



# Stack on & plug in

## Accelerating rural businesses through nano-grid electrification

# Our Initiative

## Rural economic empowerment through access to reliable electricity

The Energy for Rural Start-Ups initiative is a joint venture between Caritas Switzerland and Powerblox AG, pioneering rural electrification in Ethiopia. Partnering with local entities, it integrates experiences from other African regions. Utilizing Swiss-developed Powerblox (PBX) swarm battery technology, the initiative aims to provide last-mile connections to off-grid rural households, bridging gaps between solar home systems and larger mini-grids, thus accelerating governmental electrification plans.

In its first phase June 2023 - January 2024, 87 Powerblox were installed, empowering 16 micro-enterprises, 2 cooperatives, and 7 public institutions in the rural off-grid areas of Goba, Medawolabu, Oborso, Arero, and Teltele woredas of Bale, East Borana, and East zones of Oromia Region, Southern Ethiopia. Beyond electrifying businesses, it piloted new energy-driven business models, diversified revenue streams, and electrified neighbouring households.

With a remarkable 100% payback rate within 10 months, the initiative highlights how reliable electricity access fosters economic growth, household resilience, and social inclusion. Scaling up, the initiative has the ambition to install 7,000 Powerblox, electrify 100,000 households and 1,000 health centres, and empower 5,000 SMEs, transitioning towards a private sector-driven electrification rollout. Upon achieving this scale, a sustainable financing and operational model, including post-sales support, will ensure long term impact and success.

**JUNE 2023**

**JANUARY 2023**

**87 PBX INSTALLED**

**EMPOWERING**

**15** Micro-enterprises

**2** Cooperatives

**7** Public Institutions

**100% PAYBACK  
RATE  
WITHIN  
10 MONTHS**

# Our Approach

## Rural electrification with nano-grids

Our approach consists of primarily electrifying micro and small enterprises (MSEs) to expand their business operations, enabling extended business hours and additional service delivery to walk-in customers, nearby businesses, and private households. Whereas initially, Powerblox owners invest in operating their core business, excess energy is allocated to private use and further income diversification through household electrification via nano-grids.

After an initial individual down payment to access the technology, a lease-to-own model enables MSEs, public institutions, and private investors to pay back the Powerblox and take full ownership of the technology after an average payback period of less than 10 months. Access to Powerblox uplifts MSEs, cooperatives, public institutions,

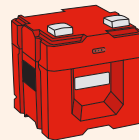
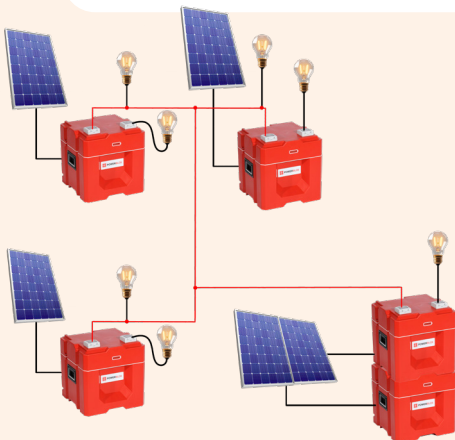
and marginalized groups, offering multiple income opportunities and ways to improve service delivery in the public education and health sectors. Literally anyone can become an energy service provider and nano-grid operator, actively contributing to Ethiopia's electrification strategy.

## Our Technology

### Powerblox - swarm battery technology

The Swiss-developed Powerblox swarm battery technology was specifically designed to address rural off-grid access and energy storage challenges.

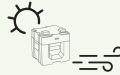
**The core product, the PBX-200, offers the following key features at a glance:**



**10 kW+ AC Power**

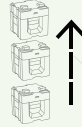
**65 kWh+ battery capacity**

# What the Technology Offers



## FLEXIBILITY

With portable batteries, electricity generated from the sun, wind, or the grid is consistently and reliably available anywhere, adaptable to various applications.



## EXTENDIBILITY

Batteries can be connected and stacked to meet specific energy demands, providing a scalable solution for MSEs and neighbourhoods along the nano-grid space.



## LONGEVITY

High-quality components ensure durability (battery lifetime 8 years; electronics 15 years).



## SERVICEABILITY

Powerblox are easy to maintain, suitable for local maintenance capabilities.



## INTEGRATION PATHWAYS

Powerblox can integrate into mini-grids and public grids, avoiding stranded assets and dead-end solutions.



## COST-EFFECTIVENESS

Scalability reduces initial investment costs



## SPEED

Thanks to Plug and Play installation, Powerblox are ready to use without complex training, allowing for quick electrification rollout.



