



**CASE STUDY**

# EnDev’s Pro-Poor Results Based Financing in Rwanda

## Country Context and Rationale for End User Subsidy

The Government of Rwanda (GoR) set itself the ambitious target of providing universal electricity access to its population of 12.3 million people by 2024<sup>1</sup>, stipulating that 48% of households should be reached with off-grid solutions. In the GoR’s revised 2019 National Electrification Plan, specific and separate areas for implementation are designated for solar home systems (SHS) and mini-grid system solutions, and strategies are to be implemented in partnership with the private sector.

Supply side interventions have significantly improved the availability of products across the country. Energising Development’s (EnDev) Results Based Financing (RBF) project helped companies overcome market barriers and expand their operations, while the World Bank-funded Renewable Energy Fund (REF) at the Development Bank of Rwanda (BRD) offers loans to households and small businesses as well as credit lines to off-grid solution providers. The EnDev RBF supports companies to deepen and strengthen their supply chains, whilst the REF has offered much needed working capital to companies. These supply side approaches were successful in helping companies overcome barriers to market entry, attracting new companies into Rwanda, and increasing sales.

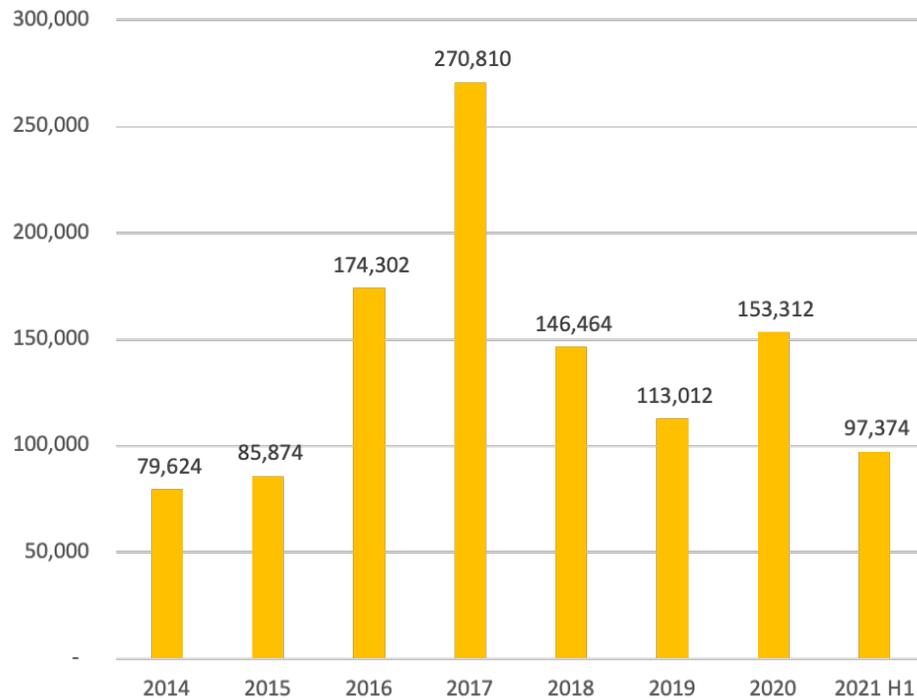
Access rates have grown rapidly over the last decade (Figure 1)<sup>2</sup>. In 2010, access was a mere 10%, while as of August 2021 access rates reached 69.5%<sup>3</sup> with almost 18% of all connections being delivered through off-grid solar solutions<sup>4</sup>. More recently sales have seen a decline<sup>5</sup>. As the market naturally shifts from higher-income urban populations to lower-income populations, this decline can be attributed primarily to affordability constraints, with 80% of the Rwandan population earning less than USD 3.20 per day<sup>6</sup>. Similarly, default rates and non-utilization for PAYG have also started to rise, as companies moved into these cash-strapped areas, households have increasingly struggled to pay regular instalments needed to keep systems unlocked and operating.



