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Yabucoa Elder Care Center

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Community Contact:
Mayor Rafael Surillo,
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Goals:
1. Provide electricity to the Elder Care Center (nursing home) by installing a solar photo-voltaic system,
2. Provide emergency backup electricity to this center for future emergencies after the grid is rebuilt.

Proposed Project:
- 3.6 Kw Solar Array System,
- replacement of florescent light tubes with LEDs

System Cost:

Solar Array System	$24,500
Efficient LED Lighting	$500
Total Cost	$25,000

The Need

Hurricane Maria devastated the electrical grid in 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 Elder Care Center has no grid electricity, but does have an operational generator which runs about 12 hours per day from 10AM to 10 PM. The building is without light and power for the rest of the evening and into the morning.

The building does appear to have water supplied by the town system, but it is sporadic and not 24/7. It is possible that a large cistern placed on the roof would be useful but GSI did not discuss this with the center.

GSI measured the output of the generator at 4,800 watts during which time part of the Laundry was in use. We determined that a 3.6 kW solar inverter would be sufficient to power most of the loads but not the laundry and so the generator will still be required.

Resiliency for the community during future destructive events is also a major concern. The residents of this center would be in a dire situation if the generator were to fail.

The Setting

The Elder Care Center is located in the center of the city of Yabucoa, a city of almost 40,000 inhabitants. There are

Recommendations and Actions:

- Install a solar array on the upper flat concrete roof of the building;
- Install inverter and batteries in the laundry room and interconnect to the building electrical system;
- Replace approximately 50% of the existing light tubes and bulbs with LEDs to reduce the electrical load.

Technical Description:

- Building Structure - The upper roof is a rectangular cement structure approximately 22 feet wide and 47 feet long.
- Solar Array – 3.6 kW, twelve 300 watt solar modules
- Inverter – 4 kW inverter by Magnum
- Battery – two 12 volt 1,500Ah batteries wired in serial
- 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

approximately 25 permanent residents of the facility, many requiring 24-hour nursing care.

Overview

The primary purpose of this project is to establish lights, fans and patient support appliances for the residents of the center on a 24/7 basis, and to provide emergency backup in the future should the grid power go down in a future storm.

The generator will be needed in the hybrid arrangement as the loads of the laundry washers and dryers are more than can be supplied by an affordable solar array. We anticipate that the generator will be used from 2 to 4 hours per day and that the solar electricity will power the building for the rest of the day.

The center building has two flat concrete roofs of approximately 22 by 50 feet. The upper roof is an appropriate location for a solar array.

Local Project Support

This project was identified as high on the list of priorities supported by the Mayor of Yabucoa, Rafael Surillo during our meeting with him and his staff.

Existing Electrical Conditions

GSI can connect electrically to the existing electrical service for the building at a breaker panel. A transfer switch and solar disconnect are installed for when the grid comes back up.