

Green Growth and Energy Transformation

Scoping Visit to Udaipur District

January 20-21, 2017

Report

In April 2016, CUTS International, in collaboration with Friedrich Ebert Stiftung (FES) India, commenced a project called Green Growth and Energy Transformation (Grow-Get) to create an implementable strategy for energy transformation in the state of Rajasthan and West Bengal through fostering dialogue among various stakeholders to identify and align their common interests by creating social coalitions, called Seed Communities. Through deliberations and discussions, the seed communities identified **Solar for Education** was identified as the catalytic project to bring energy transformation in rural areas of Rajasthan.

As part of the initiative, Scoping visit was conducted in Udaipur District of Rajasthan to understand the potential of the idea on the ground and to understand the challenges at the grassroots.

Following are the key highlights of the visit:

1. Visit to Solar powered Households in Khajuri Village, Udaipur (rural)

Background and Purpose:

CUTS team along with Boond Staff paid a visit to Khajuri Village which was around 40 Kms away from Udaipur City. Two households powered by solar were visited by the team in the village.

The purpose of the visit has been elaborated below:

- To enhance understanding in terms of technical, financial and social aspects of solar based home lighting systems set up by Boond Engineering and Development Pvt. Ltd in the off-grid remote village of Khajuri in Udaipur District..
- To understand the role of various stakeholders such as households, target community, government departments, financial institutions and Boond amongst others in successful implementation of the project..
- To take an account of the positive changes that took place in lives of people gaining access to electricity through solar powered systems, and to understand the ground realities related to the project so that it can be replicated at other places, wherever needed.

Key Highlights:

- **Demographic Profile of Village Khajuri:** As per the information shared by the stakeholders involved in the project, the majority population of the village belonged to Meena tribe. The village contained 400 households, out of which 64 households were

Solar powered by Boond team. Being a remote village, it lacked basic facilities such as access to electricity through grid, drinking water supply, public transport connectivity to the national highway, primary healthcare centre, etc. The women travel long distances twice a day to fetch drinking water from the wells nearby. The village had one Anganwadi which again was operating without electricity support. Also, a telecom tower running on Diesel Generator has been put up in the village recently.

The average monthly income of households in the village was approximately Rs. 4,000-5,000 and the major sources of income include occupations such as cattle rearing and agriculture (mostly rain fed). Most young men in the households had migrated to urban areas to earn their livelihoods, leaving behind their spouses and children in the village.

- **Cost summary of Solar based home lighting systems:** Rajasthan Marudhra Gramin Bank (RMGB) has provided loans for setting up solar based home lighting systems for 64 households in the village. 20 percent of the capital cost has to be paid as an upfront cost to the bank and the remaining amount has to be paid to the bank in the form of monthly installments extended over a period of 3 years. It was known that 63 out of 64 households have ensured regular repayment of installments till now.

As per the current market price, the capital cost of a 75 Watt Peak (WP) battery integrated solar panel is approximately Rs. 24,000, which has the capacity to power 5 LED bulbs of 3 Watts each and a plug point for charging a mobile phone. The monthly installment for a house powered on Further, the total capital cost for another household powered by a 20 WP battery integrated solar module is Rs. 8500, which has the capacity to support a single 3W LED bulb and a mobile phone charging plug point.

Initially, the Ministry of New and Renewable Energy under JNNSM programme provided for 30% of capital subsidy for the project through NABARD. The subsidy scheme however was withdrawn later due to the backlog of debts with NABARD. Another Capital Subsidy scheme is yet to be introduced by MNRE and is in a draft stage.

- According to Mr. Grover, the new scheme on integrated home lighting systems poses a major obstacle in the installation of solar modules due to the provision on standardization of output points. The scheme appears to be forcing solutions on the beneficiaries. Customization can be the best option for addressing the same.
- **Operation and Maintenance of Solar modules:** Boond has signed an Annual Maintenance Contract (AMC) with RMGB and hence visits the households for cleaning of solar panels, battery maintenance, etc. twice a year. The batteries have a longevity of 8-10 years. In addition, Boond also ensures regular collection of installments from the households on a monthly basis. As an AMC contractor, Boond earns 3% of the total capital cost of the system as revenue.

