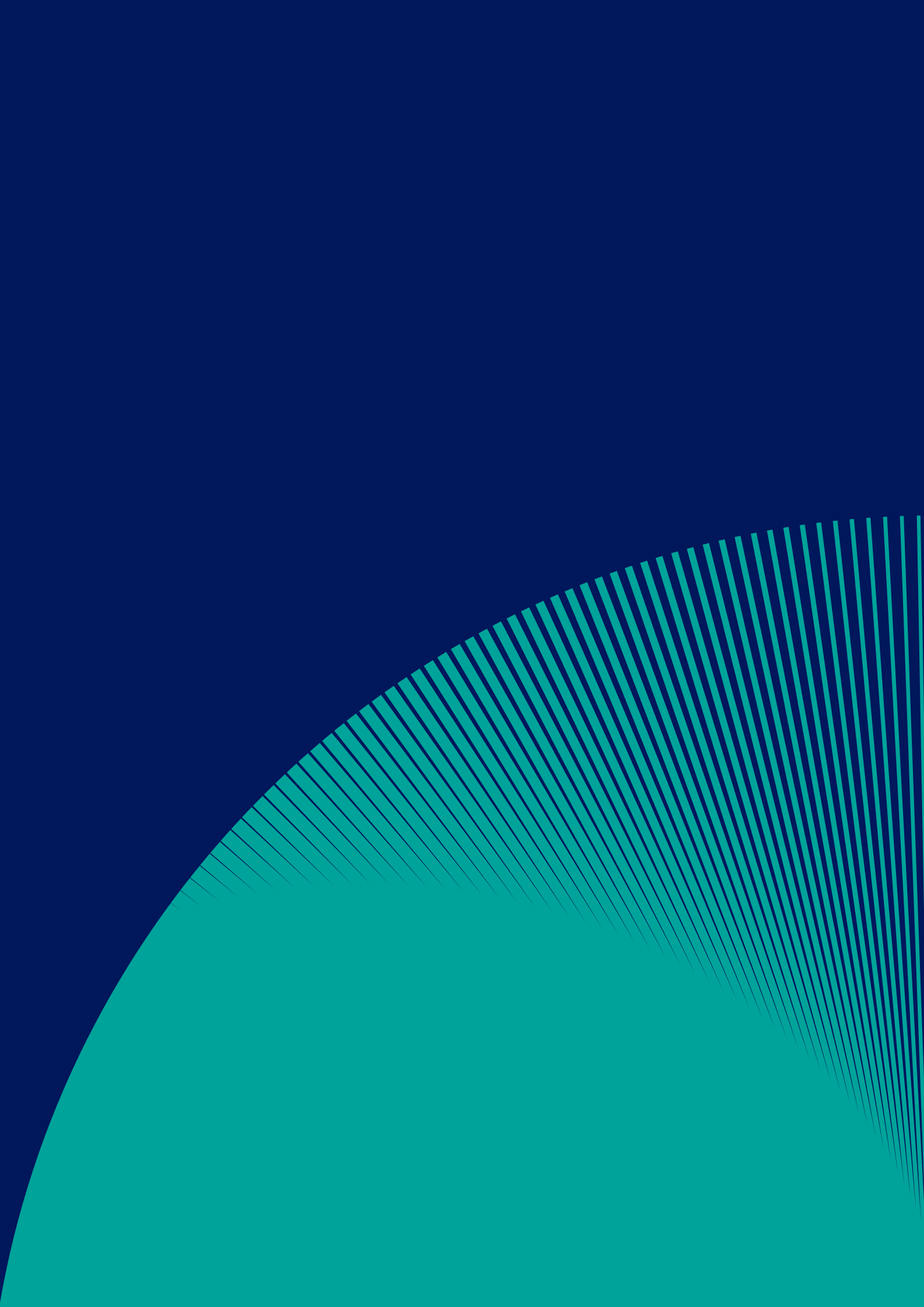
RBF project closing stories



Rays of hope

Results-based Financing Facility project closing story

Local businesses bring off-grid solar products to rural Benin

Sena Gbogbo's life revolves around three Fs: family, faith and firm. While he spends the weekends at home with his five children and in church, during the week his solar company takes centre stage. But there's no question as to the inspiration behind his business: it's called Jesuton or "for Jesus". From a small office building on the outskirts of Cotonou, the economic centre of Benin, his close-knit team processes orders from across the country. They sell solar pumps, picoPV solar systems for powering small appliances and full-scale solar home systems. Business is booming, but it wasn't always this way. In 2014, Sena quit an uninspiring job in the cement industry to follow his dream and start his own solar company. But he lacked equipment and access to reliable suppliers. And without any orders coming in, there was no way to pay for these things. It was a vicious circle.

Jesuton needed jump-starting. In 2015, Sena heard about EnDev. Through results-based financing (RBF), EnDev offered an incentive for every product that Jesuton sold. RBF helps businesses develop by providing performance-based incentives. Enterprises receive payments after pre-agreed results have been achieved and independently verified, instead of being given funding upfront. This shifts the focus of support towards results. For Sena, the promise of future EnDev payments provided the basis for a bank loan, which he used to hire staff and purchase equipment. And thanks to EnDev's reputation, this also opened the door for conversations with local councils. Recommendations from public authorities are vital in Benin for attracting social institutions such as health centres. By 2017, orders were streaming in. Sena was able to use the incentives not only to cover repayments on the loan but also to cover HR costs and invest in a pick-up truck to transport equipment to remote areas.

Now, Sena is not only looking to expand Jesuton's presence on the private market but is also confident he can meet the requirements of public tenders. "The RBF project has really put us on the map," he says. "We're now in the address book of an increasing number of firms and public institutions." The next step is to secure long-term contracts from national and international organisations and private companies operating in the electricity network and in irrigation systems.

A new market

There's huge potential in Benin for companies like Jesuton. Most people in the country's rural areas are not connected to the grid. People use kerosene lamps or candles for lighting, diesel generators to power fans and charge their phones, and wood stoves for cooking. It's not cheap: households without electricity spend about 20% of their income on energy. With solar power, homes, businesses and social institutions can tap the sun's abundant energy – they just need the right equipment. But in the absence of economies of scale and effective value chains, it has been difficult for firms to enter the market.

During the project period from 2014 to 2019, EnDev incentivised companies like Jesuton to sell solar pumps, picoPV solar systems and solar home systems by covering up to 30% of the costs for importing and installing the devices. This helped create a national market for off-grid solar products. As well as offering incentives, EnDev provided training to participating companies in the installation of customised solar home systems. The project also negotiated tax exemptions with the Beninese authorities on imports of solar products for participating enterprises. This improved the enabling environment for other companies in the sector, who now also benefit from the tax exemptions. Finally, while the process of verifying claims for incentive payments forms an integral part of the RBF approach, it had the added benefit of professionalising business practices: where issues were identified in the verification process, these had to be resolved before a successful claim could be made.

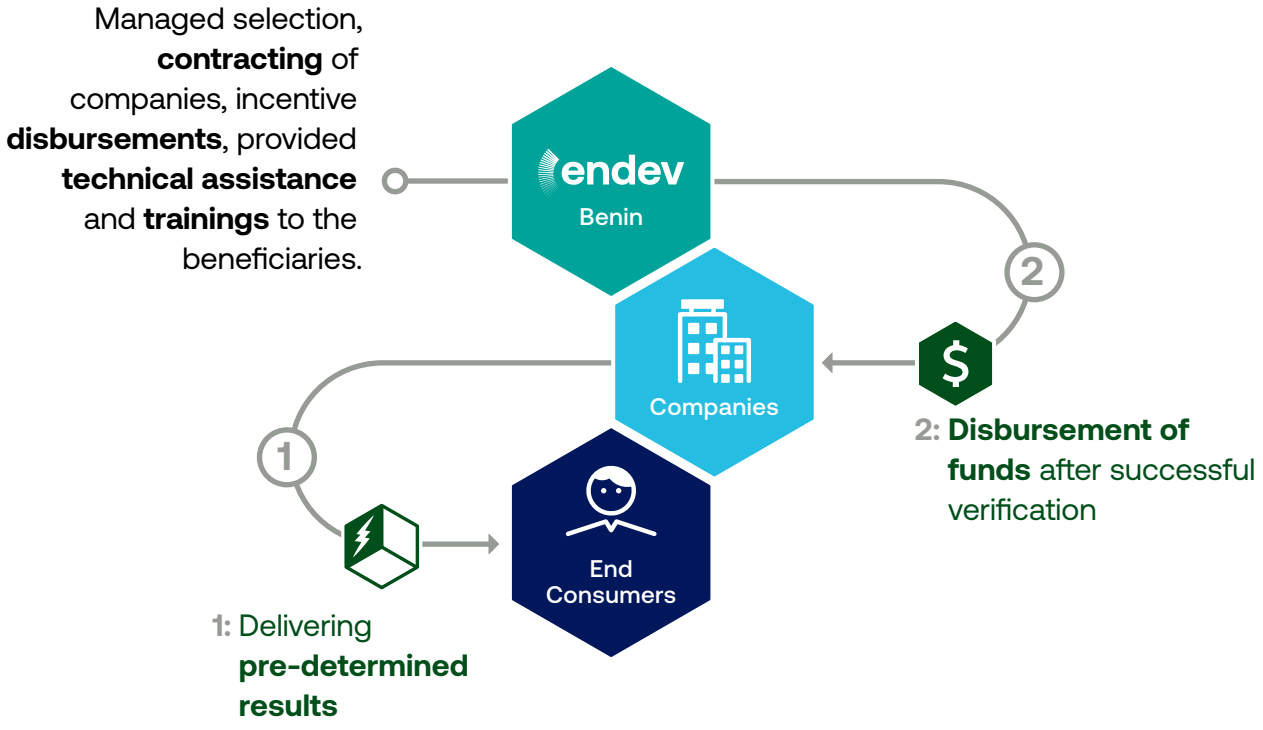
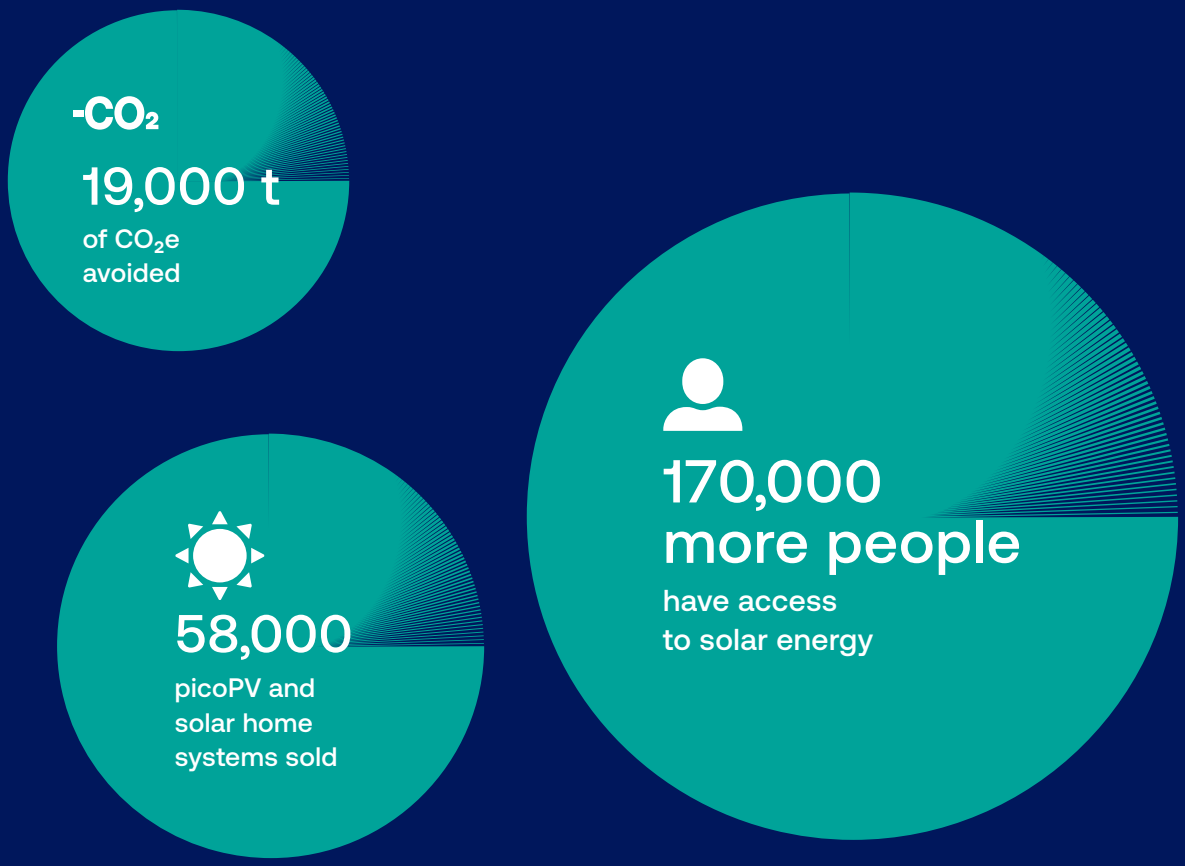


Figure: The RBF project design in Benin

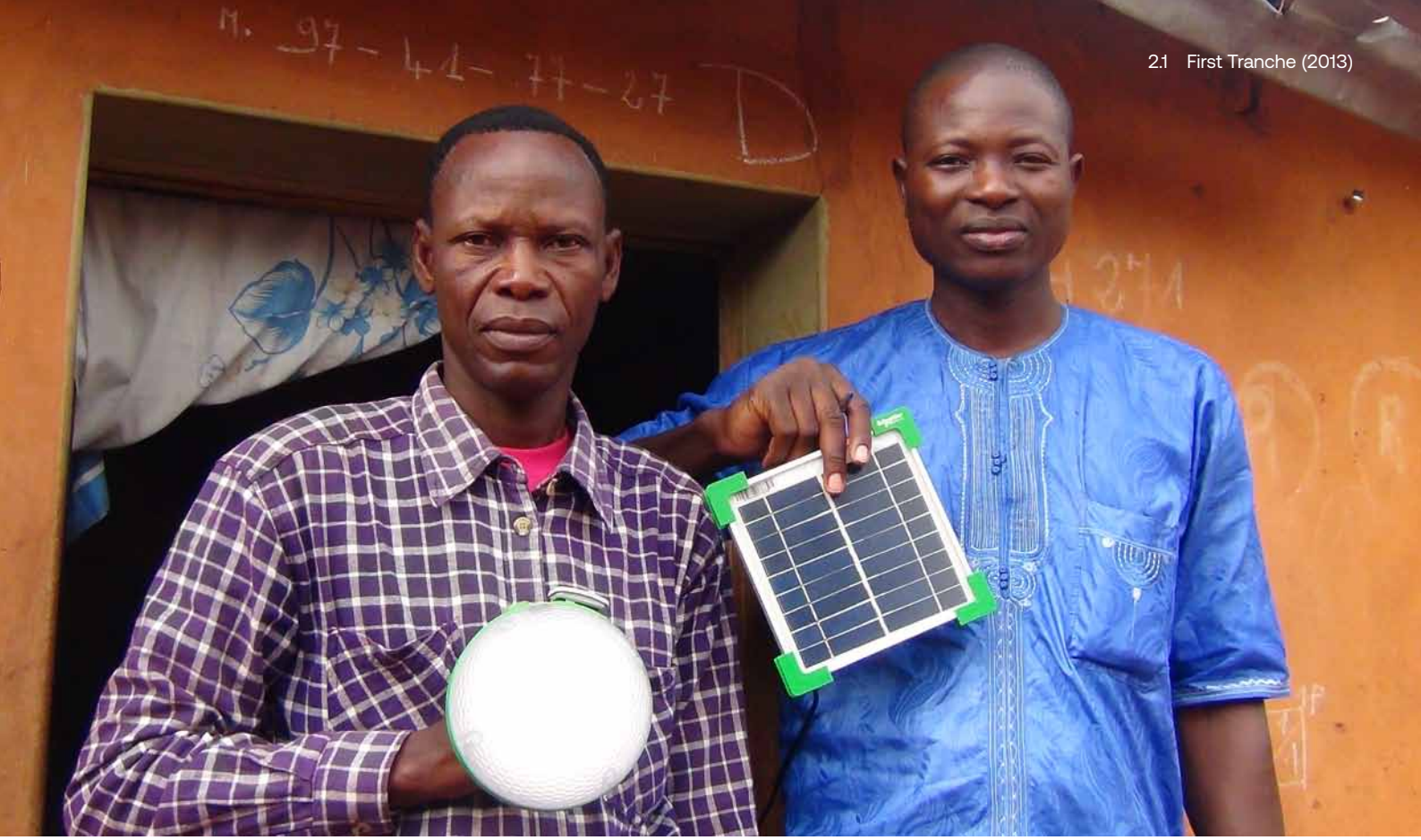


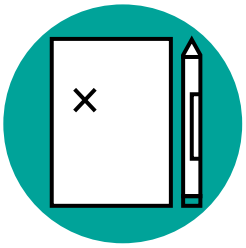
Results in a nutshell

The project started in mid-2013. While almost no sales were reported in the first two years, a steep growth of sales was observed in 2016, when companies were able to identify sources of financing for larger imports and set up distribution channels. From then on, numbers grew steadily until the end of the project in 2019.

In total, **170,000 more people** in Benin now have access to solar energy. The 280 solar pumps and almost **58,000 picoPV and solar home systems sold** through the scheme offer a healthy and safe way to generate energy. Users benefit from improved lighting, additional options to charge small appliances and the opportunity to replace diesel generators. In addition, 140 small and medium-sized businesses and 220 social institutions, such as health centres, were equipped with new solar products over the five years of the project. And because using solar energy reduces carbon emissions there are also climate benefits. In total, over **19,000 t of CO_2 equivalent (CO_2e)** will be avoided over the lifetime of the products sold.

The solar sector has been given a boost: more and more companies are importing, selling and installing solar home systems. As a result of the project, 19 solar energy enterprises entered the market and are investing in distribution networks across the country. This led to 130 new jobs, of which 50 went to women. In addition, the project was able to leverage significant investment from the private sector and end users, with participating firms and beneficiary households contributing on average almost twice as much of their own funds as was dispersed in total project expenditure.





Lessons learned and ways to improve

The design and implementation of the RBF project in Benin generated valuable lessons. For those in other projects or organisations active in the same field, these lessons provide guidance for the roll-out of future RBF projects:

1. Plan complementary technical assistance

It took considerable time to set up and continually adapt the RBF design. While the project focused on the financing needs of the private sector, further needs became evident during project implementation, including technical assistance to companies in terms of access to working capital, and policy advice on improving the enabling environment.

› Future RBF projects should plan complementary technical assistance activities to accompany the RBF incentives.

2. Develop methods to ensure the involvement of local companies

RBF is a demanding approach and requires a certain level of capacity from private sector participants. Companies that are likely to more easily deliver results through their participation in the RBF are therefore either international firms or larger local enterprises. This should be clear to the project implementer from the outset.

› If the objective is to involve smaller local companies, a number of methods can be used, including developing eligibility criteria for participating companies, introducing caps, and providing additional technical assistance for smaller companies.

Photos
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Christine Hortense Rwampungu/GIZ

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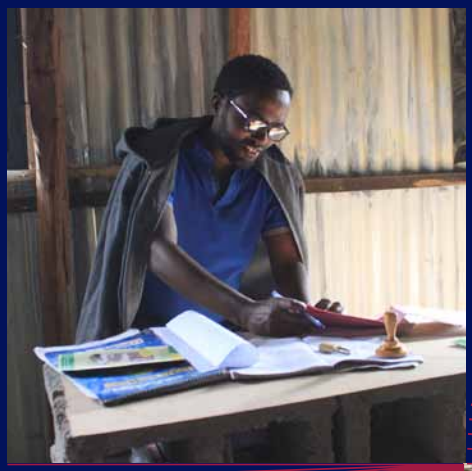
Designed by: DITHO Design GmbH

A recipe for Ethiopia's rural communities

Results-based Financing Facility project closing story



Rural markets and the environment benefit from improved cookstoves

Kemal Kedir looks on proudly as his 18 employees go about their work on a site about the size of a football pitch. His staff are busy and produce dozens of cookstoves every day. It hasn't always been like this. In 2015, Kemal started his business in Asasa, a town in Oromia, Ethiopia's largest regional state. With a starting capital of 600 euros he hired two part-time helpers and produced cookstoves in his backyard. Because he didn't have a car, he could only sell to people in his neighbourhood. The simple mud-plastered houses of the 30,000 inhabitants of Asasa are connected by narrow dirt roads, which meant that the delivery of the heavy concrete stoves was a logistical challenge. For the first few years, Kemal's prospects didn't look good.

This changed in 2017, when he learned about the **results-based financing (RBF)** project in Oromia: cooperatives and small enterprises received a financial incentive for every improved cookstove they sold. RBF helps businesses develop by providing performance-based incentives. Enterprises receive payments after pre-agreed results have been achieved and independently verified, instead of being given funding upfront. This shifts the focus of support towards results. The incentives helped cover additional costs for transport and marketing, allowing the businesses to sell to more remote rural households. Kemal was among the entrepreneurs who took this opportunity, which led to enormous growth for his business. The RBF incentives allowed him to buy a truck, and now he can deliver the stoves directly to customers in all districts of Oromia. Kemal also developed a successful marketing strategy; attending local government meetings, the entrepreneur identified influential villagers who promote his cookstoves in return for a commission.

Results-based financing: a solution for developing rural markets

In addition to Kemal, four other companies in Oromia participated in the RBF project, as well as eight companies in the northern Tigray region. In both regions, the project recognised that there was an unaddressed demand for cookstoves in rural areas. However, high transportation costs to remote villages made the products unprofitable and discouraged investment by retailers. The so-called 'Tikikil stove', for example, costs 7.50 euros in urban markets. Adding costs for transportation, and loading and unloading in rural areas, the retail price climbed to 11.50 euros – an increase of 30 percent and a very real barrier for potential customers in rural areas.

The RBF incentive scheme tackled this by linking rural cooperatives and retail enterprises with urban-based stove producers. Retailers used the RBF incentives to cover transportation and other overhead costs, thus maximising profits, while stove prices in the rural markets could be set at a fair level. This led to increased demand from rural households and stimulated market development in remote areas. Stove producers were able to reach economies of scale, and increased competition on retail side resulted in price reductions and improved end-consumer affordability. Eventually, the market will sustain itself even after RBF incentives end.

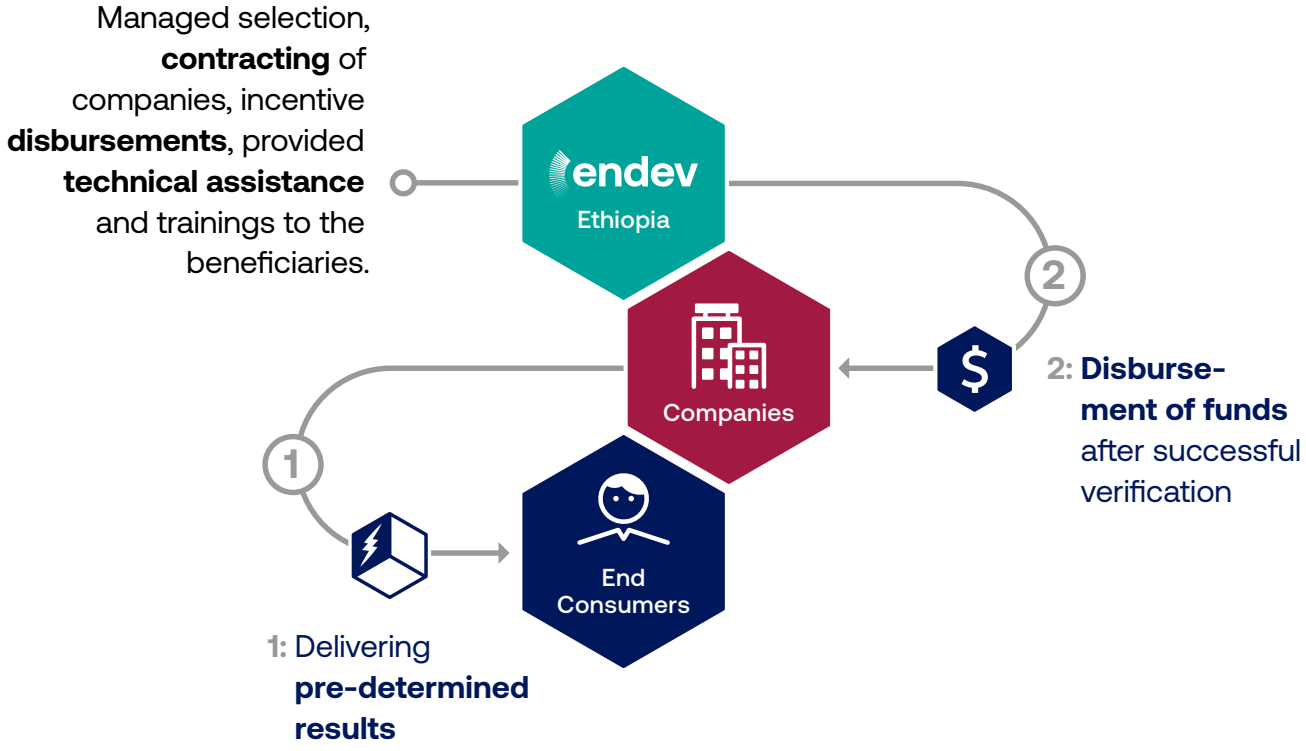
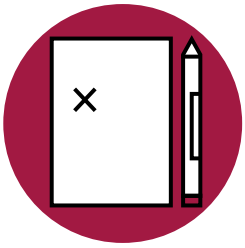


Figure: The RBF project design in Ethiopia

Results in a nutshell

The benefits for entrepreneurs like Kemal and rural communities in Ethiopia are manifold. Within two years, participating companies **sold 23,000 improved cookstoves** in Oromia and Tigray. The climate-friendly technology reduces cooking times and improves energy efficiency in domestic cooking for around **58,000 people.** Customers now use much less firewood, which improves the air quality inside homes and so benefits the health of women and children in particular. Time spent gathering firewood is reduced, and forests are protected against degradation. With a reduction in fuel consumption there was less carbon dioxide: the cookstoves avoid emissions by about **94,000 t of CO_2 equivalent (CO_2e)** over their lifetime. Finally, 100 jobs were created in stove production and marketing in the regions, which motivated other businesses to invest in this sector.

The project started in 2013. After an intensive inception and preparation phase, the first sales claims were successfully verified and reported in December 2016. From then on, numbers grew steadily until the end of the project in 2018.



