



MANOLO HEALTH CENTER SITE VISIT REPORT

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1.0 Introduction

The Manolo Health Center is situated 95 kilometers south of Mzuzu, close to the Zambian border. A population of about 20,000 people, including both Malawians and Zambians, are served by the health center. The government of Malawi provides all funding for the facility's operations. Due to its remote position, which prevents access to grid electricity, the health center has no electricity from the grid. The health facility has two worker homes that are powered by solar home systems, but owing to battery bank failure, the systems only operate for 30 minutes. Additionally, it has a pharmacy facility with an installed solar PV standalone system that powers the fans and cooling system.

2.0 Energy Access at the Hospital

The institution had a solar PV system that provided electricity for its whole operation, however later on during operation, the system was wrecked by heavy winds and rains; this incident occurred years ago. The plant currently relies on the following to satisfy its diverse energy and electricity needs.

2.1 Solar Pico home system

This solar Pico was donated by Sun-King solar company, this system consists; 4 LED bulbs and a USB port for phone charging. The 4 LED bulbs have been unevenly installed to serve as a lighting source for the hospital.



Lighting is only accessed in the doctor's office, treatment room, Ward room/maternity wing and outside the facility to provide security. The solar PICO is also used to charge or power some small appliance which needs less power to operate like blood level taster. Besides the aforementioned uses, the system also serves as a charging point for mobile phones from staff and some patients. Once fully charged the solar Pico provides lighting for at least 9 to 10 hours. This solar Pico is the only hope for the whole facility in as far energy access for lighting and phone charging is concerned.



Due to lack of electricity, pregnant women patients and their guardians are forced to carry their own solar panels to charge their phone through a local process called battery boosting as shown in the picture.

2.2 Solar Fridge

The health center has a solar powered vaccine fridge which has a separate system. The solar fridge was donated by a government project. the fridge operates 24hrs and so far, there are no problems faced regarding the fridge.



2.3 Water Pumping

The facility has a solar water pumping system which supply enough water to the whole health facility. It also has a stand-alone system which consists of a 1000L tank, solar Panels and ground water pump.



3.0 Challenges faced by the Hospital

Nurses from this health Facility are forced to use their phones as a source of lighting during odd hours when treating pregnant women and other emergencies. This happens especially when the solar PICO runs out of power.

- Failing to utilize some medical equipment, including oxygen concentrators, refrigerators, sucking machines, printers, and computers, all of which are essential for the effective operation of the health facility.
- Due to lack of electricity the health facility is failing to properly manage their data collected.
- Difficulties in implementing vaccination campaigns due to a lack of ice blocks.

4.0 Daily Energy Need of the Hospital

No	Name of Appliance	No of Appliance	Wattage (W)	No of Hours	Total Daily Energy (Wh)
1	Bulbs	25	12	12	625
2	Sucking Machine	1	200	2	400
3	Security Lights	2	100	12	2400
4	Oxygen Concentrator	1	480	8	3840
5	Fridge (upright)	1	350	24	8400
6	Printer	1	250	1hr	250
7	Laptop	2	85	12	2040
	Total				17,955

The total potential energy daily need for the hospital totals **17,955Wh**

No	Name of Appliance	Quantity	Specification
1	Solar Panels	9	350W, 40V, 8.4Iac
2	Inverter	1	5kVA Pure Sine Wave
3	Charge Controller	1	
4	Batteries	8	200AH GEL, Lithium

5.0 Recommendations

- The facility urgently needs access to electricity for smooth operations
- The system equipment to be installed requires to have a warranty of at least 1 year
- A system end user training is recommended to be conducted once the solar PV system is installed to equip them with knowledge on operation and maintenance skills
- Reduce number of sockets to minimize the unnecessary usage of electricity
- The health facility wiring needs to be assessed before installing the system