

Solar businesses embrace less-developed regions

The photovoltaic industry is finding new opportunities in rural Asia, a sunny region and home to some 800 million people who lack access to electricity.

As about 90 % of Asian people who have need of electricity live in scattered small villages, it makes extending power lines more expensive than off-grid energy solutions. And compared with other off-grid solutions like wind, hydro or biomass, solar PV solutions have an edge in requiring low maintenance and not relying on special conditions like having a river. The technology is also better positioned than diesel generators, a common energy solution in rural Asia. That is because solar solutions do not require transportation of fuels on a regular basis and are unaffected by fuel price increases. It is also easier for villagers to maintain solar solutions than diesel generators.

Sunlabob staff angling the solar panel frame for maximized solar insulation in Xieng Khouang province in Laos in September 2010

Photos (2): Sunlabob



Financing is possible

Apart from its advantages over other energy solutions, there are several factors that are attracting more companies to provide rural developing Asia with solar technology. One key factor is the drop in prices of PV modules, which makes solar energy more cost-competitive in this low-income market. Parvathi Belur, a manager at Indian solar company Selco Solar, says that anyone who earns about one US dollar a day can now be their customer. Another major reason is the emergence of financial services that are tailored for the rural poor. By accessing small loans, more people can purchase solar powered products and pay by installments. Meanwhile, supportive government policies on solar energy are also contributing to the proliferation of solar solutions among the poorest. The Nepalese government, for example, covers about 30 % of the cost of a 30 W off-grid PV system for households in rural areas, says Khem Raj Bhandari, manager at Nepalese solar company Lotus Energy.

Although there is tremendous solar business growth in rural developing Asia, its pace varies from country to country, says Seethapathy Chander, Chair of the Energy Committee at Asian Development Bank. India is among some of the more active markets, due to available financial services to the rural poor and a relatively high price of diesel. In Indonesia, however, where diesel prices are about half of those in India, solar businesses are lagging behind other Asian countries.

Selling solar solutions customer by customer

Currently, one major business activity in rural developing Asia is to provide solar solutions to households and small businesses. Interviews with local solar companies demonstrate that small solar home systems, especially in the range of 20 to 200 W capacity, as well as solar lanterns, are in high demand. Solar lanterns are attractive because they can replace smoky, unsafe candles or kerosene lamps to give light after dark. Those solar lanterns have a small fluorescent or LED light with a rechargeable battery. Some lanterns have a small built-in PV module, and others are designed to be plugged into a PV module for charging.

A solar home system is another popular solution. These systems can power light bulbs and also a radio, a common communication channel in remote areas, without the expense of dry-cell batteries. And, with a rapid growth of the cell phone network, solar

home systems allow people to charge their cell phones too.

To serve low-income markets, a solar home system is designed with sufficient PV capacity to provide the daily electricity demand throughout the year, with typically three days' storage capacity in the battery, according to The Ashden Awards, an organization that promotes renewable energy in the developing world. The organization also mentions that costs of solar home systems vary between countries. As an example, in Nepal, a 30 W solar home system can cost around US\$ 300. Such a system powers 3 light bulbs for 4 hours a day and can operate a radio, according to the local solar company Lotus Energy.

However, having the best energy solution doesn't always ensure commercial success. It also requires a smart operation strategy. And that is an aspect that could be learnt from Selco Solar, a successful solar solution provider in this market. Based in Bangalore, India, Selco Solar now has around 150 employees to serve over a hundred thousand customers in West India's Karnataka and Gujarat states. Most employees are based in small centers from which they market, sell, install and provide after-sales services. Each center takes care of the surrounding population, typically up to 2 hours away by car. Local presence is a key to success, says manager Belur, adding that it ensures doorstep service and helping customers with financing from nearby banks. Belur says most of their customers have a monthly income of US\$ 100, but even people making one third of that can afford their solar solutions. That is because the company helps them acquire a small loan from local banks to deal with the upfront investment. The loan is usually with a 12 to 15 % annual interest rate, paid over a period of three to five years, according to Belur.

Thanks to its local network and helping customers with financing, Selco increased its annual revenue by over 20 % to US\$ 3.3 million in 2009, from



Girl studying with Sun King solar lantern

Photo: Greenlight Planet

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US\$ 2.7 million in 2008. Like Selco, successful solar businesses in rural developing Asia have a common strategy, they all help customers to access financial solutions. In the case of Selco, Belur says that at the beginning the company found it very difficult to make banks agree to provide a loan to its target customers. But once a bank had given it a try and witnessed a good payback record, things became easier for ongoing cooperation.

Taking part in larger-scale projects

Along with selling solar solutions customer by customer, some companies also take part in large-scale projects to provide solar-powered water and electricity in rural villages. Some projects are financed by a mix of international aid, local governments and end-users, while others are driven by local businesses and private investors.