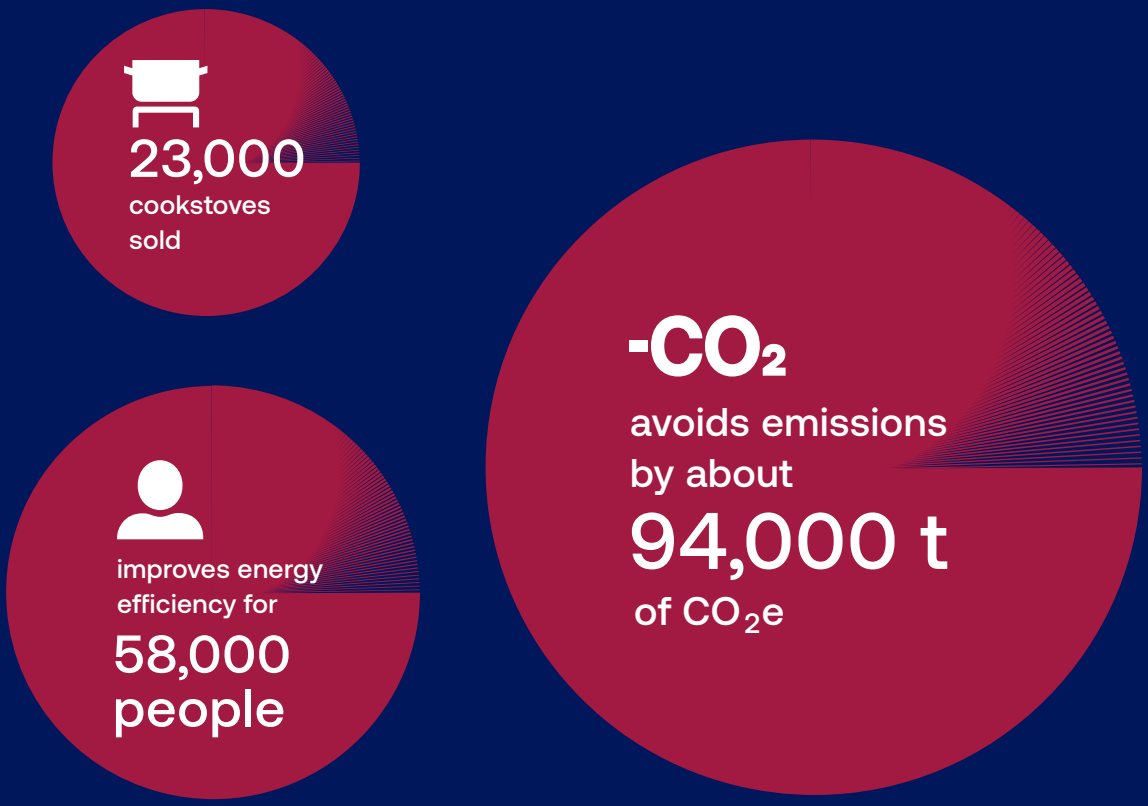
Lessons learned and ways to improve

RBF proved to be a powerful tool for stimulating market development, unlocking the growth potential of the many micro enterprises active in the cooking sector. The design and implementation of the RBF project generated valuable lessons, which are relevant to projects or organisations active in the same field:

1. Know the right actors in the supply chain and incentivise them accordingly. Be sure to thoroughly research the market before designing an RBF scheme and don't hesitate to re-design your approach if needed.

At first, the RBF project targeted agriculture and energy cooperatives. Cooperatives are well established in Ethiopia and have good rural outreach and a broad member base. They were thought ideal as an intermediary to bring urban produced cookstoves to rural families in the absence of other rural distribution and retail structures. Contrary to the project's original assumption, however, their capacity to participate in the project was very low, requiring a lot of technical support. The cooperatives had limited or no financial ability to pre-finance the RBF activities, making them highly dependent on microfinance institutions. Often, the microfinance institutions could not satisfy the financial needs due to limited lending capacities, the complexity of their lending procedures, and other priority lending areas. As a result, all contracted cooperatives performed significantly lower than expected and only about 1,000 improved cookstoves were sold.

› A fresh look at the value chain: after two years – and in light of poor performances – a decision was made to work directly with stove producers instead of cooperatives. This resulted in the intended changes and during the last 18 months of the project more than 25,000 stoves were sold. Producers themselves could decide how and where to sell their stoves, while directly benefitting from the incentives and using these to expand their businesses. Know the right actors in the supply chain and incentivise them accordingly. Be sure to thoroughly research the market before designing an RBF scheme and don't hesitate to re-design your approach if needed.



2. Be wary of data collection challenges

Cost-efficient data collection for verification purposes is key to successfully implementing an RBF approach. In the ideal case this means: sales- and customer data is collected and available as well as being fully digital. In Ethiopia – and especially with small informal businesses – paper-based reporting is still the norm, making customer data collection required for RBF verification a cost- and time-intensive endeavour.

› A lack of digital customer data management systems can become a real burden for RBF verification. However, if data collection and reporting requirements posed by an RBF project are too strict, smaller and less formal companies might be discouraged or outright excluded from participating in the project. Consider whether the extra effort and cost for verification are worth the benefit and be prepared to accept higher verification costs. Anticipate more technical support for building up reporting systems if you work in a less developed pre-commercial market setting.

3. Don't underestimate the need for technical assistance

There is still limited awareness of the health, environmental and economic benefits of improved cookstoves among rural communities in Ethiopia.

› This challenge remains despite the RBF: to date, limited awareness still hinders the successful market-based roll-out of improved cookstoves. While the RBF approach as applied in Ethiopia can make it profitable for stove producers to reach out to rural customers, it did not take companies to the point to actively engage in marketing on their own. In market settings like Ethiopia – with mostly small artisanal cookstove producers – large scale public awareness campaigns are needed to complement and support the efforts of companies. Don't underestimate the required technical assistance support and broader market development challenges if you enter into pre-commercial markets.

Photos
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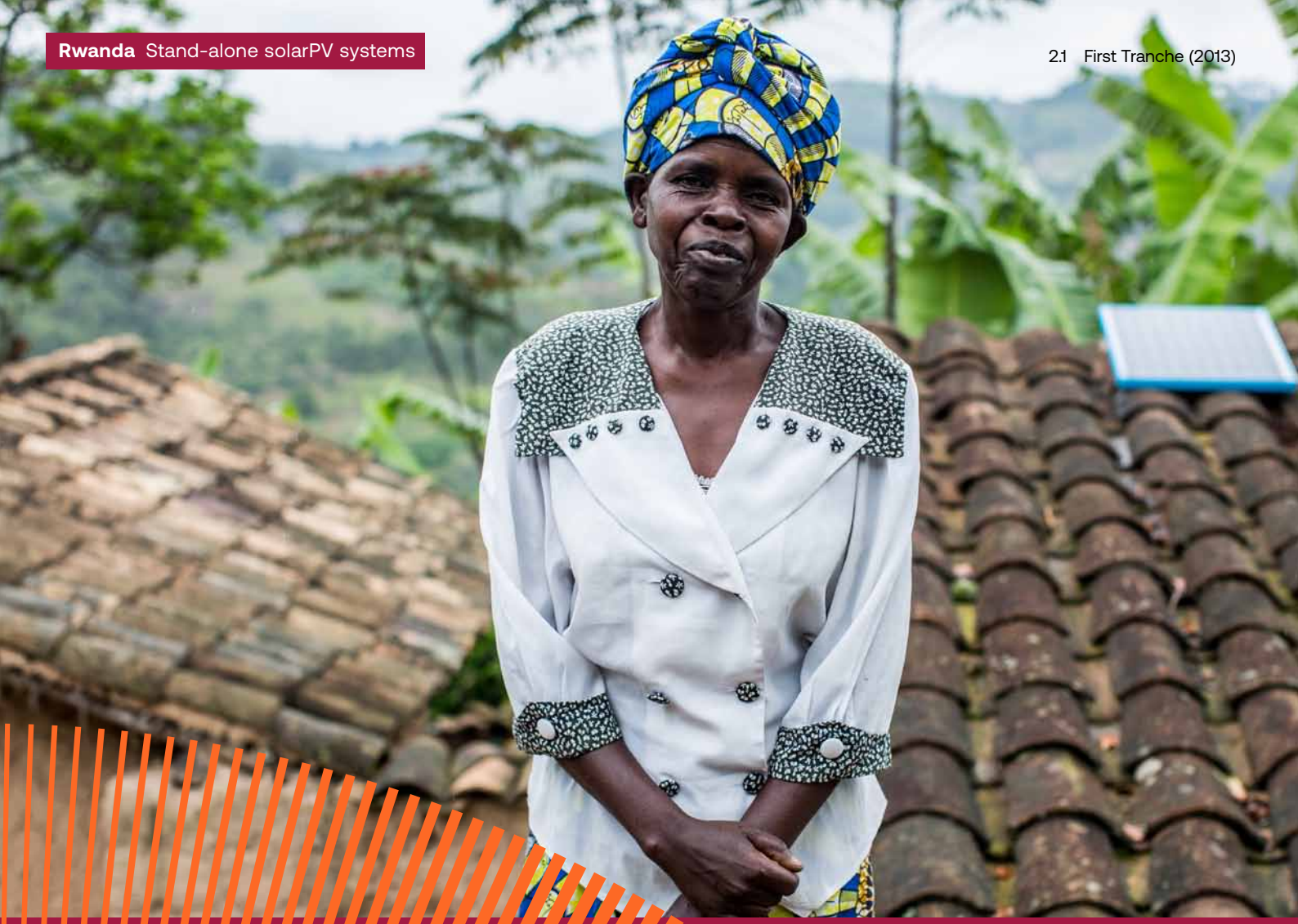
Designed by: DITHO Design GmbH



The pro-poor approach shows its potential

Results-based Financing Facility project closing story

How RBF's innovative approach to building a market for solar products benefited Rwanda's poorest communities

For many years, Therese Nyiranzabahimana worked as a maid in Rwanda's capital, Kigali. It was tiring work, which took her away from her family – fortunately, though, her parents were able to look after her three children back home in Kigarama, a farming community in Rwanda's Southern Province. However, this situation could not last, and Therese had to return to Kigarama. As a single mother, money was always very tight. To make ends meet, Therese found work on a neighbour's field, and also on her own patch of land, where she grew sweet potatoes and manioc, a plant heavy in carbohydrates. When they weren't at school, her children – aged from 6 to 15 – would join her in the fields. But, when night fell, schoolwork and farm work ended abruptly. Because it wasn't connected to the national grid, the village would be engulfed by the dark. Therese could use a candle or a battery-run lamp, but she longed for a cheaper and more reliable way to light up her house. Solar systems were an alternative, but Therese or her neighbours couldn't afford to buy these at standard prices. Hence, solar companies weren't in a position to take the financial risk involved in targeting the poorer communities.

This began to change in 2019. To make customers like Therese more attractive to companies, EnDev developed a 'pro-poor approach': it would subsidise solar home systems to accelerate access to electricity for low-income households in off-grid areas. EnDev used its experience with results-based financing (RBF) to support eight local and international companies to develop and expand into low-income market segments. The companies received performance-based incentives after pre-agreed results had been achieved and independently verified, rather than being given funding upfront. This shifted the focus of support towards results. For Rwandan solar companies, the RBF incentives meant less financial risk as well as access to a new market segment. The participating companies sold quality solar products at subsidised prices, passing on the entire pro-poor RBF incentive amount onto the customer. The value of the incentive was based on the socio-economic status of the purchasing households – the poorer the purchasing household, the larger the incentive for the company. Consumers like Therese could thus benefit from solar power. In 2020, Therese was finally able to buy a solar home system, which she used to start a small business charging her neighbours' phones. The extra income meant that she could buy a phone for herself, while also helping her community to stay connected with their families and the outside world.

A different beginning

The pro-poor approach was informed by an earlier phase of the RBF project between 2013 and 2019, when it supported 12 local and international companies in selling high-quality solar systems. Back then, the companies received incentives for their sales. The amount disbursed was based on the specifications of the World Bank's Lighting Global certificate – the more service a product provided per day (e.g. the amount of light provided or electricity generated), the

higher the incentive. Companies could use these incentives flexibly, e.g. for marketing, recruitment, staff training, or expanding distribution channels. While this approach was successful in helping companies overcome barriers to market entry and increased sales of solar products at first, the sales – and claims – started to tail-off by mid-2018. The companies had reached customers who could afford the solar systems. However, almost 80 percent of households were still without access to electricity, spending less than one euro per month on lighting and phone charging. These households simply couldn't afford solar systems.

Based on these experiences and with additional co-funding from the United States Agency for International Development (USAID) to scale this approach, EnDev changed to a pro-poor approach and started prioritising solar products for the poorest households. To do this, EnDev applied a system devised by the Rwandan government, whereby households were grouped according to socio-economic categories, called Ubudehe categories. These are based on factors such as income, employment, profession and land ownership, and are assigned by local government. They are used to identify and support poor households with interventions such as paid health insurance, cash transfers, or a small salary for working on public projects. For the RBF project, EnDev targeted households in the three lowest Ubudehe categories using a specially-developed IT-tool. Solar products could then be offered to these households at subsidised prices. The RBF project focused on five districts in the Southern province and aligned its approach and its target areas with the National Electrification Plan, which demarcates areas for on- and off-grid expansion. In the product selection, the project considered the 'Ministerial Guidelines on Minimum Standard Requirements for Solar Home Systems'.

Throughout the RBF project, EnDev worked closely with Urwego Bank, a local microfinance institution which contracted companies and disbursed the RBF incentives. The government of Rwanda had expressed an interest in implementing a similar project nationally, and saw the pro-poor RBF approach as an opportunity for the Rwanda Energy Group (REG), the national utility, to learn how to manage such a programme in the future. Thus, REG joined the implementation team in 2019.

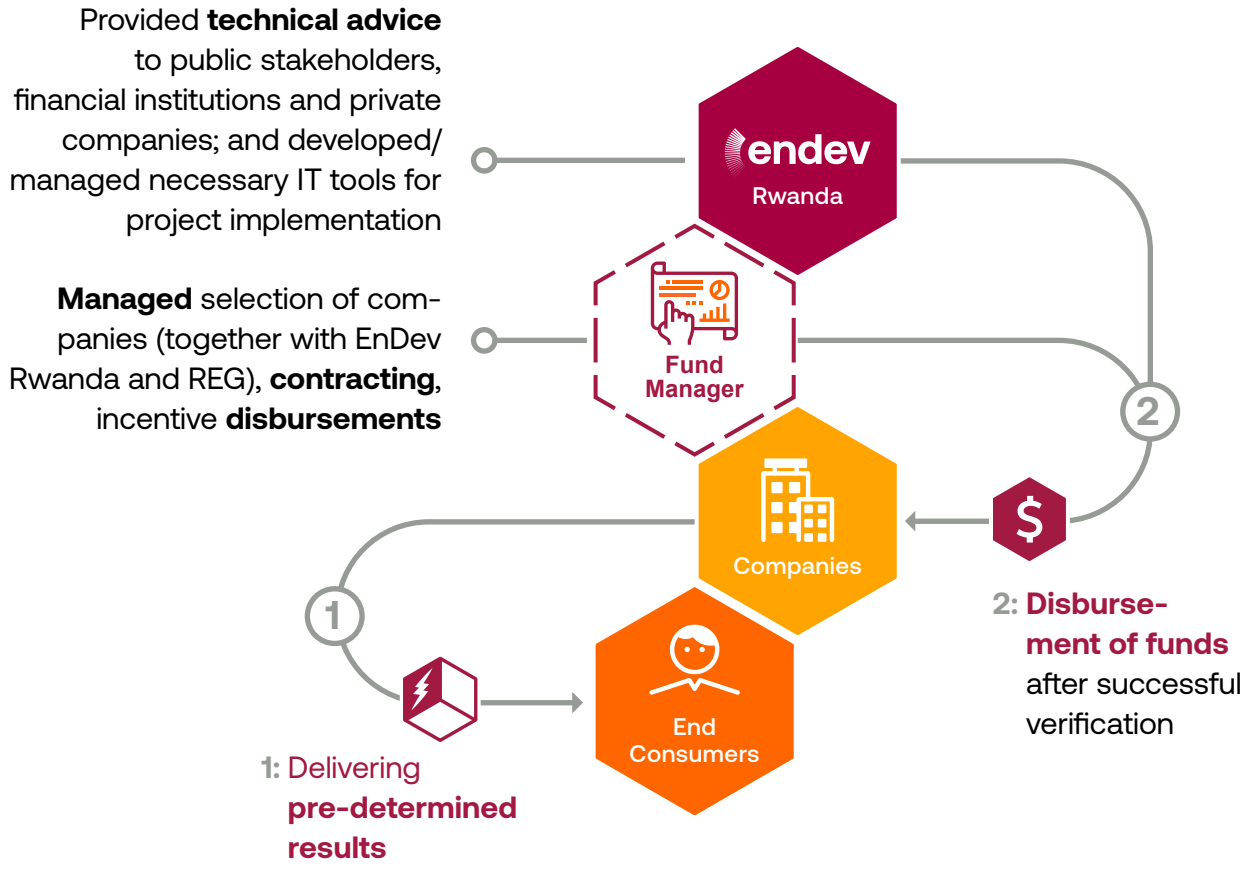
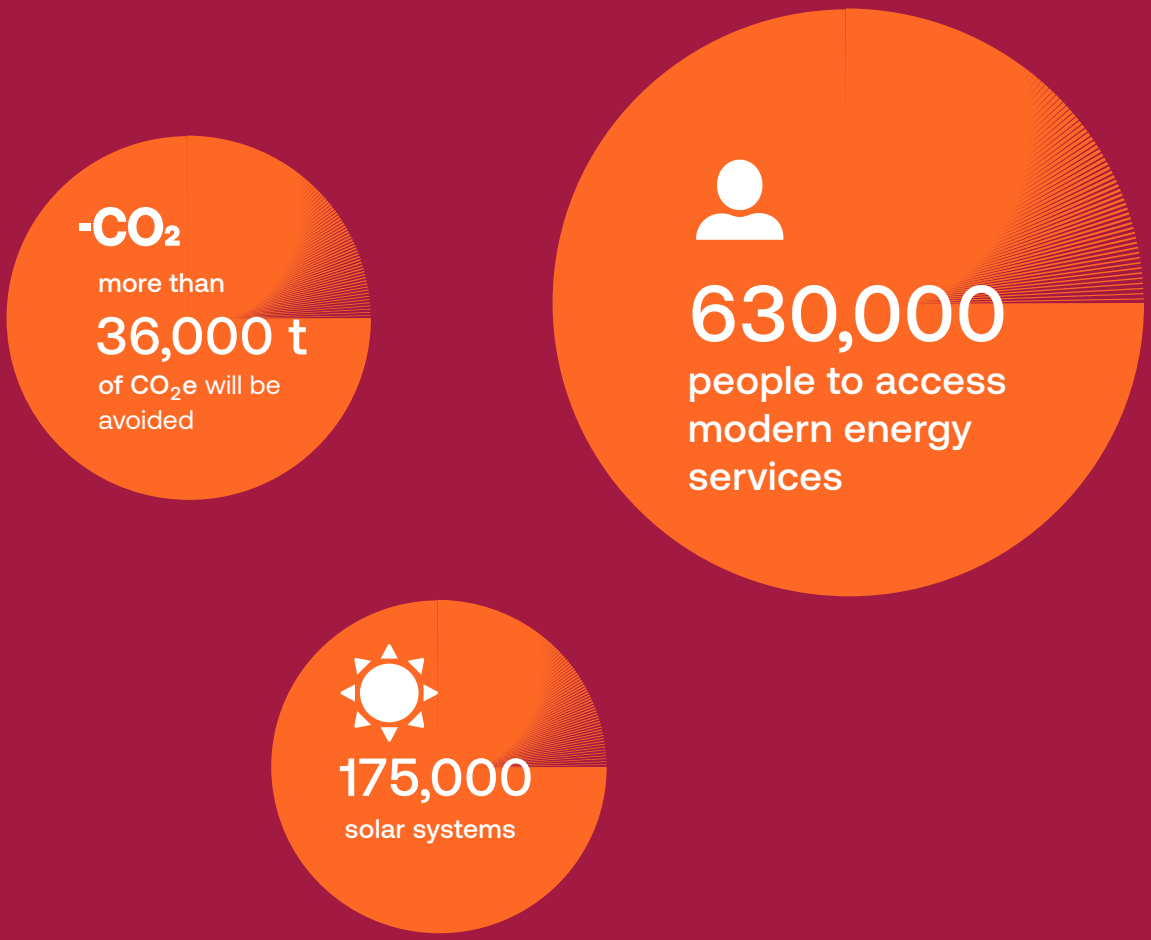


Figure: The RBF project design in Rwanda

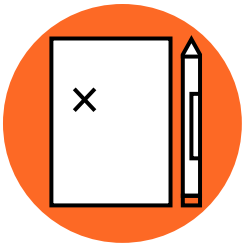


Results in a nutshell

The project was launched in mid-2013. Only a few thousand sales were reported in the first three years; however, sales rose sharply in 2017 after nearly all of the main players of the Rwandan solar market joined the project and helped to develop the market. Between 2013 and 2020, the RBF project supported the **sale of over 175,000 solar systems**, allowing **630,000 people to access modern energy services**. In the first phase, over 142,000 solar systems were sold, reaching 540,000 people and in the second phase 33,000 systems were sold which benefitted over 90,000 people. When the project was launched, just eight companies offered solar lighting products in Rwanda, the majority of which had entered the market only a short time before the RBF project's start. By the end of its first phase in June 2019, an additional 11 companies had entered the market and joined the RBF. This expansion led to the creation of more than 1,500 new jobs, of which almost 400 were for women.

Fine-tuning the RBF from phase 1 to phase 2 to include a specific pro-poor approach resulted in a dramatic, positive impact. This was especially the case in the lowest socio-economic category (Ubudehe 1), where the number of households buying an EnDev-supported solar home system increased from less than 5 percent in the first phase to 82 percent in the second phase. The pro-poor approach is now seen as an effective market-based way of reaching low-income households with solar products. Because of its activities in the solar off-grid sector and its engagement with government partners, EnDev has helped to position off-grid renewable energy technologies as a means to achieving universal energy access in Rwanda. This is reflected in the Energy Sector Strategic Plan (2018), which includes a dedicated target of 48 percent off-grid electrification by 2024. In contrast to earlier approaches, which had failed to reach the poorest households without causing significant market distortion, the pro-poor RBF concept has proven to be successful and has been scaled-up. The concept is now implemented as a nationwide programme under the World Bank funded Renewable Energy Fund.

It is not just people and companies that gain from the increased use of solar power – there is also a significant benefit for the climate. More than **36,000 tonnes of CO2 equivalent (CO2e)** will be avoided over the lifetime of the products sold as part of the EnDev RBF project.



Lessons learned and ways to improve

The design and implementation of the RBF project in Rwanda generated valuable lessons. For those in other projects or organisations active in the same field, these lessons provide guidance for the roll-out of future RBF projects:

1. Evolving with market needs

Initially, the solar RBF project offered incentives to companies to overcome market entry barriers (e.g. unqualified staff, lack of product awareness, limited distribution channels). Although this was successful at first and sales grew, this could not be sustained as bringing more and more customers on board, the remaining market potential in this market segment became marginal. At the same time, a large percentage of households without access to electricity simply could not afford to purchase solar home systems at full price. In response, the RBF project developed and implemented a pro-poor approach, which focused on subsidising solar home systems so as to open new market segments among the poorest households. Together with the national government, this approach helped enable companies to reach economies of scale and increase the affordability of systems in the long-term.

› Since implementing the pro-poor approach, the market has again picked up and new companies and products are entering the field. In line with the government's plans, solar companies are being supported to sell to off-grid areas. These are usually rural, less densely populated areas, with higher levels of poverty. Without subsidies, many companies would never have entered this market due to a lack of purchasing power and high credit risk. With government planning to implement an adapted pro-poor RBF concept, the market is expected to continue to grow.

2. Robust, digital systems for managing and monitoring results

RBF projects are very data intensive. The more complex the projects, e.g. when specific income groups are targeted, the greater the need to properly manage claims and track results.

› Robust, digital systems can significantly simplify the implementation of a project and ensure data accuracy. The project developed an eligibility tool that sourced and checked data from other databases and thus ensured that companies only sold to eligible customers. To be eligible, households had to be in one of the three lowest socio-economic Ubudehe categories. Households had to be located in one of the five off-grid areas, which were selected based on the National Electrification Plan. Each household was eligible for only one subsidised system, and was excluded if it had purchased a solar home system prior to the start of the RBF pro-poor project. The eligibility tool also tracked sales and budgets in real-time, ensuring that companies did not overstep their allocated incentive limits. This data was also used to cross-check sales reported to the Rwanda Energy Group, thereby providing an additional safety net in terms of verification and data quality.

3. Regular reviews are key to learning and adapting

Energy access markets are dynamic and continuously develop and shift, as do the needs of companies and beneficiaries, as well as national policies and standards. Subsidies may significantly disrupt the market if they're not adjusted and justified appropriately and in line with changing market conditions.

› It is important for the RBF project to be flexible and responsive to evolving needs. In Rwanda, the RBF project assessed market changes via annual, in-depth reviews. These involved interviews with companies participating in the project, as well as with other relevant stakeholders, including the government, industry associations and development partners. The reviews provided the project with valuable insights into the market, which were later used to adjust the approach and additionally adapt as policies and standards change. The reviews also helped the project to build strong, trusting relationships with companies and ensure the credibility and reliability of the project by avoiding market distortions. Based on the reviews, an off-grid sector status report was published regularly, which summarised findings and provided a means to communicate market developments and private sector needs to government, development partners and other stakeholders.

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Sarah Wollring
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Into the future with mini-grids

Results-based Financing Facility project closing story

An enabling environment helps to bring renewable energy to off-grid areas in Rwanda

Nkondo, a village in Rwanda's Southern Province, is surrounded by hills. In these hills, coltan is extracted – a mineral used in mobile phones and other electronic devices. If they don't work in the mines, people in this area live off agriculture and livestock. Yet, Philbert Ndagijimana has chosen a different path. The father of two teenage boys studied civil engineering and worked in construction for many years, helping to build schools and hospitals. Philbert has always been a hardworking, confident and dynamic man. Proficient in both French and his mother tongue, he has managed hydropower projects in Rwanda and in the neighbouring Democratic Republic of the Congo.

In 2015, Philbert decided to set up his own business, Nyakiramba. He planned to build hydro-powered mini-grids and bring clean energy to remote areas in the Southern Province, far away from the national grid. But the sector in Rwanda was still nascent – without financial help, Philbert couldn't hire workers or buy the high-priced technology and construction materials he needed. The 50-year-old project developer applied for a loan from Urwego bank.

Yet, while waiting for approval, he received an unexpected call. The bank invited Philbert to participate in EnDev's **results-based financing (RBF)** programme. RBF helps businesses develop by providing performance-based incentives. Enterprises receive payments after pre-agreed results have been achieved and independently verified, instead of being given funding upfront. This shifts the focus of support towards results.

This was the boost that Philbert needed. He used two bank loans to pre-finance the construction of a mini-grid and, after a third party had verified that the first households were connected, Philbert received the RBF incentives. Today, he operates mini-grids with almost 300 connections in four villages. He says: "I am really grateful to EnDev for their professionalism. The way that they regularly followed-up during the early stages of project development and implementation was fantastic, especially when opportunities for my business looked scarce."

A conducive policy environment boosts the mini-grid sector

Philbert was the first to benefit from EnDev's RBF project, but he was soon joined by others. Between 2014 and 2020, EnDev Rwanda supported four companies in constructing and rehabilitating hydro- and solar-powered mini-grids in remote off-grid areas. They received up to 70 percent of their project costs in the form of RBF incentives. An initial one-off payment, the **"Commissioning Incentive"**, was provided after they had successfully built high-quality mini-grids and connected a pre-agreed number of customers. Once the companies had started their operations, quarterly incentive payments, the **"Operation Incentive"**, over a period of one year were disbursed to keep connections to the village grid operational and ensure the quality of service. In a nascent market, these incentives were vital to ensuring the viability of the businesses that were brave enough to move into the market first. As start-ups or smaller companies, none of the project developers were able to finance a project like this on their own. The incentives reduced their financial risk and enabled them to make such a significant investment.

As an early supporter of the mini-grid sector, EnDev's RBF project has contributed to an enabling policy environment; this has influenced, for example, regulatory development, planning and policy, and access to finance. EnDev, through stakeholder participation, informed various policy documents including the Simplified Licensing Framework for Rural Electrification and the Guidelines on Mini-Grid Development. Meanwhile, the National Electrification Plan issued in 2019, allows companies to easily identify villages where the construction of mini-grids is permitted. This conducive regulatory and planning framework encourages investment from developers. Additionally, EnDev worked closely with the Renewable Energy Fund, which was set up by the Government of Rwanda and the World Bank in November 2017. Administered by Rwanda's Development Bank, this fund provides loans to mini-grid developers and gives a significant boost to the entire sector.

