BUSHLIGHT

Fact Sheet No. 126

November 2011

Raymangirr

The Setting

This Fact Sheet provides information about the Bushlight Community System installed at Raymangirr. The system provides power for five houses, a school, a store and an office. This system was commissioned on the 24th of November 2011.

Background

Raymangirr is situated 45kms north west of Gapuwiyak, in east Arnhem Land. Prior to the Bushlight System being installed the community used a 15kVa generator for power when diesel was available and when the generator was working. The estimated diesel cost per year was $8300.

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 56.6kWh/day. There are no DC loads. The system has been designed to meet the full load demand from Renewable Energy. However, the generator is needed to power the visitors house and the clinic, both of which are used intermittently.

The following major components are used:

- PV array – ground/roof mounted with a capacity of 20.9kWp
- Battery bank - Capacity of 2400Ah @ 120VDC providing 3 days of storage at 21% average daily depth of discharge
- Inverter – 18kW @ 40°C
- Energy Management Units (EMU) - electricity metering and management devices that replace household switchboards.
- The total project cost was $631 000. This included system mobilisation and installation, two service visits in the first year and additional works such as reticulation, installation of ceiling fans 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:

An EMU has been installed at each of the five houses. 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.

Energy Management Unit

- Each EMU incorporates an intuitive user interface to aid energy management
- 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 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.

Appliance Acquisition & Replacement

As part of the overall approach to demand side energy management, inefficient appliances are identified and replaced as the community is able to do so. Energy efficient lighting fixtures have also been fitted.

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
- 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, Raymangirr residents continue to rely on the following additional energy sources:

- Firewood for cooking outside and;
- Some thermal solar hot water services.