

SOLAR POWER IN THE WAR ZONE

Burma's Clinics Light Up

Renewable energy can mean more than environmental sustainability - it can mean the difference between life and death. For indigenous Karen medics working in rustic clinics located in conflict zones in Burma, solar power is not a luxury, it's a necessity. Walt Ratterman and Anna Garwood, Green Empowerment report.

Until recently, these remote clinics operated in the dark; medics stumbled over patients lying on straw mats across the floor, and they had to use flashlights as their only light source during emergency operations. But now, 13 clinics have solar power, thanks to the efforts of Green Empowerment, Palang Thai, the Karen Health and Welfare Department, and our generous funding partners including numerous individuals, the Open Society Institute, and Knightsbridge International. Each clinic serves 3,000-5,000 people annually, bringing the total number of people receiving improved medical services to 65,000.

Where there is no light

This project was born out of desperate need. In the remote jungles of Burma (also known as Myanmar) there is no electricity; in fact there is almost no infrastructure at all. Forced labour, arson, systematic rape, and torture have culminated in a massive humanitarian crisis. At least 200,000 people have been displaced from their land and are in constant danger of being caught in the crossfire of a decades-long civil war.

People living in this conflict zone rely on simple, thatched roof clinics to be treated for malaria, landmine injuries, and malnutrition-related diseases. The Karen Health and Welfare Department (not part of the

Burmese government) manages 26 remote clinics, scattered across 600 miles, to serve the needs of these Internally Displaced People (IDP) who have been forced to flee their villages, but remain within Burma. Seventy-five medics work at these clinics and roam the forests as "backpack medics" attending to the medical needs of thousands of people. The clinics did not have electricity due to their remote location, far from the national electrical grid and without easy access to fuel for generators.

Solar power solution

Solar photovoltaic (PV) power proved to be the perfect solution to electrify these remote clinics because it can be transported, owned, and operated at the clinic level. To make sure that the clinics have reliable lighting, we selected and designed special PV systems, and held intensive training for system operators. The systems were designed for 1) high reliability, even during rainy season and 2) mobility so that the systems could be carried, by foot, to the clinics and moved when the security situation demanded. With these considerations in mind, each system consists of a 110 watt solar PV panel, a 12-volt 125 ampere-hour deep cycle battery especially designed for solar home systems, two 12-volt, 20-watt, fluorescent lights, and a 1-watt LED that is used as a night light. The charge controller, switches, and strain-relief terminal strips are housed



Solar power: electrifying remote medical clinics in Myanmar and Thailand

Further information

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within a rugged cabinet so that the system is durable and relatively "plug and play." The system powers the lights and a DC receptacle for charging batteries for two-way radios, laptop computers, and other devices.

Teaching the nuts and bolts

What makes developing world projects succeed or fail is often not the equipment - that's the easy part - it's the underpinning of the projects with locally trained technicians that know how to manage loads, maintain batteries, replace wires, or reinstall the systems. Only when projects develop local leadership will they be self-sufficient and ultimately sustainable. For this project, two medics from each of the clinics walked up to two weeks, through the conflict zone and crossed the border into Thailand, where the solar training was held. Instructors from Green Empowerment and Palang Thai taught participants the practical aspects of solar power. The trainings combined classroom instruction with hands-on construction of the systems. The class covered the ins and outs of basic electricity (volts, amps, watts, and watt hours) and photovoltaic systems (how to maximize solar panel output, the importance of thick wires and good contacts, maintenance of lead acid batteries and optimal load management). Participants then built the systems from scratch, learning to assemble and disassemble them, and fix any technical problems that could arise. Having practiced the installation at the training, the participants carried the systems through the jungle, back to the hidden clinics, and installed the systems on their clinics themselves.

A close call

The test run of assembling and disassembling the systems was put to use in the field. In one instance, the clinic team reported having heard that the army was going to attack the clinic. Incredibly, they dismantled the solar system and escaped to a hiding place, bringing the panels, lights, and batteries with them. When they returned, the clinic had been burned down, but they have since rebuilt and reinstalled the valuable lighting systems. This exemplified the importance of the medics having a firm understanding of how to install the system.

More clinics need light

The word has spread among the medics and patients about the advantages of solar power and now five more clinics are in areas where the risk of army attacks is low enough to install the systems. Medics in these clinics are eager to have power to improve their ability to examine specimens under microscopes, operate at night, charge batteries and use laptops to research medical diagnoses and procedures. In February 2005, the project partners are holding another course to train medics from these 5 clinics on solar systems. Training participants will be given PV systems to carry back to their clinics. As the situation changes and as we are able to raise the needed funds, we intend to continue working with the medics on the electrification of other clinics inside Burma.

