Light and Life in the Bush

BUSH LIGHT

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Gubbangurru

The Setting

This fact sheet provides information about the Bushlight Household system at Gubbangurru. The system was commissioned on the 21st June 2005.

Background

Gubbangurru is located on Mornington Island in the Gulf of Carpentaria. The community previously used a 10kVA diesel generator for power. The community wanted to reduce diesel costs.

Community Energy Planning Process

Bushlight has developed a participative approach to energy planning called the Community Energy Planning Model. Facilitated by regional Bushlight staff, this process assists householders in making informed decisions about their specific energy needs, including generation and consumption, which ultimately influences the design of appropriate systems.

Basic Technical Information

The system has been designed for a maximum daily AC load of 9.5 kW hours. There are no DC loads.

The system comprises the following major components:

- Ground mounted PV array of 4.25 kWp. There are 36 panels of 123W capacity.
- Battery Bank with 2400 Ah capacity at 24VDC, providing ~3 days of storage 19% average daily depth of discharge.
- Inverter rated at 2.2 kW @ 40°C. The maximum expected peak and surge loads are 2.2kW and 8.7kVA respectively.
- The total cost was approximately $124,492. This includes installation, data logging equipment, two service visits in the first 12 months, a customised remote user interface and additional works including reticulation and construction of a concrete slab and lean-to roof to accommodate the system enclosure. The Queensland Government Renewable Energy Diesel Replacement scheme provided a rebate of $62,245 on the total cost.

Monthly Load Variations

The maximum daily power consumption is expected to occur during the summer season. The most significant contributors to the higher summer load are:

- Ceiling Fans: It is assumed that fans will be used significantly during the months from October to April
- Refrigeration: These appliances will use more power during the summer season

Technical Demand Side Management

To minimise the risk of excessive power usage the following strategies have been implemented:

- Low amp circuit breakers are used to prevent the usage of high power demand appliances
- Circuits for lights, general power outlets and a pressure pump have been fitted with centrally controlled timer switches. The duration of these timers have been set to meet residents needs
- Individual device timers have been fitted to fans and lights.
- Outside lights are fitted with sunset switches to limit use to night time.

In addition to the technical demand side management measures described above, Bushlight staff have facilitated a range of education and training activities to assist residents to manage their power consumption appropriately.

Appliance Acquisition & Replacement

Where appropriate, Bushlight organises the replacement of inefficient appliances and lights.

At Gubbangurru spotlights and 40W fluorescent lights were replaced with 20W single fluorescent lights.

Agreed Deferred Loads

During the Community Energy Planning process it was agreed with each household that some specific appliances would be treated as deferred loads. This means the appliances will only be used during those periods when the batteries are fully charged and excess power is being generated. At Gubbangurru, it was agreed that use of the washing machine would be deferred until excess power is available.

Generator Only Circuits

The following situations where a generator may need to be run have been identified:

- When the community wishes to use power tools, kitchen appliances, air conditioners or the solar HWS booster

Other Energy Services

In addition to the energy being supplied by the Bushlight system, the community relies on these additional energy sources:

- Firewood for warmth
- Gas for cooking
- Solar thermal for hot water

Contact Bushlight

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