



Republic of Botswana

PROJECT PROPOSAL:

Botswana Off Grid Project

MINISTRY OF MINERALS AND ENERGY

MAY 2025

Table of Contents

Botswana Off Grid Project:

- A. Small Scale Mini-Grid Solar PV Plants
- B. Rooftop Solar

A. PROJECT NAME: SMALL SCALE MINI-GRID SOLAR PV PLANTS

1. Synopsis of the project:

Botswana is in the process of launching a pilot-scale off-grid solution for six (6) villages under the Rural Electrification Programme. The objective is to explore and determine the necessary requirements to continuously supply electricity to these villages off-grid. This includes the development of a tariff structure and a comprehensive policy framework for off-grid and mini-grid solutions.

2. Project background and justification:

This project aims to assess the benefits of off-grid solar PV solutions in relation to project capital costs and tariff structures, compared to the costs associated with connecting these villages to the national grid. Each village is situated over 100 km from the existing grid infrastructure.

Botswana's electricity access currently stands at 83% while connectivity is at 76%. There is approximately 44 Villages with a combined total population of at least 60,000 households that requires connectivity.

Six (6) villages have been selected to pilot four (4) off-grid solar PV plants. The villages include Ukhwi, Zutshwa, Qangwa, Xaxa, Bere, and Kacgae. Ukhwi and Zutshwa will each have independent plants, while Bere and Kacgae will share a common plant due to their proximity. Similarly, Qangwa and Xaxa—located approximately 20 km apart—will also share one plant.

3. Financial Estimate:

The project is estimated at **BWP3 billion (US\$300 million)** based on mini-grid solutions and electrical reticulation.

4. Project Timelines:

The pilot project is scheduled for completion by March 2026.

The overall project is scheduled to be completed by 2030

5. Economic and Social Analysis:

a. Off grid stability

By operating independently from the national grid, these villages will benefit from a stable and dedicated electricity supply.

b. Reduced Electricity Tariffs

Off-grid consumers are expected to benefit from reduced tariffs, owing to lower maintenance costs and the generally cost-effective nature of solar power generation.

c. Improved safety and eased lifestyle

The initiative is expected to enhance the quality of life and stimulate local economic activity. Citizens will have the opportunity to start small businesses, thereby increasing household income and contributing to community development.

B. ROOF TOP SOLAR

1. Synopsis of the project:

The Government is actively implementing a renewable energy initiative aimed at empowering citizens through opportunities for self-generation of electricity. This initiative encourages individuals, households, and businesses to produce their own renewable energy, primarily via solar installations, and allows for the sale of surplus electricity back to the national grid. This approach fosters local economic growth and promotes environmentally responsible energy practices.

In addition, home solar systems that offer a hybrid to mini-grid solution have been considered.

The initiative specifically targets vulnerable groups, including low-income households, pensioners, and individuals reliant on social grants, to reduce their energy costs and ensure equitable access to electricity.

2. Project background and justification:

The Rooftop Solar (RTS) Guidelines were introduced in April 2020 to support electricity generation from small-scale solar PV systems by end-users. These guidelines enable consumers to both self-supply and sell limited surplus electricity to BPC.

This strategic initiative supports the enhancement of the national grid by incorporating clean, renewable solar energy. The justification includes strengthening energy security, reducing electricity costs, promoting environmental sustainability, and improving socio-economic conditions.

Furthermore, a pilot was conducted on a sample of selected households to assess the merits of off-grid roof top energy solutions, and the results confirmed the adequacy of the approach in meeting basic energy needs.

This demonstrated viability has reinforced the justification for wider rollout, particularly in areas where the cost of grid extension is prohibitively high. The project aligns with national development goals focused on poverty reduction, social equity, and energy sector diversification. The wider rollout is targeting at least 50,000 households.

A committee led by the Ministry of Minerals and Energy (MME), comprising representatives from the Department of Energy (DoE), Botswana Energy Regulatory Authority (BERA), and BPC as the secretariat, has been established to review the 2020 RTS Guidelines. The aim is to enhance the contribution of customer-generated renewable energy based on insights gained from the program's initial phase.

3. Financial Estimate:

The capital cost targeting 50,000 households is estimated at **BWP500 million (US\$50 million)**.

4. Project Timelines:

The target completion date is at end of 2030.

5. Economic and Social Analysis:

a. Economic Benefits:

(i) Cost Savings for Consumers

- **Reduced Energy Bills:** By generating electricity from solar energy, households and businesses can substantially lower their monthly electricity costs. Reduced grid dependence provides financial relief,

allowing funds to be redirected to priorities such as education, healthcare, and entrepreneurship.

- **Incentives for Excess Energy Supply:** Consumers can sell surplus electricity to the national grid via net metering or similar mechanisms, offering an additional income stream and enhancing the financial attractiveness of renewable energy adoption.

(ii) Economic Diversification

- The program supports diversification of Botswana’s energy mix through the integration of solar energy, reducing reliance on imported fossil fuels and improving national energy security and resilience.

b. Social Benefits:

(iii) Environmental Responsibility and Resource Management

- **Reduction in Carbon Emissions:** The shift to solar power significantly decreases carbon emissions, supporting Botswana’s climate commitments and contributing to global climate change mitigation efforts.
- The Renewable Energy Program enhances both economic and social welfare by reducing foreign energy dependence and household electricity costs. In the long term, it will bolster energy security, financial stability, and access to clean energy.

TOTAL COST - PROJECTS

PROJECT NAME	COST (US\$)
A. SMALL SCALE MINI-GRID SOLAR PV PLANTS	300,000,000
B. ROOF TOP SOLAR	50,000,000
TOTAL PROJECTS COST	350,000,000