
POWER FOR ALL FACT SHEET

Utilities 2.0 Twaake pilot: a first-of-its-kind integrated energy approach to deliver faster and least-cost universal electrification in Uganda

**POWER
FOR
ALL**

24%

OF UGANDA POPULATION WITH
ACCESS TO GRID ELECTRICITY

50%

REDUCTION IN
CONNECTION COSTS VIA
INTEGRATED ENERGY
APPROACH

3x

(AT LEAST) THE SPEED OF
TRADITIONAL GRID EXTENSION⁴

The Utilities 2.0 project was set up in 2018 to assist in ending energy poverty in Uganda through faster and lower-cost electrification, and to accelerate community development via productive use of electricity. The U.2.0 consortia, a coalition of private sector players in the decentralized renewable energy sector, utility and research organizations², is committed to proving that both centralized and decentralized energy technologies have important roles to play in achieving universal energy access. To this end, the first 'integrated energy' mini-grid was officially commissioned on June 28th, 2021.

The Twaake¹ pilot

- » Deployed across two sites: Nyenje (grid connected) and Kiwumu (non-grid DRE site).
- » Nyenje has been operational since July 2020 with over 26% of businesses to date receiving income generating assets through asset financing for the purpose of productive use. Both electricity consumption and business revenues were increased, by over 50% and 70%, respectively since asset deployment².
- » The pilot has deployed a 40kWp mini-grid in Kiwumu to power 300 households and 60 businesses. Over 50% of the latter will receive asset financing from Energrow with the hopes of increased jobs, business revenues and incomes across the village. A containerized maize mill and dryer will service farmers in Kiwumu and surrounding villages starting August 2021. The project will also utilize smart grid technology to improve overall energy system performance.

Integrated Partnerships and Collaboration - Partner role within the project

- » Collaborations between the decentralized and centralized energy companies have been developed to support accelerated access, productive use and cost efficiencies across the integrated partnerships.
- » **In Kiwumu (non-grid site):** Equatorial Power developed the mini-grid that currently operates and powers the community. It also does the onboarding, management and servicing of customers. The utility company Umeme Ltd built the distribution network and provided the smart meters and back-end system that allows customers to purchase electricity (as well as access to meter data). Asset financing is provided by Energrow to encourage productive use. East African Power built a containerized milling and drying unit to service the agriculture community. It has partnered with a local miller that will operate and manage the containerized milling and drying equipment.
- » **In Nyenje (on-grid site):** Energrow provides productive use assets to both businesses and households, targeting 50% of the businesses with asset financing. Umeme supports EnerGrow where possible to identify potential customers by providing them with data and through co-branding (to support and endorse the productive use project).

Electricity Access in Uganda

- » 41% of Uganda's current population has energy access; 24% per a grid connection and the rest by decentralized technologies (World Bank 2019) (MIT 2020).
- » With an average of 4.5 people per household, it will take over 10 million connections for Uganda to achieve universal access (Ministry of Energy and Mineral Development 2020).
- » If grid extension is the sole method of service provision, the required investment would likely be in the range of USD \$7 billion at USD \$1,400 per connection, about 20% of Uganda's current annual GDP (ESMAP 2019) (Blimpo and Cosgrove-Davies 2019) (Ministry of Energy and Mineral Development 2020).

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By the Numbers:

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Challenges for Utilities in Developing Countries

- » Transmission and distribution losses in low energy access countries, which can be five to 10 times higher than in developed ones (IRENA 2016).
- » Service interruptions: most low energy access countries suffer over 500 hours of interruptions per year.
- » Across the continent the average utility deficit is US\$ 0.12 per kWh (and can range as high as US\$ 0.49 per kWh) which compromises on average 1.5 percent of a country's GDP. It was highlighted that even as a profitable utility, Umeme experiences financing and reliability challenges (Power for All 2017). In addition, their profitability drops the further customers are from the grid, due to both the cost of infrastructure and having to service customers with low usage.

New Business Models of Integrated Energy

- » Connection costs can be reduced by 50 percent with integrated energy approaches (EEG 2020)
- » The cost savings come from reducing upfront capital cost through an integrated energy partnership whereby the Utilities balance sheet can be leveraged to access cheap cost of capital as well as increasing the value of the customer through productive use applications (EEG 2020).
- » Integrated energy through public private partnerships will bring faster connections, increase productive use of electricity, improve grid reliability and stability, reduce grid losses, promote economic growth in rural communities, and improve business profitability.

Benefits of Integrated energy

- » Integrated energy seeks to bring the optimal mix of service levels to unelectrified areas, solving for least-cost electrification in the fastest timeline possible in a given area.
- » By combining the advantages of traditional utilities like Umeme (infrastructure, transmission lines and poles, access long-term low-cost financing, existing customer billing and collections systems) and decentralized renewables (lower cost connections, fast implementation, fewer regulatory challenges), with targeted interventions to drive demand (financing, training, bundled services etc.).
- » Ultimately these types of partnerships, once scaled, will help achieve SDG 7, ensuring access to affordable, reliable, sustainable, and modern energy for all.

Share the Message

- » First-of-its-kind integrated energy pilot launched in Uganda
- » Neither centralized nor decentralized energy is purpose built to solve energy poverty alone
- » Integrated energy more cost-effective than grid only extension

Sources:

1. Twaake in Luganda (Ugandan language) directly translated means "to light up"
2. The consortia consists of implementing partners Equatorial Power, Umeme, East African Power and EnerGrow. Power for All coordinates and leads on the research and is supported by research partners such as; Rocky Mountain Institute (RMI), University of Massachusetts, Amherst, Duke University, Makerere University, Africa Mini-Grid Developers Association (AMDA), CLASP and CrossBoundary. Supporting partners of the consortium are Engie Energy Access, Open Capital Advisors, Nxt Grid, Zola Electric and Nithio. The project is funded by The Rockefeller Foundation.
3. Source: Power for All's calculations based on data provided by Energrow.
4. Based on electrification rates in nearby sites