2. Meeting with Branch Manager, Rajasthan Marudhara Gramin Bank (RMGB), Tidi, Udaipur

Background and Purpose: RMGB has provided loans to the households for putting up solar panels installed by Boond. The timely collection of monthly instalments from the beneficiaries is ensured by the field staff of Boond.

The purpose of the meeting thus was to understand the perspective of financial institutions such as RMGB on financial viability of providing loans for solar powered homes, schools, etc. in the off-grid region.

Key highlights: The discussion brought forth 4 key points:

- Projects involving Low scale solar panels such as the ones put up in Khajuri village can be financially viable if a third party such as Boond is involved in ensuring timely collection of installments from the households. This is owing to the fact that collection tasks to be done in remote villages involve travelling to long distances and thus add to financial and human resource spending for the banks. In addition, the bank officials of RMGB are already tied up doing a lot of non-banking work and thus face several challenges on the human resource front.
- Another viable option for ensuring timely collection of installments is by setting up Self Help Groups/Joint Liability Groups in the villages
- A feasible project ideasupporting the promotion of energy access through Renewable Energy would require a tripartite agreement involving representatives from Government (central and State), financial institutions and third parties (for operation and maintenance)
- The manager also suggested that CUTS should get in touch with the MLA Shri. Phool Singh Meena and the MP ShriArjunlalMeenaof Udaipur (rural) constituency who are quite progressive in their approach towards solar based energy access to villages in the district.

3. Visit to Karma Healthcare Clinic, Karawali Village, Udaipur

Background and Purpose: Boond has been supporting operation and maintenance of a battery integrated solar module powering an E- Healthcare centre in Karawali Village of Udaipur.

The purpose of the visit was to understand the functioning of the solar based E-Healthcare Centre and assess the feasibility of replicating the model in other locations.

Key Highlights:

- **About the E-Clinic:**The clinic is taken care of by a nurse who does the primary level checkup of the patients. 5 doctors, specialized in different streams of medicine and based out of different parts of the country have fixed sitting hours during the day. The consultation with the doctor takes place over video call on Skype and the prescription is prepared by the nurse as per the doctor's advice. The consultation fee for each of the doctor's is fixed on the basis of the ailment.

Interestingly it was known that the number of patients visiting the E-clinic in the village is lesser in comparison to the number of patients relying upon the doctors who hoax the pateints.

- **Solar module powering E-Clinic:** A battery integrated solar panel of 300 WP capacity powers the Clinic. As per the current price, the capital cost of the module is approximately Rs. 60,000.
- **Operation and Maintenance:**The operation and maintenance of the solar system is taken care of by the Boond staff, who pay a visit to the clinic 2-3 times in a year as AMC contractors.

Day 2

21st January 2017

4. Visit to Adarsh Government Higher Secondary School, Kaya Village, Udai-pur District

Purpose: The visit to the school was undertaken keeping in mind the following objectives:

- Understanding the functionality of solar based 'Light for Education Programme' and solar based 'Digital Education Programme' adopted by the school
- Assessing the feasibility (commercial, technical, political) of replicating the practice in other schools
- Understanding the social impact of the programme as per the school authorities
- Understanding the challenges pertaining to delivery of quality education in schools based in rural and remote areas

Key highlights

- About the school and students:** The school has been recognised as one of the most progressive schools in the district. Recently, a government primary school in the locality has been merged into their secondary and higher secondary school building. Nearly 700 students have been enrolled in the school mostly belonging

to a backward community in the district. It was also shared by the school authority that the number of boys attending the school is higher in comparison to the number of girls attending the school.