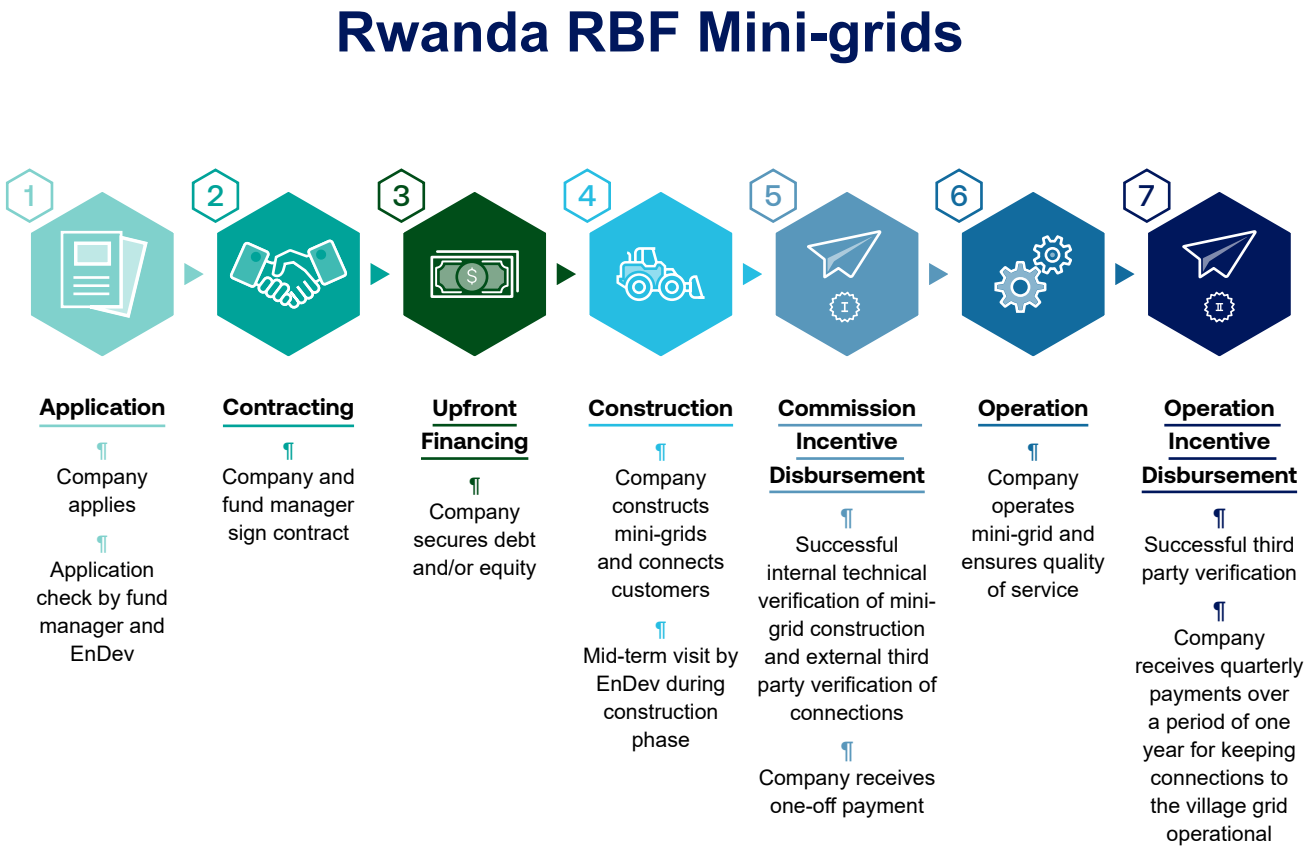

Figure: Rwanda RBF Mini-grids process

Results in a nutshell

The project started in mid-2014. After an intensive inception, preparation and construction phase, the first two mini-grids were commissioned in March 2016 and the first connection claims were successfully verified and reported in the same year. From then on, numbers grew slowly but steadily. A steep growth of connections was again observed towards the end of the project when two projects could be completed. The development towards the end of the project highlights one of the special features of RBF mini-grids projects: if the intended result is the connection of customers, the results tend to come in in bulk at the very end of the project cycle.

In total, the project supported four companies in building one hydro mini-grid, two solar mini-grids and 22 solar nano-grids. Each business received up to 70 percent of its capital costs in incentives. This contributed to the firms' viability and created 116 jobs. Beyond the participating companies, more private enterprises began to show an interest in the mini-grid sector, which was beginning to realise its potential, leading to possible further investments by donors and the private sector alike.

Reliable and affordable energy from the 25 mini-grids means that **over 10,000 residents can now light up their homes with modern energy**, charge their phones, listen to the radio and watch television. And it's not only households that benefit – the mini-grids connect **more than 20 social institutions and over 350 businesses**. Mills now have the power to grind corn, and tailors can operate sewing machines; meanwhile, shops and bars can keep their food and drinks refrigerated. Hair salons and other businesses now offer services that require electricity – during the day as well as after dark, maximising their working hours. This has the potential to lead to improvements in regional economic development. Renewable energy also contributes to a better climate. **Over the lifetime of the mini-grids, more than 3,000 tonnes of CO_2e will be avoided.**


ADEGI

Lessons learned and ways to improve

The design and implementation of the RBF project in Rwanda generated valuable lessons. For those in other projects or organisations active in the same field, these lessons provide guidance for the roll-out of future RBF projects:

1. A conducive policy and regulatory framework is key to enabling the development of a nascent mini-grid market

For many years, Rwanda's energy strategies did not fully incorporate off-grid solutions. In 2016, the Government of Rwanda issued the Rural Electrification Strategy, and in 2018, the National Transformation Strategy, further cementing its off-grid electrification ambitions. This resulted in the development of the National Electrification Plan (NEP), which demarcates areas for on- and off-grid expansion, and the Ministerial Guidelines on Mini-Grid Development. Rwanda also has a licensing framework for mini-grids, which was further adapted in 2019. Designing and implementing these sound policies and regulations promoted private sector participation in the mini-grid sector; yet, it was a lengthy process that caused uncertainty and delays in market development. Finally, by mid 2020, the Government of Rwanda had established a comprehensive set of policies, regulations and procedures to guide both the public and private sector, as well as donors, development banks and other stakeholders to mobilise and direct resources toward off-grid electrification. This reduces investment-risks and provides long-term certainity to the sector

› When designing mini-grid RBF projects, it is important to be aware of the complex and dynamic nature of the sector's policy environment. The announcement alone of revisions to certain national strategies, regulations, tariffs or licensing can have a drastic impact on how project developers react. Thus, the development of a market for mini-grids cannot be solely facilitated by RBF funding; it is highly dependent on the conduciveness, transparency and predictability of the policy environment. Beyond providing RBF incentives, the need for accompanying technical assistance to create an enabling policy, regulatory and planning framework that promotes private sector investment and ensures long-term predictability for operating mini-grids should not be underestimated.

2. Access to finance barriers cannot be tackled by RBF alone

Limited access to finance – for pre-commissioning financing – can be a critical barrier for mini-grid developers, as many commercial banks are unwilling to lend to this non-traditional sector. To address this issue in Rwanda, EnDev's RBF project joined forces with the Scaling Up Renewable Energy Programme (SREP). The programme's Renewable Energy Fund is administered by Rwanda's Development Bank and includes direct financing for mini-grids. EnDev supported the development of a direct lending window within the fund, which worked as a 'bridge loan' and provided pre-commissioning finance to developers before grant funding from the RBF project became available (upon commissioning). The successful cooperation between EnDev and SREP can be viewed as a model for potential partnership and alignment across energy access programmes. This upstream coordination ensured the complementarity of financial instruments, which avoids the risk of funding duplication or overlapping, showcasing future cooperation in market development-focused energy access interventions.

› The RBF should not be considered a standalone solution to overcomming financial barriers to market development. While RBF is an effective tool to unlock private investment, it should be designed to consider complemetary mechanisms that will enable the private sector to mobilise public or private capital, both debt and equity. Cooperation with existing initiatives, financial institutions or other donor support programs will ease bottlenecks in project financing.

3. Sustainable market transformation requires holistic sector support programmes with medium to long-term interventions

Beneficiary organizations are characterized by varying capacities, experience and level of professionalization when participating in the RBF project. Usually it is more challenging for smaller companies which lack access to capital to achieve the same milestones as bigger companies, which often have access to working capital and good networks. When aiming for sustainable market development, it is not advisable to subject all business categories equally to the same competition.

› RBF incentives should be designed to motivate business growth for organizations at different levels. It is advisable to categorize beneficiaries by organizational capacity and design different RBF incentives and approaches for each category type. For example, smaller players could operate in the "easier" markets, while larger players are incentivized to target more remote, less attractive and potentially high investment markets.

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Sarah Wollring
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Shining a light on rural areas

Results-based Financing Facility project closing story

Quality solar systems light up homes and workplaces in Tanzania's Lake and Central Zones

When Lucy Merinyo joined the company Global Cycle Solutions in 2013, she didn't know that she would witness the growth of Tanzania's solar sector first-hand. Back then, the company sold machines that separate maize from cobs. But when Lucy's boss was given a solar light from her friend, the CEO of Greenlight Planet – an Indian based solar system supplier that had just started operating in Kenya and East Africa – she saw how interested people were in the light. Recognising this potential, Global Cycle Solutions' focus shifted to selling solar lights in Tanzania. Beginnings are often tough, and limited liquidity made paying salaries a challenge. A solution presented itself in 2014, when the company took part in EnDev's results-based financing (RBF) project. RBF helps businesses develop by providing performance-based incentives. Enterprises receive payments after pre-agreed results have been achieved and independently verified, instead of being given funding upfront. This shifts the focus of support towards results. The financial support meant increased stability over time and peace of mind – a good basis for growth. "With the RBF incentives we could stabilise our finances, pay salaries reliably and cover operational costs", Lucy explains. "We expanded into five regions, and by 2015 we had 30 employees. By then, I was responsible for managing the company's finances. For me RBF means growth."

And the journey didn't end there. Three years after their initial contact, Greenlight Planet saw the developments in the solar market in Tanzania. They decided to open a branch there and wanted Global Cycle Solutions to be part of this. In 2017, they became one company. Business went through the roof. They now employ 190 people and supply products to 25 of Tanzania's 26 regions.

Selecting geographic areas and product types

From 2013 to 2020, EnDev supported 15 suppliers with the aim of improving access to quality solar systems in the country's Lake and Central Zones. The two areas were selected following a market survey in 2012 which showed high demand for solar products among the population, but a lack of available supply. Only three percent of respondents owned solar products, whereas 40 percent were eager to purchase them. To encourage companies to take the risk of moving into these remote markets, incentives were paid to selected suppliers and their retailers once they had sold small-scale, high-quality solar products to rural consumers, and these sales were verified by a third party. The size of the incentives was determined using a uniquely developed "Vulnerability Access Index", or VAI. The VAI was calculated for each region within the two target areas on the basis of socio-economic risk factors, e.g. population density, energy and water access, gender equality, and child and maternal health. The solar product and service supply was also evaluated, for example by assessing the presence of solar firms and products in that particular region. Regions with significant socio-economic risks and low market performance had high VAI scores, which meant larger incentives. This helped companies to enter or expand their market presence in these areas. As a result, competition increased and jobs were created.

Incentives were only paid for the sale of solar products that were approved by Verasol – an institution that tests and evaluates solar solutions to help industry stakeholders make better-informed decisions and to protect consumer interests. In order to qualify, solar products had to be easy to install, assemble and use without the help of a technician. Coming in two different packages, the products included either a portable LED lamp with a small solar panel and a port for phone charging, or overhead lighting through multiple LED lamps and a charger for small electronic devices. Some companies, like Greenlight Planet, offered their customers to purchase solar products using Pay As You Go (PAYGO). Lucy explains: "We used to sell solar lights on a cash basis only. When someone couldn't pay for the product, we gave them a loan, but had no control over when they would pay us back. That was difficult. PAYGO regulates this. The customers pay in instalments using an app. They are more likely to buy the product because the initial costs aren't too high. RBF incentives ensure that businesses with cash flow issues don't have to sit on huge receivables while waiting for payments and profits to come in."

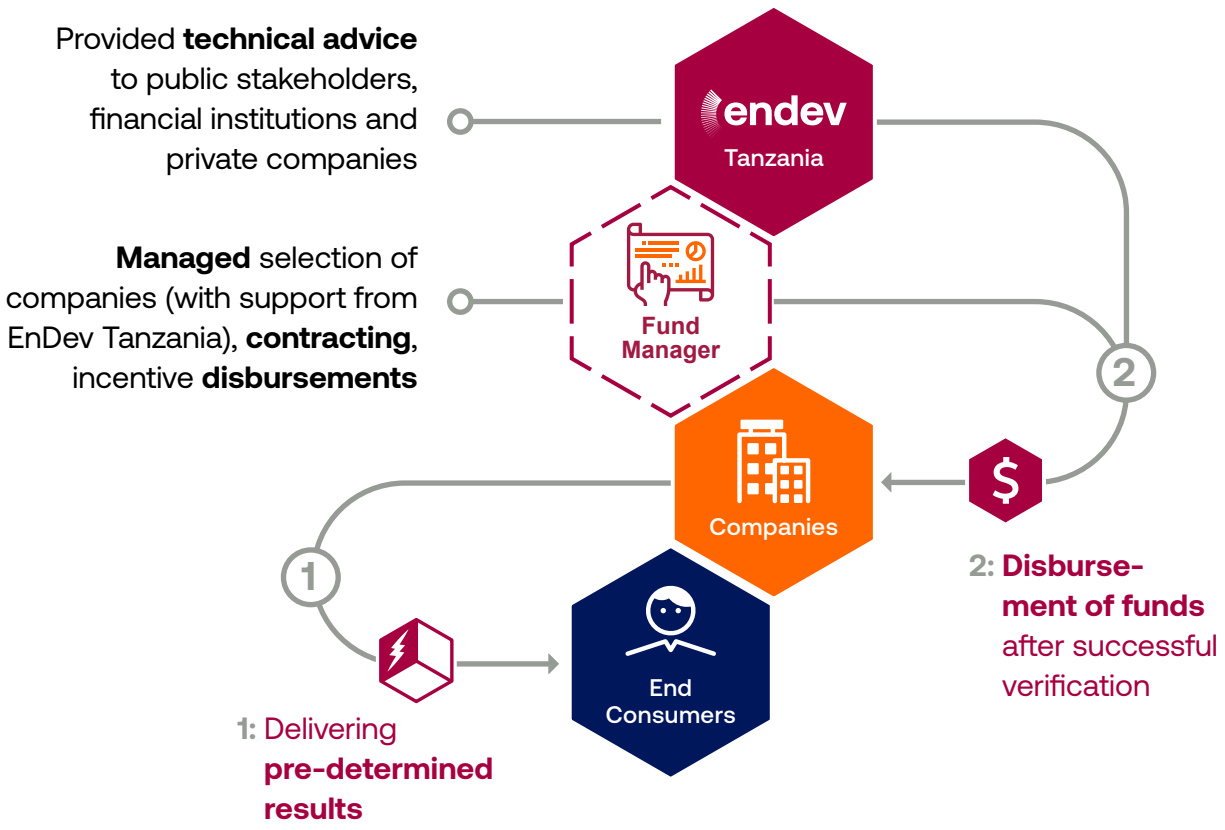
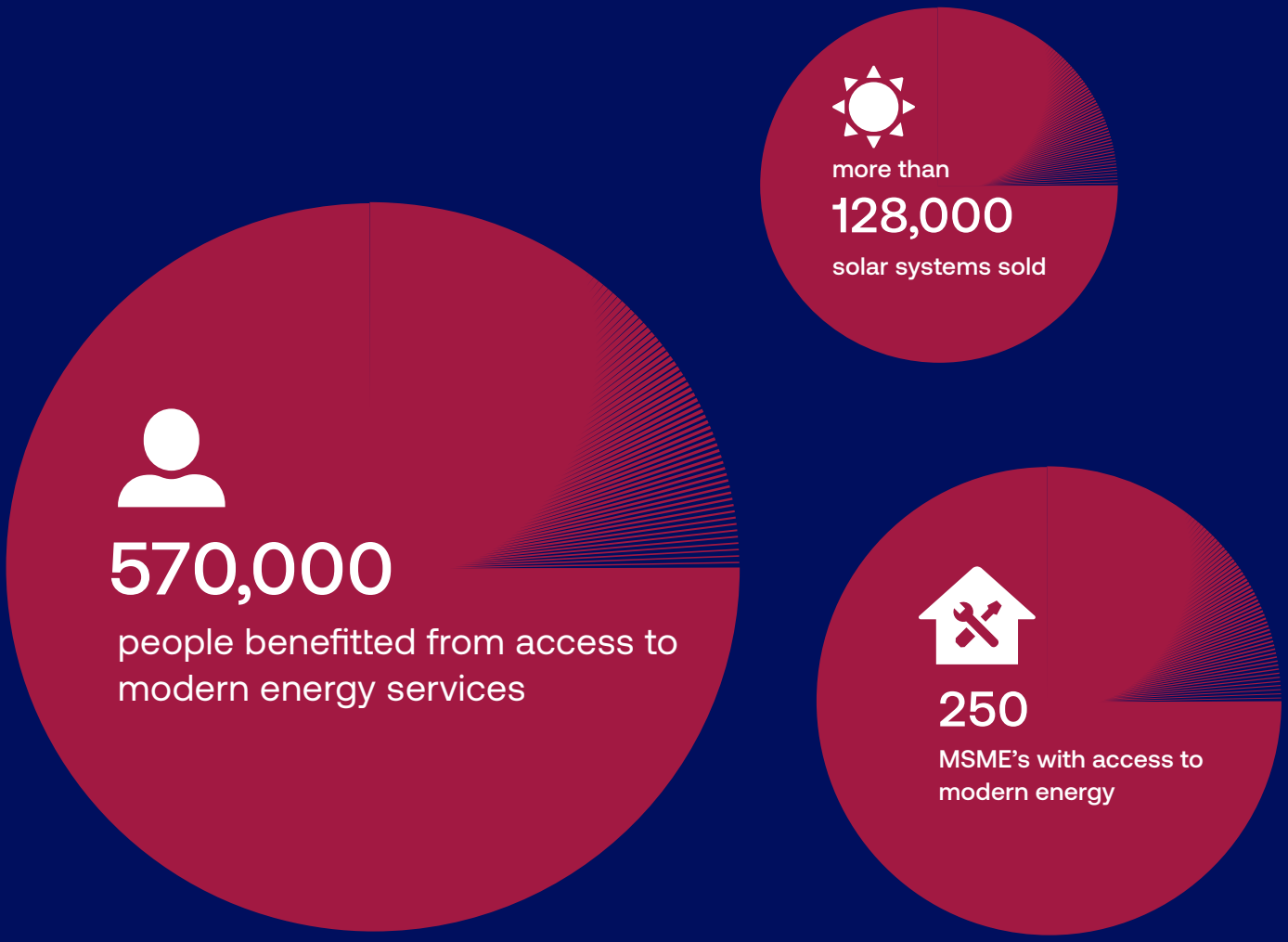


Figure: The RBF project design in Tanzania

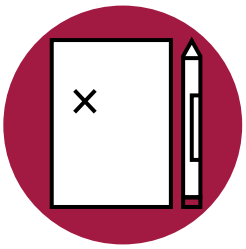


Results in a nutshell

The project started in mid-2013. A year later, the first sales were verified and reported. From then on, numbers grew steadily until the end of the project in 2020.

At the outset of the RBF project, there were no solar companies operating in the project's target markets. The first phase of the project focused on the Lake Zone in Tanzania. Based on the success of the project, the second phase expanded to the Central Zone. EnDev supported 15 solar suppliers, stimulated the testing of business models and the expansion of retail structures and sales volumes, leading to efficiency gains. Introducing the RBF approach to the sector meant that solar companies, retailers and sales agents entered new markets and expanded their businesses, resulting in more competitive markets, fewer risks, and learning among industry players. By 2020, over 1,500 new jobs were created along the supply chain, of which almost one third were for women. The RBF project had directly supported the sale of **more than 128,000 solar systems, allowing 570,000 people and 250 micro, small and medium-sized enterprises to access modern energy services**. By saving on kerosene and fees for phone charging stations, consumers who bought a simple solar lamp were able to recoup their investment quickly. People's wellbeing also improved: reduced exposure to kerosene fumes means less eye irritation, better respiratory health and fewer fire risks. Furthermore, economic activity grew, as reliable lighting allowed businesses to operate for longer hours.

It is not just people and companies that gain from the increased use of solar power – there is also a significant benefit for the climate. More than 26,000 tonnes of CO_2 emissions will be avoided over the lifetime of the products sold as part of the project.



Lessons learned and ways to improve

The design and implementation of the RBF project in Tanzania generated valuable lessons. For those in other projects or organisations active in the same field, these lessons provide guidance for the roll-out of future RBF projects:

1. Mirroring market vulnerabilities in RBF project design

In the first phase of the RBF project in Tanzania, financial incentives were calculated based on the energy output of the solar systems according to the World Bank's Lighting Global (now Verasol) brightness and duration specifications. This approach didn't directly lead to the inclusion of poor and vulnerable groups, despite increased competition leading to a greater likelihood that some companies would consider them as attractive market segments.

› To enhance and accelerate pro-poor inclusion, RBF incentives need to be designed and attuned over time for this specific purpose. As for the RBF project in Tanzania, the approach was adapted during the second phase to consider the vulnerability factors of the specific local markets. In this manner, markets with the lowest levels of socio-economic development received the largest financial incentives. As a result, the second phase saw a 20 percent shift in sales activities by firms to more vulnerable markets, with 75 percent of those reached living below the international poverty line. This pro-poor steering of the RBF project was successful. Nevertheless, extremely vulnerable markets require more than strictly finance-based sales incentives in order to support energy access development in nascent and unstable localities. There is a need for alignment of national and local governments towards energy access goals and for TA to support solar firms in adjusting their business models to attract the very bottom of the pyramid.

2. RBF is an adaptive tool best applied with patience

In a growing market such as the stand-alone solarPV market in Tanzania, it is not uncommon for successful players to change their product and service delivery models over the course of the RBF cycles. Also, the transformation of RBF-supported markets may be influenced by unpredictable external developments in the market and enabling environment, such as currency depreciation and changes in business regulations. Periods of imbalance in the amount of RBF funds available relative to external pre-financing might be another factor of instability.

› Management of the RBF project has required careful consideration throughout its lifecycle to maintain a balance between a rigorous focus on results, and flexibility to align with potential challenges, innovation and growth in the market. Trust in the RBF project among companies, combined with sufficient time, is essential for them to find their own specific market and most efficient business models.

› From the outset, RBF projects need to be prepared for unpredictable developments in the market and enabling environment that may create periods of natural plateaus during longer term growth cycles. In these periods, the RBF fund's expertise in evidenced market performance trends can play a crucial role in accelerating these transformative transitions. Nonetheless, the RBF project should maintain rigour in its core design (incentive calculations and triggers) to support players with a stable basis to model their business plans. These considerations are crucial to maintaining the willingness of private sector actors to invest in new markets, confident that they will receive proportionate financial incentives in the longer term.

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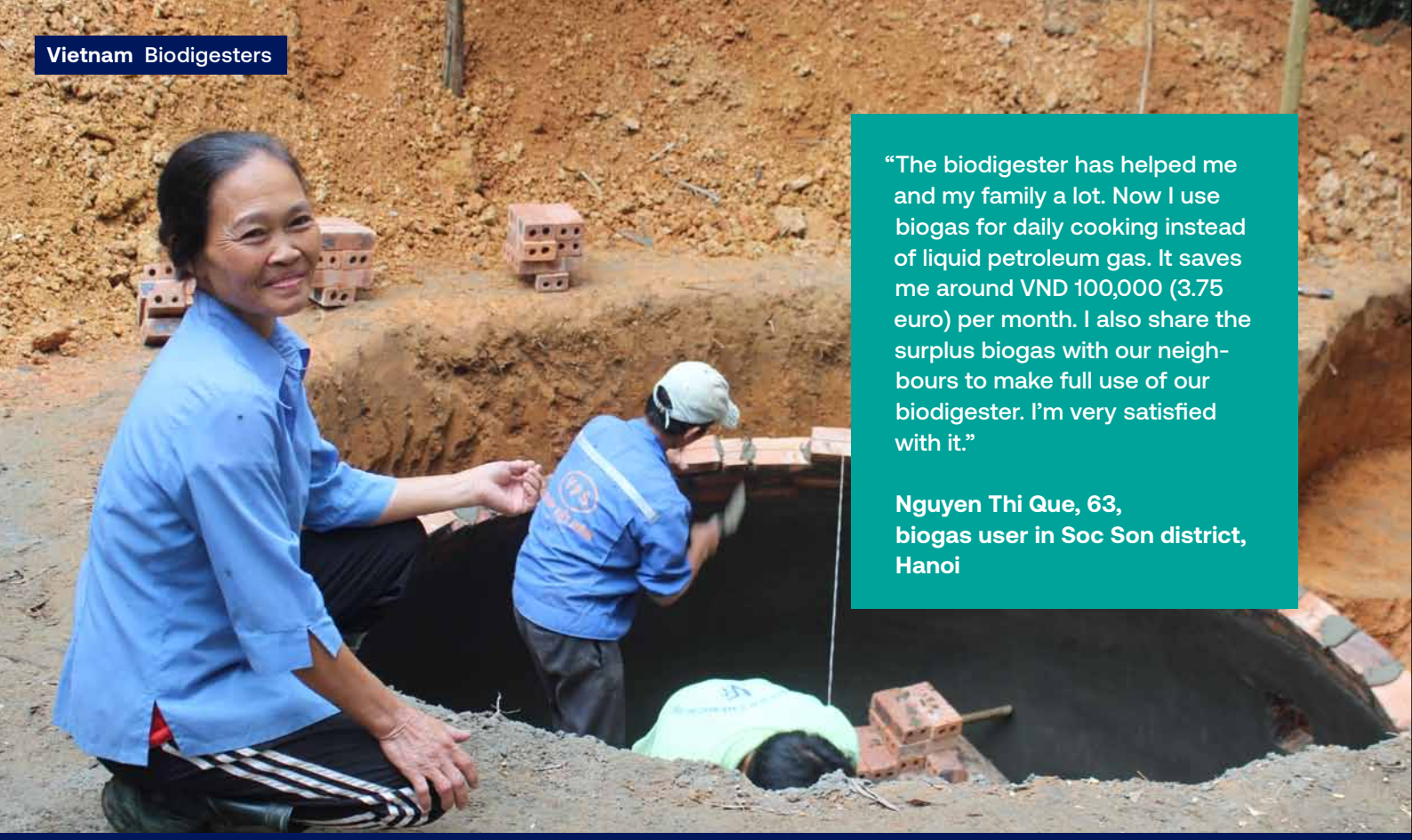
Unlocking the growth potential of Vietnam's biogas sector

Results-based Financing Facility project closing story



"The biodigester has helped me and my family a lot. Now I use biogas for daily cooking instead of liquid petroleum gas. It saves me around VND 100,000 (3.75 euro) per month. I also share the surplus biogas with our neighbours to make full use of our biodigester. I'm very satisfied with it."

Nguyen Thi Que, 63, biogas user in Soc Son district, Hanoi

Using RBF to encourage a self-sustaining commercial market for biodigesters

Thirty kilometers outside the centre of Hanoi lies Soc Son. Most households in this district of the Vietnamese capital grow rice and raise livestock, providing the city's residents with food. With little space between the household farms, people live alongside their animals, and the smell of pig manure hangs in the air. Hoang Van Khang's biodigesters are a welcome innovation: biodigesters convert organic waste into biogas, which can be used for cooking, while the slurry – or fermented manure – serves as an organic fertilizer to increase crop yields. This reduces farmyard odours and saves money that would otherwise be spent on cooking fuel and chemical fertilizer. Furthermore, it reduces soil and water pollution, forest degradation and greenhouse gas emissions. With 15 years' experience in the biogas sector, Khang knows this technology inside and out. He has built and sold several thousand biodigesters since 2004. A single biodigester can run for decades with minimal repair and maintenance.

