

Bringing light to villages the Aryavart Grameen Bank

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Uttar Pradesh is one of the poorer states in India. For centuries, people have been subsistence farmers, growing rice, wheat, lentils, and mustard seeds. Some cash crops like sugar cane, potato, and mentha are also now cultivated on a large scale. Buffalos are reared for milk and meat. Over the years, the farms have become



(Aryavart Grameen Bank) on 3 October 2006. The AGB operates in six districts of Uttar Pradesh around Lucknow, through 289 branches employing 1445 people. It provides loans for agricultural activities, including cattle, machinery, and inputs for cash crops. However, it is challenging to run a modern, computer-based bank in a place

smaller as the land is divided between children in a family. Many rural areas of the state have no grid electricity, and even where the grid is available there are frequent power cuts. Some shops provide a battery-charging service so that people can run DC lights and small appliances from car batteries. SPV (solar photovoltaic) home systems can be very effective in providing power for lighting and small appliances. However, in many parts of India, and other developing countries, the main obstacle for rural families who want to install an SHS (solar home system) is finance.

Late Ms Indira Gandhi, the former Prime Minister of India, launched the social banking system in India. This system aimed at providing banking facilities in rural areas, and at making small loans available to farmers and other rural people. The network of

RRBs (regional rural [grameen] banks), established starting October 1975, is regulated by the RBI (Reserve Bank of India) and NABARD (National Bank for Agriculture and Rural Development). The RRBs were very effective in bringing services to rural customers and currently account for a quarter of bank branches in rural areas. However, their small size gradually became a barrier to efficient operation. In 2005, the Indian government gave RBI and NABARD the task of re-organizing the RRB set up. Groups of two or more RRBs were amalgamated, creating 45 larger grameen banks and another 43 standalone RRBs, which still operate in specific small geographical locations.

As part of this process, the Avadh Grameen Bank, Farrukhabad Grameen Bank, and Barabanki Grameen Bank were amalgamated into the AGB

with unreliable mains power. In 2006, the AGB decided to install PV systems at five of its branches to provide back-up power during mains power cuts. The PV modules generate DC electricity in sunlight, which is stored in rechargeable lead-acid batteries. When the mains fail, the batteries are used to run an inverter, which converts the DC to AC at mains voltage and frequency to power essential loads like computers.

Technology and use

The AGB programme provides two sizes of SHS. The more common Venus I package has a 35-Wp (TBP 1235) PV module; a 12-V, 40 Ah tubular lead-acid battery; two 9-W CFLs, which includes reflectors to enhance the light output; a charge controller (MCR 1210 L); and a mounting assembly for the module. The larger Venus II package has a 70-Wp (TBP



1270) PV module; a 12-V 110 Ah battery; four 9W CFLs; and the charge controller (CI 10) and mounting assembly. The PV modules are made from polycrystalline silicon and manufactured in Bangalore by Tata BP Solar. The batteries, charge controllers, and CFLs are all produced in India by various manufacturers under contract to Tata BP Solar.

Both systems are specified to provide lighting for four hours per day with autonomy of three days (that is, continue to supply power for two dull days after one sunny day) although in practice up to eight hours of light is often possible. The systems can also support a mobile phone charger, a DC fan, and/or a black and white TV.

How users pay

The AGB negotiated a bulk supply deal with Tata BP Solar so that it could make available a Venus I system for Rs 13 520 (£171) and a Venus II for Rs 27 040 (£342) including 4% VAT which has been levied by the UP state government from January 2008. The bank will supply SHS only to its own KCC (Kisan [farmer] Credit Card) customers, who have already established a track

record of reliable credit repayment. The KCC is a loan scheme for farmers offered by all the banks in India. The bank offers its KCC customers a finance package through which Venus I purchasers pay Rs 2520 (£32) upfront and are provided with a loan of Rs 11 000 (£139) @12% interest per annum, which is repaid with monthly instalments of Rs 245 (£3.10) over five years. For the Venus II package the down payment is Rs 5040 (£64) and the instalments are Rs 490 (£6.20) per month.

