

CMES's Experience in the Dissemination of Solar Photovoltaic Energy in Bangladesh

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Introduction

Non-conventioned energy is still something of a Novelty in Bangladesh and its share is as yet insignificant. But the potential and the necessity of the same are great, and these are already been felt. Solar PV home systems have been the only really commercialized item of the renewable energy so far in Bangladesh. The enthusiasm for solar electricity in the rural areas has been encouraging for the obvious advantage it offers. But the high initial prices are beyond the affordability of most of the families, and this remains the crux of the problem. This and other limitations have kept the extent of dissemination and commercialized rather small.

The Centre for Mass Education in Science (CMES) a NGO with an aim to bring the messages and actions of science and technology nearer to the life-activities of the common people of Bangladesh, took up a program to try to understand the problem and to give hand in the dissemination of Solar PV. In particular, CMES attempted to get a feel of the basic gap between the needs and wishes of the people and the extent these can be fulfilled so far as the solar electricity is concerned. The next thing it addressed being the exploration for the strategies to minimize this gap.

Study of the Current Projects

Before CMES started its own bit of dissemination work on Solar PV, it had the good fortune to be able to study at close quarters, some pioneering work in the field of the extension of solar home systems. REB's (Rural Electrification Board) Narshingdi project and GS's (Grameen Shakti) have been, in their own different ways, the first real attempt to reach the rural home in any size and significance. CMES could lend a hand, through its own field of interest, in both of these. The CMES Solar Team met almost all of the REB clients and interacted with them because of its involvement with the consumer training, before and after the installation and through the first days of experience with this novel technology. Similar things happened with the initial few of the GS clients whose reactions were vital for its subsequent progress.

Some of the things which we learned from these interactions with the clients and their family members on the one hand, and with the actual observation and measurements of the performance of the system on the other, provided the necessary background to some interventions of our own. These include the following:

- Consumers still come predominantly from the relatively well-off families—middle or rich farmers, people in business in the town but living in or often visiting the village home, foreign wage earner's families etc. Naturally, systems with higher power (at least 48 WP) are more in demand, and TV viewing is very much in the agenda.

- Excitement with the electrification, its novelty, and pride of possession and control, played a major part in the popularity of the home systems. However, there has been also a tendency to regard this as this as the second best option because of its severe limitations for the relatively well-off consumers. The latter would like to use electricity for larger hours and for more power-intensive purposes
- The humbler people would like to meet then basic necessity of lighting from a small PV system, but it is harder for them to afford one, and given the severe limitation of their income, they can not put electricity in the priority. While paying for a purchased system outright or in installments, may be very hard even paying an economic tariff lighting care actually enhance their income somehow.
- The battery charging station option started popular because of its flexibility in use. But the care and maintenance both from the part of the user and the management proved to be too critical in this case to be quite successful.
- For the stand alone solar home system, however, maintenance has not proved to be a big handle. Of course there have been abuses families and shortages, particularly during the rains. But the people gradually seen to understand better, and adapt themselves to the basic house-rules of solar PV.
- The problem with the blackening in the fluorescent lights has been most persistent technical issue. In the GS's are this led to quite a wide range of experimentation's with tubes and ballast's. The problem has been reasonably contained and the need of replacements etc. is not now overwhelming.

Surveys and Demonstrations

CMES took an initiative in conducting a feasibility survey to see the actual extent of demand for solar PV in various regions of the country. CMES has 17 Rural Technology Centre (RTC) each with its network of 20-28 technology-oriented Basic Schools—all well distributed the country including some very remote areas. These have been used as the bases for the survey-looking at the local needs, alternatives available and the willingness to pay for PV. Preparatory to this general survey a team of 34 Senior Teachers (most of them polytechnic diploma holders) were trained on the basis of PV and the survey methodology.

Based on the results or the general survey four different areas were selected for an intensive work of fact finding and dissemination. The are :

- Some chars (islands) in the river Jamuna, near Shirajgonj
- Nayadiari, Nowabgonj
- Deuty, Pirghacha, Rangpur
- Khasherhat, Patuakhali
- Patharghata, Borguna

Out of these the potential consumers in the Jamuna chars were the most ambitious one. They seem to be quite enterprising and already have arranged for meeting their electricity need partially from makeshift diesel fueled generator. They are interested in solar PV only if the latter is cheaper and capable of some heavy-duty work as the diesel fueled electricity. The other selected areas seemed to be good candidates of solar PV systems even if they come with more modest abilities.

