

Case study: the potential for off-grid solar in Bihar

Introduction:

Over the **last 2 years**, the initiative has come a long way, taking advantage of a number of existing policies to provide better energy access to the underserved.

Pilot phase:

SEWA Bharat and SELCO in partnership undertook a pilot project in 2010 in Munger district of Bihar. The project electrified 57 off-grid homes with solar home lighting and mobile phone charging systems. These systems were financed by SEWA Bharat's microfinance wing through one women Self Help Group which took the responsibility of collection of repayments from end-user households. The project was extremely successful, where people saved on a monthly basis- avoiding the monthly expenditure of Rs.150 on kerosene for lighting and Rs.75 on charging mobile phones.

Project with larger scale and targets:



Encouraged by the response of users in the pilot phase, SELCO was confident that a full-fledged project could be undertaken on a larger scale, given human resources and coordination support from SEWA Bharat. This project, operational since April 2012, has a target of 400 Solar Home energy systems over a period of one financial year (2012-2013) with 100 systems being installed every quarter. The aim was to create a holistic and sustainable model, after considering all aspects of financing, technology, community interaction and current policy.



Till date 100 solar home lighting systems have been installed through SEWA Bharat-SELCO partnership in Khadagpur taluk of Munger. End users were linked with bank financing through Self Help Groups and technology was installed by local trained personnel. The energy systems installed during this phase are primarily solar home lighting systems consisting of the following components- 2 LED Lights (2.4 W, 1.2W); 15Ah Tubular battery; 10W panel with Charge regulator and a 5 year warranty on the entire system, with 8 years on the Panel. The systems also come with a mobile charging unit.

Impact:

Monetary savings and asset ownership are some of the most compelling reasons for providing rural households with bank financed solar energy access. In addition, the monthly instalment based financing matches the cash flow of households and fits well with their current expenditure patterns. On average, each household saves around Rs. 250 on a monthly basis on energy consumption. In comparison, the Equated Monthly Instalment to be paid on the loan for a 5 year period is only about half of this amount.

Lighting and expenditure: The most obvious impact has been in terms of improvement in lighting source. The solar lights installed in specific locations in the house have replaced kerosene usage of 5-6 liters- reducing expenditure by Rs.180 per month on average. In this region, household expenditure on kerosene that includes 2 liters from the Public distribution system at Rs 14 per liter and the remaining at market rate of Rs.35 per liter.

Social Benefits and livelihood generation: Women, in particular, emphasize that brighter lighting in the kitchen helps them cook in greater convenience. A number of women are also able to engage in income-generating activities such as leaf-plate making and agarbatti rolling- during the evening hours after completing household work. Children find school work more interesting given the comfort of better lighting and no longer suffer problems of eye irritation and coughing, common from inhaling fumes emitted under kerosene light. Thus, the health benefits for the family, albeit intangible and not noticed in the short term, are also significant.



Mobile Phone recharge: While it may seem trivial, a number of women claimed that one of the greatest benefits was the ease with which they could charge their mobile phones. Previously, in order to charge mobile phones, members of the household were forced to travel 6-8 kilometres each way, at-least thrice a week, to the nearest town for electricity access and pay Rs. 5 for every recharge. Today, families save a minimum of Rs. 75 per month not considering the additional amount that would have been incurred on travel expenses.

Empowerment and Ownership: At the larger level, this initiative has brought a sense of independence amongst households, who are no longer dependent on kerosene, candles or the hope of grid-based electricity. The fact that households have purchased and are paying for the system has led to a sense of ownership, with increased responsibility of using the system well. This is especially significant as the women in the household (often shunned from expenditure decisions) have been integral in accessing financing for the system.



Environmental benefits: Although not the primary motivation for improving energy access, the environmental benefits of replacing kerosene are incidental but significantly large. Given the reach of the project till date, on average, the burning of 750 liters of kerosene per month is avoided, translating to large reductions in carbon emissions.

This phase is characterized by wider reach, the support of more partners and greater operational sustainability. Details of organizations involved and the process involved are summarized below:

Financing- Bihar Kshetriya Grameen Bank and NABARD:

The first phase of the roll out capitalized on the existence of SHGs, previously created by SEWA Bharat for Micro-finance activities. These Groups were connected to the Bihar Kshetriya Grameen Bank (BKGB), the Regional rural bank operating in 8 of most under-developed districts of Bihar including Munger. The linkage with the bank proved to be of great value in providing appropriate instalment-based financing for end users. Availing of subsidies on solar off-grid installations as declared in the National Solar Mission also became a possibility.

Given that this was the first time the bank was approving a loan for solar home lighting, SEWA Bharat's track record and its previous interactions played a role in convincing bank managers. More importantly, individual interest of key players in the banking sector- for eg: the Chairman of the bank, NABARD's District Development Manager, the nodal officer, local Branch manager- and their confidence in the benefit of energy access provided the much needed push for the project. Owing to the involvement of such individuals championing the cause, processes of acceptance

through the Bank's Board, sanctioning of loans and the willingness of NABARD to ensure speedy subsidy disbursement, were all made possible.



Capacity building, technology and best practices- SELCO India:

SELCO's contribution lay in bringing in financing best practices and technological expertise to the field. SELCO has relied on the 'tried and tested' Bank financing mechanism over the 17 years of its work in Karnataka state- and sought to transfer the learnings to the Bihar context. It supported the training of local technicians for system installation and maintenance- vital to the long term functioning of the solar home lighting system. The organization helped cover operational costs to facilitate the project and take it off the ground through funding support from Renewable Energy and Energy Efficiency Partnership (REEEP) and World Bank Development Marketplace.

Community mobilization and Project Facilitation- SEWA Bharat:

SEWA Bharat's work in the district formed the basis of contact to the community and facilitated the provision of energy access. Women who were already part of Self Help Groups were given first priority in the provision of solar home lighting systems. SEWA Bharat acted as an intermediary facilitating the transactions between SHGs, the Bank and SELCO, and completing paper work required for the loan.



The SHGs formed a vital part of the chain and became the single point of contact for the bank. Thus, the bank branch was not burdened with high transaction costs and the task of processing a number of small loans. The loan with the group is relatively large, working out to about Rs. 80,000 on average compared to loans that would otherwise have been sanctioned for each individual member (Rs. 6000). The loan has been sanctioned by the bank to the Group with individual borrowers names on the agreement. Since the loan has been sanctioned, SEWA Bharat personnel interact with the SHGs and end users, playing an integral role in ensuring collections and repayment. Their local trained technicians also maintain and service systems on a regular basis. Thus local capacity has been effectively developed to ensure operational longevity of the project.