For the first 10 years, Khang didn't make much headway in the biogas market. That changed in 2013, when EnDev launched its **results-based financing (RBF)** project in Vietnam. RBF helps businesses develop by providing performance-based incentives. Enterprises receive payments after pre-agreed results have been achieved and independently verified, instead of being given funding upfront. This shifts the focus of support towards results. For Khang's company, RBF was the extra push it needed: with additional money coming in, Khang was able to diversify his range of biodigester products, to expand his market area well beyond his hometown, and in the process grow his business from three to 30 staff members. He is proud of his impact on the community, which can now generate its own renewable energy, contributing to a greener lifestyle and lower pollution.

The RBF project also encourages households with biodigesters to share surplus biogas with those who don't have their own digester. This means that digester owners can make full use of their biogas by sharing with the villagers nearby, reducing their communities' greenhouse gas emissions and protecting the environment. Users spend less money and time on securing alternative energy sources, such as fuelwood, and it also contributes to the socio-economic development of Vietnam's rural

areas. Hoang Van Khang has become involved in this business model, too. He now sells combined biogas appliances for multiple households, developing a model for biogas sharing among neighbours.

Khang is also pursuing new ventures: between 2017 and 2018, he built ten biodigester treatment plants for large pig farms. These biodigesters are ten times larger than the normal household-size biodigesters with a volume of 200 cubic metres. A recent transition to more professional and commercial farming in Vietnam offers new market potential for such large biodigesters.

> "Since 2017, I installed a biodigester for my pig farm. We couldn't even use the full amount of biogas that it produced. Now, thanks to the new biogas mini-grid, we can share the surplus biogas through pipes with our three neighbours. That feels great."
>
> **Nguyen Van Bien,**
> **Dong Lac village, Tien Duoc commune,**
> **Soc Son district, Hanoi**

Towards a commercial biogas sector in Vietnam

Hoang Van Khang is a particularly successful entrepreneur in the biogas sector, but he isn't the only one. Almost 200 companies benefitted from the RBF project across more than half of Vietnam's 63 provinces. In the past, masons and installers of biogas plants profited from investment subsidies provided to farming households by the Provincial and National Government, and from the Provincial Government's agricultural extension services that provided marketing support, as well as customer selection and user training. Although this support significantly assisted the uptake of biogas technology in Vietnam, the downside was that the biogas companies had little drive to invest in innovation and expansion of their businesses on their own. By shifting these responsibilities to the private sector, it helped to improve the businesses and make them more visible to customers. The companies now work more independently and spearhead the development of the biogas market with considerably less outside support.

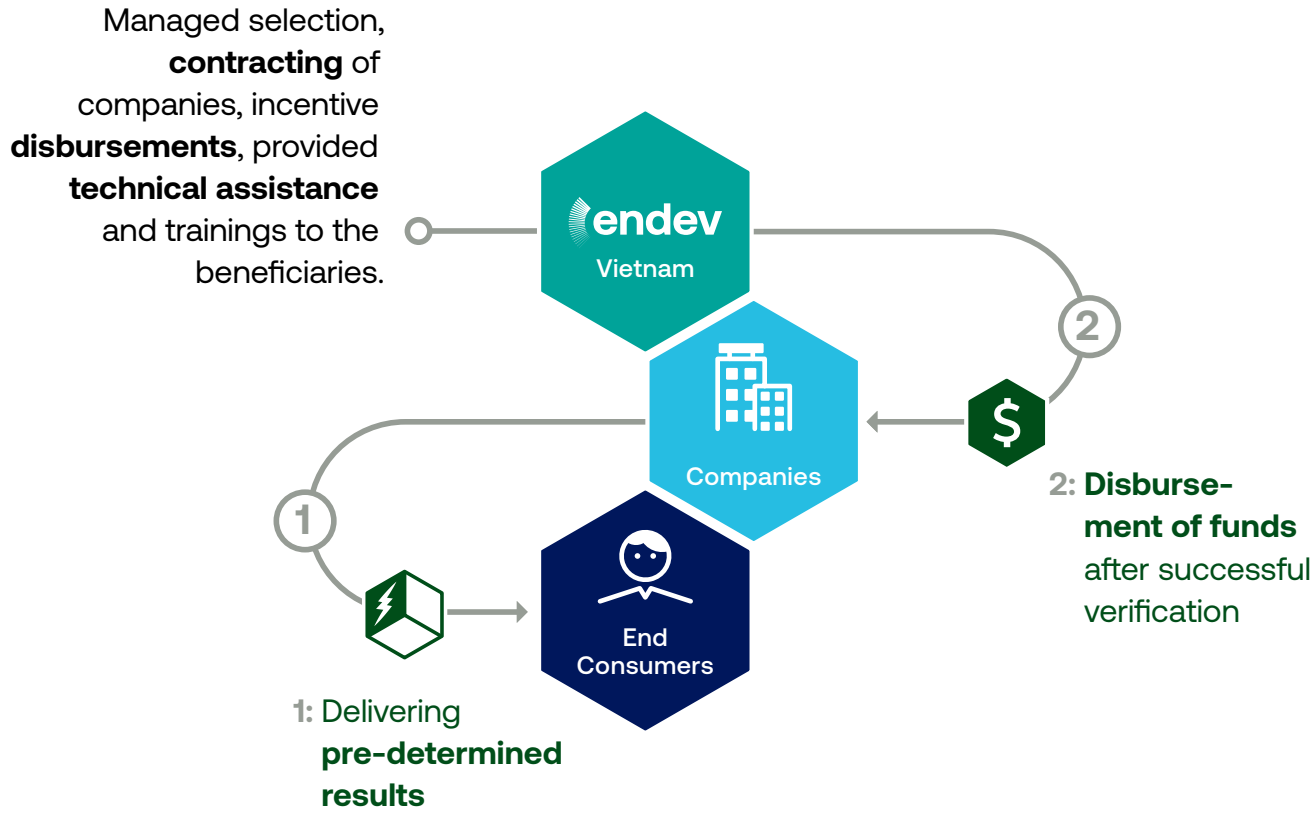
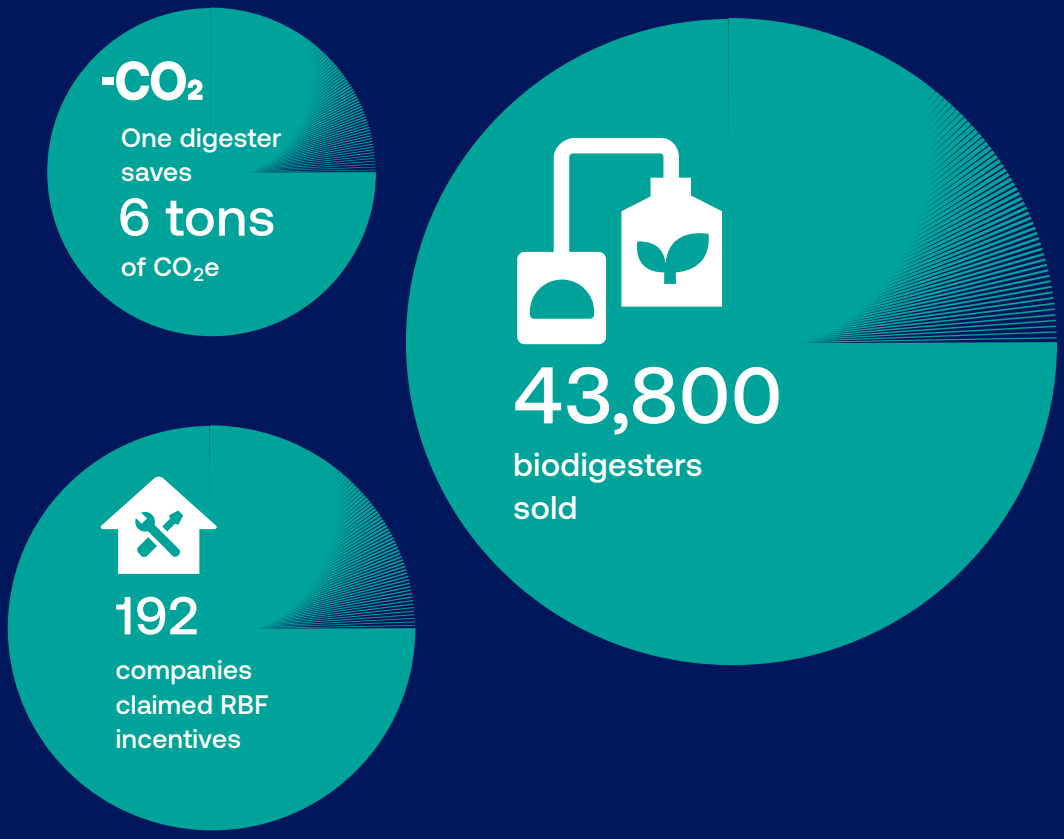


Figure: The RBF project design in Vietnam



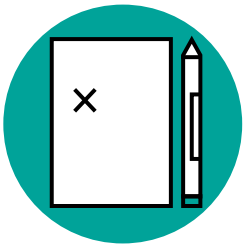
Results in a nutshell

Running from July 2013 to June 2018, the RBF project saw **43,800 biodigesters sold.** Six months after project start, the first biogas digesters were verified and reported. From then on, numbers grew steadily until the end of the project in 2018.

Farmers needed to invest an average of 700 euros for a biodigester. In total, 1.7 million euros were invested in the form of results-based financing cash incentives, bringing the project's private sector leverage to a ratio of 5.6. The RBF project was successfully introduced in 37 of Vietnam's 63 provinces, where **192 companies** successfully claimed RBF incentives, exceeding the initial target of 160 enterprises.

One digester saves around 6 t of CO_2 equivalents (CO_2e) per year – about the same level of emissions as would be produced by one person flying from Germany to Vietnam and back again. In collaboration with the Vietnamese Government, the RBF project successfully converted these reduced emissions into 2.3 million carbon credits. The credits are sold to those that wish to offset their emissions. The revenues from credit sales contribute to the Vietnamese Government's budget for running the biogas programme.

Most importantly, the project equipped the biodigester companies with a more complete set of entrepreneurial skills, enabling them to expand their operations, and run their businesses more independently with less external support thereby driving the development of the market by themselves.



Lessons learned and ways to improve

RBF proved to be a powerful tool to encourage entrepreneurship in a market that was previously focussed on government implementation, by shifting responsibility to the many micro enterprises active in the sector. As such, the RBF approach also successfully served as an 'exit strategy' for a programme that was long dependent on public support.

The design and implementation of the RBF project generated valuable lessons. For projects or organisations active in the same field, read here about our experiences and conclusions:

1. RBF – a catalyst for market development

Many services in the Vietnamese biogas sector, such as promotion, customer identification and user training, used to be provided to the biogas enterprises by local staff of the Ministry of Agriculture. The objective of the project was to transform the sector from a government-led programme into a self-sustaining commercial market that can grow with less government help, and less dependence on ODA and subsidy funds. Using RBF incentives to shift responsibility and ownership to the private sector proved feasible and turned the programme into an increasingly commercial market with companies becoming the main actors capable of leading the biogas market.

› In Vietnam, RBF clearly meant much more than just a money transfer. It was instrumental in achieving a mind shift that inspired and empowered micro enterprises to become more confident and independent in their commercial activities, and put them in the driver's seat for developing their own businesses and the biogas market. In the words of a biogas entrepreneur: "I became more grown up".

2. RBF – a cost-effective development approach

Transferring responsibility to private companies reduced their dependency on public services and increased the efficiency of the government-led biogas programme, cutting programme management costs by 30 percent. The RBF project has proven to be more cost-effective in comparison to previous technical assistance programmes and end-user subsidy schemes provided to the Vietnamese biogas sector.

› The RBF project contributed to the commercialisation of biogas enterprises and serves as a convincing case of how collaboration with the private sector can reach similar or even stronger achievements with less public investment.

3. Mobile technology for efficient verification

The RBF project introduced an innovative mobile app that allowed biogas enterprises to self-report their results. This simplified reporting and subsequent independent verification – especially in a large-scale project with over 200 enterprises in a country as large as Vietnam. While the younger technophile entrepreneurs got the hang of the tool easily, some of the older entrepreneurs had to invest in and learn to use a smartphone first, which they did with additional training from the project.

› Modern technologies and digital tools that are widely available and low-cost may be a worthwhile investment for RBF projects to make verification processes lean and cost-effective. With the digital tool requiring the RBF participants to submit both photographs and GPS coordinates of their installed biodigesters, the tool reduces possibilities of manipulation, as opposed to traditional paper-based monitoring systems.

Photos
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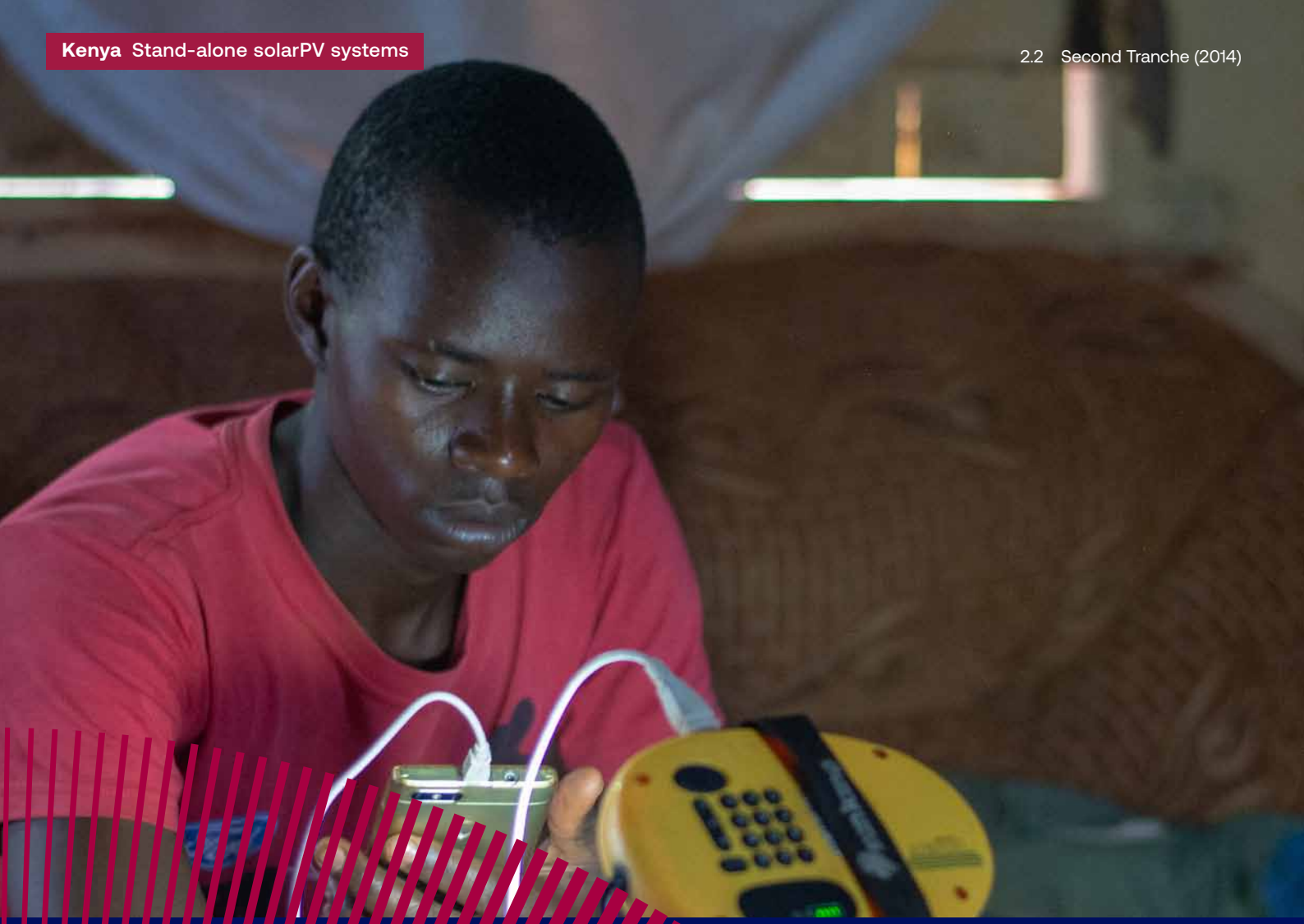
Designed by: DITHO Design GmbH



Climbing the energy ladder

Results-based Financing Facility project closing story

Boosting access to finance for small solarPV systems in rural Kenya

Just a stone's throw from the banks of Lake Victoria, Teddy Odindo sits at his desk, deep in thought. The 35-year-old Kenyan is the commercial director and one of the strategic brains behind Mwezi Ltd, a medium-sized enterprise that distributes small solar systems to communities across the Lake Victoria basin region. Teddy is working on a marketing strategy for a new product line to include solar-powered barber clippers and milling machines. It's all a far cry from when he joined the firm in 2014. Back then, Mwezi had a limited product range and little prospect of expanding much beyond Kenya's third largest city, Kisumu. At the time, the company's network of agents had to reach customers in person to explain how to use and maintain the systems, and to chase repayments on loans issued to pay for the products. Defaults were common. As a result, the business struggled to attract finance – a firm that relied on the good will of customers to pay off their loan was an unappealing investment for most bank managers.

Enter EnDev Kenya. In 2014, the programme began offering businesses like Mwezi results-based financing (RBF). RBF helps businesses develop by providing performance-based incentives. Enterprises receive payments after pre-agreed results have been achieved and independently verified, instead of being given funding upfront. This shifts the focus of support towards results. Mwezi used the incentives to create a flexible payment scheme for its customers. As part of this, it acquired a customer relationship management (CRM) tool, a database used by companies to improve their interactions with customers. It was a complete game-changer. The tool communicates with pay-as-you-go (PAYGO) technology that Mwezi began embedding into its products. With PAYGO, customers don't pay all the costs for the solar system up front, but make payments over time based on use. This means they have to plan when and how much they use the solar systems, reducing the risk of default. Mwezi's customers made cashless payments using mobile money and received a code which they used to turn the system on. Thanks to this more viable financial model, the business managed to secure investment from sources beyond the project incentives offered by EnDev.

Teddy is delighted: “By using digital solutions, we’re able to operate over a much larger area. We now have agents in 12 counties – and distribute to 24.” With improved capabilities for after-sales support, Mwezi is now looking to expand its product range further to include irrigation systems and water storage tanks. “The project has really helped us deliver on our goal of using market-based solutions to improve access to sustainable energy for Kenyans,” says Teddy.

Flexible finance

It wasn’t just Mwezi that benefitted from the RBF incentives. EnDev Kenya offered them to distributors and financial institutions across Kenya to create flexible payment systems for small solar products. These RBF beneficiary organisations could choose whether to use the funds to subsidise products for end users or to offer them to last-mile entrepreneurs (LMEs) to purchase stocks and fund marketing activities. Only small solar systems that met Lighting Global quality standards were eligible for incentives. Solar energy is still a largely untapped resource for rural communities in Kenya. While people in the capital, Nairobi, increasingly use solarPV systems to charge their phones or power their TVs, rural Kenyans generally do not have access to electricity. Most rural people simply don’t have the funds to invest in small solar systems.

From 2018, the incentive structure was adjusted to better target poorer areas and spread the support available across a larger number of businesses. With this in mind, total funding available to each organisation was capped, and a third of the incentives were earmarked for marginalised areas. In addition, larger products became eligible for higher incentives. This encouraged participating companies to transition their customers “up the energy ladder” – and to buy bigger, more powerful systems. So not only could end users charge their phones, but also watch a solar powered TV or eat their evening meal by the light of a solar lamp.

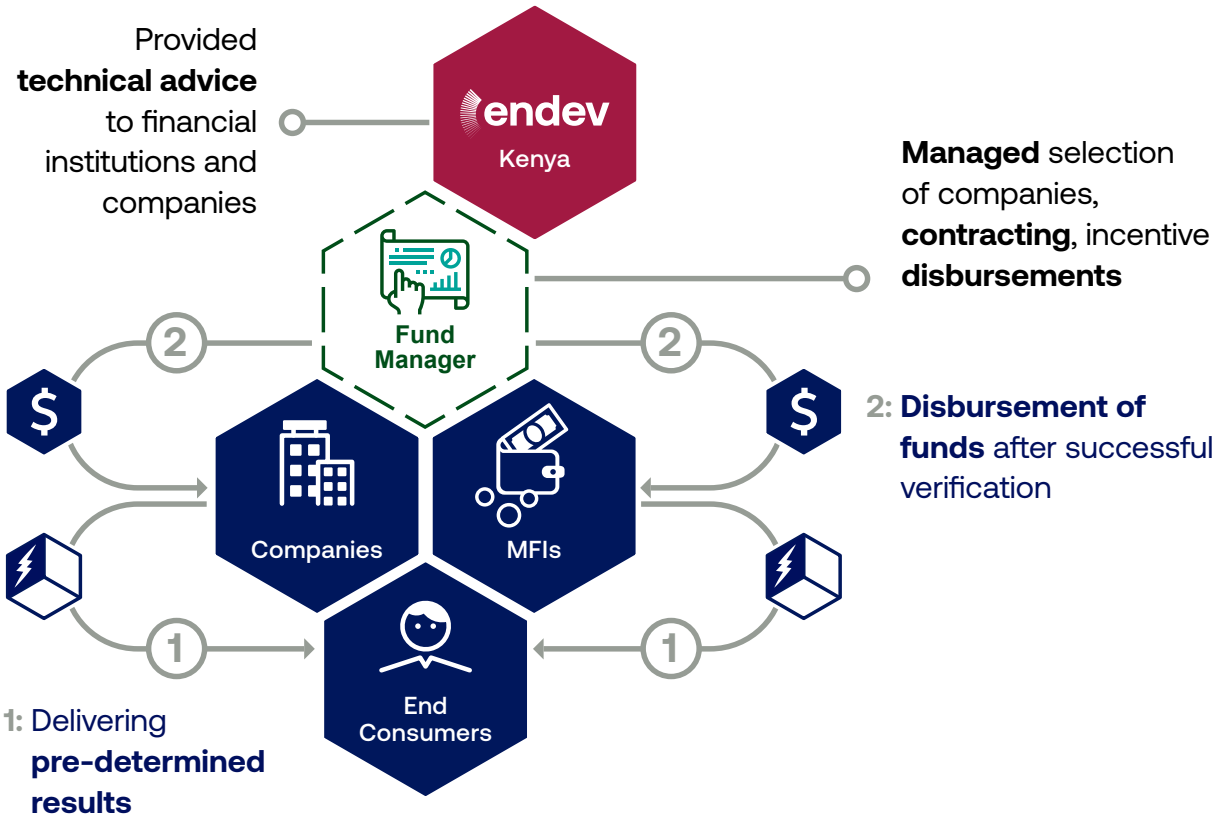


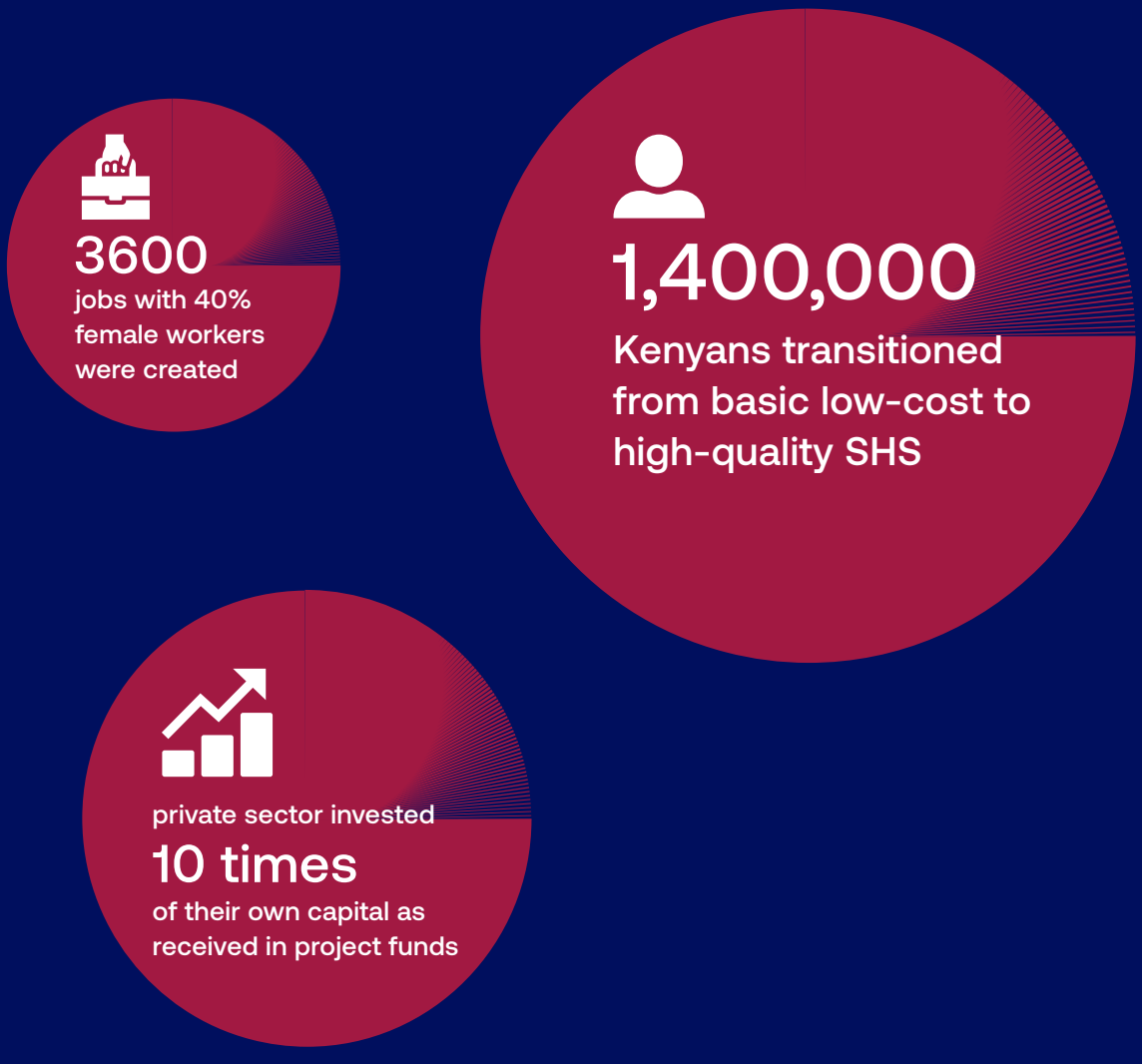
Figure: The RBF project design in Kenya

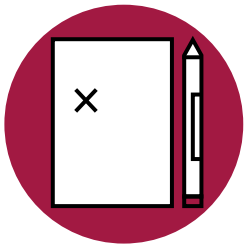
Results in a nutshell

The project started in mid-2014. After an intensive inception and preparation phase, the first sale claims were successfully verified and reported in December 2016. From then on, numbers grew steadily until the end of the project in 2019.

More than one and a quarter million Kenyans benefitted from the project. Thanks to the graduated incentive structure, these customers increasingly transitioned from basic low-cost products to high-quality solar home systems. In addition to private households, nearly 400 enterprises purchased products through the project, and 27 distributors and financial institutions received incentives. Together, these organisations were responsible for the distribution of 270,000 small solar systems and created **over 3,600 jobs, 40% of which were for women.** Many distributors and financial institutions have enhanced their last-mile distribution channels through marketing and branding and the expansion of their networks of agents. Some of them have also improved their customer service platforms and data management systems. This helps make the products more accessible and affordable for end consumers. The project was also very successful in **encouraging private sector investment, with participating organisations investing over ten times as much of their own capital** as they received in project funds.

It is not just people and companies that gain from increased use of solar power – there is also a significant benefit for the climate. More than 50,000 tonnes of CO_2 equivalent (CO_2e) will be avoided over the lifetime of the products sold as part of the project.





Lessons learned and ways to improve

The design and implementation of the RBF project in Kenya generated valuable lessons. For those in other projects or implementers active in the same field, these lessons provide guidance for the roll-out of future RBF projects:

1. Use capping to achieve project objectives

Larger companies generally enjoy bigger supply and distribution networks, larger economies of scale and lower business expansion costs than small companies. An incentive cap encouraged the participation of smaller firms in the market. This and further caps by product and county also served to enhance the sale of units and steer companies towards more remote locations and more sophisticated technologies.

