EEP AFRICA CASE STUDY

VERSATILE HUBS FOR SOLAR ENERGY AND CLEAN WATER

OffGridBox is providing off-grid communities with clean water and renewable energy through an all-in-one system that fits into a 2m x 2m x 2m container. With solar PV panels on top and a water purification system inside, these highly portable yet durable boxes have many possibilities to facilitate climate adaptation and resilience.

Each box can supply 400 households with clean water and electricity for lighting, phone charging and small electrical appliances. The power is provided through rechargeable battery packs, with customers able to choose how often they want to recharge the battery for a small fee.

Water purification has been a standout success as clean water is often more critical than lighting in very poor areas. Customers can purchase a PAYG battery + water package in which they can refill jerrycan with purified water each time they recharge. Excess water can be sold in local shops.

Each box provides 5 jobs, including two for local women employed as box keepers and coached in bookkeeping, marketing and maintenance. Being a box keeper can increase women's standing in the community and empower them to take on new roles. OffGridBox provides a forum for the box keepers to communicate with each other for mentoring support and to help brainstorm solutions to issues as they arise.

The boxes can be installed within 3 hours, are easily relocatable and enable communications through WiFi hotspots, making them good solutions for disaster response and humanitarian missions. Each box is built to last up to 20 years and can pay for itself within 5 years at just 20% of installed capacity

TARGETED OUTCOME AND IMPACT

OffGridBox has installed 30 boxes across East Africa, serving 50,000 people. Eighteen of these are in rural villages in Rwanda, including one at a refugee camp and another powering a health clinic. In most locations, customers have been using the service about 2-3 times a week to recharge the battery and get 20 litres of purified water.

Women in the communities have reported that their children have less diarrhea, indoor air is cleaner, and they avoid the time and labour of gathering wood. In addition, access to lighting, phone charging and WiFi has expanded education and economic possibilities for their entire family.

Solar power is about 35% more cost effective than diesel and each box creates enough renewable energy in one year to replace 1.4 tons of diesel fuel, preventing close to 2 tCO_2e annually. Using solar PV instead of wood or fossil fuels to boil water has numerous health, environmental and social benefits. It also reduces pressure on areas that have been heavily deforested as Rwanda already experiences frequent landslides.

OffGridBox is exploring using the boxes for a variety of agricultural and other productive uses, such as irrigation, refrigeration, drying, and power for schools, restaurants and small businesses. The boxes could also be used for desalination or water pumping for fire and flood prevention. They can also power weather stations or serve as a network of climate data collection points.

The company is scaling up rapidly in East Africa and other regions, with over 70 units already installed around the world.

Project developer:
OffGridBox

Technology:
Solar (hub)

Key synergies:

Key linkages:

Adaptation

- Afforestation
- Business continuity planning

Resilience

- Continuous access to essential services
- Increasing resources to poor/vulnerable
- Safety/emergency preparedness planning

Location:
Rwanda

Solar Panel Array

The solar panel array captures and transforms the sun's energy into direct current.

Integrated Inverter

The direct current is converted by the integrated inverter into useable elevtricity.

Battery Pack

The electricity can be used by a commercial grid, local network or building, or stored in batteries for later use.

Water Collection System

Untreated water can be collected by the integrated rain capture system or from external sources such as a river.

Water Storage Tank

The large integrated polyethylene tank stores untreated water to be cleaned when needed.

Water Treatment System

Some electricity is used to filter and sterilise the untreated water and then clean water is distrbuted.