In each of these areas a basic demonstration kit was exhibited around, usually on board a rickshaw van appropriately decorated for the purpose. While demonstrating the abilities of 50 WP system, things have been patiently explained to everybody interested, including those which can be and not be expected from the system, the possible costs not excluded. The results of the demonstration-exhibitions have been a lot of enthusiasms for this new technology and a desire to observe it more closely for a longer period. Many came forward to negotiate terms under which they can procure a system for themselves. Needless to say that often there has been quite a gap between what they can afford and what can be offered. Nevertheless possible marketing strategies were explored which may close the gap.

Alternatives in the Marketing packages

The CMES program made a cost analysis of the Solar PV systems taking into account the prices; possible repairs, replacements and maintenance over the year; and the depreciations. This led to several possible marketing strategies to be piloted by the program:

- Sale of the system with a 50% down payment and the rest to be paid in several installments.
- Learning the system for one year in exchange of a yearly rent to be paid in advance. Materials and service guarantee for the first 3 months of the year and thereafter these are provided only at cost.
- A micro utility set up in which a local provider would supply to many contiguous consumers and collecting tariffs on a daily or weekly basis.

Examples of all these strategies are on trial by CMES, with significant success in each so far. However the number tried are so far few, being limited by the systems that may be provided by CMES program.

On the installment sale, the strategies is not a novel one, and so long as the installments may be kept small and non-frequent enough, there are takers. There are even more takers for the leasing scheme-as the consumer feels less at risk in this type of deals. He would think about a renewal of the lease only if satisfied during the first year. In fact, all the leases have been since renewed. So long as the yearly rent is fixed so as to cover all the possible repairs and replacement costs as well as the depreciation costs along with the profits and interests, this can be a feasible marketing strategy. Of course the rent should also match the yearly energy budget of the consumers.

The most exciting experience that the CMES's Solar PV program has had so far, is that with its micro utility, perhaps the first of its kind in the country. The site is the Alok Dihi

Bazaar at Ranir Bandar, Dinajpur. Here 20 shops are being illuminated by solar electricity supplied by two big systems conveniently placed in two spots within the bazaar, There is a waiting list of another 20 shops to be connected. Each of the shops has to pay a small security deposit and a very small daily tariff of Tk. 4 (US 8) for a 5 hour electricity supply every night. In fact their cost for oil- based illumination has been almost double before this. A recent study on the customer satisfaction after about one year of service, shows that in spite of a few occasions of failures, mainly caused by weather, they are quite satisfied and none would think about an alternative other than the grid electricity.

One important by product of the marketing pilot schemes is the training of local technicians in the maintenance of all these. In fact CMES has trained technicians from these localities, many more than necessary for its own purpose. The trainees offered themselves for the training's bearing their own costs for logistics and travel to Dhaka, because of their confidence that there would be a greater demand for this skill soon enough.

Adaptive research on and production of accessories and appliances

For a more thorough understanding of the real- life problems of Solar PV, and for a better conduction of dissemination and marketing pilot program, CMES has undertaken adaptive research on accessories and appliances of Solar PV system. Through this process, it has developed and produced various interfaces the PV systems appropriate for the present situation. These include ballasts, charge controllers, and inverters as accessories and converted solar sewing machines and solar drilling machines as mechanical appliances with potentials to be used in income generation activities.

The system being used in the demonstration and marketing pilots are using these accessories. While the process provided much less expensive components for the system than those available in the market, it has also facilitated the experimentation's to optimize the cost-benefit situation for the cases a point.

Conclusion

The CMES efforts in the dissemination and development of solar PV system is still in their early stage. But it has already set up an example where R & D, field level interventions and marketing initiatives in this technology can be taken up in right earnest by a non-profit NGO; working in the interest dissemination and commercialization of this renewable energy source, without itself being a commercial organization.

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