› Use caps to manage the distribution of funds but also reassess their suitability as the project progresses – and adapt as necessary in order to achieve the project objectives.

2. Consider whether or not to support credit

Ultimately, there was little interest from conventional financial institutions in providing credit schemes (i.e. business-related loans) for LMEs, with these entrepreneurs accounting for only 5% of the total incentive amount. This was because the LMEs were able to market products and induct new customers without necessarily requiring additional working capital.

› Understand the structures, interests and motivations of RBF beneficiaries in order to assess where there is potential to deliver significant results.

3. Hire and retain a well-equipped verification team

Training was provided to verification agents to explain the RBF approach, the project design and the implementation guidelines. Shortcomings in the verification process occasionally led to some delays in disbursements, which impacted on the ability of beneficiaries to plan their cash flow.

› Consider hiring a pool of independent consultants specialised in the area of verification as opposed to third-party organisations. This will give the project more control in selecting and managing verification agents, and will reduce staff turnover.

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Author/Editor: Steffi Noelting, Alex Bradbury,
Isabella Lehmann, Sarah Wollring
Designed by: DITHO Design GmbH

“RBF was a big boost for our company”

Results-based Financing Facility project closing story

Strengthening modern cookstove businesses in Kenya

When LivelyHoods started up as a non-governmental organisation (NGO) ten years ago, Joseph Osoth had just finished school. It was by chance that he met the founder and has been involved in the NGO ever since – as a sales agent, office manager, distribution model developer, branch officer and operations manager. He knows LivelyHoods inside out, and supports its mission to provide urban and rural communities with access to life-improving products such as modern cookstoves. As a distributer, LivelyHoods promotes and sells a range of improved cookstoves, which are a more efficient, environmentally friendly and healthy alternative to the traditional way of cooking on three stones.

The NGO trains unemployed youth and disadvantaged women to become their sales agents. Once they understand the job and products, the agents sell improved cookstoves from door to door. But getting the cookstoves into the villages hasn't been easy. "To begin with, we only operated in Nairobi, and sales agents would travel only as far as they could walk", Joseph says. "It was hard selling anything with everyone working in the same neighbourhoods. We needed to explore new markets if the business was to survive, but back then LivelyHoods had limited means of supporting trips outside Nairobi."

In 2017, LivelyHoods found the impetus it was looking for with EnDev's results-based financing (RBF) approach that helps businesses explore new markets by providing performance-based incentives. Enterprises receive payments after pre-agreed results have been achieved and independently verified, instead of being given funding upfront. This shifts the focus of support towards results. LivelyHoods used the RBF incentives to recruit and support more than 100 additional sales agents. Joseph was delighted:

"This was a big boost for us. We used the incentives to pay for our agents' bus fares into the villages, where they sold the products and built customer networks. A good relationship with our agents is vital, so alongside the commission for each sale we give them monthly bonuses for reaching specific sales targets. This improves motivation and drives sales. Today, we work in eight regions and have 15 branches outside Nairobi."

Financial support and technical guidance

LivelyHoods was not the only cookstove supplier in Kenya that benefitted from the RBF project. EnDev provided incentives to 25 producers, distributors, financial institutions and NGOs to overcome market barriers. RBF incentives were paid upon verification that the technology was sold to the end-user. The companies were allowed to use the funds flexibly. Some would invest in different modes of transportation to transport their products further, while others enhanced their customer care and after-sales support by opening service centres and branch offices. The result was a growth of sales and more awareness about performance-based practices. Customers learned about improved cooking technologies and when they weren't able to pay for the stoves right away, they could buy the products on credit or in instalments.

EnDev didn't just provide finance to the companies; it also contributed to further outreach of high-quality technologies in the market. Businesses could only sell cookstoves that were tested by the Kenya Institute of Research and Development (KIRDI) and approved by the project, if they wanted to be part of the RBF project. This meant that products had to undergo a technical check stage and meet the minimal standards as required by KIRDI. And also Joseph feels the benefits: "Now we know exactly what we want to sell, and manufacturers come to us to pitch new models, instead of us running after them."

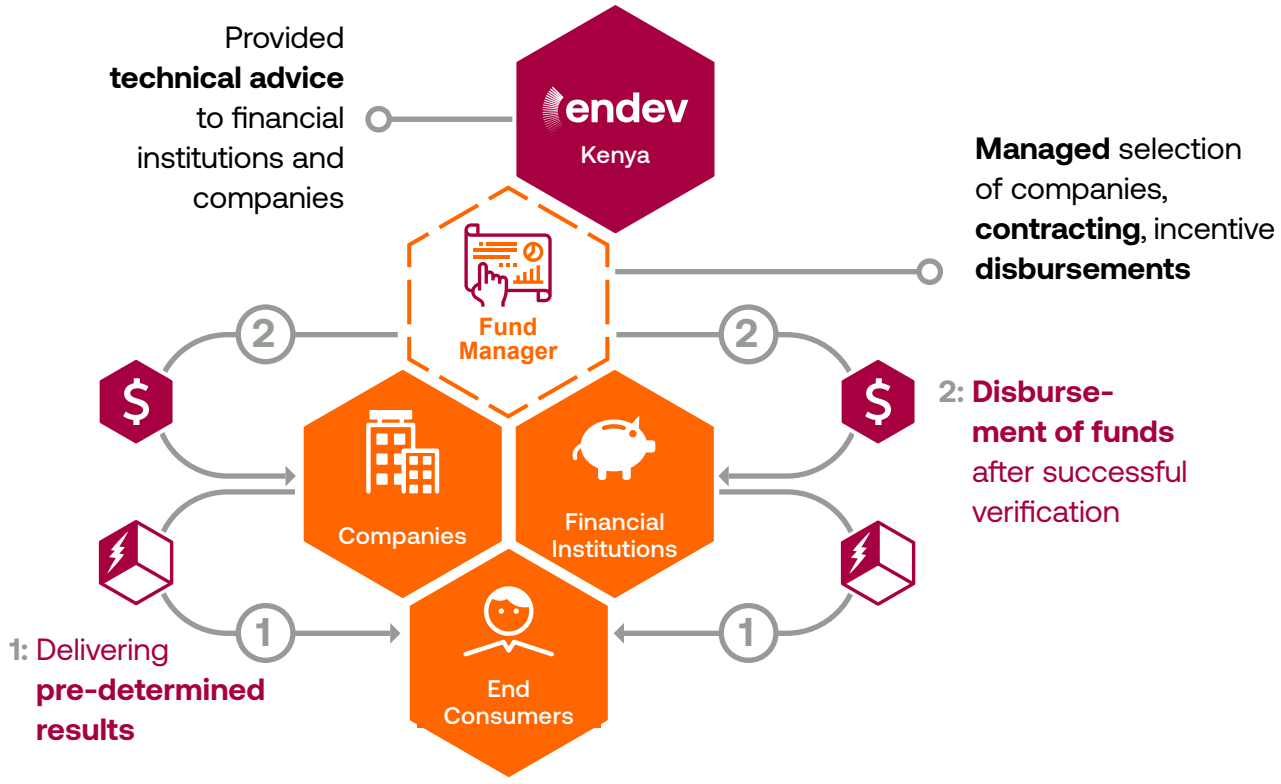


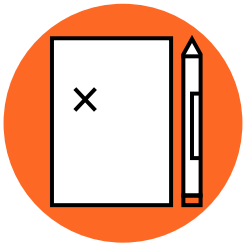
Figure: The RBF project design in Kenya

Results in a nutshell

The project started in mid-2014. After an intensive inception and preparation phase, the first stove claims were successfully verified and reported in December 2016. From then on, numbers grew steadily until the end of the project in 2019.

A total of 14 modern high-quality stoves were promoted over the implementation period – compared to an initial three that were available in Kenya before the start of the project. These charcoal, wood, liquified petroleum gas (LPG) and ethanol stoves are now accessible in larger commercial centers. Between 2014 and 2019, more than 110,000 of these stoves were sold, surpassing the initial project target of 80,000. **More than 550,000 people now benefit from the improved cooking solutions**, better air quality and living standards. The cookstoves also contributed significantly to a better environment and climate: **195,000 t CO_2e will be avoided over the lifetime of the stoves** distributed.

Introducing the RBF approach to the sector meant that companies selling modern high-quality cookstoves entered new markets and expanded their businesses. **EnDev partnered with 25 RBF beneficiaries, producers ("own-product-distributers"), distributors, financial institutions (banks and MFIs) and NGOs** – and brought them together to cooperate with each other. Almost half of the incentives were received by stove distributors, mainly selling charcoal stoves. This allowed companies to recruit and train staff members, sales agents and promoters. Almost 1,000 new jobs were created along the stoves supply chain, of which almost 50% were for women



Lessons learned and ways to improve

The design and implementation of the RBF project in Kenya generated valuable lessons. For those in other projects or organisations active in the same field, these lessons provide guidance for the roll-out of future RBF projects:

1. Beneficiary selection

The project initially targeted financial institutions as the main drivers of improved cookstoves uptake in the country. Over time, financial institutions realized that the gains from promoting these technologies were too low to warrant them investing their time. They refocused on their core business that had higher returns. As a result, only 20% of sales within the project were achieved through financial institutions

› It is vital to recognise key barriers and drivers for the sector; in this project, key drivers were the distributors and manufacturers. Adjusting and changing the structure, if necessary, has been a success factor. Following the inclusion of distributors and manufacturers in the project, annual incentivised sales grew by 90% between 2017 and 2019. By the end of the project, distributors and manufacturers contributed 80% of the total project target achievement in terms of sales

2. Eligibility requirements

In the early phase of the project, sales numbers were low due to the very limited types of stoves available in the market and the requirement to comply with the set quality standards. This caused frustration on both sides: private companies experienced that their stove models were excluded from RBF support, and a project team which was concerned about the progress and success of the project. However, this changed over time with the introduction of new stove types

› Communicating realistic eligibility criteria transparently from the beginning helps to manage expectations and avoid frustration on all levels. These criteria may refer to product quality as described above but could as well be linked to customer groups or targeted geographic areas, among others. A thorough market analysis and identification of market barriers is key at the beginning of the project to manage expectations and give the private sector adequate time, if new products need to be introduced to the market

3. Incentive structure design

Beneficiary organizations are characterized by varying capacities, experience and level of professionalization when participating in the RBF project. Usually it is more challenging for smaller companies which lack access to capital to achieve the same milestones as bigger companies, which often have access to working capital and good networks. When aiming for sustainable market development, it is not advisable to subject all business categories equally to the same competition

› RBF incentives should be designed to motivate business growth for organizations at different levels. It is advisable to categorize beneficiaries by organizational capacity and design different RBF incentives and approaches for each category type. For example, smaller players could operate in the “easier” markets, while larger players are incentivized to target more remote, less attractive and potentially high investment markets

› It is advisable to consider paying an upfront grant to smaller players facing challenges with access to finance to ensure that specific milestones can be achieved before the verification process triggers the release of the first incentive. To ensure sustainability and avoid dependence, initial incentive rates can be higher and be reduced proportionately over time.

Photos
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Author/Editor: Steffi Noelting, Alex Bradbury,
Isabella Lehmann, Sarah Wollring
Designed by: DITHO Design GmbH

Using solar energy to power economic growth

Results-based Financing Facility project closing story

Results-based financing supports companies to build solar-powered mini-grids in rural Kenya

Evans is no rookie: he has spent decades studying and working in the energy sector in the USA and Kenya for international and local Kenyan companies. He knows the Kenyan energy industry inside-out – from the reality for consumers in rural villages, to the challenges for energy suppliers and developments in the market. There has never been a dull moment. But in 2018, he took up a particularly exciting challenge. Evans started managing mini-grids for the private developer Nirav Agencies Limited (NAL). Solar-powered mini-grids transform sunlight into clean, reliable and affordable energy for households, businesses and social institutions. They can be built in remote areas beyond the national grid.

While the advantages of the mini-grids are clear, the sector is still very young. None of the companies developing mini-grids have been around for long – and financial viability is one of the major barriers hindering the mini-grid sector to develop. “One mini-grid site is not enough for a business to survive,” says Evans. “We are connecting the so-called last mile: the small villages in rural Kenya with households that are often quite poor. They use only a few basic appliances – maybe one light bulb and one point to charge a phone. Consumption therefore is low, and companies would need 20 years to earn back what they have invested in technology and construction without some form of subsidy.

Considering this situation, it’s no surprise that the market didn’t take off on its own, despite the potential of solar energy. So in 2014, EnDev became the first development partner to introduce the results-based financing (RBF) approach to the mini-grid sector in Kenya. RBF helps businesses develop by providing performance-based incentives after pre-agreed results have been achieved and independently verified, instead of being given funding upfront. This shifts the focus of support towards results – and increases the profitability of solar-powered mini-grids for private companies. Evans jumped at the chance to participate. EnDev and the county governments identified viable mini-grid sites and EnDev conducted feasibility studies as part of their technical assistance package. Project developers were then selected competitively, obtained the required permits and licenses where NAL started building its first mini-grids in 2019.

By mid-2020, NAL had built six mini-grids and connected around 900 households – using the incentives they received for one site to build the next one. More sites mean lower operation and management costs, greater consumption and higher revenue, allowing the company to continue its work.

Three companies lead the way

NAL was one of three private developers to benefit from RBF incentives for the construction and operation of mini-grids in the north-western counties of Turkana and Marsabit. The villages in need of the technology were identified through EnDev's feasibility studies. In some of them, only 10 percent of residents had access to electricity, relying on expensive energy sources, such as small diesel generators. The mini-grids changed their lives. With clean and reliable energy they can run a business, a kiosk or a barber shop. Electricity leads to improvements in healthcare, education, livelihoods, self-reliance and safety. This is in line with the Kenyan Government's ambition to ensure that every Kenyan has access to electricity by 2022. And while most of the mini-grids are not yet used to maximum capacity, the companies inspire customers with ideas to use the electricity more productively – and therefore to make the mini-grids more viable.

In this young sector, commercial viability is still the main challenge. Mini-grid projects currently only get off the ground with financial support. This is a pre-requisite for private businesses to consider entering the field at all. NAL and the other two companies received up to 50 percent of their project capital expenditure in the form of RBF incentives after proving they had successfully built mini-grids and connected the agreed number of customers. The private developers mostly invested their incentives directly into the capital costs of site development, which indirectly foster affordable end-user tariffs. Thus, the benefit of the RBF project goes beyond the financial incentive. In this early stage of the mini-grid sector in Kenya, the project developers learned a lot – from site selection and materials, to the operation and management of mini-grids. And while this is still all new and under development, Evans is sure of one thing: "We don't know yet where the road will take us, but I will definitely stay around for some time."

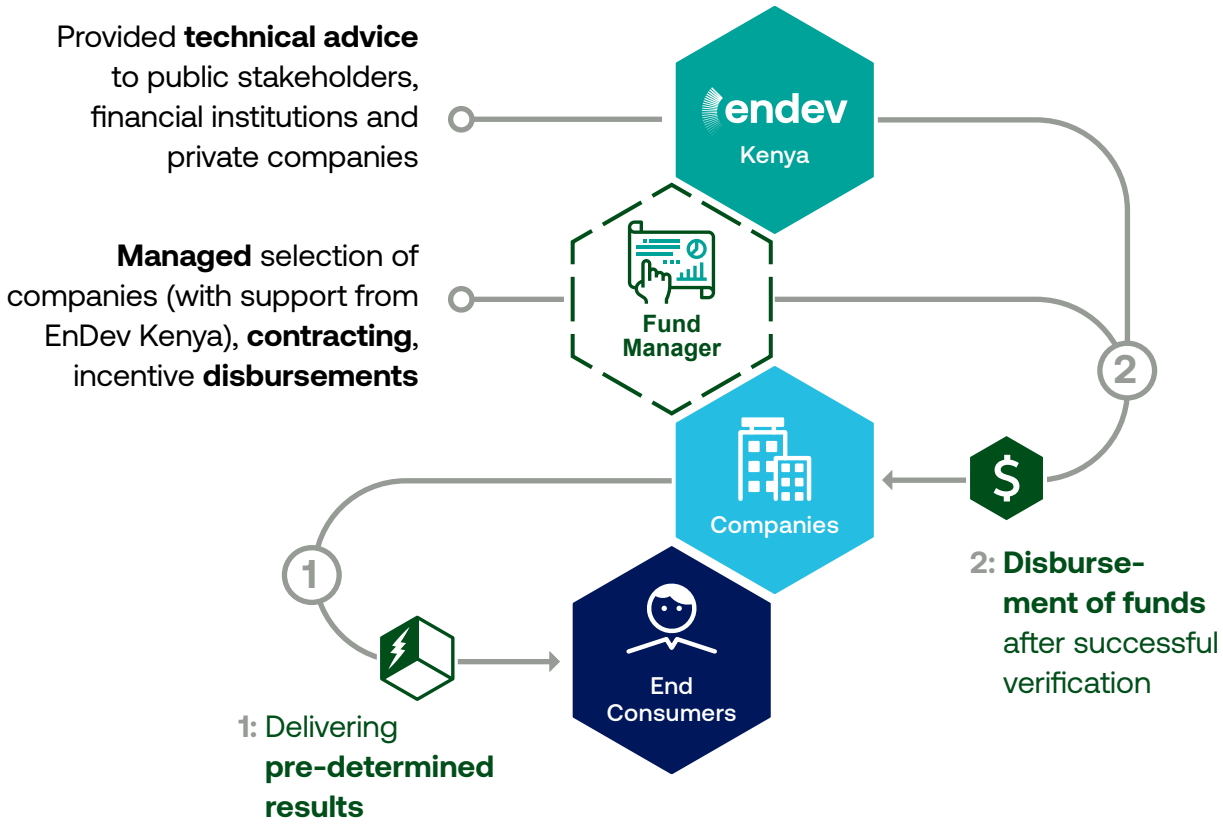


Figure: The RBF project design in Kenya

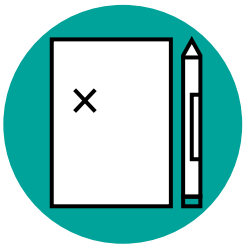
Results in a nutshell

The project started in mid-2014. After an intensive inception, preparation and construction phase, the first mini-grids were commissioned in March 2019 and the first connection claims were successfully verified and reported in June 2019. From then on, numbers grew steadily until the end of the project in the first half of 2020. This development highlights one of the special features of mini-grids projects when supported with RBF: if the intended result is the connection of customers, these results come in at the very end of the project cycle.

Three private companies constructed **10 solar-powered mini-grids in rural Kenya**. More than 1,500 households were connected in 10 villages as of March 2020. **More than 7,500 people now benefit from access to electricity.** Due to their locations in the central trading centres of these villages, the mini-grids provide electricity to more than **260 small and medium-sized enterprises**, as well as **72 public and social institutions** such as schools, health centres, community halls and churches. More than 100,000 people living in and around these villages will therefore benefit from the mini-grid projects through access to goods and services powered by clean energy. The private companies, who own and operate the mini-grids, aim to increase system sizes and the number of connections and expand into neighbouring villages.

The mini-grids have reinvigorated economic activity in these areas, supplying affordable, reliable, 24-hour clean power. This enables businesses to grow and operate longer hours; it generates income, creates youth employment and improves safety through streetlighting. For example, in Longech Island in Lake Turkana, fish are now preserved in freezers; and in Naduat, welders now use solar-powered electricity instead of gas. It will also end the reliance on diesel in a gold mining business in Naduat, which has shifted to solar energy to power its stone crushers. More and more businesses are seeing the advantages and plan to make use of the mini-grids as well.

Using solar panels, these mini-grids also contribute significantly to a better climate: **60,000 tonnes of CO_2 equivalent (CO_2e) are avoided every year.**



Lessons learned and ways to improve

The design and implementation of the RBF project in Kenya generated valuable lessons. For those in other projects or organisations active in the same field, these lessons provide guidance for the roll-out of future RBF projects:

1. Regulatory framework for infrastructure-based projects

The Kenyan mini-grids RBF project was to be implemented back-to-back with the GIZ project Promotion of Solar Hybrid Mini-Grids which supported the Kenyan partners to develop draft mini-grid regulations. These regulations had not yet been gazetted by the time the RBF project was implemented. This caused and increased need for coordination, for example in mini-grid sites selection, as some very promising sites were in so-called ownership contention and thereby reserved to be developed by other private companies and the rural electrification agency.

› An established regulatory framework is key to deploying innovative models like the RBF facility for infrastructure-based projects. Close coordination, especially with national authorities responsible for permissions and national planning processes, is key from an early stage onwards.

2. Capacity development for private companies

Many local companies were interested in owning and operating mini-grids and participating in the RBF project. The early development stage of the markets coupled with lack of experience in the field led to a high need for accompanying technical assistance for local companies, which were awarded RBF incentive contracts to develop mini-grids. Another key challenge experienced by the local firms was the limited access to finance and credit from local financial institutions. Due to the high investment costs, this was problematic.

› Private companies should be supported with accompanying technical assistance (training and capacity development measures) to receive RBF incentive payments, especially for new technologies and business models in a nascent market. Support should be extended to include access to finance and financial institutions.

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Author/Editor: Steffi Noelting, Alex Bradbury,
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Designed by: DITHO Design GmbH

Fire without smoke

Results-based Financing Facility project closing story

Building the private market for improved cookstoves in Nepal

For Manoj Gupta, the fight against indoor air pollution is personal. As a young man, he lost an aunt to the harmful effects of traditional biomass cookstoves, which claim thousands of lives every year in Nepal because of the noxious fumes they emit. Now, at 47, he has a thriving improved cookstove business called Husk Power. It manufactures and distributes life-saving portable stoves across central Nepal from its base in Birgunj, a bustling trade hub on the border with India. But getting this far has not been easy. Despite designing an award-winning firewood stove, Manoj initially struggled to connect with customers. Many families and restaurants in rural Nepal were not aware of the benefits of improved cookstoves or could not afford them.

It was through the public sector that Husk Power made its first significant sales. Following the devastating earthquake that struck Nepal in 2015, the government began to order improved stoves in bulk and distribute them free of charge to the hundreds of thousands of Nepalese families living in temporary shelters. While Manoj was proud to play a part in the disaster relief, he knew that relying on public tenders would not grow his business in the long term. For that, he needed his own private customers and a functioning value chain.

That's why, in 2016, he jumped at the chance to get involved in **EnDev's results-based financing (RBF) Facility**. RBF helps businesses develop by providing performance-based incentives Enterprises receive payments after pre-agreed results have been achieved and independently verified, instead of being given funding upfront. This shifts the focus of support towards results. Manoj was able to use the incentives to offer his customers a discount on the cookstoves. In a landscape in which households had come to expect free stoves, a discount was essential in generating demand for commercially sold stoves.

It paid off. As of 2020, Manoj employs 43 people at a state-of-the-art facility on his own land. He's even creating an international learning centre for renewable energy. "The project gave us the motivation we needed to expand our business," he says. "That's because it ensured the long-term sustainability of the market."

Addressing supply and demand

Manoj was not the only improved cookstove supplier in Nepal struggling to reach new customers. The entire market was in the early stages of development and distorted by public sector interventions. So the project engaged with actors along the whole value chain: from companies importing stove parts through trading hubs like Birgunj, to last-mile distributors knocking on doors in rural villages across central Nepal. Local financial institutions were also engaged in providing loans to purchase cookstoves. All these industry actors helped create a sustainable supply chain and build economies of scale. NMB Bank, who managed the funds, worked closely with the project on selecting suitable companies and cookstoves, as well as on verifying sales.

The dispersed incentives could be used flexibly. So while many suppliers used them to bring down prices by up to 50%, they could also be deployed for capital investments or marketing costs. The local financial institutions used them to create new credit lines for households to buy stoves and to cover up to 50% of the premiums. The project closely monitored the effectiveness of the incentive rates, based on developments in the market. After the earthquake, for instance, the rate was temporarily adjusted upwards to 75% of the cookstove price, in response to the free distribution of stoves by government and relief organisations. In total, incentives were provided over a period of five years and gradually decreased. As companies' capacities grew, they were able to produce at scale and decrease costs, thus meeting demand on their own.

Whilst a well-oiled value chain was essential, it was no use if people did not want to buy the products. The discounts were instrumental here. But potential customers also needed to know about the benefits of improved cookstoves. EnDev raised awareness through meetings with local government and community groups, radio broadcasts, leaflets, posters and text messages.

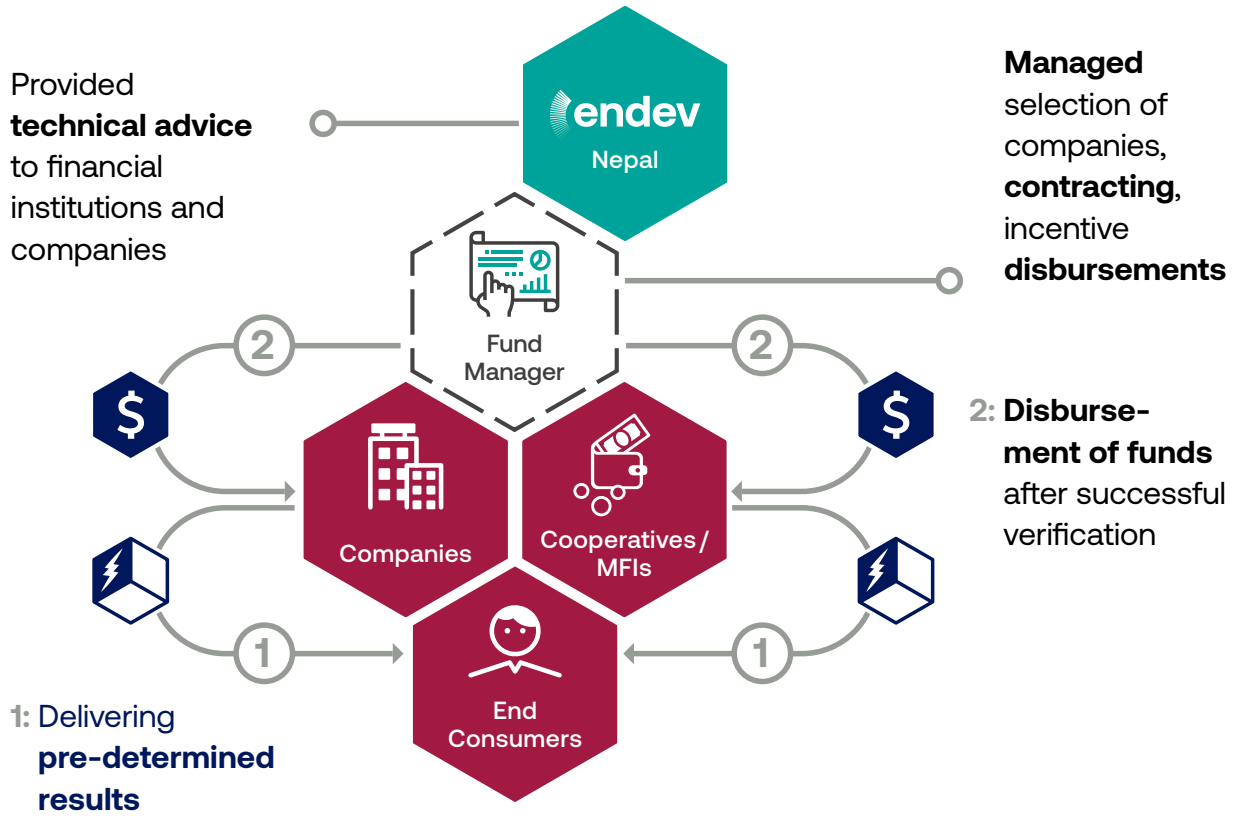


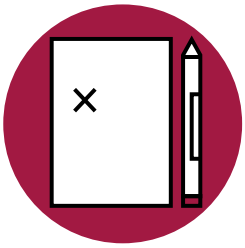
Figure: RBF project design in Nepal

Results in a nutshell

The project started in mid-2014. After an intensive inception and preparation phase, the first sales claims were verified and reported in December 2015. From then on, numbers grew steadily until the end of the project in 2019.