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1 2019 National Electrification Plan: GoR Energy Sector Strategic Plan 2018  
 2 Rwanda – Beyond Connections: Energy Access Diagnostic Report Based on the Multi-Tier Framework <https://esmap.org/node/170493>  
 3 Rwanda Energy Group, <https://www.reg.rw/what-we-do/access/>  
 4 <https://www.reg.rw/what-we-do/access/>  
 5 Sales data as indicated in the adjacent graph were sourced from the GOGLA/ Lighting Global Half Yearly Sales and Impact Data Reports  
 6 World Bank World Development Indicators

Figure 1. Rwanda's Off-Grid Solar Sales from 2014-2021 (H1<sup>7</sup>)



Source: GOGLA half-yearly sales data collection.

## The Pro-Poor RBF

To address this affordability constraint, EnDev piloted the Pro-Poor RBF focused on making off-grid solar products affordable for the poorest households through a market-based subsidy mechanism. The objectives of the program were multifaceted, focusing on both access and market expansion. The design targeted low-income households, leveraged existing companies and their networks, and were developed with the intention for a later scale-up. Working with several suppliers and distributors, the Pro-Poor RBF allowed qualified consumers to choose between different product offerings complying with the GoR's Ministerial Guidelines on Minimum Standards Requirements for SHS.

EnDev worked closely with the Rwanda Energy Group (REG), commissioned to manage Rwanda's energy infrastructure and liaise with private sector energy investments and Urwego Bank, a local microfinance institution. During the design phase of the Pro-Poor RBF, the Government of Rwanda and development partners were consulted to capitalise on expertise and create ownership. The pilot ended in March 2021 with participating companies selling products between January 2020 and end of February 2021.

Companies were mandated to pass on the entire subsidy to eligible households in the form of a price reduction, which ranged from

<sup>7</sup> 2021 sales data is only for the Jan – Jun 2021 period, denoted by H1. All other years represent full 12-month periods.

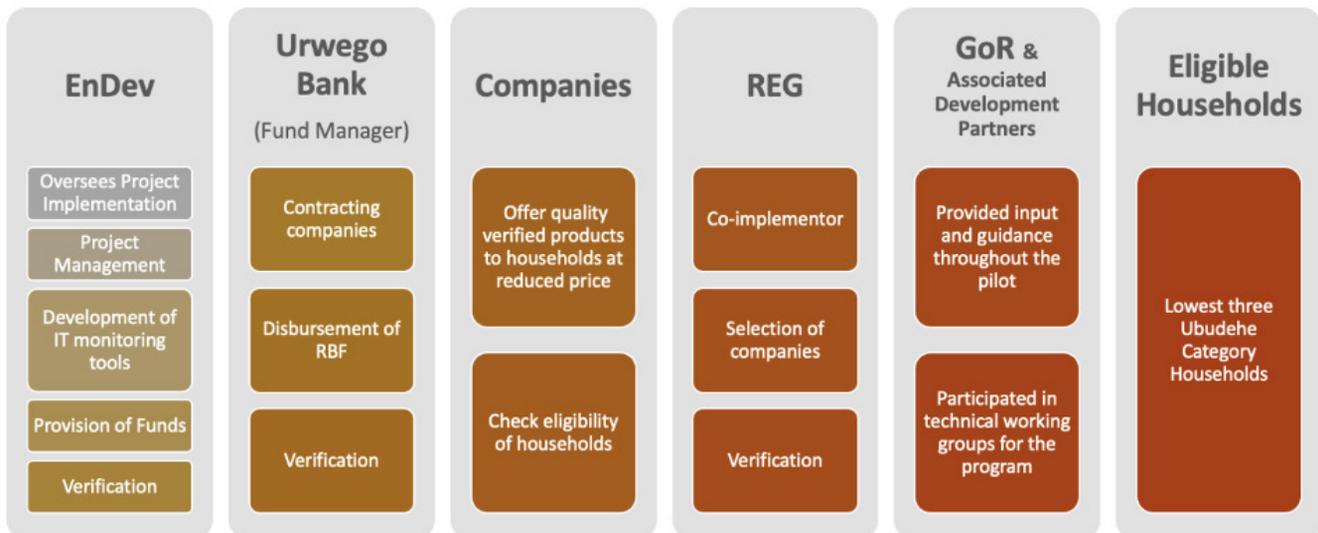
Figure 2. Pro-Poor RBF Program Process



EUR 50 to EUR 90, depending on the income-level category of the household and product selected. As the subsidy was designed as a price reduction subsidy, even the lowest income households had to contribute some proportion of the purchase price of the product, which aimed to reduce the risk of market distortion,

and create a sense ownership, encouraging maintenance of the product. The customer paid the subsidised purchase price to the company, which then received the subsidy making up the differential through Urwego Bank upon successful verification of the sale.

