

## Rural Development Powered by Bangladesh's Solar Energy Program

Although the energy needs of rural Bangladeshis are modest, energy is essential to their development: They need light for extended opening hours in market stalls, cafés, rice mills, saw mills, tailoring shops, and grocery shops. Their children need good light to study in the evenings, and schools need energy in order to be able to teach the IT skills mandated in the national high school curriculum. Community health centers need a refrigerator to store vaccinations and other medications. Mobile phones keep villagers in touch with market prices for their produce and with relatives working in the cities or overseas.

However, 75% of all rural Bangladeshis have no electricity in their homes – the grid does not extend to the remote villages where they live and in fact, in most cases, the power lines will not reach them for another 15 or 20 years. These villagers do most of their work from dawn to dusk, and in the evenings they depend on kerosene lamps, which provide poor illumination and produce emissions that cause respiratory and eye problems.

Solar technology is an effective and environmentally sound way to provide most of these people with electricity. And, in fact, one of the world's most successful solar energy programs has been working in Bangladesh for the last ten years to do just that: over 1.2 million solar home systems have been installed in the country's rural villages since 2002, benefitting over six million Bangladeshis.

The program was initiated by the Infrastructure Development Company Ltd. (IDCOL), a Bangladesh-Government-owned financing company, and has been supported by the World Bank, the Asian Development Bank, the Global Environment Facility, the Islamic Development Bank, and German development cooperation through KfW Entwicklungsbank and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. GIZ has contributed to installation of over 160,000 such solar home systems.



Tailoring shops, market stalls, cafés, rice mills, saw mills, and grocery shops can have light and extend their opening hours, allowing the owners to increase their earnings.

IDCOL works through 30 local partner organizations that sell, install, guarantee, and maintain the systems. A typical 50 watt solar home system, which can power four to six energy-efficient lights plus a socket for TV, radio, or battery recharger and a mobile-phone-charging unit, costs around 25,000 takas (less than 250 euros). Customers can pay cash for their system or take advantage of a micro-credit scheme (variable down payment and monthly installments) that makes solar home systems affordable for ordinary rural families.

The genius of this program lies in the fact that the partner organizations have a permanent presence in the rural areas. They not only extend micro-credit in order to sell the systems; their technicians – often women – install the solar systems, guarantee them (20 years on the panel), and perform any required maintenance, free of charge, when they collect the monthly payments at the customers' homes. If something fails – the lamp, for example – the outlet of the partner organizations is less than 15 kilometers away, and a replacement can be easily obtained.

This unique financing and service scheme is the critical element that is missing in most countries and has made Bangladesh a model for numerous countries worldwide, where two billion people have no access to electricity and can best be served by solar energy. IDCOL continues to expand rapidly: the company recently announced plans to provide financing for another one million solar home systems to be installed in Bangladesh by 2014.

#### Small solar home systems for the very poor

Although the solar panel cost per watt peak has declined in recent years, the price of a solar home system still remains out of reach for millions of rural Bangladeshis. Therefore, the Sustainable Energy for Development (SED) Program, supported by the Bangladesh Ministry of Power, Energy, and Mineral Resources and the German Federal Ministry for Economic Cooperation and Development through GIZ, spear headed a number of new approaches for reaching the very poor with solar power.

With SED support, private-sector partner organizations employed new light-emitting diode (LED) technology to design solar systems of between 10 and 21 watts that can power two to four lights and charge a mobile phone at a cost of only 10,000 or 15,000 takas (100-150 euros). Public response to these small solar home systems was so positive that IDCOL agreed to include these smaller systems in its solar home systems program.

However, SED has been working with its partners to develop an even smaller solar system to meet the basic lighting needs of even poorer households. These Pico PV solar lanterns, with panel sizes of less than 10 Wp, use efficient LED technology to ensure maximum light output from a small amount of energy. Lithium based batteries with a capacity to run the lights at full power for a period of 12 hours make these products environmentally clean and reliable also in the rainy season, where light levels can remain low for a number of



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days. With at least 200 lm per system, the lanterns are able to light a small hut much more comfortably and efficiently than the traditional kerosene lanterns. The aim of the project is to hold the cost of this new solar lantern below the amount that a household could potentially save within two years by replacing its kerosene lamps.

Financing has been arranged for the first 60,000 lanterns. GIZ, with co-financing from the Dutch-German-Norwegian Partnership Program Energizing Development, is providing buy-down grants and other support for partner organizations to help them develop the market for these smaller systems, using the same successful model employed for the larger systems.

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