In total, over **46,000 improved cookstoves were sold** through the project, avoiding indoor air pollution for some **220,000 people.** The vast majority of these stoves were portable. However, over time the project began incentivising fixed stoves for houses that had been rebuilt or that were in less earthquake-affected districts. In total, 1,600 fixed hood-stoves were sold, which are a combination of a specifically designed smoke-hood and an improved biomass stove. These results also had a significant environmental and climate benefit: 224.000 t CO_2e will be avoided over the lifetime of the stoves distributed.

In terms of private sector development, **220 jobs** were created across 50 new or upgraded enterprises, with 100 of these jobs going to women. Crucially, these private firms invested as much of their own capital in developing production and supply as they received from the project. Overall, the project supported three portable cookstove manufacturers, nine hood-stove manufacturers, eight importers and 50 retailers and distributors. Thanks to the project, an impressive 230 financial institutions now provide loans to households to purchase cookstoves.



Lessons learned and ways to improve

The design and implementation of the RBF project in Nepal generated valuable lessons. For those in other projects or organisations active in the same field, these lessons provide guidance for the roll-out of future RBF projects:

1. Create demand through awareness raising activities

The private enterprises were often reluctant to invest in large-scale awareness-raising activities. They saw these as a risky investment with no guarantee of generating demand for their particular products. Ultimately, the labour was shared between the project and the private firms. While the former focused on raising awareness, the latter concentrated on product marketing.

› Consider using technical assistance project funds to create demand such as through awareness raising activities. This should be carried out at large scale and focus on the negative impacts of traditional cookstoves and the benefits of improved cookstoves. Private companies can build on this work with their own individual marketing campaigns in those locations where interest has been sparked.

2. Specifically target vulnerable groups in the project design

When using RBF incentives, it can be difficult to strike a balance between achieving scale and ensuring inclusion in terms of gender, poverty and remoteness. In a market-based model, innovators and early adopters (i.e. more educated and affluent households) benefit the most.

› If the RBF project is not specifically designed with a focus on vulnerable groups, gender or other then it is unlikely to reach them in signficant numbers. Such specific target groups need a targeted RBF design.

Photos
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Something's cooking in Peru

Results-based Financing Facility project closing story

Results-based financing triggers new prototypes and market adoption for portable improved cookstoves

José Humberto Bernilla has been in the cookstove business for over ten years. He firmly believes in the value of this climate-friendly cooking technology for Peru. During his time, he has seen big changes in the sector: at first, cookstoves were home-made, usually built by the families that used them. From 2008, EnDev supported local stove builders to produce cookstoves that can be permanently installed in kitchens. However, these models had major drawbacks: they could not be transported and stove builders and materials necessary for their construction were hard to find in remote areas. This hindered scaling up production and distribution.

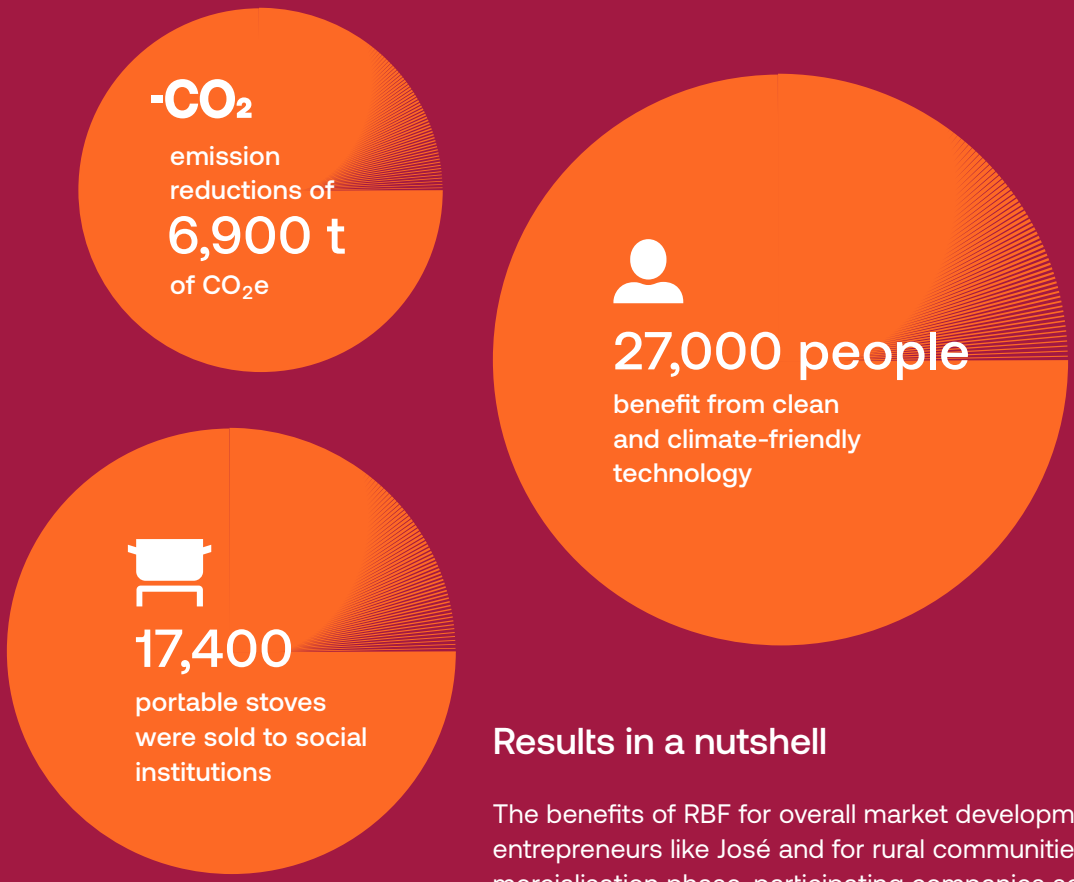
In 2014, EnDev Peru initiated a new project to overcome these challenges: through **results-based financing (RBF),** EnDev supported cookstove companies and entrepreneurs like José to boost research and development in portable improved cookstoves. RBF helps businesses develop by providing performance-based incentives. Enterprises receive payments after pre-agreed results have been achieved and independently verified, instead of being given funding upfront. This shifts the focus of support towards results. Thanks to the RBF project, a dynamic market for portable stoves was created, since these newly developed stove types could be easily transported to customers in rural areas. Manufacturers and distributors were supported throughout the entire business cycle. They received financial incentives at each step of the process: upon developing portable stove prototypes which meet the national standard and its requirements; professionalizing their business model; and finally for the production and commercialisation of the new portable stove models at scale.

Results-based financing enables the development of improved cooking technologies

In order to participate in the project, entreprises had to develop new portable cookstove models. This meant that local manufacturers were required to partner with industrial producers. José partnered with the Portuguese company Gamadaric, which specialises in metallurgical services and the manufacture of stoves. Together, the companies developed a new portable cookstove. The prototype was a success: it met all requirements for efficiency and safety, received a certificate of durability from the National University of Engineering in Peru, and was tailored to customer needs. José started to manufacture at scale and market the stove. Soon his company was selling not only to households, but also to institutions: it won an international tender to produce and install over 5,700 portable stoves in rural schools as part of Peru's National School Feeding Programme. For this major order, José optimised distribution and delivery times in just four months so that all cookstoves were ready to be used. Today, José highlights the role that the state and development projects played in increasing the visibility of the products and creating a sustainable market. His business is thriving, and he has started exporting to Bolivia and Colombia.

In addition to José, the RBF project supported five other manufacturers and seven distribution companies in Peru. Manufacturers were invited to visit leading cookstove production companies in Peru, Brazil, Honduras, Mexico and Portugal to gain knowledge and share know-how. With technical support, they developed and marketed six types of portable cookstoves. Ten 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. This product portfolio now serves the different customer segments and needs.

Figure: The RBF project design in Peru

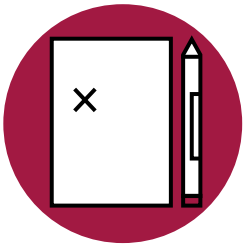


Results in a nutshell

The benefits of RBF for overall market development were manifold for entrepreneurs like José and for rural communities in Peru. During the commercialisation phase, participating companies sold 5,400 portable stoves to rural Peruvian families. **More than 27,000 people** now benefit from the clean and climate-friendly technology. Over the lifetime, the use of portable stoves results in emission reductions of more than **6,900 t of CO_2 equivalent (CO_2e).**

The new cookstoves have brought together supply and demand and transformed the market: remote households – that previously did not have access to climate-friendly cooking technologies – have now been reached. These customers use much less firewood, which improves the air quality inside their homes and benefits their health, reduces time spent gathering firewood and protects forests from degradation. Manufacturers, local wholesalers and retailers have started to form alliances, benefitting all involved parties and increasing sales numbers significantly. SENCICO, the national certification body, has updated its standards for improved cookstoves and developed technical specification for the safety and durability of portable cookstoves. The project has also indirectly laid the groundwork for the parallel development of portable stoves for social institutions, such as schools. With its first national tender for portable improved cookstoves, the Peruvian government acquired a total of 11,400 portable stoves to be installed in local schools. Altogether, **17,400 portable stoves were sold to social institutions** during project implementation.

This project started in 2014 and was split into two phases: the first one focussed solely on R&D for new portable cookstove technologies, while the second one focused on commercialisation of the technologies. The first sales claims were successfully verified and reported in June 2017 after completion of the first phase. While the sales figures initially increased slowly, a steep growth was observed in late 2017 until the end of the project in 2018.



Lessons learned and ways to improve

The design and implementation of the RBF project as an innovation and development contest in the Peruvian cooking energy sector has generated valuable lessons. For those in other projects or organisations active in the same field, these lessons provide guidance for the roll-out of future RBF projects:

1. RBF can be an effective instrument to trigger innovation

Before the RBF project, cooking technologies in Peru were unsuitable for promotion and distribution in remote areas like the Amazon jungle. By offering financial incentives for the development of innovative improved cookstove prototypes – that meet quality and user standards of rural markets – RBF incentivised stove manufacturers to find solutions. Out of the seven manufacturers that submitted prototypes, six were successful. Not only are these models now available in the market, they have even led to a revised national standard for improved cookstoves.

- Target incentives to encourage R&D and reap the benefits of innovation later.

2. Different stages of market development require different RBF designs and timelines

The project was very successful in bringing different versions of a new product type to the market. However, with a timeframe of less than three years, the project design was ambitious: when the project ended, some manufacturers had only just established their distribution networks and started working with local retailers. Fortunately, they were able to benefit from a fund managed by the Inter-American Institute for Cooperation on Agriculture (IICA) that supported distributors of thermal energy solutions in Peru. Consequently, businesses were able to continue to build on the successes of the RBF.

- Be clear about the purpose of the RBF instrument and the intended change, as well as about timelines and limitations.

3. Enabling market transformation and product diversification

The RBF project was successful in bringing a new product to the Peruvian cookstove market. This triggered many other positive developments that contributed to the diversification of the market, such as:

- Some manufacturers continued to invest in research and development of portable cookstoves even after the project ended. The cookstoves were further adapted to the needs of users, adding practical components such as integrated ovens to heat homes in elevated colder regions of Peru, or adjusting the stove model to the needs of social institutions such as schools. This highlights how product lines available for both domestic and institutional use continue to be diversified.

- International stove manufacturers and distributors entered the market in the final commercialisation stage of the project. Even though they did not benefit from incentives for prototype development, these manufacturers saw the market potential after the local stoves were certified. They obtained national testing certification to enter the market and participate in the dissemination phase of the project. This further broadened the range of products on offer and illustrates the positive effects RBF can have on overall market transformation.

- Manufacturers started to form alliances with local wholesalers and retailers whose trained sales staff could provide customers with information on how to obtain microfinance to purchase portable cookstoves. The alliances increased sales numbers substantially, emphasising the benefits of partnerships resulting from RBF.

Photos
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Author/Editor: Steffi Noelting,
Isabella Lehmann, Sarah Wollring
Designed by: DITHO Design GmbH

Boosting the market for clean energy technologies in Peru

Results-based Financing Facility project closing story

Climate-friendly solar water heaters are on the rise in remote areas

Óscar Yance was born in Huancayo, the capital of Junin Region in central Peru. Located in the Andean mountains at over 3,000 metres above sea level, Huancayo is relatively cold, but sunny. Óscar saw a business opportunity in these conditions: with the help of solar water heaters, sunlight could be used to heat cold water. Having worked at a microfinance institution with a green portfolio, Óscar was familiar with the technology. Solar water heaters have been utilised in Peru over decades; however, until 2015 their demand was almost entirely limited to the city of Arequipa and its surroundings. Reasons for this were manifold, starting from low quality products to lack of promotion and lack of access to consumer financing. This changed in 2016, when EnDev initiated its results-based financing (RBF) project to bring solar water heaters to rural areas by offering financial incentives to private companies. RBF helps businesses develop by providing performance-based incentives. Enterprises receive payments after pre-agreed results have been achieved and independently verified, instead of being given funding upfront. This shifts the focus of support towards results. The project also brings microfinance institutions on board: banks are offered incentives for each loan issued for the purchase of solar water heaters, making it easier for potential clients who cannot afford upfront payments.

Óscar saw his chance. He started importing solar water heaters from China and sold them locally, focusing on rural areas where water was traditionally heated on open fires – a method harmful to individual health and to the climate. Óscar is proud to provide access to this clean and climate-friendly technology, and the money he earned from each sale allowed him to improve his business, for example by buying a motorcycle-truck to reach rural areas faster and at less cost. Sales of Óscar's solar water heaters grew at an astonishing rate. After two years, Óscar had five employees and signed an agreement with the local bank Caja Huancayo, offering loans to customers to buy solar water heaters. Óscar was now selling more than 30 solar water heaters per month in Huancayo, where previously the private sector sold only 5 per month and showed little interest in developing the market segment due to high logistical and advertising costs.

Market expansion feasible

Thirty-one other Peruvian entrepreneurs have, like Óscar, benefitted from the RBF project between 2016 and 2018. For each verified solar water heater sold and installed, the entrepreneurs received an incentive payment from the project. Each urban sale had to be matched by at least one rural sale in order to be eligible for incentives. Over the course of the project, this was increased to at least two rural sales. Sales anywhere in the country were considered eligible for incentives, except those made in the city of Arequipa. This allowed companies to broaden their customer base in easy-to-reach urban areas, while at the same time requiring them to move into rural areas in order to receive incentives. Growth in both urban and rural areas led to increased awareness about the benefits of solar water heaters throughout the country, and take-up in rural areas continued to increase significantly.

As the RBF project continued, the incentives were reduced year-on-year; entrepreneurs received less money for each sale taking positive market development, increased sales and business growth into account. Now that the project has come to an end, companies are more confident that a sustainable market has been established and continue to offer their services and products in rural areas. In addition to this, the project supported market linkages between different actors: EnDev supported importers in finding wholesalers and retailers to establish sustainable local distribution structures in rural areas. Some wholesalers or retailers have become importers and now generate higher profit margins. Two other companies have successfully started exporting to Bolivia.

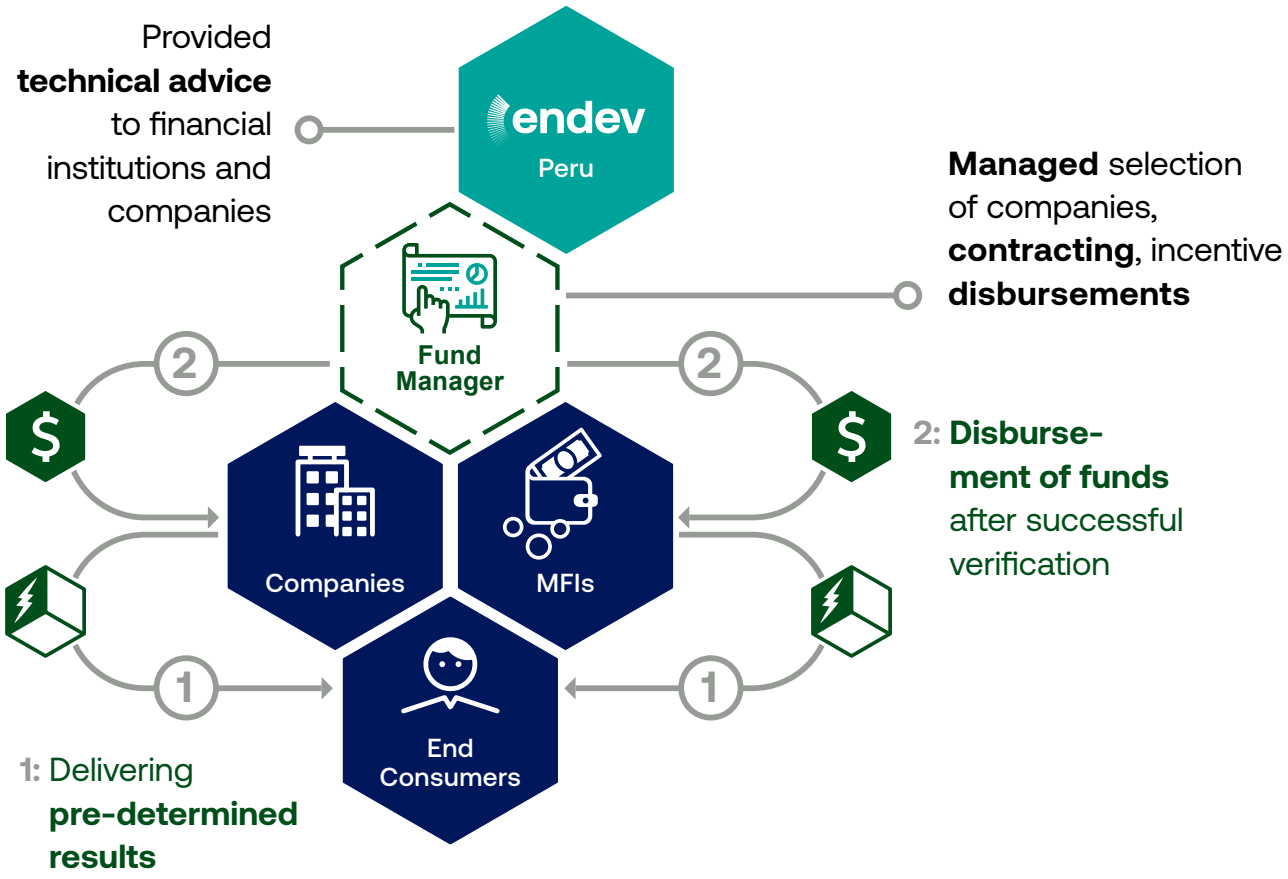
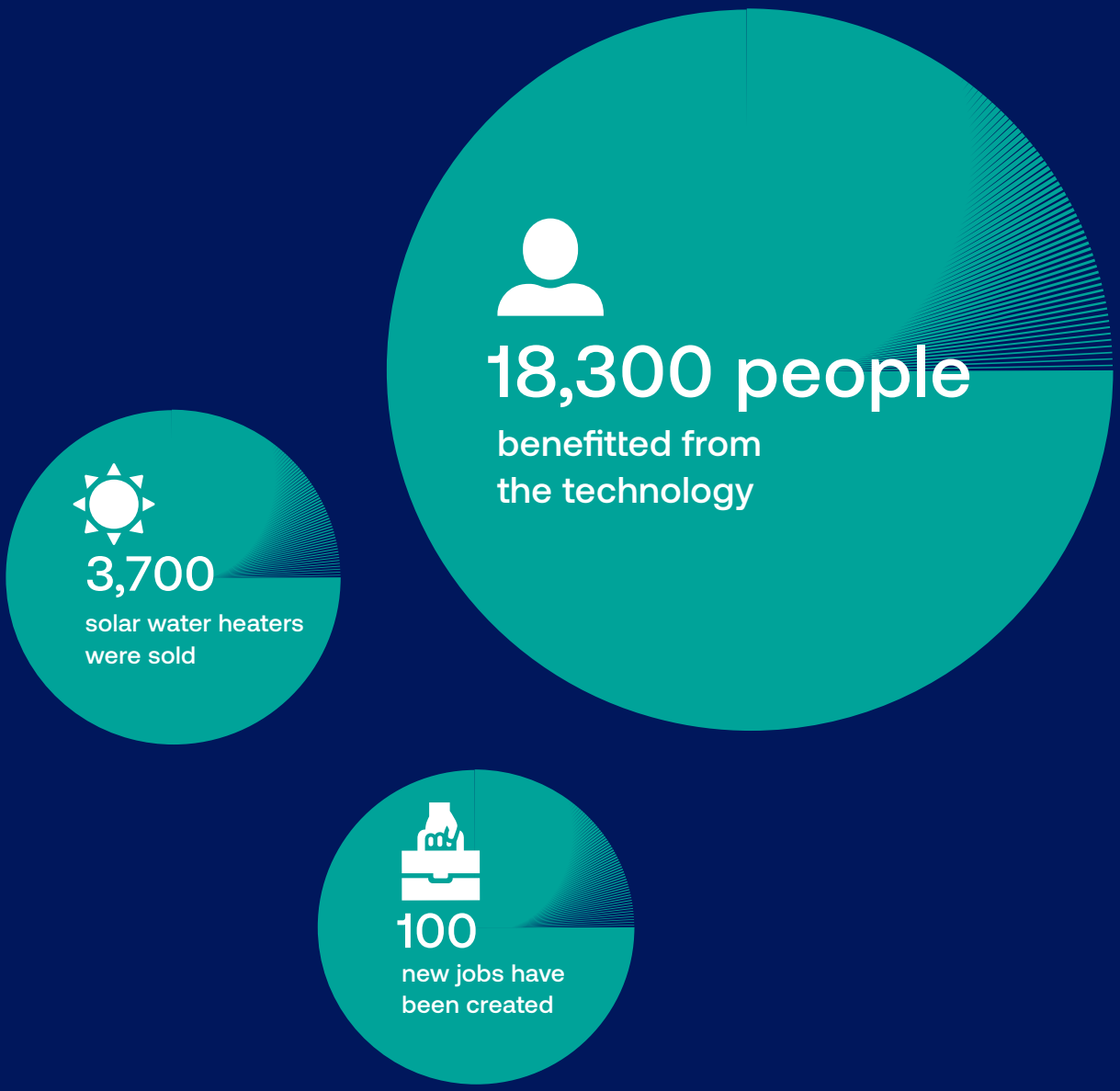


Figure: The RBF project design in Peru



Results in a nutshell

Thanks to the RBF, a great transformation of the sector has been achieved with numerous benefits. Within 3 years, the project recorded sales in Peru of more than **3,700 solar water heaters** in 18 of 25 regions. In comparison, only 5,000 units were sold in the previous 30 years and limited to the city of Arequipa alone. With approximately five family members per household, over **18,300 people** benefitted from the technology by the end of 2018. Within the RBF project, 31 companies have sold solar water heaters in rural areas and six microfinance institutions offered loans for the acquisition of these. More than **100 new jobs** have been created, 40 percent of them for women. In some cities, the number of shops selling solar water heaters has increased from 4 to 20 within 4 years.

The project started in the second half of 2015. The first sales claims for solar water heaters were verified and reported in December 2016. From then on, numbers grew steadily until the end of the project in 2018.

Learn more about the project here

Lessons learned and ways to improve

The design and implementation of the RBF project in the Peruvian energy sector generated valuable lessons. For those in other projects or organisations active in the same field, these lessons provide guidance for the roll-out of future RBF projects:

1. Put the right actors in the driver's seat

From the start of the project, it was assumed that a lack of access to microcredit was one of the barriers preventing the growth of the solar water heater market among consumers. However, internal processes of microfinance institutions were found to be slower than those of providers. Only 10 percent of sales in the first and second phase of the RBF project were enabled by loans, hence incentives for banks were stopped in the final phase. In this regard, one of the main lessons learnt is that rural markets cannot be developed by microfinance institutions alone and require an energy company pushing and marketing its product in the rural market.

› Companies are drivers for market development: make sure they are put in the driver's seat to promote their products in rural settings. Microfinance institutions can complement companies' activities, but they have to be actively engaged by the respective companies. This is necessary to establish a direct relationship and gain sufficient familiarity with, and certainty about, the product in order to include it in their loan portfolio. It takes time for companies and microfinance institutions to build these relationships on their own. Be sure to include structures and processes in your project to facilitate and accelerate this process.

2. Be clear on target areas

Clear geographical targeting for RBF incentives can be effective to develop rural markets: with the explicit focus on remote areas, the project was able to move companies into this segment. With the incentives acting as a kind of guarantee, companies were willing to take the risk and invested in outreach in rural markets to promote solar water heaters – and were rewarded for it. As a result, these companies and their products are now represented in 18 of Peru's 25 districts.

› Be sure that the incentives encourage companies to move into the desired geographical locations.

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Author/Editor: Steffi Noelting,
Isabella Lehmann, Sarah Wollring
Designed by: DITHO Design GmbH

Doing business with the neighbour countries

Results-based Financing Facility project closing story

Advanced cookstoves improve lives and grow businesses in Cambodia, Vietnam and Laos

Bich Nguyen likes to talk business. And no wonder: the last few years have seen his small social enterprise SolarServe expand its horizons far beyond Bich's hometown of Da Nang in northern Vietnam. Standing in the firm's workshop on the outskirts of the city, where half a dozen workers transform steel sheets into climate-friendly gasifier stoves, Bich explains how it all came about.

Back in 2015, SolarServe's business had stagnated. It had a solid network of customers dotted along the north central Vietnamese coast, but there was little prospect of expansion – certainly not abroad. The investment costs for expanding the distribution network were prohibitive, and Bich lacked expertise in international shipping, import duties and tax regulations. So when Bich heard about an opportunity to sell his products in neighbouring Cambodia, he was intrigued. Because of a virtually untapped demand for cleaner cookstoves, EnDev was offering to connect international stove producers with local Cambodian distributors through its results-based financing (RBF) project. RBF helps businesses develop by providing performance-based incentives. Enterprises receive payments after pre-agreed results have been achieved and independently verified, instead of being given funding upfront. This shifts the focus of support towards results.

Knowing that more than 90 percent of households in Cambodia still used traditional wood and charcoal stoves, Bich was keen to test his advanced gasifier stove in the Cambodian market. Because they create gas from solid biomass, the stoves are safer, more efficient and produce fewer emissions. After Bich had been connected to local Cambodian distributors and gained their market insight through participation in the project, SolarServe duly prepared an initial shipment of 200 cookstoves. However, they did not sell as well as Bich had hoped. It was a blow, but

feedback received from end-users quickly identified the problem: the stoves did not have the high-end look that consumers expected when they invested in a new advanced biomass stove. So Bich and his team went back to the drawing board. A second consignment of 1,000 units, featuring stainless steel, improved handles and a stylish base, soon followed. The new stoves quickly sold out. Bich was so happy with the changes that he even shifted production to the new design for his domestic business in Vietnam.

The EnDev project has helped grow the business considerably, both in terms of turnover and staff. "I learned so much through this project," says Bich. "We refined our product and gained expertise in exports, customs and transport. We are now truly international – we are setting up a new assembly plant in Cambodia and are even looking into exporting to Myanmar."

Three countries – one objective

It is not just Cambodian families that struggle with the health risks of traditional stoves: millions across the Mekong region inhale noxious fumes every day when they use wood and charcoal to cook their meals. But like SolarServe, manufacturers have difficulties reaching these people because of the underdeveloped supply chain for advanced cook-stoves and the risks inherent in entering a new, unknown market. That is why the EnDev project introduced an innovative auction-based process to all three countries in the region – Cambodia, Vietnam and Laos.

