Global Solace

empower • inspire • sustain

Global Solace, Inc
20530 Beallsville Road
Beallsville, MD 20839
(301) 972-8672
info@globalsolace.org

Marco Sanchez Elementary School

SFPR Contact:
Rafael Quinones,
rafaelq535@msn.com

Community Contact:
Beatriz Velasquez, Principal
(939) 579-0316
D32706@de.pr.gov

Goals:
1. Provide electricity to the school to facilitate its use as a school and community meeting place by installing a solar photo-voltaic system;
2. Provide emergency electricity for future emergencies;

Proposed Project:
- 5Kw Solar Array System,
- Replacement of florescent light lamps with LEDs

System Cost:

Solar Array System	$35,000
Efficient LED Lighting	$5,000
Total Cost	$40,000

The Need

Hurricane Maria devastated this rural community located in the mountains above the town of Yabucoa, downing trees and wires, and destroying many homes. Roads have been cleared, but the electrical grid restoration in this area may be as much as a year away.

This rural school has no electricity and no operational generators, and is currently functioning at a reduced capacity. The school has no water supply and children must bring drinking water from home.

Resiliency for the community during future destructive events is also a major concern. The school serves as a refuge during storms and as a food and water distribution point afterwards.

The Setting

The Marco Sanchez School is the local elementary school serving a community of 1,500 people with pre-hurricane number of students of 400. This school building acted as a refuge for the community during hurricane Maria, and is presently a distribution center for food, water, and other donated items.

The school is located approximately 3 miles from the center of Yabucoa in the surrounding mountains. Hurricane Maria destroyed the local electrical grid and, as a consequence, shut down the municipal water and sanitary systems.

Overview

The primary purpose of this project is to bring lights, computers, and the Internet to the "Research Center for Families and

Recommendations and Actions

- Purchase annual Internet access for the school, approximately $500 per year;
- Upgrade a small section of the roofing material underneath the array with new membrane;
- Install a solar array on the flat concrete roof of the school building containing the library and four classrooms;
- Install inverter and batteries in a storage room off the library, and interconnect to the building electrical system;
- Remove approximately 50% of the existing fluorescent bulbs as unnecessary loads;
- Replace 50% of existing florescent lamps and light fixtures (if necessary) with more energy-efficient LED replacements devices;

Technical Description:

- Building Structure - The library building is a rectangular cement structure, approximately 40 feet wide and 120 feet long with a flat concrete roof;
- Solar Array – 5 kW, sixteen 300-watt solar modules;
- Inverter – 5 kW inverter by Magnum;
- Batteries – two 12-volt 1,500Ah batteries wired in series;
- Mounting Structure – AET Rayport rack, mounting bolts epoxied into cement roof;
- Interconnection – transfer switch between grid in and solar inverter in breaker panel;
- Roof modifications – new membrane under solar array.

Children" section of one building and four adjacent classrooms on the same floor. The school library is co-located with the Research Center and thus would be powered also.

Local Project Support

This project is supported by the Mayor of Yabucoa, Rafael Surillo, who grew up in the neighborhood and attended the school.

GSI met with the Principal and several members of the maintenance staff to determine the most pressing requirements.

Existing Electrical Conditions and Design Assumptions

GSI will connect to the existing electrical service for the building at a breaker panel. A transfer switch and solar disconnect will be installed to accommodate the grid when it comes back up.

The Research Center room is equivalent to a double classroom and is 30 feet wide by 60 feet long. This room has a large open space and an adjacent store room which is 30 feet wide and 15 feet long. There are thirty (30) florescent light fixtures and each fixture holds four 4-foot lamps of 40 watts each. These lamps in the fixtures will be replaced by new LED lamps, reducing the load significantly. The number of powered fixtures will be reduced by close to 50%. Changing each fixture from four 40-watt bulbs to two 20-watt LED equivalents cuts the lighting load by 75%.

The Office has 8 computers, the Library has 2 computers and Internet access.

Additional Needs: A Phased Approach

Lighting in support of additional classrooms and power to make the cafeteria functional will require additional solar components that can be added in a modular manner. A combination of gas appliances, additional solar capacity, and generating capacity can further improve the ability of the school to become fully functional. GSI can develop additional recommendations as the funding permits.