Mpale Solar Micro Grid

Why to choose this solution?
Access to affordable and reliable electricity is vital for Tanzaniaâ€™s attainment of its socio-economic goals. This is specifically difficult in Tanzaniaâ€™s northeastern village of Mpale in Korogwe District, where the mountainous terrain poses a technical challenge in deploying grid lines. In the village, kerosene has been the main fuel source for lighting, while biomass has been used as the main energy source for cooking. Limited access to reliable electricity has been a barrier to social and economic development activities in Mpale. Ensol developed a 50 kW solar micro grid in Mpale village, nearly 50 years after village was established.

Savings per day or production:
There is notable cost saving for customers who are using energy-efficient appliances in comparison to the prices thatthey used to pay for diesel generators, which were supplying power for a limited period of time. Time and money savings have also been realized by local government officials at village and ward offices, where they are no longer traveling to town for stationary and printing services. Instead, these activities are done at the village, as some entrepreneurs have started providing printing and photocopying services.

Cost in money and in own time to construct:
The microgrid system cost about USD 558,776.

Lifetime:
About 15 to 20 years for solar panels and 3-4 years for solar batteries.

Maintenance needed:
Regularly remove dust from the panel, as dust reduces the amount of sunlight that is able to reach the modules. Ensure that the charge levels in the lead acid batteries never fall below 50%. Over- discharging will significantly shorten the life of the batteries, and could potentially cause the system to fail if they cannot be replaced.

Resources needed in use:
Solar radiation.

Problems and limits:
Construction delays due to the topography and remoteness of the village, poor supporting infrastructure and weather.

Where and how can you get it or make it?
The microgrid was designed and developed by Ensol (T) Ltd, a Tanzanian company located in Dar es Salaam.

Skills needed to produce, install. maintenance, use:
Skilled technicians are required for installation, maintenance, and operation of the solar microgrid.

How to use it:
https://www.uncdf.org/article/6076/mpale-solar-power-mini-grid--maximizing-household-incomes-with-solar-power

How to maintain it:
https://www.youtube.com/watch?v=Pd3NCphnOs0

Climate effect (if any):
Electricity generated from the Mpale microgrid avoided the use of fossil fuels and has thereby helped to reduce and avoid CO2 emissions.

Where it is used and how many users are there?
More than 206 households and 50 SMEs are connected to the microgrid in Mpale village, Korogwe district, Tanga Region, Tanzania.

Why is it successful?
The success of the project is a result of close collaboration between Local Government Authority and Community members throughout the process.

If you can make it, a short description, typical problems, materials needed:
Not relevant.

How to make it (if possible):

How is it delivered and by whom?
Ensol is the project developer; United Nation Capital Development Fund (UNCDF) provided capital fund to cover initial costs, technical and advisory support. Energy and Environment Partnership Programme (EEP) with Southern and Eastern Africa, United States African Development Foundation also financed the project on grant terms.

Successful financial model
Considering the high investment costs and the lack of economies of scale to make Mpale solar micro-grid project attractive to purely commercial financiers, development partners provided development finance to subsidize catalytic development projects to prove concepts and demonstrate track record necessary for scale up.

What policies and strategies helped the success?
The first and second generation Small Power Producers (SPP) Frameworks of 2008 and 2015, respectively, developed by the government of Tanzania, the Rural Energy Agency (REA), Electricity and Water Utility Regulatory Authority (EWURA) guidelines, Environmental and Social Impact Assessment.

More info:
https://ensol.co.tz/

Sources:

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