Technology

Solar Multi-Utility Platform for Livelihood Generation Activities

After the successful implementation of centralized solar charging stations for solar lanterns as part of the LaBL campaign, TERI, in partnership with SCATEC Solar, a Norwegian company, has now extended the concept by designing and developing a solar multi-utility (SMU) platform. The SMU has been piloted in the remote village of Dakshin Dimoria located in Assam's Kamrup district.

What is solar multi-utility platform?

Solar multi-utility (SMU) is a charging apparatus that utilizes locally available solar energy resources to generate electricity that is used for a variety of applications such as charging lanterns and batteries, and powering computers, mobile phones, and water purifiers among others. The popular livelihood generation activities are explored through a comprehensive scoping study covering the community.

In a village, an SMU, located near the load centers in a village, provides electricity services as per the need of the local community. The pilot SMU in Dakshin Dimoria has been designed to be energized by solar photovoltaic array of 5kWp capacity.

Load assessment and market survey:

The most common livelihood activities such as bamboo stick making, spice grinding, and honey skimming were first identified through an extensive survey. Most of these tasks were found to be generally performed by manual labour, thus leading to slow and inefficient results and simultaneously employing significant amount of physical labour and time.

Thus, some of the machines and equipments were motorized as per the capacity of the SMU. Other facilities such as solar lantern, smaller batteries, water purifiers, etc., were also included and the SMU was customized to efficiently power all these loads. Details including average solar array output of the region, power requirement of equipments, hours (daily and monthly) of operation of each load, and the requisite energy were some of the major parameters considered in efficiently designing the SMU. The SMU also involves charging of battery banks through SPV array that, in turn, feed the equipments.

Performance assessment through remote monitoring system:

The battery bank also stores energy that is used during non-sunny hours and low-sunshine days. A state-of-the-art remote monitoring system (RMS) has also been developed and customized for monitoring and analysing the SMU's operations. The RMS is integrated with the important junctions of the SMU with the relevant electrical signals sensed and logged. The utilization pattern and any malfunctioning can be tracked even by a remote computer system.

Table 1 (below) provides an overview of the loads powered by the pilot SMU.

Solar capacity of the SMU	5 kWp
Services provided through the SMU	• Honey extractor • Water purifier • Battery charging • Bamboo splitter • Grinding (turmeric/ black pepper/red chilli) • Solar lantern charging

Concept of solar multi-utility platform

Building a strong institutional base for implementation:

Scoping, training, and capacity building activities have been carried out by leveraging an efficient institutional setup that was developed as an integral part of the project. A renowned NGO along with several self-help groups (SHG) are engaged in conducting the various activities. The responsibility of maintenance and operation of the SMU rests on the NGO and the SHGs. Thus, the SMU platform provides the village SHG, as well as the various beneficiaries who regularly avail of the SMU's facilities, an excellent income opportunity through livelihood generation activities. In return, the SHGs maintain and operate the SMU.

- Dr Nivedita D Thakur, TERI