The approach was tailored to the differing levels of market development of each country. In Cambodia, where local distributors were scarce, the auctions were used to aggregate demand. By bringing together a critical mass of distributors, EnDev removed the need for international suppliers like SolarServe to embark on the resource-intensive process of building new relationships. Distributors would bid for small lots via their phones, with EnDev guaranteeing a price to international suppliers. Any shortfall between the highest bid and the guaranteed price was covered through the RBF incentives. As demand picked up, the highest bid increased, eventually removing the need for the incentives entirely.

In Vietnam, it was the manufacturers themselves that did the bidding. They calculated the amount of financial support they would need in order to sell the product to the end-users. The incentive then went to the lowest bidder. After the sale, the producers supplied the customer data to EnDev, and this was verified by an independent party. Finally, in Laos, existing artisanal producers were offered incentives to shift to the production of next-generation stoves.

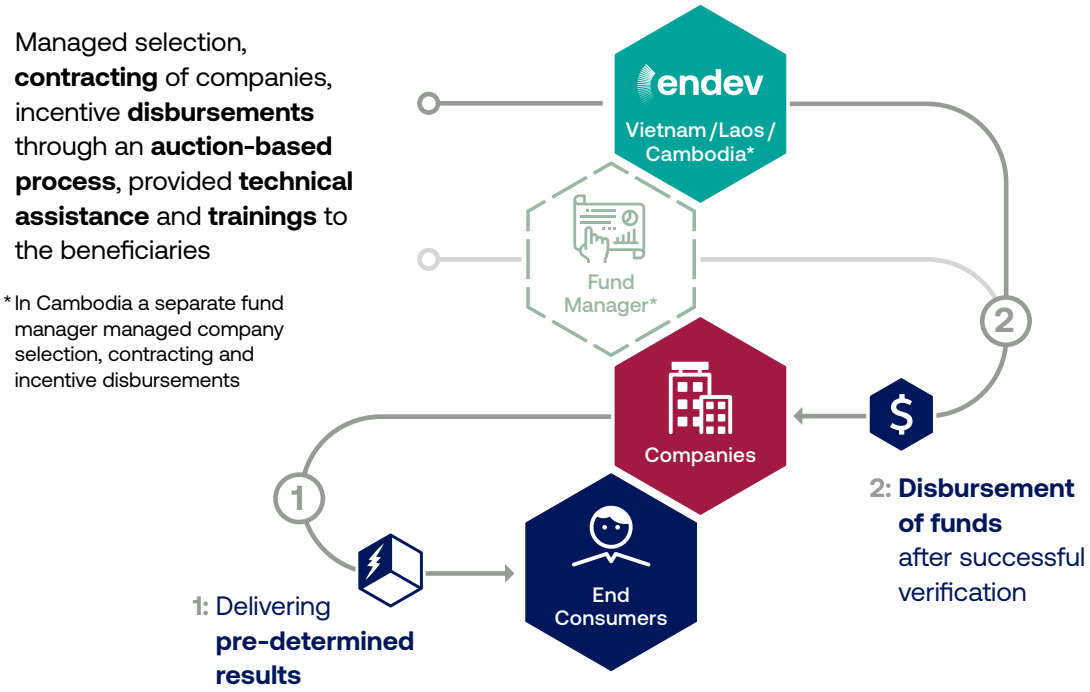


Figure: The RBF project design in the Mekong

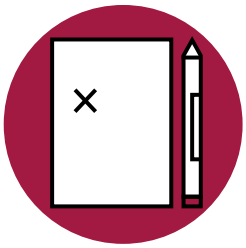
Results in a nutshell

The project kickstarted markets for advanced biomass cookstoves in Cambodia, Vietnam, and Laos. Nearly **90,000 people** now have improved access to clean cooking, and around **40,000 advanced biomass cookstoves have been sold.**

There are also a number of new businesses in the supply chain who are experimenting with new cookstove models. To date, four international stove manufacturers and 16 local distribution companies have been engaged in Cambodia; there are five local producers in Vietnam promoting eight different models; and five local producers with more than 90 retail points are participating in Laos. New participants are being brought on board on a continuous basis. The project saw significant investment from the private sector. In Cambodia, over EUR 560,000 was leveraged, with companies investing in production assets, raw materials, workforce training, marketing and sales, and enterprise management systems.

The environmental benefits were also considerable: ultimately, **28,000 t of CO_2 equivalent (CO_2e)** will be avoided over the lifetime of the stoves sold under the project.

Whilst the project started in early 2015, the first stove sale claims were verified and reported in December 2016. From then on, numbers grew steadily until the end of the project in 2018.



Lessons learned and ways to improve

The design and implementation of the RBF project in the Mekong region generated valuable lessons. For those in other projects or organisations active in the same field, these lessons provide guidance for the roll-out of future RBF projects:

1. Use RBF to kickstart new markets

RBF is predominantly used in advanced markets, but this project showed how RBF can help create new markets. In Vietnam, incentives encouraged producers to expand to new geographies. In Laos, the incentives led artisanal producers to invest in upgrading their production facilities, innovate better performing stoves, and build relationships with other actors in the value chain, including distributors. In Cambodia, auctions at the wholesale level reduced the risk for market actors of testing whether a market existed. The gradual reduction of incentives over time established a self-sustaining market in which the actors could sell the stoves at their real market price.

› Tailor the incentive mechanism to local circumstances and to address specific supply side risks. Use auctions to determine the incentive needed to create a sustainable market.

2. Don't rely on RBF alone in developing nascent markets

While RBF was instrumental in the project's success, it was not sufficient on its own to create new markets for cookstoves. Project participants also requested other forms of support, including awareness raising of the benefits of advanced stoves, guidance on technical improvements to stove design and training on enhancing distribution chains. However, since the project had been designed to focus on incentives, there was limited scope for more traditional technical assistance.

› Combine RBF with a comprehensive package of instruments in order to ensure that markets are successfully stimulated.

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“My life is so much better now”

Results-based Financing Facility project closing story

Biodigesters: A simple technology changes lives in East Africa

Elosy Kendi lit the fire in her small house in the village of Kiamutuja. It was July, the coldest month of the year in Meru County, situated in the highlands of central Kenya, and she had to keep her family warm and cook their meals. The situation was the same for many families in the village. The fires filled their homes with smoke, which got in their eyes and caused respiratory infections. They used more firewood and charcoal during the cold months, and that meant spending money which normally went towards school fees and rent. But things would change on this cold day in July 2017: Elosy's neighbour had installed a biodigester and started converting organic waste from his farm into biogas. This helped him save money and reduce his dependency on natural resources like firewood by using the biogas as a fuel for cooking and heating. The side product, bioslurry, served as an organic fertilizer, which increased his crop yields. Beyond the village of Kiamutuja, biodigesters help reduce greenhouse gas emissions, and protect against deforestation, as well as soil and water pollution.

Elosy immediately saw the potential of this simple yet life-changing technology and went to a 'farmer field day' to learn more. She was given information about biodigesters and – to her surprise – offered a life-changing opportunity: a company that sold and installed biogas systems gave her a job in sales. Elosy quit her underpaid job as a cashier, and just one year later she was one of the company's most successful sales representatives. However, regardless of how many biodigesters she sold, her salary remained the same.

In 2018, Elosy heard of the Kenya Biogas Programme, which used EnDev's results-based financing (RBF) approach. Elosy knew that she could personally benefit from this approach as it helps sales agents and businesses develop by providing performance-based incentives. Enterprises and agents receive payments after pre-agreed results have been achieved and independently verified, instead of being given funding upfront. This shifts the focus of support towards results. Elosy was contracted by the RBF project, but this time as a freelance sales agent. Her job didn't change much: she still visited people in their homes and attended farmers field days and agricultural shows to speak about biogas and the benefits of biodigesters. But now, for every successful sale she received a commission of 6,000 Kenyan shillings, the equivalent of 50 euro. It wasn't just a boost to her income; it was a turning point in her life. "My life is so much better since I started receiving the sales incentives," says Elosy. "I have been able to repay a loan, cover my kids' school fees and pay my rent. And I love this technology! The next target I want to achieve is to get a biodigester for my family."

Support for entrepreneurs along the entire value chain

The RBF project was implemented in Kenya, Uganda and Tanzania under the umbrella of the Africa Biogas Partnership Programme. In all three countries, the project accelerated market uptake by incentivising sales agents like Elosy, as well as biogas construction enterprises, farmers groups and community-based organisations. Here's how it worked: after the sale of a high-quality biodigester, a service provider would either assemble it at the customer's property or, if it was a prefabricated model, directly install it. After three months, the service provider visited the customer to ensure the technology was running smoothly. An independent agent verified the digester was in place and that the after-sales service had been provided. This verification allowed the RBF incentive to be disbursed to the service provider. These sales- and quality-driven RBF incentives (see graphic and lessons learnt below) resulted in an enhanced relationship between clients and service providers.

Biodigester production companies saw the advantages of freelance sales agents within the RBF project and replicated the approach, paying freelance sales agents a commission in multiple regions. This led to the creation of new jobs and greater visibility for different technologies, as well as price and quality competition, which benefitted the end-consumer. And while the production sector is still dominated by men, more and more women are joining the sales and marketing teams of biodigester companies. EnDev organised training to improve their sales skills. "In the past, the biogas sector attracted men, and women were left out," says Elosy. "Many women are unemployed, so any opportunity is worth taking. My women friends now want to become sales agents, and we will see more women in the biogas sector in the coming years." Today, one third of all biodigester sales representatives in Kenya and Uganda are women, and their success will define the future of the technology.

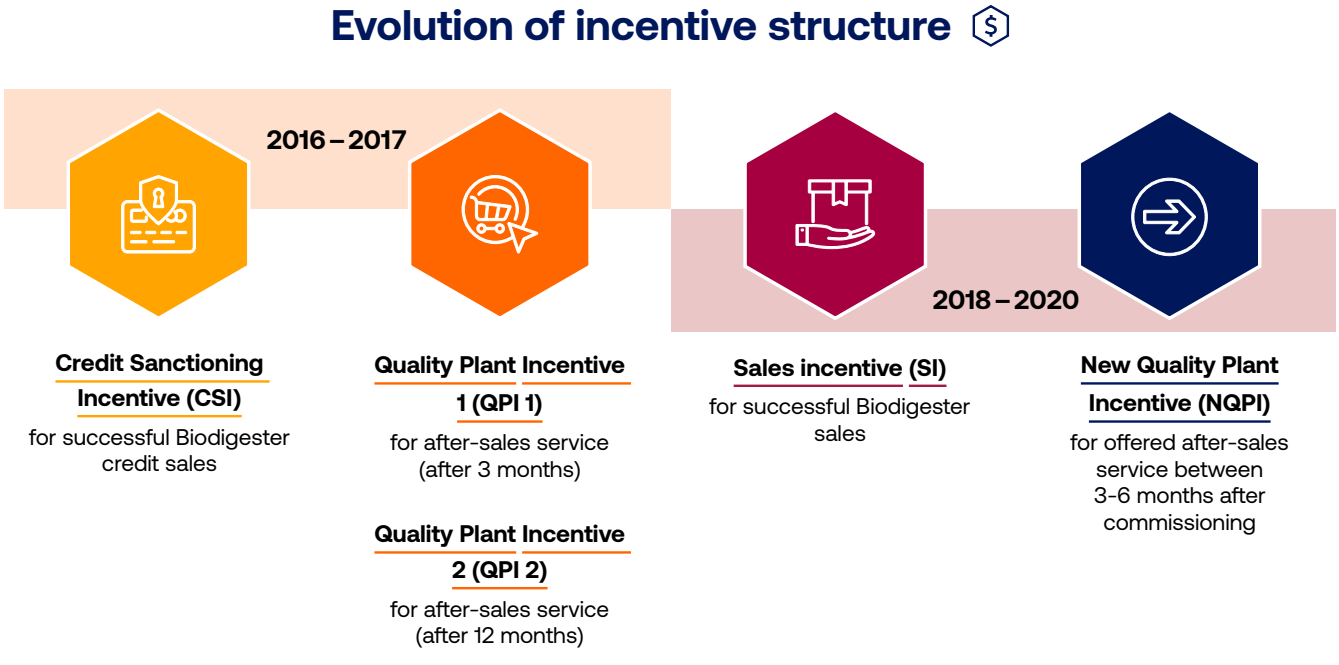


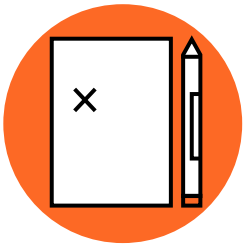
Figure: Evolution of the incentive structure

Results in a nutshell

The project started in 2015. While sale figures only grew slowly during the first one and a half years of the project, a steep growth of sales was observed in 2018, when the new incentive structure yielded positive results and companies offering pre-fabricated biodigesters additionally entered the market. From then on, numbers grew steadily until the end of the project in early 2020.

In total, EnDev supported almost 440 Kenyan, Ugandan and Tanzanian biogas construction enterprises, sales agents, farmers groups and community-based organisations under the umbrella of the Africa Biogas Partnership Programme. Together they produced and sold more than 8,500 biodigesters. The benefits are now felt by more than 45,000 end-users. A total of 300 new jobs were created in Kenya, Uganda and Tanzania, many of which were for women.

These results also had a significant climate benefit: over their lifetime, the biodigesters that have been sold will lead to a reduction in CO_2 equivalent (CO_2e) of 605,000 tonnes.



Lessons learned and ways to improve

The design and implementation of the RBF project in Kenya generated valuable lessons. For those in other projects or organisations active in the same field, these lessons provide guidance for the roll-out of future RBF projects:

1. Be flexible in redesigning your incentive structure

At the beginning of the RBF project, the initial incentive structure included two types of incentives:

a. The Credit Sanction Incentive (CSI) supported Microfinance Institutions (MFIs) in offering credit for the purchase of biodigesters

b. The Quality Plant Incentive (QPI) supported high-quality products by disbursing incentives in two tranches: 3 months after a plant was commissioned, produced gas and the first after-sales service was successfully conducted; and then after 12 months of plant operation.

In the course of the project, EnDev realised that the incentive structures were not addressing the markets' needs to achieve the goals of the project.

› It is vital to allow the incentive structure to meet the markets' needs. In this RBF project, the incentives were restructured to be more sales- and quality-driven and to bring about a change in attitude among service providers so that they actually provide biogas to their customers, and not just a (possibly non-functioning) constructed biodigester:

a. The CSI was replaced with a Sales Incentive (SI) which incentivised direct sales of a biogas plant. This opened up the value chain to include sales agents.

b. The incentive paid in two tranches was changed to the New Quality Plant Incentive (NQPI) which was paid in only one tranche after a plant was commissioned and the after-sales service was provided a few months later.

2. A robust monitoring and verification system is key to success

An overly complex monitoring and verification system within the RBF project led to long paper trails and lengthy data flow processes at the beginning. This resulted in an often limited quality control and the inability to easily tell the status of products due to delays in verification.

› For the success of a RBF project, a robust monitoring and verification system is strongly recommended. In this RBF project, this included a management information system, finance and quality control systems, a web-based management system, a mobile app for data collection and a call centre for verification. Successful verification processes go hand-in-hand with credible data collection and management systems. Although the initial investment costs were relatively high, the benefits spoke for themselves: the monitoring and verification system enables real-time insights in plant functionality and customer satisfaction, supplier grading for accountability, improved quality control, higher efficiency and effectiveness as well as improved reporting. The higher the transparency and quality of the monitoring and verification system, the lower the risk of cases of non-compliance and malpractices.

3. The power of a call centre

Next to site visits, call centres were used as independent agents to verify that biodigesters were in place and that the after-sales service had been provided. This served as a simple verification mechanism to trigger the disbursement of RBF incentives. Phone and field verification go hand in hand. As time went by, the project realised that the value of call centres went beyond verification.

› Data gathered from the call centre was used beyond triggering the disbursement of RBF incentives; it became a powerful tool in professionalising the sector and improving accountability. The control of data meant that biodigester production companies or masons were required to deliver high-quality products. By using a Net Promoter Score tool, the programme was able to establish the biogas users' satisfaction levels.

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A social approach to building markets

Results-based Financing Facility project closing story

In Malawi, vulnerable groups are the early adopters of modern energy solutions

Baxton Malove was a farmer who lived in Mulanje, on the southern tip of Malawi, for all of his life. But in this densely populated area it was becoming harder and harder to earn enough to look after his family. In 2006, the Community-Based Rural Land Development Project, known locally as 'Kudzigulira Malo', allocated new land to the residents of Mulanje. Baxton packed up and moved to Chimwaza, 260 km north of Mulanje. Along with his wife, four children and 25 other families, Baxton started afresh. But settling in was not easy. He tried different work, for example by growing tobacco, but the hilly area was not suited to agriculture, and none of his plans seemed to take off.

Then, in 2016, EnDev launched a project to bring modern cookstoves to the people of Malawi. The project addressed an essential need, as over 80 percent of Malawians live in rural areas and cook on three-stone open fires. This traditional method requires a lot of firewood and produces a lot of smoke. In line with the goal of the Malawian Government to have two million improved cookstoves in use by 2020, EnDev started promoting portable clay stoves called Chitetezo Mbaula, which means 'protective stove'. These locally-produced improved cookstoves use 30 percent less wood thus they are more environmentally friendly and emit less smoke. They can also be moved easily, meaning that families can cook outside, which further reduces their exposure to smoke and protects their health.

The Chitetezo Mbaula allows entry into the sphere of improved cooking technologies. But for the stoves to reach people, they first needed to be produced. Baxton decided to get involved. After learning how to build the Chitetezo Mbaula through EnDev, he formed the 'Mphatso stove production group' together with 10 men and 12 women. Today, Baxton is as happy about his contribution to protecting the environment as he is about the business itself: "Before the stove business, I never imagined I could achieve the things I have achieved so far," he says. "Our business is a success and I can pay for my children's school fees. Some of the group members have renovated and built houses, and invested in small livestock like chickens and goats. Almost all the surrounding villagers now want to produce stoves after seeing how successful we've been."

From production to sales: interventions along the entire value chain

The Mphatso stove production group is one of 22 groups that have benefitted from EnDev's results-based financing (RBF) approach to create and scale-up their stove businesses in Malawi. RBF helps businesses develop by providing performance-based incentives. Entreprises receive payments after pre-agreed results are achieved and independently verified, instead of funding being given upfront. This

shifts the focus of support towards results. In Malawi, the RBF incentives were managed by EnDev's implementing partner, 'United Purpose', which is one of Malawi's largest NGO's focusing on breaking the cycle of poverty. The production groups sold the majority of their stoves to United Purpose, putting the revenue they earnt back into their businesses. The purchases of the stoves were guaranteed until the project ended in 2020. United Purpose passed the cookstoves on to a network of sales agents, distributors and promoters, who sold the stoves to the end-users.

Living in one of the poorest countries in the world, most Malawians have limited financial capacities, if any. It would be difficult for the 'poorest of the poor' to buy a regular priced Chitetezo Mbaula from a stove producer. Targeting these families, the RBF project decided not to use a market-based approach, but to work hand in hand with the governmental Social Cash Transfer Programme: the ultra-poor 10 percent of the population received a voucher for a cookstove, following the 'leave-no-one-behind' rationale. The costs of the stoves were entirely covered by the RBF project.

Alongside the distribution of stoves via the Social Cash Transfer Programme which represented the largest share of the project's approach, 10 percent of all stoves produced under the RBF project were sold commercially at a reduced price through the same network of sales agents and local entrepreneurs, such as shop owners. These sales were partially subsidised, which stimulated uptake by consumers. The producers started to build their own distribution directly to end-customers and the government is replicating the voucher system in one district with the aim to expand the distribution in the future. This made supplying rural areas economically viable and boosted the commercial market for the Chitetezo Mbaula producers and sales agents. In addition, consumers learnt about the benefits of the cookstoves, which generated more demand for commercial sales in remote rural areas and beyond the capillary last mile.

The introduction of the technology to a wider community has opened up the market in rural areas. It has been a vehicle to establish local value chains and built-up production capacities as well as increasing awareness and stimulating demand. All of the service providers – from producers to sales agents – received specific training by EnDev, for example about stove production, usage, sales and data collection.

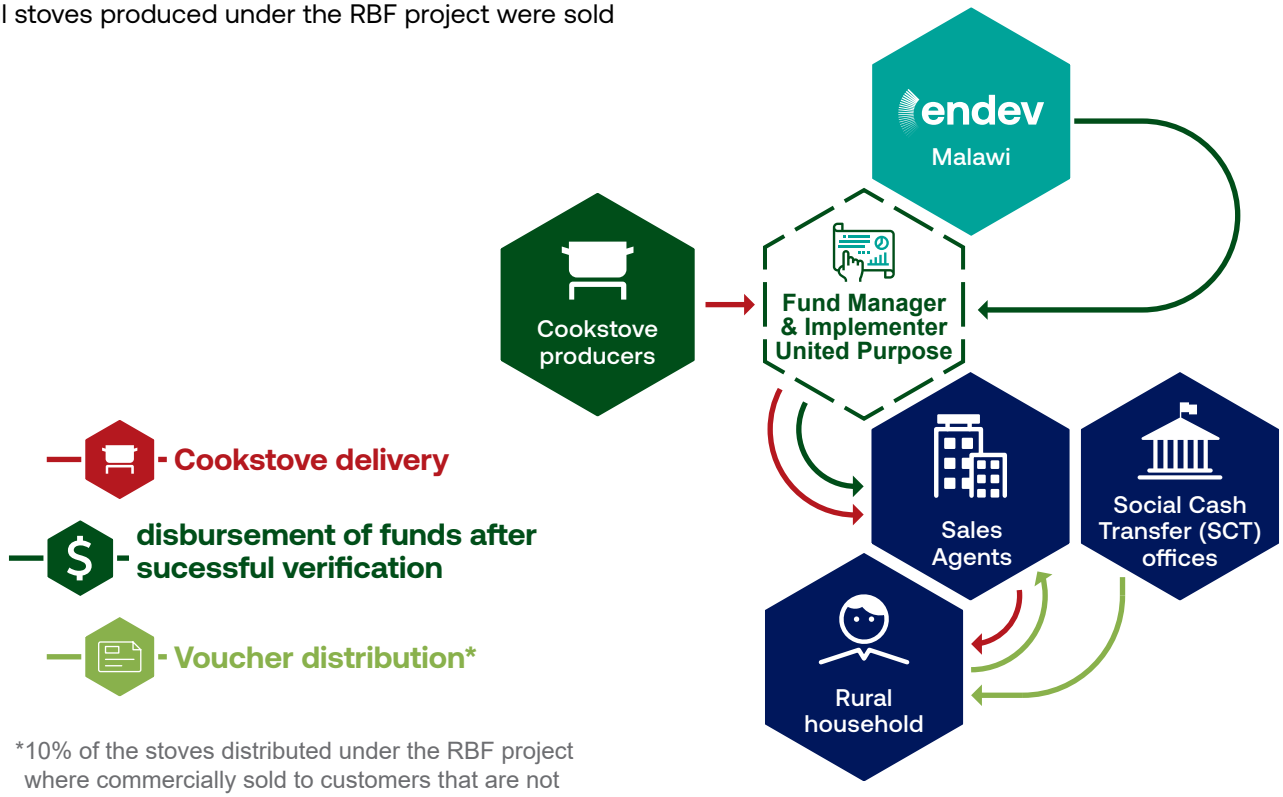
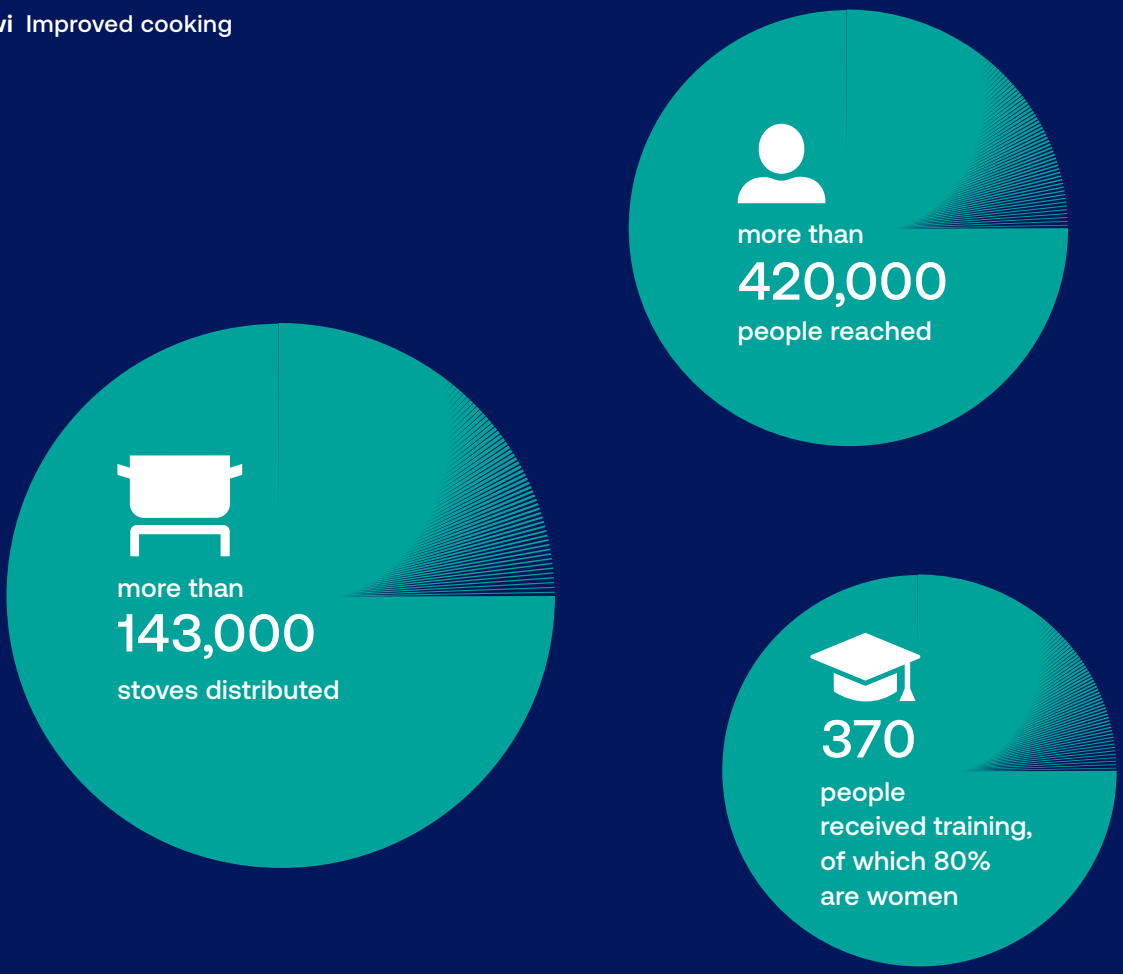


Figure: The RBF project design in Malawi



Results in a nutshell

The RBF project was launched in early 2015. After the approach was successfully integrated into Malawi's Social Cash Transfer Programme for the poorest of the poor, the first stove sales were verified and reported in June 2016. From then on, numbers grew steadily until the end of the project in 2020.

Before the RBF project, only 60 percent of rural households were aware of the Chitetezo Mbaula cookstoves. The RBF project incentivised the production and distribution of more than **143,000 stoves reaching more than 420,000 people**, and facilitated the technology's commercialisation. Through the RBF project, stoves were distributed or sold to rural households in 12 out of 28 Malawian districts. And the word has spread: a survey in 2020 found that more than 90 percent of people are now aware of the Chitetezo Mbaula, and almost as many preferred them to the three-stone fires. This impressive effect on consumer awareness was achieved because communities could see the benefits of the stoves from their friends and neighbours.

In total, **more than 370 people organized in 22 stove production** groups received training in manufacturing techniques, of which over 80 percent were women. In addition, **850 stove salespeople**, of which around 60 percent were women, were involved in distribution and continue to sell the cookstoves and meet the demand after the RBF project has ended.

It is not just people and companies that benefit from the project – using the stoves cuts firewood usage and therefore protects the climate. Over the lifetime of the stoves distributed, around 180,000 tonnes of CO_2 equivalent (CO_2e) will be avoided.

