Light and Life in the Bush

BUSH LIGHT

Fact Sheet 11 November 2004 www.bushlight.org.au

Kurraya

The Setting

This fact sheet provides information about the two Bushlight Household systems installed at Kurraya. The systems were commissioned on the 12th of October 2004.

Background

Kurraya outstation is located on the Waramungu Aboriginal Land Trust approximately 40km east of Tennant Creek. Prior to the Bushlight systems being installed, power was generated by a 21kVA generator that was run for up to 12 hours a day. Access to the community is generally good but can get difficult during the wet summer making the transportation of generator fuel difficult during this period. This project was part of the NAHS-funded Julalikari Outstations Infrastructure Project.

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 two systems have been designed for maximum daily AC loads of 5.4 and 6.5 kW hours. There are no DC loads.

The systems comprise the following major components:

- Roof mounted PV arrays of 1.8 and 2.1 kWp capacity. Using 80W panels, the respective numbers of panels are 24 and 28.
- Battery Banks with the following capacities; 1200 Ah and 1300 Ah. Both systems are 24VDC and provide ~2 days of storage at a 50% maximum depth of discharge.
- Inverters rated at 1.5kW @ 40°C. The maximum expected peak and surge loads are 1.1/1.2kW and 4.0/4.4kVA respectively.
- The total cost was approximately $180,900. This includes installation, data logging equipment, two service visits in the first 12 months, significant modifications to the existing house wiring and a customised remote user interface. The Northern Territory Government Renewable Energy Rebate Program provided a rebate of $69,996 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 twice as much power during the summer season when the ambient temperature is higher

Technical Demand Side Management

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

- Low amp circuit breakers are used to prevent the usage of high power demand appliances
- Light and general power circuits in the new house have been fitted with centrally controlled timer switches. The duration of these timers have been set to meet residents needs
- Individual timer switches are used on all fans and lights in the toilets, bathrooms and utility rooms

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

Appliance Acquisition & Replacement

Where appropriate, Bushlight organises the replacement of inefficient appliances. At Kurraya the following items were replaced:

- One existing large inefficient fridge/freezer was replaced with a new 390L Westinghouse fridge/freezer
- Three existing inefficient fridge and/or freezer units were replaced with one new 390L Westinghouse fridge/freezer

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. In the case of the Kurraya houses, it was agreed that the use of washing machines and battery charger would be deferred until excess power is available.

Generator Only Circuits

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

- During cloudy periods there may not be sufficient excess power for the use of the washing machines and/or battery charger
- When the community wishes to use electric kitchen appliances, outdoor floodlights, power tools, air conditioners and/or the solar hot water booster

Other Energy Services

In addition to the energy being supplied by the Bushlight systems, each household relies on a range of additional energy sources such as:

- Firewood for outdoor cooking
- Gas for inside cooking
- Solar thermal for hot water

Contact Bushlight

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