Extending the training

The Karen people -- one of several indigenous groups being oppressed in Burma -- live on both sides of the Thailand/Burma border. Tens of thousands of Karen live in refugee camps in Thailand, having fled the harsh conditions in Burma. Other Karen have lived in long-established villages in Thailand, since the Thai/Burma border runs through the Karen people's historic lands. Therefore, Green Empowerment has formed a partnership with local organizations to mount a program to work with Karen refugees and villages, in addition to the medical clinics inside Burma, in order to help them in their development of renewable energy skills. The current focus of this program is to expand the local knowledge base so that people will be aware of their choices, and to learn how to manage and maintain the solar systems that are already in place.

The Thai government has undertaken a momentous program to provide electricity to all of the non-electrified rural villages in Thailand - many of which are currently inhabited by indigenous peoples, such as the Karen. This program has started and is proceeding rapidly. However, as ambitious as the program is, there is not enough emphasis on the training of the users of the systems, or on creating a core group of technical people who have advanced knowledge about troubleshooting the systems.

Without proper training, the villagers will not be aware of how best to manage their use of electricity (load management) to keep their systems operating at their maximum potential for many years to come. And, in the event of a failure, they currently have no technical skills or resources to troubleshoot the systems or take the appropriate actions in seeing that they are fixed.

This opportunity is tremendous, and the effort involved huge. Through the government program, an estimated 290,000 solar home systems are being installed. Without the appropriate training on the village level, these systems could follow the direction of so many other well-intentioned, but poorly designed renewable energy programs, resulting in large percentages of them failing in a relatively short time. It is the goal of our



With proper training, villagers will be aware of how best to manage their use of electricity



Installing a PV system at a clinic

partnership to correct this situation and train local instructors, who can then go out and teach village leaders and residents how to keep their systems working.

We also plan to make this training available to the Karen currently held in the refugee camps. They will then have the added skills to participate in renewable energy projects in the camps and inside Burma once they are free to return. The first training to address the energy needs of the Karen on the Thai side of the border will be in February 2005. We are seeking funding partners so that we can build on this training and ensure the sustainability of one of the largest solar home system programs in history.

International partnerships

This project, which is the product of an ongoing partnership of local and international groups, including the Karen Health and Welfare Department, Palang Thai and Portland-based Green Empowerment, exem-

plifies the opportunity for international collaboration in the efforts to implement renewable energy projects. This partnership brings together technical expertise in renewable energy design, implementation, and training with a sound track-record of working closely with the Karen medics and communities. Together, we have the breadth of skills and experience to successfully develop solar power into a viable long-term solution.

Palang Thai is a Thailand-based nonprofit organization dedicated to empowering grassroots communities and small entrepreneurs to use renewable energy in ways that support sustainable development and participatory democracy. Palang Thai works both at the community level and the national policy level. The Karen Health and Welfare Department (KHWD) is coordinating the medics from the clinics receiving solar electric systems and organizing the training in Mae Sot, Thailand. The KHWD is dedicated to addressing the needs of internally displaced Karen people in Burma. They organ-

ize and support a network of 28 health clinics that provide crucial medical care for over 100,000 people annually living under violent and oppressive conditions.

Green Empowerment is a nonprofit organization based in Portland, Oregon, USA dedicated to advancing community-based renewable energy and water delivery projects around the globe. By utilizing micro hydro, biomass, solar power systems, and hydraulic ram pumps, our projects have a positive social impact and conserve natural resources. Along with this Thai/Burma solar project, Green Empowerment, together with our partner NGOs have implemented renewable energy and conservation projects in Nicaragua, Guatemala, Ecuador, Peru, Malaysia, and the Philippines. Our projects are associated with residential lighting and electricity, power for schools and clinics, energy for economic development and micro-enterprise, watershed protection and provision of potable water.

Green Empowerment makes it a point to partner with local non-governmental organizations (NGOs) and rural communities to construct community-owned renewable energy systems. The role of Green Empowerment is to catalyze the use of renewable energy for community needs by providing organizational support, fundraising assistance and technical expertise to local groups. We emphasize strengthening the local leadership to be able to technically and financially maintain the energy systems, encouraging self-sufficiency and non-dependence.

RE for a sustainable global future

Although we are growing fast and reaching more people every year, the need for appropriate, small scale renewable energy is great. About a quarter of the world -- nearly two billion people -- have no electricity. It is essential to couple this great need with the great opportunity of renewable energy as an alternative to fossil fuel energy. Since poverty alleviation and access to reliable energy are inextricably linked, it is time to use the innovations of small scale renewable energy to address the basic needs of thousands of people. From clinics in Burma, to villages around the world appropriate-scale renewable energy can make a huge difference, sometimes even saving lives.