



Fact Sheet 9

November 2004

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Putulki

The Setting

This fact sheet provides information about the three Bushlight Household systems installed at Putulki. The systems were commissioned on 14th October 2004.

Background

Putulki is a small outstation on the Warumungu Land Trust located approximately 30km north east of Tennant Creek. Prior to the Bushlight systems being installed, power was generated by a 10kVA generator that was run for up to 14 hours a day. Access to the community is generally good but roads can become impassable during the wet season, making it hard to maintain the generator fuel supply. 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 three systems have been designed for maximum daily AC loads of 6.5, 7.1 and 5.3 kW hours. There are no DC loads.

The systems comprise the following major components:

- Roof mounted PV arrays of 2.4, 2.55 and 1.8 kWp capacity. Using 80W panels, the respective numbers of panels are 30, 32 and 24.
- Battery Banks with the following capacities; 1352 Ah, 1450 Ah and 1050 Ah. All 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 1.2kW and 4.5kVA respectively.
- The total cost was approximately \$263,500. This includes system supply, installation, data logging equipment, two service visits in the first 12 months, modifications to the existing house wiring. The Northern Territory Government Renewable Energy Rebate Program provided a rebate of \$109,603 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 such as electric frypans.
- Light and general power circuits systems 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 and laundry rooms

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 manage their power consumption.

Appliance Acquisition & Replacement

Where appropriate, Bushlight organises the replacement of inefficient appliances. At Putulki the fridge/freezers in all three houses were found to be inefficient and were replaced with appropriately sized (RJ series) Westinghouse units.

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 Putulki houses, it was agreed that the use of washing machines, small power tools and a keyboard would be deferred until excess power is available.

Generator Only Circuits

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

- During cloudy periods when there is not sufficient excess power for the use of the washing machines, small power tools and/or keyboard
- When the community wishes to use electric kitchen appliances, larger power tools, air conditioners and/or an existing old 300L freezer in house 2

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
- Solar bore pump



Contact Bushlight

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