Figure 3. Program Stakeholder and Associated Roles



## Detailed Technical Design

To achieve the intended results and to guard against market distortion, the pilot targeted a specific segment of Rwanda’s population, with the subsidy amount calculated to closely match customer affordability.



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### Customer Eligibility

The program targeted Rwanda’s poorest population which was easily identified following the GoR’s household socio-economic categories, known as ‘Ubudehe’ categories. The categories, divided into four groups (Ubudehe 1-4, with Ubudehe 1 being the lowest), are based on factors such as income, employment, profession, and land ownership, and are assigned by local government. For the Pro-Poor RBF, EnDev targeted those Ubudehe 1-3 households that were living without access to electricity in off-grid areas within the five districts selected for the pilot.

### Private Sector Participants & Product Eligibility

The program, being channelled through the private sector, was open to all solar companies or commercially operating organizations in Rwanda that met the following criteria: the company (i) was legally registered, (ii) was in compliance with tax and social security requirements, (iii) had signed a Cooperation Agreement with REG, (iv) was in compliance with government reporting requirements, and (v) had a product end-of-life management policy. Only multi-light solar home systems that met a minimum performance criterion (including, but not limited to VeraSol Certified products already being sold in-country) were eligible.

### Calculation of Subsidy

The subsidy level was calculated considering the average PAYG price of six low-cost solar products minus the estimated end-users’ ability

to pay<sup>8</sup>. The subsidy level was determined as a percentage of the retail price, however, it was also capped at a maximum absolute subsidy level. For example, an Ubudehe 1 household buying a system that was priced at EUR 98 would receive a subsidy of EUR 85 ( $98 * 87\%$ ). If the same household bought a product priced at EUR 150, the relative subsidy level ( $EUR 150 * 87\%$ ) would exceed the absolute amount, hence the subsidy paid out would be EUR 90 (Table 1). By combining an absolute and a relative maximum subsidy amount, the program design safeguarded against the possibility of over-subsidization or of participating companies inflating the retail price:

**Table 1. Subsidy Calculation**

Ubudehe category	Absolute subsidy level	Relative subsidy level
Ubudehe 1	EUR 90	87%
Ubudehe 2	EUR 70	68%
Ubudehe 3	EUR 50	49%

### The Eligibility Tool

Companies identified qualifying customers and calculated the correct subsidy level using a web-based ‘Eligibility Tool’. The tool allowed companies to (i) check customer eligibility and applicable subsidy levels, (ii) pre-register the customer if moving forward with a sale, (iii) confirm customers and secure subsidy upon verification of contract signature and system installation, and (iv) track subsidy amounts.

<sup>8</sup> The estimated end-users’ ability to pay was based on various survey data on disposable income and energy expenditure by Ubudehe categories.

To check the eligibility of customers, the Eligibility Tool relied on data from two government databases:

- 1. LODA MEIS:** The Local Administrative Entities Development Agency (LODA), a subsidiary of the Ministry of Local Government, is tasked with providing direct support in the form of a monthly stipend to the poorest Rwandans. LODA has developed an IT system called the Monitoring and Evaluation Information System (MEIS) that is used to prepare the payroll in which payments are made to all beneficiaries. This database was used to check whether the customer met the Ubudehe eligibility criteria.
- 2. OMIS:** this is an online information system, which allows REG to track the latest developments in off-grid electrification through solar home system sales and mini-grid connections. OMIS was developed by EnDev with the financial support of Power Africa and is now managed by EDCL. This database was used to check if the customer has previously purchased a solar system or otherwise been connected to electricity.

During the eligibility check, the Eligibility Tool retrieved, through the integrated LODA MEIS database, a customer's Ubudehe category and household ID<sup>9</sup> category by using his / her national identification number. Whether the customer lived in an eligible area was determined by cross referencing the location entered by the company in the eligibility check interface with the NEP village demarcations in OMIS. Through this tailor-made tool the Pro-Poor RBF could track sales in real-time, validate data, and reduce the reporting burden for companies when it came to claiming subsidy payments.

