



## Blue Bush

### About this Case Study

This Case Study describes the establishment of the Bushlight community Renewable Energy (RE) system at Blue Bush and how this has helped residents to pursue their livelihood aspirations. Bushlight began their relationship with the Hooker family of Blue Bush in June 2005 with a series of energy planning meetings. Based on these discussions and the information collected during them, a system was designed then commissioned in June 2006. The community has continued to be permanently occupied and a range of new and planned livelihood activities have been realised by residents. The Blue Bush story shows how improved access to energy services can benefit an active and forward looking community.

### Background

Blue Bush is a small homeland community 100km North West of Tennant Creek. It is also referred to as Karlantijpa North Aboriginal Land Trust. The residents at Blue Bush are Norman and Bunnie Hooker and their family. Bunnie, the traditional owner, is Waramungu. The main language spoken at Blue Bush is English. The community has traditional links to the country as well as more recent links via Norm's father's involvement in the cattle industry on the surrounding stations. The community also has ongoing affiliations with nearby stations. The community has links with the resource agency, Julalikari Council Aboriginal Corporation (JCAC) via CDEP and essential and municipal services provision. JCAC is also the community's housing organisation.

During the time of the Community Energy Planning (CEP) visits in 2005, the core population of this outstation was 3, with an additional 14 residents moving in and out of the community periodically.

Prior to the Bushlight System being installed, power was provided for 15 to 20 hours a day by a 23kVa diesel generator, which cost the community almost \$20,000 a year to run. Estimated total annual fuel consumption in the 12 months prior to Bushlight was 11,000 litres. All of the fuel was purchased by the community and transported by them in their own vehicle.

The RE system installed by Bushlight at Blue Bush is a 48V centralised community system that provides power for three houses and two sheds. This system was commissioned on the 7th June 2006.

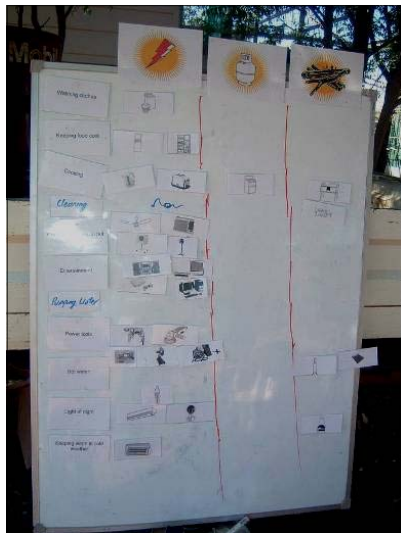


*Bunnie and Norman Hooker*

## Community Energy Planning (CEP) at Blue Bush

At the time of the CEP meetings in 2005, the residents of Blue Bush stated their main aspirations as establishing Blue Bush as a viable cattle station and providing a 6-month 'diversionary' program for young 'at risk' men (teenagers) from July through to December. The cattle enterprise remains the main focus of the community and during the energy planning process they outlined a number of plans for its development including installing a water pipe from a nearby bore and the provision of further stock watering points.

Residents identified that reliable and affordable 24 hour power was important to help them achieve these aspirations, as reducing their reliance on the diesel generator would free up significant amounts of money to be invested elsewhere. The Hooker family indicated that they would like a Bushlight RE system to provide power to the station kitchen, the big house, the house the 'young fellas' stay in, and the two sheds.



*Energy services mapping at Blue Bush*

## The Blue Bush RE System

The RE system installed at Blue Bush is a 48V community solar RE system that provides a maximum daily AC load of 14.8 kWh/day. This power is distributed via overhead reticulation to three houses through Bushlight Energy Management Units (EMUs), a workshed (through an Energy Meter) and one storage shed (lighting only). There are no DC loads. The system is comprised of the following major components:

- PV array - ground mounted with a capacity of 5.76kWp (36 x 160W panels)
- Battery bank - Capacity of 1700Ah @ 48VDC providing 2 days of storage at 23% average daily depth of discharge.
- Inverter – 5kW @ 40°C, with expected peak and surge loads of 4.9kW and 6.2kVA respectively

The total project cost was approximately \$211,000. This included system mobilisation and installation, two service



*Bushlight Energy Management Unit*

visits in the first year and additional works such as reticulation, fencing materials for the PV array compound and replacing switchboards with EMUs. The Northern Territory Government Renewable Energy Rebate Program provided a rebate of ~ \$95,200 of the total cost.