One of these businesses, called Sunlabob, is based in Vientiane, Laos. Sunlabob designs projects and finds private investors to make things happen. For example, the company offers solar rental services in Laos. In this sort of project, the first step is to open a fund as an investment opportunity for private investors who target social benefits more than a fast return on investment. Then Sunlabob uses this fund to purchase solar PV equipment, installs energy systems and rents those systems out to a village committee, which consists of Sunlabob-trained villagers. The committee takes care of technical problems with systems and en-

ures the collection of rent. The rent covers all costs, including replacements, operators' pay and on-going servicing costs.

According to Sunlabob, the solar renting project is popular among villagers because it protects the rural poor from technical problems and upfront investment. Sunlabob also implements micro-grid solar PV systems. Andy Schroeter, the company founder and director, says that micro-grid is more reliable than solar home systems, but requires higher upfront investment.

Micro-grid is also a practice in other parts of rural Asia. In India, through government rural electrification programmes, "lots of states have implemented micro-grids based on PV," says Debajit Palit, Fellow at the nation's The Energy & Resources Institute (TERI). For example, Chhattisgarh state, in central India, has almost 1,300 villages covered by solar PV micro grids, he adds.

Playing a role without on-the-ground presence

Selling products and developing projects require industry players to operate locally, but some companies without on-the-ground presence are also tapping into this market. For example, the solar PV manufacturer Canadian Solar has been exporting PV panels to Bangladesh. There is, however, another way to become active. The US investment firm E+Co has been investing in clean energy businesses in low-income markets for years. Basically, E+Co seeks potential entrepreneurs, helps them to develop business strategies and invests in them to launch or expand operations. For solar businesses in rural Asia the firm has invested US\$ 350,000 in Nepal's Lotus Energy and US\$ 224,000 in India's Selco. As a non-profit enterprise, E+Co's gross portfolio return is around 8 % of its global investments, and this year the firm is about to launch a for-profit investment operation specifically in developing Asia. Alongside E+Co, more institutions are now looking for investment opportunities that can make a social change in low-income markets.

One example is the Solar for All Initiative, a consortium of non-profit institutions including the Fraunhofer Institute for Solar Energy (ISE) and the Deutsche Bank Americas Foundation. The initiative is scheduled to launch a tailor-made investment fund this year. The fund aims to support enterprises serving all aspects of the solar supply chain, from production and distribution to technical support and consumer finance. Its typical investments will be up to \$ 3 million and can be provided in a wide range of forms, including equity finance, working capital facilities, term loans and growth capital, and trade credit guarantees. In the rural Asian market, the Solar for All initiative currently focuses on the Indian subcontinent and South East Asia.

Major challenges and ways to overcome them

Although many solar businesses have been growing during the past few years, promoting solar products or

A solar home system in rural India.

Photo: Selco Solar





Sunlabob Solar Lantern Rental System (SLRS) training session for village technicians in Laos

services in rural developing Asia is still not easy. Most companies, even successful ones, say the sector has its challenges. For instance, Palit reports that the most critical difficulty is finding a way to provide customers with after-sales services. This requires companies to develop local operations and foster a large pool of talent in remote areas. Another big challenge for companies is how to help customers deal with the high upfront costs of solar solutions. Financial services to the poor have yet to reach everywhere in rural developing Asia, and even though they exist in many areas of India, the relatively high interest rates still prevent a part of the population from taking out a loan, says Palit.

Another problem that companies face is the bad reputation of solar solutions. In many cases villagers have had an experience with poor-quality products, or inadequate after-sales support. Their trust must be regained before sales can take place. This process could even take two years, according to Belur. Still, solar businesses have figured out various solutions. In dealing with a bad reputation caused by poor-quality products, Selco helps villagers to fix and replace broken solar products, even though those products were not sold by their company.

Others have also found their own ways to reach rural markets and develop a local workforce. For instance, the US solar lantern maker Greenlight Planet has a working pilot programme in 30 districts in Bihar and Karnataka, two states of India. There, its 35 rural sales leaders recruit, train and support a network of over 200 village direct sellers, who are already selling 2,500 of their solar lanterns each month. Amid challenges, solar businesses are looking forward to a brighter future in rural developing Asia. In the case of Greenlight Planet, the company is now trying to raise funds and expand its sales network from two states to five states in India, targeting a 10-fold increase in operations.

Yotam Ariel

Further information:

- Bennu-Solar: www.bennu-solar.com
- Greenlight Planet: www.greenlightplanet.com
- E+Co: <http://eandco.net/>
- Lighting a Billion Lives of TERI: <http://labl.teriin.org/>
- Lotus Energy: www.lotusenergy.com
- Selco Solar: www.selco-india.com
- Solar for All: www.sfa-pv.org
- Sunlabob: www.sunlabob.com
- The Ashden Awards: www.ashdenawards.org
- International Energy Agency: www.worldenergyoutlook.org/docs/weo2010/weo2010_poverty.pdf

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