□ **Solar based Light for Education Programme:**

- A 40 Wp battery integrated Solar Panel has been put up on the rooftop of the school in order to provide power source to power plugs by a Netherlands based Mr. Keepi Foundation. The power plugs are used for recharging the batteries of LED lamps provided by the Foundation to 20 students in the school bereft of electricity access at home. The programme acts as an incentive for students to attend the school
- The LED lamps running on the lowest level of intensity can last for 10-12 hours on battery and the battery requires charging time of 4-5 hours
- The beneficiary students were identified through a needs assessment survey conducted by the school authorities
- The school authorities claimed that the overall result of the students has improved after the implementation of the programme

□ **Digital Education Programme:**

- A 100 Wp battery integrated Solar Panel has been put up on the rooftop of the school to provide the power source to the projector room in the school consisting of a projector device and 4 LED bulbs.

□ **Other highlights:**

- Mr. Khatik stated that the MLA of Udaipur rural constituency, Mr. Phool Singh Meena has been pro-active in promoting the practice adopted by their school in the district
- The school also conducts night classes for students to help them attain better results. The teachers make sure that students attend the night classes, wake up early to study and keep up with the attendance
- Mr. Khatik along with other supportive school staff is preparing a plan for a high-tech school in the neighbourhoods to deliver quality education and is planning to seek support from the Corporate Foundations, active political leaders

Key Lowlights

- The students attending the school confront day to day struggles of life related to access to basic resources of food, water, clothing, electricity and thus it becomes difficult for them to dedicate time for studies.

- Since all the students belong to backward communities, there is lack of competition amongst them to perform better. The students in the locality who are good at studies, do not prefer studying in government schools and look for opportunities to study in private schools.
- When asked about the funds allocated to the schools and operationalisation of other schemes such as the Mid-Day Meal Scheme, the school authority expressed concerns regarding lack of sufficient funds to hire cooks for preparing meals to be served to approximately 550 students enrolled in the primary and secondary classes.

5. Meeting in Boond Office:

Purpose: Understanding the modus-operandi of **Boond Engineering** and nature of funding.

Key Highlights:

- Mr. Keepi Foundation has been working with Boond Engineering since 2012 with the Business Model of Creating awareness around clean energy with social impact.
- This model originated from SELCO, is a social initiative with multiple partners especially designed for off-grid villages who lack basic energy access.
- SELCO in partnership with Menda Electricals have resulted in many lighting solutions in Bangalore. 50% of funding comes from SELCO whereas remaining 50% comes from community funding. The community funding results in ownership.
- Huge cost involved in venturing into rural areas, therefore partnering with local partners will drastically reduce cost.
- However, training at source or partnering with local people is always not possible as they lack proper education and generally have a myopic vision towards new initiatives.
- Banks are not open to providing small loans for scalability of solar lighting solutions which poses a big challenge in this initiative. **Tripartite Business Model** in which a third party will ensure the collection of money from the consumers on behalf of the bank and **Public Procurement Model** where government will have a role in procuring the systems is likely to yield results.
- SELCOs major funder is SKDRDP , a semi-religious organisation, with a huge SHG network
- Rural energy access is the primary mandate for funds for Boond Engineering.

- According to Simran, policies are more manufacture oriented and therefore needs to be more conducive to the rest of the value chain including suppliers and end users.
- DC Micro-Grid project Unnao, UP, is mostly for home lighting systems.
- AC micro grids are needed for providing electricity to commercial consumer which is cost intensive and Boond plans to get into the segment in the near future.
- **OMC Power** has telecommunication towers in the region which provide anchor loads for the proper functioning of micro grid system.
- Average annual insolation of UP is very low which also possess a challenge to solar power generation in winter and majority of electricity is produced from diesel generators.
- **Problems with Mini-Grid:**
 - Covering the entire community with mini grid with Infrastructure for generation, transmission, distribution and other ancillary setups is a challenge.
 - It is very difficult to avail Loan facilities in these cases.
 - Certain policy decisions, like, whether the subsidy of 30% by NABARD is enough for rural consumers needs to be introspected and debated.
 - Presence of private players is very less in off-grid solutions. There is a need to allocate funds not just through capital subsidy but also through PPA model.
- **Policy Advocacy:** Boond has been working with MNRE for the past 2yrs, but most of the advocacy happens through CLEAN network of organisations. However, to make things more visible at grassroots level and for the implementation of solar energy project smoothly it wishes to closely engage with MNRE.