



Fact Sheet 6

August 2004

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## Bawaka

### The Setting

This Fact Sheet provides information about the two Bushlight Household Systems installed at Bawaka homeland. These two systems provide power to two houses at Bawaka and were commissioned on the 22<sup>nd</sup> and the 25<sup>th</sup> of August 2004.

### Background

Bawaka is a homeland approximately an hour drive South South East from Yirrkala in East Arnhemland. Prior to the Bushlight Systems being installed a 5kVa generator provided power, this was run for about 5 hours each day. However, the availability of 24 hour power was necessary to power medical and refrigeration equipment.

### 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 combined maximum daily AC load of both systems is 11.8kWh/day. There are no DC loads.

The following major components are used:

- PV arrays - Both roof mounted with a combined capacity of 5.55kWp (total of 74 x 75W panels)
- Battery banks - Combined capacity of 4,100Ah @ 24VDC providing  $\cong$  3 days of storage at a 50% maximum depth of discharge for each system
- Two inverters - 1.5kW and 2.2kW @ 40°C, with expected peak and surge loads of 1.3/2.9kW and 1.7/3.9kVA respectively
- The total cost for both systems was approximately \$193,148. Included system mobilisation and installations; data-logging equipment, two service visits in the first year and additional works (installation of AC house wiring and reticulation). The Northern Territory Government Renewable Energy Rebate Program provided a rebate of approximately \$96,574 on the total cost

## Monthly Load Variations

The time of year that the maximum daily power consumption is expected to occur is different for the two systems. The main contributors to the increased loads are:

- Refrigeration: These appliances use 10 to 20% more power during the wet season months when the ambient temperature is higher
- Increased Population: The number of people staying at both houses is expected to increase significantly during school holidays, one house more so than the other

## Technical Demand Side Management

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

- Low amp circuit breakers have been installed to prevent the usage of high power demand appliances
- Individual device timers have been installed for all ceiling fans and lights
- Light and general power circuits have been fitted with centrally controlled timer switches. The duration of these 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 the residents to manage their power consumption appropriately.

## Appliance Acquisition & Replacement

Bushlight helped to organise acquisition or replacement of the following appliances:

- In one house the existing inefficient AC chest freezer was replaced with a new 312L Vestfrost chest freezer. For the second house a new Vestfrost chest freezer was provided
- Three portable spotlights have been replaced with 20W fluorescent lights
- Two small refrigerators were purchased (one for each house)

## Agreed Deferred Loads

During the Community Energy Planning process it was agreed with the householders 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. At Bawaka, it was agreed that the washing machine would be a deferred load or generator power would be used.

## Generator Use

One generator only circuit has been installed in each system. The following situations where the generator may need to be run have been identified:

- During the wet season there may not be sufficient excess power for the use of the washing machine
- When the community wishes to use kitchen appliances, such as electric frypans, kettles and toaster; or power tools and musical instruments
- For large appliances visitors bring, such as televisions, camping fridges, portable fans, spotlights, etc.

## Other Energy Services

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

- Gas for inside cooking
- Firewood for outdoor cooking and warmth
- Independent solar bore for water



## Contact Bushlight

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