## Verification Process

The verification process is crucial for an RBF and determines whether the subsidy is disbursed or not. The Pro-Poor verification process was

designed based on the following principles: (i) at least two separate verification steps, (ii) independence of verifiers, (iii) statistical sampling, (iv) cost efficiency, and (v) quick to perform. The resulting robust methodology consisted of four verification steps:

- 1. Claim eligibility and data validation:** Eligibility Tool registrations were cross-checked with company monthly sales reports by the implementation team.
- 2. Phone verification:** Half of the sample was selected randomly and verified via a phone call by independent verification agents (IVAs), Urwego Bank, and REG technical staff.
- 3. Field verification:** The remaining 50% of the sample was checked through in-person field verification performed by IVAs and REG technical staff. However, due to COVID-19-related movement restrictions, contract verification (see below) later replaced field verification. Under the COVID-19 verification process the whole sample underwent phone and contract verification.
- 4. Contract verification:** Contract verification was originally only done if issues arose during field verification and the results were inconclusive. For these exceptional cases, the program would request companies to send scanned copies of the contract signed between the customer and company.

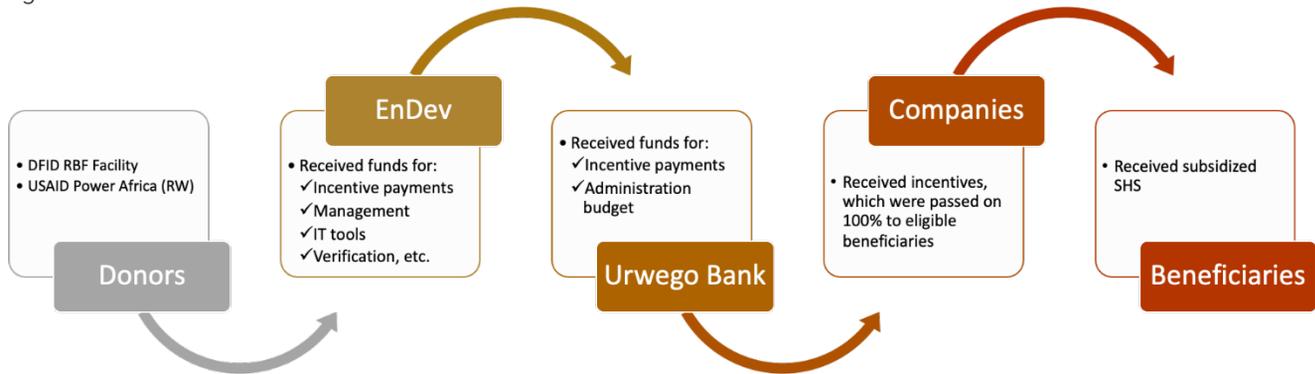
## Flow of Funds

The funds were first disbursed from the supporting donors<sup>10</sup> to EnDev, at which point the money was transferred to Urwego Bank, and subsequently passed on to the companies, who could then commence with sales to household beneficiaries (see Figure 4).

<sup>9</sup> In Rwanda, every household has a unique identification number. Each household member with his / her individual national ID is assigned to this household ID. The Ubudehe classification is applied to each household.

<sup>10</sup> DFID RBF Facility and USAID Power Africa (RW)

Figure 4. Flow of Funds



## Impact to date

In total, six companies participated in the pilot (Figure 5), ensuring competition in the market and allowing for consumer choice. The Pro-Poor RBF has extended access to more than 22,000 low-income households, of which 71% were classified

in Ubudehe 1, the lowest poverty category. For PAYG companies, the utilization rate increased, and default rates decreased, pointing to overall healthier customer portfolios.

Figure 5. Participating Companies in the Pro-Poor RBF



## From Pilot to Scale

Based on the success of the EnDev pilot, the GoR opted to expand the Renewable Energy Fund (REF) with World Bank support and allocate USD 15 million to capitalize a new, fifth window that provides Pro-Poor RBF subsidies to address household affordability. The REF has scaled up the Pro-Poor RBF pilot with some adaptations to a nationwide program, now covering 30 districts. An additional USD 15 million was subsequently

allocated under the World Bank-funded Energy Access and Quality Improvement Project, approved in September 2020. By October 2021, more than 28,000 connections had been achieved since the launch of the new window in February 2021. It is anticipated that under the REF Window, 5.2 million household connections will be made.

