Pro Mini-Grids – Clean Electricity for Rural Uganda

Improving the national framework for privately operated renewable electricity distribution

The challenge

Uganda is endowed with great renewable energy potential, able to generate power from solar, hydro, biomass and wind. However, only about 20% of the country’s population has access to any kind of electricity. Outside of the cities, the number drops to just 10%. This low electrification rate is considered a major barrier for economic development and poverty reduction. Unfortunately most rural villages are small with low electricity demand, making it financially unviable to connect them to the national electricity grid. This is where mini-grids step in, with clean, low-cost technology to supply village homes and businesses with grid-like electricity.

The Ministry of Energy and Mineral Development (MEMD) seeks to promote private investment and operation models to increase electricity access, reduce dependence on kerosene, diesel and expensive substitutes, and enable income and employment generation activities in rural Uganda. The aim is to reduce poverty by self-determination, as well as improving health and education through modern services. This will also alleviate the pressure on over-crowded cities through rural-urban migration.

However, limited investment and a policy and regulatory framework adapted for large generation projects have made it complicated for mini-grid projects to reach the necessary scale.

Only around ten mini-grids are so far registered in Uganda, operated mainly by communities and non-profit organisations. Only five have leveraged private investment and sustainable operation models.

Our approach

Pro Mini-Grids and Pro Mini-Grids NU are the first bundled off-grid electrification projects using mini-grids in Uganda, implemented in partnership by MEMD, the Rural Electrification Agency (REA) the Electricity Regulatory Authority (ERA) and GIZ. Where in the past, mini-grids were developed as unsolicited single-village projects, ours are initiated through bundled tenders, hosted by Government, to select strong project developers and operators. This not only ensures long-term quality of supply in each village, but also adds much-needed private investment to electrify more areas faster.
Impact in figures ...

In partnership with REA, an electrification planning tool for the selection and prioritization of mini-grid locations has been applied. The resulting map identifies over 300 villages in Uganda’s South Service Territory which are suitable for mini-grids. In Northern Uganda, the same criteria have been applied to initially identify 25 further project sites. REA uses this data to prioritize projects.

A tender mechanism for private sector involvement in mini-grid electricity generation and distribution has been developed in collaboration with REA, guaranteeing a transparent and efficient process for awarding mini-grid concessions and selecting competent project developers. Simplified licensing procedures, a subsidy scheme and long-term concessions have also been integrated into the tender framework to incentivize private investment and operation in rural electrification projects.

A multi-level training program for solar electricians has been developed in cooperation with Nakawa Vocational Training Institute and Cologne Chamber of Skilled Crafts and Small Businesses. Over 60 electricians will be trained and certified in installation, operation and maintenance of solar photovoltaic mini-grid systems.

Data collection and estimates on energy demand in selected villages have been completed in two regions. This improves planning for project developers in future, to improve system sizing, financial modelling and project integration in communities.

A series of strategic mini-grid policy objectives have been defined by MEMD, ERA, REA and GIZ. These objectives consist of policy, regulatory, operational and financial measures for government stakeholders to adopt in the implementation of mini-grid electrification projects. These objectives are being integrated into the appropriate national electrification policies and strategies.

... and in stories

Despite the vast off-grid areas in Uganda, only a few mini-grid projects have been implemented. Concessions are usually granted on a direct award basis and operation is conducted non-commercially, leading to poor system performance, short lifespans and insufficient electricity. Private developers have shown hesitation towards mini-grid projects, as the policy and regulatory framework has provided insufficient guarantees to secure their investments.

Through the project, private developers invest their own capital to build, own and operate mini-grids in designated off-grid areas. REA finances distribution lines while the EU and BMZ make a partial contribution to the generation asset. Through private investment and revenues on operation, developers naturally opt to provide as much power as a village needs.

Tenders are hosted by REA and supported by an independent tender agent. Developers submit a bid for a price per kilowatt-hour and the concession is awarded to the best offer based on the evaluation criteria including price, technical concept and performance forecast. A contractual framework for operation of the partially subsidized mini-grids is then signed with the winning bidder, including the required license exemption certificate and approved tariffs.

During this pilot phase, the tender mechanism will be used to select a private company for the electrification of up to 15 villages in the South and up to 25 in the North.

As subsidies are still needed to make solar mini-grid tariffs affordable for Uganda’s rural customers, the tender process will identify developers requiring the lowest subsidies. It will also enable transparent and efficient use of government and donor funding in mini-grid projects, with a focus on phasing out subsidies and attaining cost-reflective operational revenues.

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