

# Light and Life in the Bush

**BUSH** LIGHT

Case Study 7

December 2005  
**Milibundurra**

[www.bushlight.org.au](http://www.bushlight.org.au)



*Milibundurra community members with their Bushlight system during system maintenance.*

## The Setting

Milibundurra is a small Yanyuwa homeland near Borroloola in the South West Gulf region of the Northern Territory. The community is also known as Duck Island, as it sits by a bend in the McArthur River near a small island of that name. In the wet season when the river is in flood, there is no road access to the homeland and residents use a dinghy with an outboard to get to Borroloola or King Ash Bay, a local Barramundi fishing establishment, for food, fuel and health needs. Fishing, hunting and cultural activities are very important to the people at Milibundurra.

There are three houses and other small buildings on the community. When Bushlight began working with the residents in early 2004, there were only two houses. Bushlight commenced energy planning resulting in a Bushlight Household Renewable Energy (RE) System being installed at each house.

Mabunji Aboriginal Resource Association Inc. (Mabunji) was successful in funding a third Bushlight RE Household System, which they undertook to purchase from Bushlight and install themselves in December 2005. This case study looks at the two systems installed by Bushlight which were installed and commissioned by the 28th October 2004.

## Bushlight's Approach

Bushlight has established a process for use with homeland communities to plan and manage their energy services. This process involves a series of facilitated workshops called the Community Energy Planning Model (CEPM). Bushlight regional staff work with community residents through this process.

The process informs residents and helps them to choose and manage energy services that are best for them and that will help them achieve their livelihood aspirations.

Residents are provided with technical and other

information so they can choose sustainable – that is, affordable and reliable – RE services that will meet their current and future energy needs.

In making decisions about energy services, residents take into account the technical and financial limitations that are associated with their various energy service options.

12 months after installation, Bushlight undertakes a Community Energy Planning (CEP) Review with the community to obtain feedback on Bushlight services and assess community outcomes.

## Energy Service Goals

When Bushlight first started working with the people of Milibundurra they stated that their aspirations for energy services consisted of:

- 24 hour reliable power
- Reduction of diesel fuel costs
- Access to 24 hour refrigeration
- Provide for easier and more comfortable living through access to energy services

## Existing Energy Services

In the initial discussions it was determined that the community used:

- Wood for cooking
- Solar thermal hot water system
- Diesel and petrol for power generation and transport

The community did most of its cooking on open fires, with electric frying pans also used frequently and wood stoves used occasionally.

The community pumps water from a bore about 15km away as the water at the site is of poor quality. This system sometimes fails due to horses, pigs and buffalo breaking the pipeline to get water during the dry season when water is scarce. The new house has been provided with rainwater tanks to partially ease the water problem.

The community had been using a petrol generator since their 8kVa diesel generator broke down a few months before Bushlight commenced work at Milibundurra. The community used about 12,000 litres of fuel a year for power generation. This is based on usage of 20 litres a day (7,300l/yr) for the generator and 4,700 litres a year to transport generator fuel into the community. Each year they were spending an estimated \$9,000 on diesel and another \$5,800 transporting that diesel to their homeland.

The community has an essential services agreement with Mabunji, who are based in Borroloola. This agreement covers the provision of water, sewerage, power services and other essential services and

infrastructure, such as housing maintenance and generator service and maintenance.

During the wet season, Milibundurra residents travel to Borroloola or King Ash Bay by boat for everything they need. On arriving back at the homeland they put jerrycans of fuel and other supplies into wheelbarrows and push them up the river bank and to the homeland - about 500 metres in boggy conditions.



*Milibundurra residents do most cooking outside*

## Energy Services Planning

During the Energy Services Planning stage of the CEP, Bushlight provides education about energy service options and finds out about the community's energy needs and issues, social structures, mobility, household members and daily activities. Bushlight looks at all the energy sources available to the community in order to assist people with making decisions about what would be the best energy options for their homeland.

The end result of the process is a Community Energy Plan, a document that details the most appropriate sources and uses of available types of energy. This document includes details of the proposed RE system.

Bushlight developed Milibundurra's Community Energy Plan in consultation with the community and Mabunji.

It was decided that two Bushlight Household Systems would be installed at Milibundurra, one for each existing house. As it is common in the Borroloola area to have several cloudy weeks in a row during the wet season, it was anticipated that the generator may be needed to back up the RE

systems during this period.

It was decided that a mix of energy sources would be used at Milibundurra:

- RE for refrigeration, lights, fans and entertainment equipment. The washing machine would also be run from the RE system when enough energy was available.
- Firewood for cooking
- Diesel for power tools, kitchen appliances, air conditioning and the water pump
- Solar thermal for hot water



*Community members, Bushlight staff and Mabunji staff planning energy services*

## System Specifications

The two Bushlight household RE systems at Milibundurra were commissioned on 28 October 2004. Both systems were installed on the house verandahs. At house 1 the existing verandah was unable to accommodate the system. Mabunji extended the roof, wall and concrete slab to support and shelter the system. This work was contracted out to Mabunji as part of the installation.



For each system a photovoltaic array was mounted on a free standing frame near the house. At house 1 several trees were removed to provide an area free of shading.

Bushlight systems power non-critical appliances via “discretionary” circuits and critical appliances via “essential” circuits. To attempt to ensure continuous power to critical appliances (like fridges and freezers), power to discretionary circuits is cut when the battery charge drops below a predefined level.

The contract for the installation of the Bushlight Household RE systems at Milibundurra was won by Mabunji. The staff member who performed the installation work is accredited with the Business Council for Sustainable Energy (BCSE). Two CDEP workers from Mabunji assisted with installation works. Mabunji is the first resource agency in the Northern Territory to install a Bushlight RE System under contract to Bushlight.



