

Light and Life in the Bush

BUSH LIGHT

Fact Sheet 39

January 2006

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Kulpa



The Setting

This Fact Sheet provides information about the Bushlight Community System installed at Kulpa. The system provides power for an existing house, a planned new house, a caravan and a shed. This system was commissioned on the 10th December 2005.

Background

Kulpa is on Cape York Peninsula in Far North Queensland. Prior to the Bushlight System being installed a legacy RE system was used for power during daylight hours, with a petrol generator for backup and power at night. Diesel costs have been estimated at approximately \$4,700 a year.

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 to make informed decisions about their specific energy needs, including generation and consumption, which ultimately influences the most appropriate energy service options.

System Enclosure and new Power Shed



Basic Technical Information

The maximum daily AC load of the system is 13.9 kWh/day. There are no DC loads.

- The following major components are used: PV array - ground mounted with a capacity of 6.72kWp (total of 56 x 120W panels)
- Battery bank - Capacity of 1700Ah @ 48VDC providing 3 days of storage at 22% average daily depth of discharge.
- Inverter – 3.3kW @ 40°C, with expected peak and surge loads of 1.8kW and 2.3kVA respectively
- Energy Management Units (EMU) - electricity metering and management devices that replace household switchboards.
- Energy Meter (EM) – electrical metering for small buildings e.g. 1 shed and caravans.
- The total project cost was \$157,061. This included system mobilisation and installation, two service visits in the first year and additional works such as reticulation, fencing of the PV array compound and replacing switchboards with EMUs.

Monthly Load Variations

The design load allows for the maximum daily power consumption to occur during the summer months when fridges and freezer are cycling more frequently and ceiling fan use is greater.

Demand Side Management

To minimise the risk of excessive power usage the following strategies have been implemented in consultation with the residents:



Energy Management Meter

- An EMU has been installed at the house, and another will be installed at the new house. The primary purpose of the EMU is to control the total load on the system, and ensure a fair and equitable distribution of power by providing each household with a predetermined amount of energy (the 'energy budget') each day.
- Each EMU incorporates an intuitive user interface to aid energy management



Energy Meter

- An EM will be installed in the shed. These units also provide an "energy budget".
- Low amp circuit breakers have been installed to prevent the usage of high power demand appliances

- Individual device timers have been installed for certain lights. The duration of these timers have been set to meet residents' needs
- Centrally controlled timers have been installed for fan and general power circuits. The duration of the timers have been set to meet residents' needs

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

During pre-installation discussions residents agreed to use certain appliances, such as washing machines, only when there is enough power available. The best time to use them is in the morning, before the EMU resets the energy budget at midday.

Generator Use

The existing generator was connected to the solar system to enable battery charging when the generator is running.

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

- During extended periods of cloud cover and when there are many visitors
- When the community wishes to use power tools or air conditioners

Other Energy Services

In addition to the energy being supplied by the Bushlight Systems, the Kulpa residents continue to rely on the following additional energy sources:

- Firewood for cooking and warmth
- Gas for cooking
- Thermal Solar Hot Water

Contact Bushlight

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