## UPGRADABILITY

Existing batteries can be easily replaced and integrated with new technologies.



# Our Achievement

## Empowering communities through sustainable energy solutions

Our initiative has achieved significant milestones in providing access to energy and promoting economic development in underserved areas.

### KEY ACHIEVEMENTS

#### Installation of Poweblox (PBX) units

87 PBX units have been installed across 49 locations, including 2 cooperatives, 7 public institutes such as schools and health centers, and 15 SMEs.

#### Diverse revenue streams

The top 10 appliances and revenue streams include lighting, mobile charging, TV services, laptops/desktops, audio tools, health center appliances, printer/copy machines, barbershop, rechargeable lamps, rechargeable batteries, and others.

#### Financial sustainability

Within just 10 months of operation, an impressive 100% of the PBX units have paid back 100% of their loans, demonstrating the financial viability of our initiative.

#### Empowerment and job creation

Our project has empowered 78 business operators, including 36 women, and created 49 additional jobs, contributing to the local economy and promoting gender equality.

#### Health centre impact

The project has resulted in significant energy savings for health centers, with an average weekly energy savings of ETB 2428 (USD 43). This has enabled health centers to improve their services, benefiting an average of 1134 patients weekly.

#### Overall impact

The project has powered a total of 531 lamps, with 242 for own use and 289 for income generation. Additionally, 1013 mobile phones are charged daily, further enhancing the quality of life for community members.

# Our Impact



## JOB CREATION

EneRSU has generated a total of

# 49 JOBS

## Case study

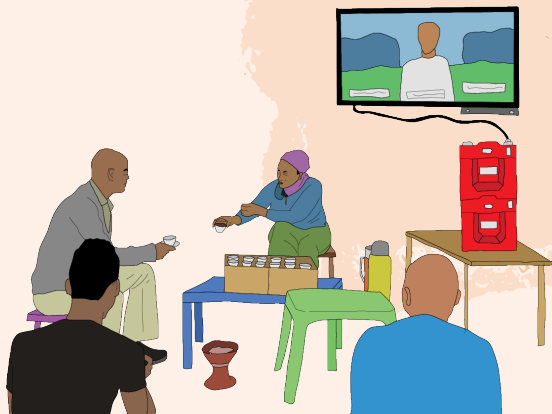
Amanuel Kusiya and Charika Mini Grid Micro and Small Enterprise in Taltele Woreda, Borana, have changed their lives and community through the Powerblox/PBX-200, transitioning from survival to thriving business sustainability within eight months. By diversifying their services to include selling power for lighting, mobile charging, and offering free street lighting for security, the enterprise has not only met community needs but also created job opportunities, opening positions for two unemployed youth in the neighborhood.

“ After struggling to find a job after completing my engineering degree, I returned home to search for remote work. However, with no electricity, I had to travel to the city to charge my phone, costing me money for transportation, meals, and charging fees. My friend and I attempted to launch a charging service using generators, but had to give up due to high expenses. I then focused on helping my family with subsistence farming until Powerblox transformed our lives in a short time.

**Mr. Amanuel**

MSE member in Borana





## **BUSINESS OPERATORS**

EneRSU has empowered

**78 INDIVIDUALS**  
of which 36 are women

## **Case Study**

In Medawolabu Woreda, Borana, Ethiopia, a thriving cafe and breakfast service owned by four women, Mrs. Rabla, Mrs. Tayba, Mrs. Munisa, and their friends, has achieved great success within 6 months by leveraging Power Blox-PBX technology subsidized by Caritas Switzerland, transitioning from subsistence farming to a lucrative business venture that directly impacts the lives of 27 children and 7 parents across their extended families, strategically expanding to three branches while diversifying revenue streams and hiring unemployed youth, demonstrating the power of women's entrepreneurship in creating a lasting legacy.

“ I am the second wife of my husband, and we live together with his first wife and her children. Together, my husband and I have 5 children, while he has 12 children from his first marriage. It has been quite challenging to provide for our large family, including the relatives who live with us, solely through my husband's subsistence farming. However, we are grateful to God that we are now able to support all 27 members of our family. This is mainly due to the income we generate from our restaurant, mobile charging service, and barbershop, which utilize the new technology, Powerblox.