*Bushlight and Mabunji staff work together to install the Bushlight RE systems*



## Costing Information

The total installed cost of the two RE systems was \$233,324. This figure includes costs associated with two service visits in the first year and additional works, i.e. reticulation connecting the generator, additional house wiring and lighting, energy management fittings, construction of the concrete slab and extension of the veranda to the existing house. The Remote Renewable Power Generation Program (RRPGP) provided a rebate of approximately \$98,722 on the total cost.

The total diesel offset by the provision of 24 hour RE

power to the community is equivalent to 11,040 litres per annum. This equates to an annual cost saving of approximately \$17,000, and greenhouse gas abatement of 32 tonnes.

### Major System Component Specifications

#### House 1

PV Array	3.0kWp (40 x 80W)
Battery Bank	2,400Ah @ 24VDC
Inverter	1.5kW @ 40°C
Charge Controller	2 x PL60 (2 x 60A @ 24 VDC)

#### House 2

PV Array	3.0kWp (40 x 80W)
Battery Bank	1960Ah @ 24VDC
Inverter	1.5kW @ 40°C
Charge Controller	2 x PL60 (2 x 60A @ 24 VDC)

### Community Service Agreement

The Community Service Agreement (CSA) is an agreement between the community, its support or resource agency, the agency funding maintenance of essential services and Bushlight where each party agrees to work together, in a spirit of cooperation, to maintain and sustain the energy services. The CSA clearly articulates the roles and responsibilities of each party as well as describing maintenance and repair arrangements.

As of the 1 July 2006 Bushlight will be responsible for the maintenance and repairs of all Bushlight RE Systems. However the actual delivery mechanism will be determined by local circumstances. Existing CSAs will be renegotiated to include this new arrangement.

The CSA also covers the collection of user contributions to pay for future maintenance carried out by the Resource Agency. At Milibundurra, community members working on CDEP (the Community Development Employment Program) each contribute \$10 a fortnight for future RE system maintenance, with the funds held by Mabunji. At the

time of the Bushlight's visit to the community at the end of 2005, there were seven CDEP participants in the community.

### Post Installation Community Training

Community Training was delivered to Milibundurra residents with the aid of a pictorial based User Manual and their RE systems. This training included system operation and maintenance, basic troubleshooting and energy use management. Bushlight training was designed to be broken into stages to allow time to experience system use and operation.

Two weeks after installation, Milibundurra residents left the community for cultural reasons following the death of a community member. The community was left unoccupied for eight months.

When Bushlight visited in July 2005 people had recently returned to live at the community. Residents then requested further training in use of the RE systems. This training was delivered in October 2005 when Bushlight trainer Ken Turner visited the community. After establishing that some residents were confident with use of the systems, Ken arranged for this training to be delivered by one resident to other members of the community who had missed aspects of the initial training. Ken found that with a small amount of encouragement, community member's existing competency in using the system was validated, and those present then felt comfortable in passing this knowledge onto others. This demonstrates the community's improved confidence in using the RE system and their ability to manage it.

When Bushlight staff talked to Milibundurra residents during the CEP Review, it was obvious that residents had a good knowledge of system use and how to manage power.

*"We only need to use the generator when the needle gets low, like when its cloudy and we want to do a lot of washing."*

*Gillian Friday, Milibundurra CEP Review*

### Service and Maintenance

Residents at Milibundurra are fortunate in currently having access to a BSCE accredited RE technician. This staff member is familiar with the community and is accustomed with the Bushlight RE Systems. Mabunji staff check on the systems regularly while visiting, and are on call in case of any problems with the power supply.

There have been two cases when system repairs were required at Milibundurra. One of these was resolved during the period when the community was

unoccupied and did not adversely impact on residents. This problem was the result of a faulty battery at House 1, and was solved when Mabunji organised the battery's replacement under warranty.

The second problem was reported by residents at House 1 after their return to the homeland. The community found that timed circuits were not working. Mabunji organised for a faulty "easy relay" at House 1 to be swapped with the one from the system at House 2, which was unoccupied at the time. This work was undertaken by a RAPS technician and electrical contractor. When the replacement was received in the mail the relay was then swapped back to the rightful system and the replacement relay installed at House 1.

The supplier of the relay suggested that a lightning strike caused a power surge in the system, burning out the "easy relay".

goal of reducing fuel costs. From spending around \$9,000 a year on diesel, they estimate they will now spend less than \$1,000. They still plan to use the generator to run air conditioners at night during the wet season, but they will need much less diesel over this period. This also means pushing fewer wheelbarrow loads of diesel back from the river.

An unexpected benefit has been gaining more verandah space from the verandah extensions done by Bushlight, a valuable addition when the verandah is the most used "room" in the house.

As the family has been back at Milibundurra for only a few months since the Bushlight systems were installed, long-term effects of this increased capacity are yet to be seen. At this time, community members do not aspire to establishing business ventures at the homeland. Their primary goal is to live on their country and practice their culture.

## Community Outcomes

Since returning home to the community after the period of sorry business, residents now leave the community less often and for shorter periods, thanks to the increased comforts made available at home by the Bushlight installation. Both residents and Mabunji staff have commented on this change.

As before, many small children come and stay with family at Milibundurra, to take advantage of the space and lifestyle before they need to go to school. While the children are usually playing outside, the family says they also appreciate the access to entertainment equipment such as television that RE has provided.

Residents also recognise they will achieve their

*"People stay here now, don't go anywhere much."*

*Gillian Friday, Milibundurra CEP Review*



*Gillian Friday talks to Bushlight's Zoe Pilven during the CEP Review*

## Contact Bushlight

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