

Case Study: PV Power and Energy Storage at St. Peter's Hospital, Likoma Island, Malawi



The need

The hospital serves a population of 15000 to 18000 on an island in Lake Malawi. This island, including the hospital is served by a diesel engine powered electricity grid. The grid supply is part time, 0700 until 1230 and 1400 until 2200, and suffers interruptions and voltage stability problems at other times.

This is not adequate for a hospital providing maternity and operating theatre services.

The solution

In order to provide round the clock electricity supply, energy storage in the form of a lead-acid battery was installed. Inverter/chargers can store energy in the battery when the grid is present, and supply power to the hospital when the grid is not available.

In addition, solar power was implemented in order to provide additional security in the event of long term power interruption and to reduce the hospital operating costs.



Results

Following successful commissioning of the equipment in April 2016, the hospital is now able to meet the majority of its electrical requirements from energy provided by the sun and either used directly or stored for later use.

The power system is able to meet the demand of all key clinical equipment including operating theatre task lighting, oxygen concentrators, vaccine and pharmacy refrigeration and autoclaves, as well as general lighting, computers for administration work and so on.

Funding

This project has been generously supported by UK charity African Steps.

Technical Overview

15kWp roof mounted PV array

18kW rated battery inverter/chargers, 230V, 50Hz, single phase configuration

15kW rated PV inverter AC coupling the PV array to the hospital mini-grid

118kWh of available stored energy in a sealed maintenance free lead-acid battery (VRLA), 48V, 4940Ah at C100.

Step-by-step manuals supplied with each system



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