

EnDev Rwanda



Countries	Rwanda
Technology	solar, hydro, stoves, grid
Project period	05/2006 - 12/2024
Volume	EUR 27,432,097
Partners	Ministry of Infrastructure (MININFRA), Rwanda Energy Group (REG), private sector
Objective	Transforming markets to provide access to affordable, reliable, sustainable, and modern energy as a means to deliver social, economic, and environmental change
Achievements until 12/2020	<ul style="list-style-type: none"> • PSP Hydro: Four hydro power plants providing electricity to 45,000 people • Solar Lighting RBF: more than 630,000 people having gained access to energy through solar lighting products • Mini-Grid RBF: 25 mini-grids providing electricity to 10,000 people • Grid densification: 14,800 poor households connected

Background

EnDev has worked in Rwanda since 2006 with the private sector to promote electrification, biogas and modern cooking solutions. EnDev works with the private sector to facilitate the development of micro hydro power (MHPP) plants, has implemented two results-based financing (RBF) projects for decentralised energy solutions and, more recently, has launched “Reducing climate impact of cooking in Rwanda through improved cooking energy systems” (ReCIC). In addition, it supports several authorities in the country in establishing a suitable regulatory energy framework. Until 2011, EnDev Rwanda was also active in the biogas sector.

Rwanda has made considerable progress in its electrification targets, with electricity access increasing from 19% in 2014¹ to 56% in 202, of which 41% are on-grid connections and 15% are off-grid connections². Currently, the total installed capacity in Rwanda is 238 MW³, up from 126 MW in 2014.

The Government of Rwanda (GoR), has taken a number of strategic and policy reforms in the energy sector, aiming to achieve universal access until 2024, with 48% receiving access through off-grid technologies and 52% through the grid. The private sector plays a key role in achieving these targets, which has been formally recognised by the Government of Rwanda in the Rural Electrification Strategy. The off-grid market today is increasingly served by Solar Home Systems (SHS) companies, and there are about a dozen privately owned mini-grids in Rwanda. Rwanda Energy Group (REG) is responsible for the transmission, distribution, and supply of electricity to customers connected to the national grid. As of today, there are 17 independent power producers (IPPs) in Rwanda, which constitute 48% of the national generation capacity, while REG

¹ MININFRA, SE4ALL Rwanda Assessment and Gap Analysis, November 2014
² MININFRA, Energy Sector Performance Report, Backward Looking Joint Energy Sector Review Report 2019-2020, October 2020

³ <https://www.reg.rw/what-we-do/generation/>

manages the remaining 52%.⁴

In the cooking sector, the GoR, through its Biomass Energy Strategy (BEST) seeks to reduce the share of households using inefficient cooking solutions from 83.3% (2014) to 42% by 2024. To date, nearly 70% of the population in Rwanda continues to use three-stones and traditional stoves for cooking and that 95% of households depend on firewood (82%) or charcoal (13%) as main sources of energy for cooking.⁵

Project Approach

Energising Development (EnDev) began working in Rwanda in 2006 with an approach that focused on the private energy sector and has maintained this focus throughout the project. At the same time, EnDev Rwanda works at the policy level by supporting efforts by the Ministry of Infrastructure (MININFRA), REG, Rwanda Utilities Regulatory Authority (RURA) and stakeholders to develop a sustainable energy strategy and establish a suitable legal framework for promoting renewable energy.

EnDev initially supported the biogas and micro-hydro power sector. EnDev has supported the National Domestic Biogas Programme (NDBP) during its first phase (2007-2011). Since 2012, the NDBP is run by the Energy Development Corporation (EDCL), a subsidiary of REG, without further EnDev support. Since 2006, EnDev has implemented the project “Private Sector Participation in Micro-hydro Power Supply for Rural Development” (PSP Hydro). Through a Public-Private Partnership (PPP) approach it has enabled small and medium-sized businesses to install and operate micro hydropower plants (MHPP). EnDev provides technical, business management and financial support; the latter as viability gap funding to private MHPP developers.