## Lessons learned

Over the course of implementation of the EnDev Pro-Poor RBF, a series of learnings ensued, many of which can inform programs in other markets. Some of these lessons are noted below.

### Program Implementation

Garnering the support of local authorities makes program implementation much smoother. By clearly defining the role of local government and formalizing cooperation agreements, potential bottlenecks can be greatly reduced.

### Determining Subsidy Levels

Before defining the subsidy levels, product eligibility and ability to pay needs to be determined. If only products below a certain price point are eligible, a relative subsidy amount can be applied. But if all products meeting minimum quality standards are eligible, and are not limited by a maximum price, a combination of relative and absolute subsidy levels should be applied to avoid over-subsidization whilst promoting consumer choice. Local market conditions, dynamics, and customer behavior should all be factored in during the design stage, as well as during implementation. The subsidy amount can be adjusted over time (dynamic subsidy), e.g. starting with a higher amount and tapering off to stimulate market development, or start off low and gradually increase as the market serves increasingly lower income households.

### Eligibility criteria and market development

Key factors for strong market development:

- 1. Diverse group of participating companies:**  
An effective policy design allows broad company participation. To do this, it is

important to avoid overly bureaucratic eligibility criteria which tend to create barriers for small/local companies that do not have the capacity or finances to participate in the face of these hurdles. Keeping the end-to-end participation process flexible and adaptable ensures openness to business model diversity and innovation.

- 2. Ensuring product quality and keeping down costs:** Limiting eligible products to those that meet minimum standards improves product quality and customer perception. Staging customer awareness raising campaigns throughout the targeted region can greatly improve program reach and acceptance. To reduce overall transaction costs, companies should be used as intermediaries to deliver these campaigns.

### Digitization

Digitizing eligibility checks and claims leads to efficient program management for both companies and administrators. With greater complexity (i.e. an increasing number of target groups), the need for digitalization increases to be able to ensure process quality, effective monitoring and fast processing. When planning and designing digital tools, however, it is important to consider the following factors:

1. Local and company level data protection regulations and policies,
2. Compatibility with devices used by company agents,
3. Network coverage and network reliability, and
4. Available local capacity for trouble shooting and improvements.

## Verifying Results

To reduce the time and money spent at the time of verification, it is important to plan with a thorough understanding of the capacities and limitation of time, budget, and resources. This can be done by using multiple verification methods as well as independent verifiers to balance reliability and cost efficiency. For example, a combination of site visits and phone calls selected at random can support the robustness of the verification process, while keeping costs lower.

## Disbursing Funds

It is essential to consider the impact of different disbursement models on price, company, and customer behavior. Single upfront payment can help to reduce the cost of capital and end-user prices; however, multiple payments or monthly

top-ups may ensure better long-term service. The latter, however, will require a level of capacity to manage a larger number of payments without resulting in undue delays. If designing in multi-tranche disbursement, make sure there are adequate contractual means to manage final verifications and payments.

## Fund Management

Often, using a fund manager can reduce bureaucratic hurdles for contracting and disbursements. However, to avoid operational impediments, it is important that the role of the fund manager is expressed with clarity and specificity, that appropriate training and support is provided, and that adequate incentive is provisioned.

## Beyond the Pro-Poor RBF, Lessons Learned Mainstreaming the Pilot under REF

The transition from pilot to mainstreaming under REF had both successes and challenges. Close collaboration between EnDev, the GoR, and the World Bank was paramount in enabling a smooth transition, facilitating open sharing of lessons learnt, and to fully leveraging systems built and materials developed. The well-established Eligibility Tool provided a strong foundation for the transition. Entities performing verification, as well as participating companies, were the same under the pilot as under REF, supporting a positive and efficient transition. The biggest challenge encountered was the change in

disbursement structure. The program began with a single disbursement, then moved to staggered disbursements to incentivize after sales services beyond the initial sale. Processes had to be adjusted to the new disbursement schedule, resulting in growing pains. A key takeaway from this experience is to try to keep changes between pilot and scale up as small as possible and to design systems and processes that can also support the scale-up phase. This ensures tested structures and systems built can be fully leveraged.