As of September 2007 (after 458 days of operation) the Blue Bush system has produced a total of 2977 kWh of AC power (only 44 of which were from the generator), and 8334 total AC hours. Analysis of system performance data (collected periodically from all Bushlight systems) shows the system is operating well in conditions of moderate use.

In addition to the energy being supplied by the Bushlight System, Blue Bush residents continue to rely on the following additional energy sources:

- Firewood for cooking and heating
- Gas for cooking
- Solar hot water heaters
- Diesel powered bore pumps to two overhead tanks located in the community.

## Training, Servicing and Support

The Blue Bush RE system is operated and principally maintained by community residents. The community's resource agency, JCAC, has signed the Community Service Agreement (CSA) but has not as yet organised for user contribution collection, performed the scheduled service activities or provided technical support, as outlined in this agreement. Norman and Bunnie have also signed the CSA and are doing a good job of carrying out their prescribed



*Blue Bush's generator is now used very rarely*

## **Bushlight's Community Energy Planning Model**

Bushlight's objective is to improve livelihood choices for remote communities by increasing their access to reliable energy services. To do so, Bushlight works directly with community members to provide them with independent advice and information about choosing which energy services are best for them, and advice on demand side management, and energy conservation. Using a range of pictorial resources, Bushlight invites communities to consider how they use energy and how much it costs them; and looks at what options are available for improving their access to reliable energy services.

Through workshops and community mapping exercises, Bushlight works with residents to prepare Community Energy Plans (CEPs). These plans detail the community's current energy needs as well as any future livelihood aspirations. The CEP constitutes an agreement between Bushlight and the community by setting out household energy budgets and the roles and responsibilities of the community in using and looking after their solar power system. The responsibilities of Bushlight, the community's service agency, and the system installer are also laid out.

After the initial CEP meetings and completion of the system design, Bushlight coordinates the installation of the RE equipment. Following installation, Bushlight provides education and training in system operation and maintenance over several visits during the course of the first year. Bushlight's approach expands on the typical RE industry process by involving the community in all key activities and decisions.

maintenance tasks. Bushlight is working with JCAC to ensure Blue Bush residents have access to a sufficient level of support.

The service and maintenance regime on all Bushlight systems is comprised of a three tiered approach. Community residents make up the first tier of the regime, supported by their resource agency (the second tier who own the hardware), in turn supported by suitably qualified electrical contractors (the third tier). To build the capacity of JCAC and help facilitate their support to Blue Bush, Bushlight provided higher level training to five JCAC staff. Undertaken in October 2005 (3 staff) and September 2007 (2 staff), this training covered key areas including: basic electrical concepts; RE system components and what they do; basic maintenance tasks; common problems and how to fix them; managing energy use and working safely with RE equipment. JCAC staff visit Blue Bush and provide some assistance where possible. However Blue Bush currently receives the bulk of its technical support from Bushlight. Due to the robustness of Bushlight RE systems, and the good care of Blue Bush residents the system continues to supply reliable and sustainable power to the community.

All permanent and some mobile residents participated in the training delivered by Bushlight regional team staff on system commissioning and in a number of subsequent visits. This training was delivered to residents with the aid of a picture based user manual and hands-on interaction with their Bushlight system and included system operation and maintenance, basic troubleshooting and energy use management. Bushlight training is designed to be broken into stages to allow time to experience system use and operation. Since then, the community has managed their power well and performed all necessary maintenance tasks. Blue Bush residents have thus reached a high level of confidence in their Bushlight RE system and their capacity to operate and maintain it.