Lessons learned and ways to improve

The design and implementation of the RBF project in Malawi generated valuable lessons. For those in other projects or organisations active in the same field, these lessons provide guidance for the roll-out of future RBF projects:

1. Targeting the poor through cooperation with social protection programmes

Linking RBF incentives with social protection programmes is a powerful and fast way to reach households at the bottom of the pyramid for a truly 'leave-no-one-behind' strategy. This model offers a structured and efficient way to provide pro-poor subsidies. Verification by third parties shows that there is a sustained uptake and use of improved cooking technologies amongst recipients. Studies suggest that there is a correlation between decreased respiratory problems and fewer miscarriages, which are life-changing for the poorest 10 percent of society. When working with government programmes, you should anticipate the need for TA support to the programme and the need to adjust to changes in procedures of social protection.

› It is advisable to cooperate not only with the national social protection programme offices, but also to work closely with decentralised government structures when it comes to the distribution of vouchers and awareness raising on the ground. Ownership of this stage by the local government structures is an important success factor. changing the structure, if necessary, has been a success factor. Following the inclusion of distributors and manufacturers in the project, annual incentivised sales grew by 90% between 2017 and 2019. By the end of the project, distributors and manufacturers contributed 80% of the total project target achievement in terms of sales.

2. Limits of market development in ultra-poor contexts

By adopting a social approach and creating a demand for the cookstoves, actors along the value chain were incentivised to increase the supply and quality of the products, which generated professionalism. Greater demand also means greater awareness of the products' benefits among consumers through word-of-mouth and decentralised sales points, which spills-over into commercial sales figures. The most vulnerable thus become trailblazers for a new technology and allow other members of the community, who are in the position to purchase the stoves, to gain direct experience of the cookstoves. By building on the pro-poor approach, the project was thus able to also build a commercial market for improved cookstoves. However, commercialisation and market development have their limits in a socio-economic context like Malawi. Although the market price of the stove is comparably low, the ability to pay remains lower. Such difficult market conditions demand smart and sustainable private sector initiatives, but also alternatives to market-based approaches that follow the 'leave-no-one-behind' rationale.

› The degree to which commercial sales in such a socio-economic environment can be achieved depends – amongst other aspects – on the commitment of the sales agents in the districts. Sub-contracting to local stove distributers should be encouraged, since they have a vested interest in a steady supply and in the beneficiaries beyond the social protection programmes of the government. This ensures supply, enables the advantages of the product to gradually unfold and makes it more likely that commercial sales can be realized in the mid- to long-term.

3. Friction between project's verification requirements and businesses' cashflow requirements

To ensure actual RBF incentive payments are realised, RBF projects place a high value on sound data management and rigid verification systems. However, the submission of data through claim documents, verification of the claimed results by phone or in the field, and payment of incentives takes its time. This process has to be structured and planned well to avoid hick-ups in the process, potentially resulting in cashflow challenges on company side which hampers the continuation of the project and further business development.

› RBF incentives should be designed to motivate business growth for organizations at different levels. It is advisable to categorize beneficiaries by organizational capacity and design different RBF incentives and approaches for each category type. For example, smaller players could operate in the "easier" markets, while larger players are incentivized to target more remote, less attractive and potentially high investment markets.

› It is advisable to consider paying an upfront grant to smaller players facing challenges with access to finance to ensure that specific milestones can be achieved before the verification process triggers the release of the first incentive. To ensure sustainability and avoid dependence, initial incentive rates can be higher and be reduced proportionately over time.

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Pump up the volume

Results-based Financing Facility project closing story

Building the market for off-grid solar appliances in East Africa and Bangladesh

"What's the biggest challenge facing most Tanzanians?" asks Marianne Walpert. Talking on a Zoom call from her home in Dar es Salaam, her words brim with focus and determination. "It's poverty," she says. That's why Simusolar, the solar enterprise she co-founded, aims to increase the productivity of rural entrepreneurs across Tanzania. "The buzzword is 'productive use'," explains Marianne. In a country where 65 percent of the population works in agriculture, Simusolar wants to support farmers and fishermen by manufacturing and distributing income-generating modern energy products.

After selling solar lamps to fishermen on Lake Victoria for several years, in 2017, the company wanted to expand its product range. The majority of smallholder farmers in Tanzania rely on increasingly erratic rainfall or expensive fuel-powered pumps to irrigate their crops. So Simusolar researched the market and decided to start producing solar water pumps (SWPs). Once the customer pays off their pump, the equipment is cost-free to operate – they only need to pay for any repairs. What's more, the need for irrigation is at its greatest outside the rainy season when solar radiation is at its highest – that's when SWPs really come into their own.

The problem for Marianne was that the market for SWPs in Tanzania was – and is – very much in its infancy; many smallholders are not even aware that SWPs exist. So it didn't make business sense for Simusolar to produce or purchase pumps in large volumes without knowing whether there would be uptake among farmers. But distributing small quantities would mean prohibitively high prices for end-users and substantial overheads. It wasn't a goer.

Then she found out about the EnDev results-based financing (RBF) project implemented building on the Global LEAP Awards*. RBF helps businesses develop by providing performance-based incentives. Enterprises receive payments after pre-agreed results have been achieved and independently verified, instead of being given funding upfront. This shifts the focus of support towards results, and decreases the financial risk of launching new product lines.

When, in November 2019, the Global LEAP-RBF project started offering incentives for the sale of SWPs in Tanzania, Simusolar jumped at the chance to have several of its own pumps tested and approved for incentives. The company also began distributing eligible pumps from other manufacturers, splitting the incentive payments with them. By distributing a range of models, Marianne and her team wanted to see which products would be most popular on the Tanzanian market.

Things were looking up. Then in 2020 the COVID-19 pandemic started. Simusolar experienced a significant dip in sales, and essential site visits to assess farmers' needs and familiarise them with the pump technology became impossible. EnDev and its partners were quick to act. The Global LEAP-RBF

*) The Global LEAP Awards are international competitions to identify the world's best off-grid appliances, including for the solar market.

project adjusted the incentive structure, shifting the focus from disbursements tied to end-consumer sales, to disbursement of much higher incentives for product inventory. This adjustment recognised that distributors had working capital tied up in inventory sitting in their local warehouses, which they were unable to sell due to restrictions in movement. It ensured access to solar technologies in the medium term, and helped Simusolar stay on its feet. This support offered to companies participating in the RBF project prepares the ground for an immediate uptake of sales once the restriction due to the pandemic are lifted. “I’m so grateful to EnDev and Global LEAP for how they dealt with the situation,” exclaims Marianne. “It really helped us through a difficult time.”

Quantity and quality

Of course, Simusolar was not the only company to participate in the project. From 2016 to 2020, incentives were disbursed to 65 solar manufacturers and distributors across Bangladesh and East Africa. With other EnDev RBF projects primarily focusing on access to electricity or cooking energy, this RBF project took a special route focussing on solar-powered, off-grid, energy-efficient appliances such as fans, fridges, TVs, electric pressure cookers – and solar water pumps. Improving energy services is not only about access to energy, but also about making the best use of the energy available. After all, people aren’t interested in generating electricity for its own sake, they are interested in the goods and services that electricity makes possible. goods and services that electricity makes possible.

The project didn’t want to take a scattergun approach to the appliances that were eligible for incentives. It aimed to create a thriving marketplace for SWPs and other quality solar devices for productive uses of energy as well as household appliances. Only products being awarded as winners and finalists from the Global LEAP Awards were eligible in the Global LEAP RBF project. The Global LEAP Awards are international competitions to identify the world’s best off-grid appliances, including for the solar market. The project therefore explicitly encouraged suppliers to source high-quality verified products that were suitable for their market contexts.

Solar distributors based in Bangladesh and East Africa chose products outlined in the Global LEAP Awards Buyers’ Guides. An underlying consideration for winner and finalist appliances is energy-efficiency, as this is particularly important to users in off-grid settings: smaller solar systems often struggle to power several energy-guzzling devices at once. Overall, this focus on quality and efficiency boosts the confidence of suppliers, distributors and end-users in a fledging market.

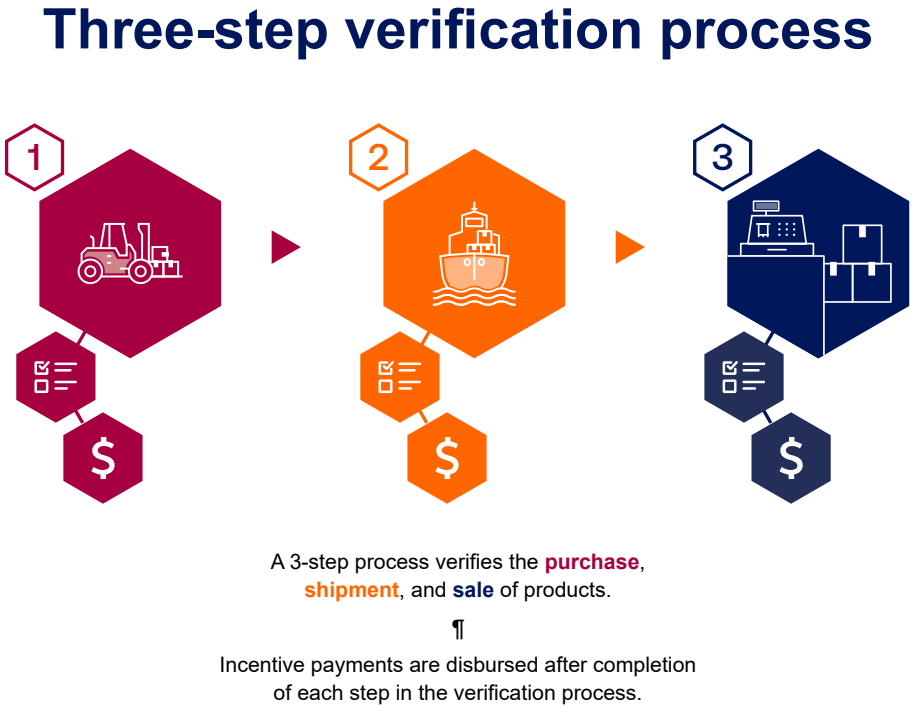
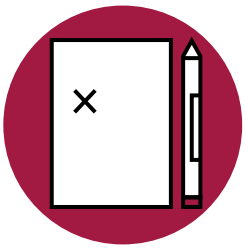


Figure: Three-step verification process

Results in a nutshell

The project started in 2015. While only a slow sale uptake was observed in the pilot round of the project focusing on Bangladesh, a steep growth of sales was observed in 2018, after the project opened the first call for proposals in late 2017 for companies to promote off-grid TVs and fans operating also in Kenya, Rwanda, Tanzania, and Uganda. Since then, numbers grew steadily and the product range eligible for the RBF was extended in 2019 to refrigerators, solar water pumps and electric pressure cookers.

During the project, **45 enterprises** were newly created or existing companies supported with the aim of financing, manufacturing, retailing, distributing and installing solar appliances. **More than 270,000 life-changing appliances were distributed in total.** These **boosted the livelihoods of nearly 1.2 million people** and more than 4,500 micro, small and medium-sized enterprises by enhancing energy access, reducing the cost of electricity, and, thanks to the efficiency of the devices, enabling the use of multiple appliances within tight energy budgets. The programme was also often successful in reaching end-users that were underserved by the solar energy market. For instance, 67% of farmers who purchased the solar water pumps promoted through the project said they didn't have easy access to alternative products.



Lessons learned

The design and implementation of the Global LEAP-RBF generated valuable lessons. For those in other projects or organisations active in the same field, these lessons provide guidance for the roll-out of future RBF projects:

1. Understand the market

You must get acquainted with the characteristics of the market where you're applying the RBF project. While the East African off-grid solar market is ahead of other African markets, it is still quite small and dominated by a few strong players. The Bangladesh market, on the other hand, has a more spread-out distribution network led by a few principal manufacturing companies partnering with multiple distributors across the country. It's also important to look at other factors such as tax and trade policy, regulations for solar devices, and government subsidy programs

› Consider all aspects of country- and stakeholder-specific context when designing the RBF in order to ensure an impactful and meaningful project delivery.

2. Be flexible

The off-grid appliance sector is still nascent and highly vulnerable to adverse impacts from market externalities. The occurrence of the COVID-19 pandemic in 2020 is one such example. Lockdown and curfew measures put in place by governments for the safety of their citizens caused disruption to last-mile distributors supported by the RBF and in general. Companies faced interruptions in their supply chains, reduced sales and repayment challenges. Both businesses and consumers were forced to re-prioritise.

› Markets can develop rapidly, so it's important to ensure that the RBF project can be flexibly adapted, if necessary, to respond to business needs without compromising the objective of the project.

2. Choose a reliable partner for verification and gaining market and customer intelligence

Hire a professional and experienced service provider to support the verification process and collect additional data on appliance usage patterns by consumers, their preferences, concerns and expectations. This provides crucial feedback not only for the project management but also for participating companies who better understand their clients and can shape business operations to deliver on consumer needs. In this project for example, about a third of farmers purchasing SWPs reported difficulties in operating the devices, so it's important for manufacturers to invest in customer education.

› The choice of a professional and reliable provider for monitoring and evaluation is critical not only for the verification process but also in gathering market intelligence.

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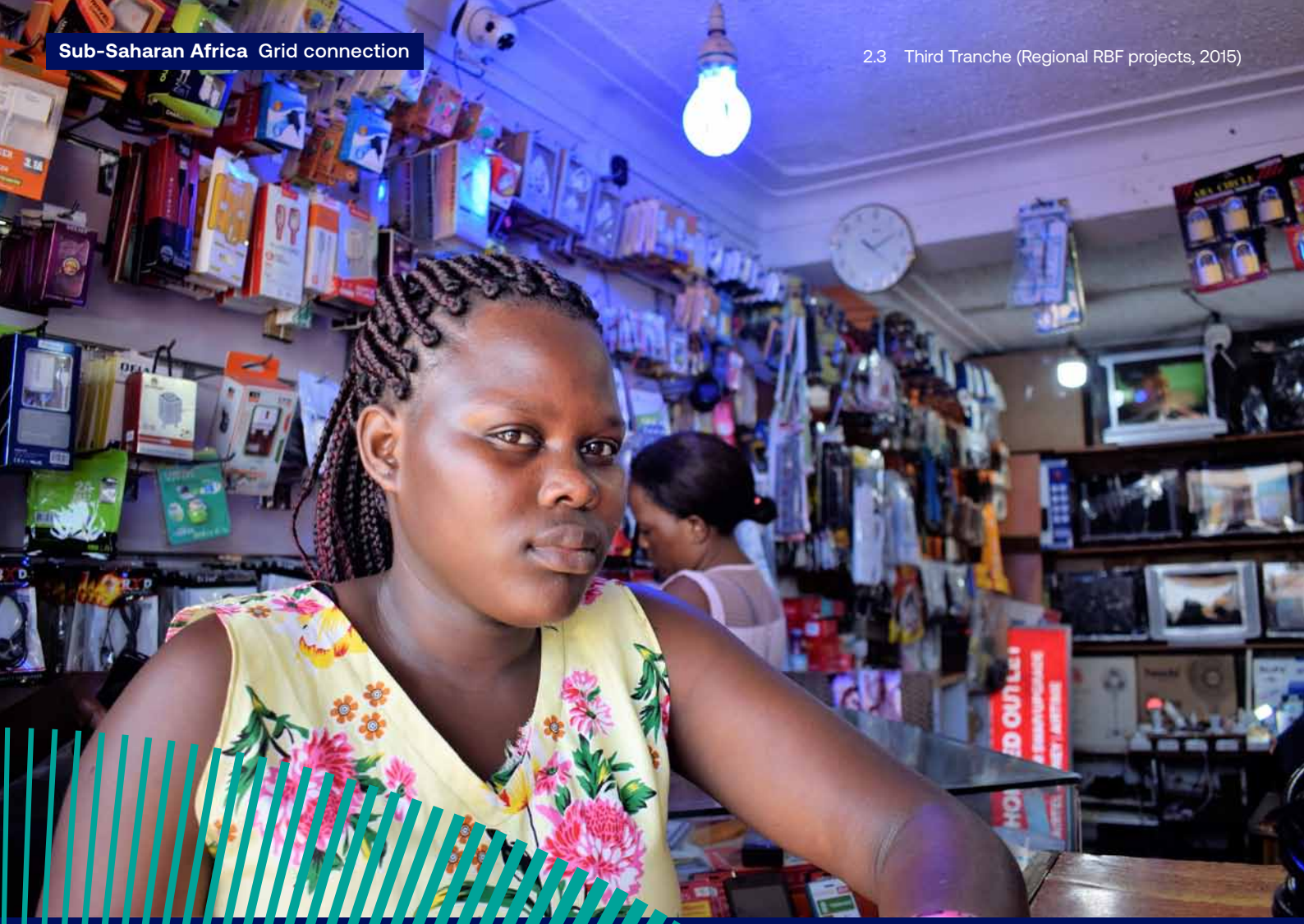


Three countries – one goal

Results-based Financing Facility project closing story

How the RBF model helps to connect households to the grid in Uganda, Rwanda and Mozambique

In Uganda, more than two thirds of the population are not connected to the national grid. Many of them rely on candlelight or use expensive diesel generators to keep their businesses afloat; the emissions from generators are harmful to both people and the climate. Access to electricity avoids this, while also allowing economies and regions to develop. Great strides have been made in electricity generation and transmission infrastructure, and the Government of Uganda has set an ambitious goal to connect 60 percent of all household to the national grid by 2027. However, with a fast-growing population, this goal was proving hard to reach. Innovative solutions were needed. One such plan was provided by the governmental Rural Electrification Agency (REA) and EnDev. Together, the partners selected three companies to connect poor households and small businesses in remote areas to the national grid. As part of EnDev's results-based financing (RBF) project, the companies that connected the end-users received an incentive for every connection made. RBF helps companies develop by providing performance-based incentives. These incentives are disbursed after pre-agreed results have been achieved and independently verified, instead of being given funding upfront. This shifts the focus of support towards results and made the involvement of companies viable. The REA managed and paid out the incentives only after connections had been verified by an independent third party. EnDev covered three quarters of the full incentives, while the remaining quarter came from the Government of Uganda.

For the customers, connections were free of charge, which increased demand. Within two years, almost 10,000 households – or 48,800 people living in these households – were connected to the grid, finally bringing light into homes and helping businesses thrive, and thus contributing to socio-economic development in the regions. Although end-users didn't have to pay to be connected to the grid, internal house wiring and appliances came at a cost. The RBF project therefore offered pre-wired 'ready boards' to 2,500 poor households. A ready board is a piece of board with a breaker, a bulb, switch and socket that has been designed for premises that cannot be wired due to to lack of sold walls/building material and is used as a cost-efficient way to enable basic electrical access. The boards include energy-efficient light bulbs, allowing customers to light their homes as soon as they join the grid.

Spreading the word: from Uganda to Rwanda and Mozambique

EnDev didn't only implement the RBF project in Uganda, but also in Rwanda and Mozambique. The Government of Rwanda intends to electrify the entire country by the end of 2024, which involves connecting over half of the population to the national grid. Together with the Rwandan government and national utility, EnDev facilitated grid connections for almost 15,000 households in remote areas – meaning that an extra 74,000 people now benefit from improved access to electricity. To reach the poorest households in the country, EnDev used the so-called Ubudehe categories: based on factors such as income, employment, profession and land ownership, local governments assign households to socio-economic groups. These categories are used to identify and support poor households with interventions, such as paid health insurance, cash transfers, or as a tool for the implementation of social protection programmes and the targeting of beneficiaries. For the RBF project, EnDev selected households in the three lowest Ubudehe categories. The poorest households in Ubudehe category 1 had their connection fees and internal wiring fully subsidised and were prioritised for ready board installation. Beneficiaries from Ubudehe categories 2 and 3 had to pay a quarter of the connection fees themselves.

In Mozambique, EnDev supported the national state-owned electricity company EdM to connect 13,500 poor households in rural and urban areas to the national grid. In total, 70,200 people gained improved access to electricity. To qualify, potential beneficiaries had to have lived in an already electrified area for at least a year. The state-owned electricity company visited the households and evaluated the conditions to ensure that only poor families benefitted from the project. Ready boards and LED lamps were assigned in cases where households could not be wired. Subsidised by EnDev, families only paid a minimal amount of the high up-front costs for their connection. Following the pro-poor approach, customers were able to pay their share in instalments.

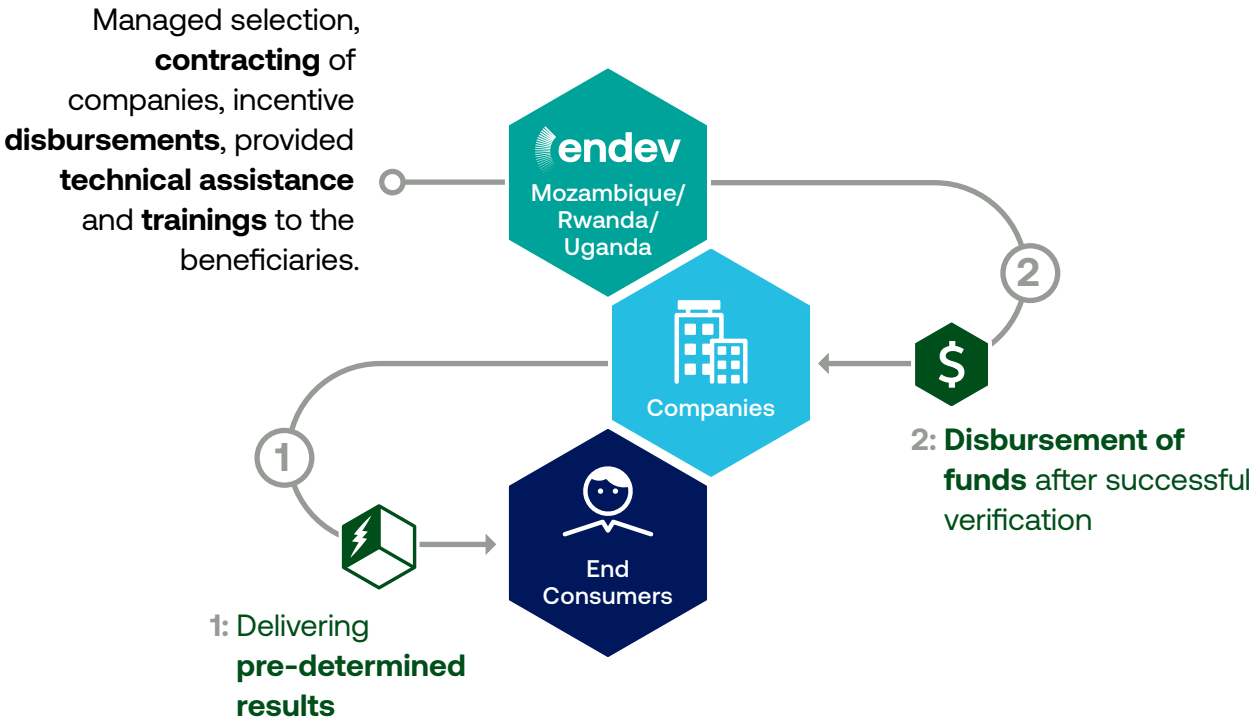
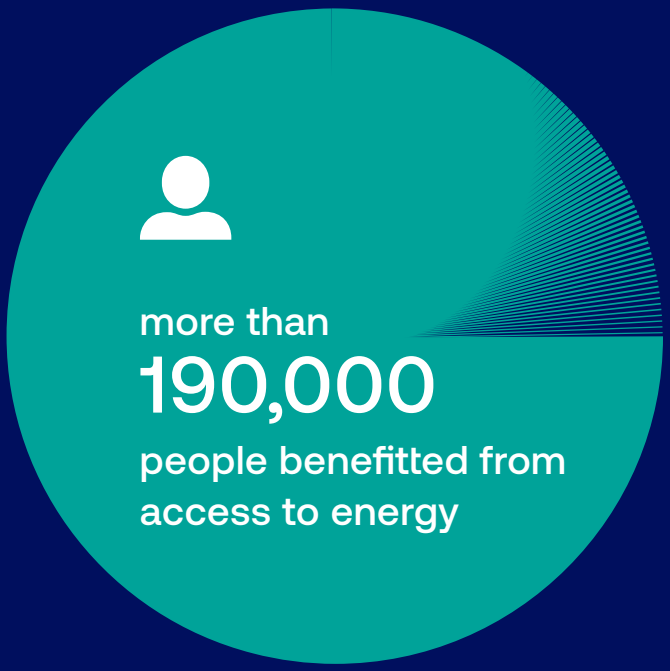
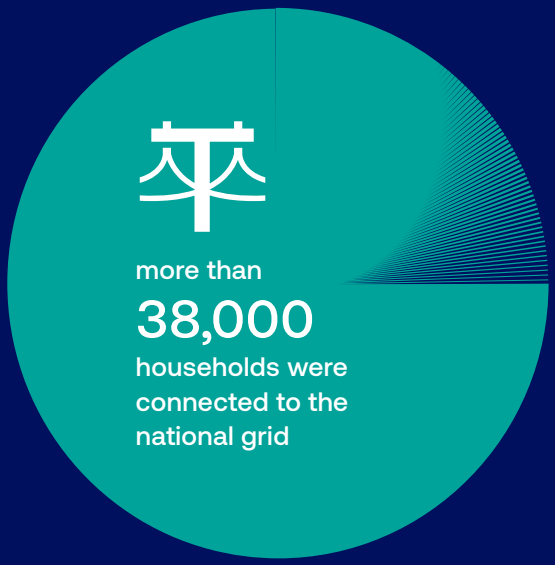


Figure: The RBF project design in Mozambique, Rwanda and Uganda

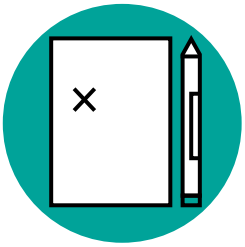




Results in a nutshell

The project started in early 2015. Due to an intensive inception and preparation phase, no connections were reported in the first three years of the project. However, the number of connections rose sharply from December 2018 onwards, when Mozambique successfully verified and reported its connections; this was followed by Uganda and Rwanda one year later.

Between 2018 and 2020, **more than 38,000 households were connected to the national grid** in Uganda, Rwanda and Mozambique. While this **benefitted over 190,000 people**, it also had an impact on the climate: 3,300 tonnes of CO2 equivalent (CO2e) have been avoided since the project started.



Lessons learned and ways to improve

The design and implementation of the RBF project generated valuable lessons. For those in other projects or organisations active in the same field, the lessons derived from the implementation in Uganda provide guidance for the roll-out of future RBF projects:

1. Joint planning is needed to overcome pre-finance & timeline challenges

The Ugandan energy sector includes a number of service providers offering electricity to specific target groups in various markets. The RBF was initially designed to include all service providers to ensure regional inclusivity and to spread the potential risks associated with implementation. In reality, however, many of the smaller service providers were unable to fulfil the implementation criteria as they struggled to pre-finance connection materials within the project's timeline. The RBF was thus ultimately included three companies, despite broader initial interest.

› Joint planning with both the RBF fund manager as well as the participating companies ahead of time is needed to address issues such as pre-financing, verification and disbursement timelines. This can ensure that a workable compromise is reached for all parties, and may involve limited levels of pre-financing for connection materials to enable smaller service providers to participate.

2. Support needs beyond connection fees to ensure the intended benefit

The RBF project was implemented in line with the Electricity Connection Policy (ECP) established by the Government of Uganda in order to increase electricity access and provide cleaner energy for Ugandans. However, connection costs were not the only barrier for poor households – additional costs such as wiring homes and the use of inefficient appliances were also obstacles. The RBF project therefore provided ready boards and energy-efficient light bulbs to a number of customers to reduce future electricity costs.

› More focus needs to be placed on how grid connections will be used once they are provided to ensure that the intended impact is achieved. This includes thinking beyond the cost of the physical connection to the grid, to including internal house wiring, ready boards, or support for energy efficient appliances to ensure that new customers can actually afford their energy bills in the long term.

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