



Corkwood Bore

This fact sheet provides information about the seven Bushlight systems installed at Corkwood Bore between November 2003 and April 2004.

Background

Corkwood Bore is a newly established outstation located approximately 70km northeast of Alice Springs. The outstation, consisting of seven new houses with associated infrastructure, was developed as a result of the existing outstation being relocated away from the new Alice to Darwin rail corridor. Bushlight was contracted by the Northern Territory Government to supply and install solar systems at each house.

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.



A typical system installed at Corkwood Bore capable of producing 6 kWh/day

This process was carried under difficult circumstances, as most of the residents were not living in their houses at the time of the meetings.

Basic Technical Information

The average maximum daily AC load across all seven systems is 6.0 kWh/day. There are no DC loads.

A typical system is comprised of the following major components:

- PV array - 1.80 kWp provided by 30 75W panels
- Battery Bank - 1200 Ah @ 24VDC providing ~2 days of storage at a 50% maximum depth of discharge
- Inverter - 1.5kW @ 40°C. Maximum expected peak and surge loads are 1.2kW and 5.5kVA respectively
- The average system cost was \$70,000. This includes installation, data logging equipment, two service visits in the first 12 months and modifications to the existing house wiring. The final cost of each system, including the Renewable Energy Rebate Program rebate, was approximately \$34,533

Monthly Load Variations

The maximum daily power consumption is expected to occur during the hot summer months. 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 September to April
- Refrigerators: Refrigerators use more power during the summer months when the ambient temperature is higher. It is estimated that refrigerators are likely to operate for 13 hours/day in summer compared to only 5 hours/day in winter

Technical Demand Side Management

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

- All circuits, except a dedicated fridge circuit and smoke detector circuit, have been fitted with centrally controlled timer switches. The duration of these timers can be adjusted to suit individual householders' needs
- Low amp circuit breakers are used to prevent the usage of high power demand appliances
- Individual timer switches are used on some appliances such as lights in hallways and toilets

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 to manage their power consumption appropriately.

Appliance Acquisition & Replacement

Bushlight staff have assisted each household to purchase appropriate appliances for use with the Bushlight systems. Where appropriate we have replaced existing inefficient appliances with new energy efficient ones.

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 Corkwood Bore houses, it was agreed that the use of washing machines will be deferred until excess power is available.

Generator Only Circuits

Two generator only circuits have been installed in each house. To provide power to these circuits, a generator will have to be available and the system must be switched from solar to generator mode. The two generator circuits are:

- Solar hot water booster: It was agreed with each house that the use of boosters would require more power than could reasonably be generated by the solar system. Therefore, the most appropriate solution is to use a generator if the booster is required
- Generator only power circuit: Two dedicated power sockets have been installed in each house, one in the kitchen and one on the veranda. These sockets can be used to supply (diesel and/or petrol generated power) for appliances with high power demands, such as electric frypans, electric ovens and larger power tools and welders

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 and warmth
- Gas for inside cooking
- Solar thermal for hot water

Contact Bushlight

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