



Photovoltaic array on Thomonde hospital, Haiti  
Photo by Nadia Todres, courtesy of Solar Electric Light Fund

"DOCTORS OPERATING OR WOMEN IN LABOR CAN'T HAVE THE LIGHTS GOING OUT WHEN A GENERATOR BREAKS DOWN OR RUNS OUT OF FUEL. IT'S CRITICAL THAT WE DELIVER TOP-NOTCH ENERGY STORAGE, PARTICULARLY TO ENSURE THAT EMERGENCY AND OTHER PROCEDURES AT NIGHTTIME CAN OCCUR."

- Rick LaRue, Solar Electric Light Fund

## **Thomonde Hospital**

central region of Haiti

### **System specifications:**

- **Batteries:** 48 Trojan L16RE-2V
- **Inverters:** 4 Outback VFX3648
- **Solar modules:** 126 SolarWorld 230W
- **Charge Controller:** 6 Outback FM 80
- **Racking:** Unirack

Located in the central region of Haiti, the town of Thomonde and its surrounding communities are home to more than 35,000 people who live without access to reliable electricity. The Thomonde residents are primarily small farmers who earn a living by growing and selling sugar cane, rapadou, tobacco, bananas, and coffee. As the poorest country in the Western Hemisphere, Haiti is in great need of access to quality health care, something that is very hard to achieve without a reliable source of electricity 24 hours a day.

In 2006, Partners In Health (PIH), a non-profit organization that provides healthcare to some of the poorest people in the world, built a hospital in Thomonde to improve healthcare in this region of the country. The 17-bed Thomonde hospital has a full maternity ward and inpatient services and serves hundreds of patients every

day. Hospitals require the use of many electrical devices to test, care for, and treat patients and a reliable energy source is critical to the success of many medical procedures. Since the hospital was built, it has been powered by a diesel generator which is expensive to run, difficult to maintain and a source of air pollution. For these reasons, the generator is not used 24 hours a day, which limits the care the hospital can provide.

After the Haiti earthquake in January 2010, the Solar Electric Light Fund (SELF), a non-profit organization that designs and implements sustainable energy solutions for enhancements in health, education, agriculture and economic growth in the developing world, was asked by PIH to install a solar electric system for the Thomonde health care center as part of a larger Rebuilding Haiti project. The Thomonde project would help reduce the center's recurring fuel costs, provide reliable electricity and reduce carbon emissions by offsetting the diesel generator.

Designed and installed by SELF, the 29 kilowatt (kW) off-grid photovoltaic (PV) system powers compact florescent light bulbs and florescent tube lighting, lab equipment, ceiling fans, water coolers, refrigeration, computers, a satellite communication system and other medical and operational equipment including kitchen appliances used to cook meals on-site for the patients and staff. Reliable electricity also allows for cell phone charging and

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Patient waiting at Thomonde hospital  
Photo by Nadia Todres,  
courtesy of Solar Electric Light Fund



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48 Trojan L16RE-2V batteries  
Photo by Jeff Korcan,  
courtesy of Solar Electric Light Fund

advanced teaching aids like TVs, DVDs, and radios for HIV education.

Solar electricity is generated by 126 solar modules and is stored in 48 Trojan L16RE-2V batteries. Designed with a 10-year battery life, Trojan Battery's Premium line of flooded deep-cycle batteries is specifically engineered to withstand the rigorous conditions of renewable energy applications such as extreme temperatures, remote locations and the intermittent nature of solar power generation. Trojan's deep-cycle batteries are designed to be cycled regularly and are engineered to perform optimally under conditions where the batteries are not fully charged or discharged every day, a common occurrence in renewable energy applications due to the varying levels of irradiance, temperature, and available sun hours.

The 48 L16RE-2V Trojan batteries are wired in a two string configuration, 24 series by two parallel, for 48V DC output with a total capacity of 1,110 Ah at C20. The flooded battery technology used requires simple maintenance to ensure maximum battery life by adding distilled water to the individual cells regularly to ensure maximum battery life.

The Thomonde battery bank was designed for 40 percent depth of discharge and only one day of autonomy due to the large loads of some of the medical equipment and the availability of the diesel generator.

While the solar system installation was successful, the project was not without its challenges. The system was installed during the rainy season, making travel to the site and working conditions more difficult. An undelivered shipment of system components caused delays, and an unexpected outbreak of cholera in the area while the project was taking place required tents be set up around the hospital to accommodate the influx of cholera patients.

During periods of predominantly sunny weather,

the PV system can produce nearly 100 percent of the hospital's energy needs but the diesel generator is available for use during cloudy weather or as an emergency backup power source. For some medical equipment such as an X-ray machine, where the power rating exceeds the capacity of the inverter, the generator is used. SELF and PIH are working with the hospital to make energy efficiency improvements in its air conditioning units, fans, X-ray machines, and other equipment through trainings and facility updates. The solar array includes a monitoring system that enables SELF to remotely monitor the PV array output and voltage, the inverter output, and the state of charge of the batteries through a satellite-based Internet service. Field staff members from PIH and SELF provide ongoing training, updates, and regular system maintenance to ensure the project's ongoing success.

**For more information contact:**

**Trojan Battery Company:**

**[www.trojanbatteryRE.com](http://www.trojanbatteryRE.com)**

**Solar Electric Light Fund:**

**[www.self.org](http://www.self.org)**

**Partners In Health:**

**[www.pih.org](http://www.pih.org)**



Trojan batteries are available worldwide.

We offer outstanding technical support, provided by full-time application engineers.

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