

Light and Life in the Bush

BUSH LIGHT

Fact Sheet 50

January 2006

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Karrinyarra



The Setting

This Fact Sheet provides information about the Bushlight Community System installed at Karrinyarra community. The system provides power for three houses and two shelters. This system was commissioned on the 16th December 2005.

Background

Karrinyarra is 260km north west of Alice Springs off the Tanami Highway. Prior to the Bushlight System being installed power was provided by a 5 kVA diesel generator, which was operated about 4 hours a day, costing the community more than \$12,000 a year for diesel.

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.

Basic Technical Information

The maximum daily AC load of the system is 9.8 kWh/day.

There are no DC loads.

The following major components are used:

- PV array - ground mounted with a capacity of 3.52kWp (44 x 80W panels)
- Battery bank - Capacity of 960Ah @ 48VDC providing 2 days of storage at 23% average daily depth of discharge.
- Inverter – 3.3kW @ 40°C, with expected peak and surge loads of 2kW and 6.2kVA respectively
- Energy Management Units (EMU) – metering and management devices that replace household switchboards.
- The total project cost was approximately \$149,583. This included system mobilisation and installation, two service visits in the first year and additional works such as reticulation, repairing the old streetlights and replacing switchboards with EMUs. The Northern Territory Government Renewable Energy Rebate Program provided a rebate of approximately \$58,407 on the total cost.

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:

- An EMU has been installed at the three houses. The primary purpose of EMUs is to control the total load on the system 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 Management Unit

- 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 light, fan and general power circuits. The durations 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 needs to be run:

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

Other Energy Services

In addition to the energy being supplied by the Bushlight Systems, residents at Karrinyarra continue to rely on the following additional energy source:

- Firewood for cooking and warmth and for heating water in chip heaters