To promote the idea of the SHS, the AGB branches hold 'credit camps' in villages. Speakers from the bank and solar industry demonstrate the SHS and explain how it works. They also explain the details of the finance package, and invite participants to sign the contract agreement for a SHS.

Training, support, and quality control

PV systems need checks and occasional maintenance even if they are manufactured and installed to high standards. The AGB has developed an innovative way of providing this continuing supervision, which also brings employment

to rural areas. Branch managers identify and engage young people with reasonable education in each village to become part-time 'business facilitators'. These facilitators are trained by the local Tata BP Solar dealer in system installation, maintenance, and repair, and the company provides them with a basic tool kit and a mobile phone. Each facilitator is allocated 100 SHS customers, and helps the Tata BP Solar engineer to install their systems. The facilitator then trains the customer in the use of the system, answers any questions, and is available to solve basic problems.

Direct benefits to families

The Venus SHS provide power for at least four hours and sometimes as much as eight hours per night with three days autonomy. Solar lighting enables school- and college-going children to study for longer and in brighter light without the fumes and fire risk associated with kerosene. With a kerosene lamp they would study for no longer than two hours in the evenings. With an SHS, pupils preparing for higher school examinations are now studying for up to four hours in the evening and two hours in the morning.

Environmental benefits

The replacement of kerosene reduces the emission of greenhouse gases. A typical household using eight litres/month of kerosene would have produced about 240 kg/year CO₂. The total saving for the 8007 systems installed up to the end of April 2008 is about 1900 tonnes/year CO₂. The target of 25 000 systems by October 2008 will save about 6000 tonnes/year CO₂.

Potential for growth and replication

In many parts of India, and other countries, the main obstacle for rural families who want to install an SHS is finance.

Banks are cautious about providing personal loans to purchase SHS. In addition, solar dealers have to take out commercial loans to buy stock, and this restricts their rate of growth. Having a bank, which actively promotes solar is therefore an enormous benefit. The AGB is convinced of the benefits of SHS and is confident that loans will be repaid, because it has set the standards for systems quality and maintenance, and is lending to its own customers with an established credit history. By bulk-supplying stock and using existing dealers as installers, the bank has also saved the dealers from having to take out commercial loans.



The Ashden Awards

The AGB was one of the winners of the Ashden Awards in the international category for the year 2008. The £20 000 award was received by Mr N K Joshi, Chairman, AGB. The awards ceremony

was presided over by Nobel Laureate, Dr Wangari Maathai.

The Ashden Awards were founded in 2001 by the Ashden Trust, one of the Sainsbury Family Charitable Trusts.

Since then, it has helped more than 80 innovative projects develop their work. Today, the awards are an internationally recognized yardstick for excellence in the field of sustainable energy.

Electrification of hamlets in district Panchkula, Haryana using solar photovoltaic systems

Though all villages in the state of Haryana have been electrified, there are still few hamlets (Dhanies) in the hilly Shivalik Belt of district Panchkula that are yet to be electrified. These hamlets have very few households and are not accessible by road. People in these hamlets were using kerosene and so on to meet their lighting needs. Electrification of these hamlets with the conventional electricity grid is not economically feasible due to hilly terrain and few houses in each hamlet.

Realizing the needs of the people living in such unelectrified hamlets of Block Morni, District Panchkula, HAREDA has taken up the electrification of 45 such hamlets of Morni Hills using SPV technology. In 38 hamlets, SPV home-lighting systems consisting of two light points and one fact to each household alongwith SPV streetlights were provided. In the remaining seven hamlets electrification was achieved by installing SPV power plant of 5-kW capacity in each hamlet. This project provides electricity to 305 houses in the 45 hamlets with a population of 1564 at a total cost of Rs 250.19 lakh with the ministry providing central financial assistance of Rs 146.83 lakh.