When there was a problem with the system, the community



*Sue Graham from Bushlight and Bunnie Hooker from Blue Bush during system training*

attempted to fix it themselves, using the supplied Bushlight User Manual as a guide. After trying to troubleshoot, they decided that the problem was electrical in nature and needed a qualified technician to fix it, so they contacted Bushlight. Ideally, JCAC would be their first point of contact, however, Blue Bush residents have indicated they would prefer to speak directly to Bushlight about the system.

### **Community Satisfaction**

Records for the one month post-installation visit note that the RE system were well looked after and there had been no issues with the energy supply. Community satisfaction was recorded as high and residents reported no trouble with power even though the school holidays visitors had really tested the capacity of the system.

At the 12 month post-installation visit and review, residents reported that overall they are very happy with the Bushlight system, and are very happy to be saving money as they are spending virtually nothing on diesel. When



*Blue Bush RE System being installed, May 2006*

asked how they are using power they reported: there's plenty of power in the houses now; Bunnie is able to use the microwave and washing machine without a problem, and Norm has worked out how to budget to use power tools (drill) also on solar power. With regards to the community maintenance regime, Norm goes into the shed every month to perform routine maintenance, he sweeps the battery room and ensures everything else looks OK.

When asked how much they spend on diesel now, Bunnie replied that their expenditure now was negligible; they only buy diesel for vehicles and for the bore pump. In addition JCAC has indicated that they will provide the community with a solar bore in the near future, which will reduce diesel expense even further. There had been an ongoing problem with the generator not synchronising with the Bushlight RE system, a result of which was that they couldn't run it at all last summer, however a small stand-alone generator was brought in to power the air conditioners and since then, no generator power has been used. "We use the generator rarely" says Bunnie Hooker.

This issue of synchronising the generator with the RE system was finally resolved by Bushlight in mid 2007, however, later in the year, some defective air-conditioning units started causing faults. Bushlight then advised residents that they needed to purchase replacement air-conditioner units. At the community's request, Bushlight also provided some information about the energy efficiency of different makes and models of air-conditioners as they are planning to purchase new units.

### **Community Livelihoods**

Since the commissioning of the Bushlight RE system at Blue Bush, the cattle enterprise and other farming activities on the community have expanded rapidly and there are plans to have a telephone/fax installed inside the house to help facilitate cattle trading in the near future.

During this time there have been no improvements to the community infrastructure, however, plans are in place to upgrade the workshop and move the road. The workshop will be used as temporary housing for Bunnie's daughter, her partner and their children who are planning on visiting Blue Bush more frequently. Norm plans to move the road further away from the array and towards the back of the property to help ensure access is adequate for a truck to

enter the Bushlight shed to replace batteries when the time comes.

Of the livelihood aspirations identified during CEP, those associated with the cattle enterprise have been realised. The community currently has 500 head of cattle and is aiming to have 4000. Norman cooperates with the neighbouring properties during mustering time and is paid in cleanskin cattle. They are also about to purchase 100 Brahmin cattle. Blue Bush also has a small but quickly growing herd of goats and African desert sheep, as well as horses and pigs (with 6 new piglets), chooks, geese and dogs.

The diversionary program identified at CEP is still underway, but in a different format than first expected. While the community had initially planned for young people to spend up to six months at a time at Blue Bush, Norm and Bunnie now collect the boys from town when they require help with a specific task (eg mustering). The boys normally stay for about a month before heading back to town. This has occurred 3-4 times over the past 12 months.

Norm and Bunnie have plans to train the boys in various aspects of cattle property work before moving them on to one of the two neighbouring cattle properties for permanent employment. While this has not occurred yet, it seems promising given the community's good relations with their neighbours. In mid-2008, Blue Bush residents began a collaborative project with Charles Darwin University. Students will now visit the community on a regular basis to experience life on a small Indigenous outstation.

The establishment of a Bushlight RE system at Blue Bush is a real success story for both community residents and Bushlight. It is an example of how effective engagement with a community, coupled with motivated residents, can bring about real and sustained improvements in the life and livelihoods of Indigenous people living on outstations.



*Bunnie & Norman Hooker in front of the Bushlight array, July 2008*