**Mrs. Fatuma** “

MSE member in Borana





## INCOME INCREMENT

Weekly income increment  
after electrification

# 68020 ETB

at project level

## Case study

In Borana, Tellele Woreda, four youths established a Micro and Small Enterprise named Gulufa, Sachama & Yando Mobile Charging MSE, incorporating a barbershop and printing service, leveraging the solar technology PBX. Despite supporting 37 dependents, the group, comprising Kebede, Gulfa, Yando, and Sachama, transitioned from subsistence farming and sporadic wage employment to a thriving business, generating a minimum monthly revenue of 20,000 ETB through mobile charging, DSTV services, barbershop, and printing. Grateful for the technology's impact on their livelihoods, they have shifted from government welfare and livestock sales to a sustainable business model, showcasing significant income growth and improved living standards, with plans to expand their services and accommodate additional PBX units.

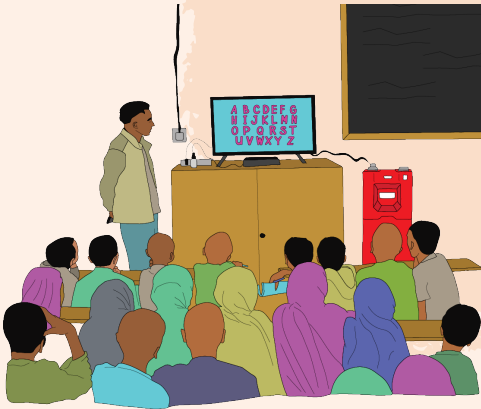


“ We have a team of 4 people in our business group. Initially, we faced challenges in providing for our families, which led us to sell our livestock and seek government assistance. Thankfully, with the help of Pöwerblox technology, we now generate income from mobile charging, DSTV, barbershop, and printing services. As a result, we are now able to support a total of 37 family members. ”

**Mr. Kebede**

MSE member in Borana





## Case study

Bidimo Elementary School in the heart of Hora Kore Kebele, Meda Wolabu Woreda, East Borana teaches 512 boys and 413 girls. In a YEAR, the school acquired five Power Blox Units, each boasting 200 watts of solar power. Apart from covering the energy needs of the school itself, Bidimo Elementary has become a hub of energy provision offering light and mobile charging services to 10 neighboring households. This generates additional income vital for school development.

“ The new solar technology has revolutionized our school. Teachers now have access to laptops and printers, enhancing lesson preparation and delivery, says the school’s director ”

**Mr. Shis**

Director of school in East Borana

## BETTER EDUCATION SERVICES

Three schools now have improved access to electricity, leading to better education services in several key areas:

**1** For teachers, the enhanced electricity access enables the use of new curriculum textbooks and teaching materials, expanding the resources available to support effective instruction.

**2** For students, extended library opening hours up to 9pm allow for evening studies, providing learners with more opportunities to engage in self-directed learning and academic enrichment outside of regular school hours.

**3** For the broader community, the improved electricity infrastructure enables additional education services such as adult literacy classes in the evening, promoting lifelong learning and skill development.

**4** For the schools themselves, the reliable electricity supply creates opportunities for revenue generation through the sale of energy, which can be reinvested into further improving educational resources and facilities.





## Case study

Dibe Gaya Health Center in Taltale Woreda, Borana Zone, Ethiopia, serves 16,492 individuals, primarily children, elders, and maternal care patients. The center's director, Mr. Zakir Wayo, credits the adoption of solar technology through Caritas Switzerland for significantly improving emergency services, particularly for vulnerable groups. By replacing generators with PBX-200, the center has reduced fuel costs from approximately 10,000 ETB to zero, while extending working hours and enhancing healthcare quality. The solar power supports laboratory services, emergency cases, surgeries, delivery rooms, compound lighting, mobile charging for 23 health workers, and printers, with the only limitation being lower capacity in the morning after extended nighttime use.

## BETTER HEALTH SERVICES

Three health facilities have benefitted from new or improved access to electric power, leading to better health services in several key areas.

Following the installation of the PBX, the health centers have reported significant savings resulting from the transition in energy sources. Previously reliant on diesel generators and torch lights, the centers have seen increased income due to extended operating hours and diversified revenue streams, including expanded diagnostic and laboratory services, and round-the-clock service provision. The consistent and reliable power supply, with minimal downtime, has not only facilitated better service delivery but also saved time for healthcare professionals.

“Our health center has experienced a significant transformation. The new solar technology adopted through Caritas Switzerland is playing a crucial role in providing a quality service mainly for emergency services for vulnerable groups of the community such as children, the elderly, and expectant mothers who require antenatal care.”