In 2014, EnDev Rwanda also started to provide support to private solar companies and mini-grid developers through DFID-funded results-based financing. The key objective of the two RBF programmes was to boost energy access markets through private sector-led development. Participating companies were able to receive financial incentives upon delivering results, i.e., new sales / connections, which were monitored and verified. The fund was managed by a local micro-finance institution, Urwego Bank. Given the success of the solar RBF, EnDev launched a second iteration of its programme, the Pro Poor RBF, from 2019-2021, to address the widening affordability gap. EnDev has also developed a national off-grid monitoring database, in partnership with Power Africa, which will be managed by EDCL.

Through RBF-Grid densification challenge fund, EnDev supported REG in connecting 14,800 households to the power grid, including the ones belonging to the poorest population category, known as “ubudehe 1”.

In 2019-2020, SNV implemented EnDev’s **cooking activities in Rwanda**, which supported local workshops, and which produced and disseminated approximately 20,000 ICS in

2020. EnDev also signed a co-financing agreement with the EU to expand activities in the cooking sector until October 2025. Through EU’s support, EnDev Rwanda launched a new cooking intervention to contribute towards the achievement of the BEST strategy by 2024. This project is called “Reducing climate impact of cooking in Rwanda through improved cooking energy systems” (ReCIC) and it seeks to implement a market-based approach to overcome barriers on the supply and demand side of the ICS markets as well as the enabling environment in the biomass sector.

Outcomes and Impact



Producers storing liners at Geni Green Solutions head office in Kigali

Through the PSP Hydro project, the first privately-owned micro hydropower plant in Rwanda was connected to the national grid (96 kW) in 2010, followed by two plants in 2012 and 2013 (with respective capacities of 500 kW and 438 kW), providing electricity to around 17,000 people. In 2020, the project supported an additional 1,840 kW to the national grid, connecting 28,000 people. The remaining three projects are expected to be commissioned in 2022. The programme not only spearheaded private IPP’s but encouraged joint ventures between local companies and foreign investors, as well as Rwandan banks to lend to private energy projects. Through the advice and guidance of EnDev, in 2015 existing off- and on-grid small hydropower plants owned by the GoR were leased to private investors for 25 years. PPA’s were signed and these plants were upgraded and connected to the grid (for the ones that were not).

The promotion of off-grid solar lighting through the RBF has resulted in more than 630,000 people having gained access to modern lighting energy through the sale of 175,000 solar lighting products. The solar lighting RBF programme successfully spurred sector development, with a now vibrant sector, with multiple players, contributing to the majority of off-grid access in Rwanda. The Pro Poor RBF also served as a proof-of-concept for a wider government program; in early 2020, the Government of Rwanda and the World Bank decided to upscale the Pro Poor RBF to a USD 30 million nationwide initiative.

EnDev has supported four companies in building one hydro mini-grid (11kW), two solar AC mini-grids (50kW and 120kW) and 22 nano-grids (1kW each), providing access to

⁴ RURA, Annual Report 2017-2018

⁵ National Institute of Statistics of Rwanda (NISR), Ministry of Finance and Economic Planning (MINECOFIN) [Rwanda], 2012. Rwanda Fourth Population and Housing Census.

10,000 people. EnDev is also supporting the development of productive uses at six mini-grid sites in Rwanda.

Lessons Learnt & Outlook



Azela Mugeneyimana, living in Ruhango district, was able to buy a solar system from Bboxx with the support of EnDev

EnDev Rwanda published a report outlining the lessons learnt from more than eight years of promoting private sector participation in micro-hydropower development. One critical lesson is the importance of ownership: “An owner of the plant who acquired commercial debt to finance it has excellent reasons to maintain and operate it well. Indeed, the private

plants have far better performance statistics in terms of plant availability and plant utilisation factor than comparable-sized public plants.” In addition, the project demonstrated the value in joint ventures between domestic and international companies, which combined the experience and technical know-how of international companies with the ability of local companies to navigate local institutions and market conditions.

The RBF programmes faced early challenges in a lack of conducive enabling and regulatory environment. Companies also faced access to finance challenges in obtaining financing. In the context of a nascent market – such as was the case in Rwanda at the launch of the programme – an RBF needs to be complemented by additional action to prepare the policy and regulatory framework, tackle the lack of pre-financing options and strengthen the capacities of the private sector. By 2020, EnDev has contributed to a sector that has reached some development, with an increasingly sound policy, regulatory and planning framework, increased private sector participation, increased provision of technical assistance and increased financing available for solar lighting companies and mini-grid developers.

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