**Mr. Zakir**

Director of health center in Borana



## Case study

In Borana, Ethiopia, the Kulucha Health Center, serving approximately 31,000 people with a focus on maternal and child health, has experienced a transformative impact since adopting the PBX-200 six months ago, replacing costly and environmentally harmful generators that incurred 70,000 birr every three months, enabling staff to charge phones, access the internet, and power essential medical equipment like fridges, printers, and laboratory apparatuses, expanding laboratory services from 50 to 150 patients per day, and empowering the center's 35 employees across six health posts to provide reliable, high-quality healthcare,

“The health center has faced numerous challenges in providing quality healthcare services to the community, relying solely on diesel generators. This has resulted in significant costs for the center, amounting to over 70,000ETB per quarter. In the past, we even had to resort to using a hand battery for deliveries and minor surgeries during night services, limiting our capacity to serve only 50 individuals for laboratory services. However, since implementing Powerblox technology, the quality of our services has greatly improved. We are now able to serve 150 individuals for laboratory services and provide round-the-clock healthcare services to the community.”

**Mr. Kulula**

Deputy Director of health center in Borana

## ECOLOGICAL IMPACT

The project has replaced

**13 DIESEL GENERATORS  
AND 6 GASOLINE  
GENERATORS**

Additionally, the customer base  
of the MSE's has grown

**FROM 329 TO 4387**

indicating a growing demand  
for clean energy solutions.



# Electrifying rural Ethiopia, empowering communities

## OUR VISION

Our vision is to play a pivotal role in supporting Ethiopia's national electrification plan, with a specific focus on rural areas. We are committed to providing innovative, solid technological solutions that cater to the unique needs of nano-grid spaces, serving households, neighborhoods, and small communities for both private and productive use.



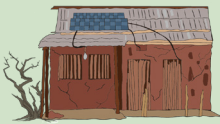
## OUR GOAL

Our goal is to accelerate rural electrification through our technology and approach, while also paving the way for future integration into larger mini-grid and public grids. By doing so, we aim to make a meaningful impact on the lives of rural Ethiopians, fostering economic growth, and improving overall well-being.



# ADVANCING SUSTAINABLE ELECTRIFICATION IN ETHIOPIA: OUR MID-TERM GOALS

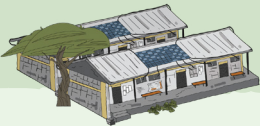
Our strategic roadmap outlines targets to drive sustainable electrification across Ethiopia. In the mid-term, we are dedicated to achieving the following milestones:



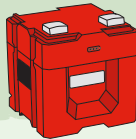
**ELECTRIFICATION OF 100,000 HOUSEHOLDS**



**EMPOWERMENT OF 5,000 SMES**



**ELECTRIFICATION OF 1,000 HEALTH CENTERS**



**DELIVERY OF 7,000 POWER BLOX UNITS**

These concrete objectives underscore our commitment to expanding access to reliable electricity, fostering economic growth, and enhancing healthcare services in underserved communities.

Furthermore, we are focused on optimizing efficiency and affordability aiming at halving the cost of household electrification compared to traditional solar home systems.

This cost-effective approach ensures that our solutions are not only sustainable but also accessible to a broader segment of the population.

Our ambition reflects our dedication to making a tangible difference in the lives of Ethiopians, driving progress towards a more electrified, empowered, and sustainable future for all.



# Our partners

## Collaborating for sustainable impact

Energy for rural start-ups is the result of a strong partnership between diverse organizations, the key partners involved are:



### Caritas Switzerland

Caritas Switzerland, a Swiss NGO registered in Ethiopia since 1974, plays a crucial role in this partnership. With their extensive experience in the region and commitment to social justice, Caritas Switzerland provides valuable insights and support to ensure the project's alignment with local needs and priorities.



### Power-Blox AG

Power-Blox AG, a Swiss innovator and tech-developer of the Powerblox swarm battery technology, brings cutting-edge solutions to the table. Their innovative approach to energy storage and distribution is a key component in delivering reliable and sustainable electricity to underserved communities.



### Oromia Regional Government

The Oromia Regional Government in Ethiopia serves as a key supporter and signatory of project and business-related undertakings. Their involvement ensures that the project is aligned with national priorities and benefits from the necessary policy support and institutional frameworks.

WITH THE FINANCIAL SUPPORT OF



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

**Swiss Agency for Development  
and Cooperation SDC**

## Join the effort

Partner with us to revolutionize rural last-mile electrification in Ethiopia. Learn more about our initiative and impact and discover how to get involved on our website today.

## Contact us

Website: [www.caritasempower.com](http://www.caritasempower.com)  
Email: [info@caritasempower.com](mailto:info@caritasempower.com)  
Telephone number: +251(0) 11 667 2273  
Caritas website: [www.caritas.ch](http://www.caritas.ch)

