HERMANNSBURG, YUENDUMU AND LAJAMANU SOLAR POWER STATIONS

INTRODUCTION

The solar power stations at these three remote indigenous communities in Australia's Northern Territory are constructed using Solar Systems' CS500 concentrator dish systems.

The project was conceived by Solar Systems and is now producing electricity to complement the existing diesel generators under a long term power purchase agreement with Power and Water Corporation, the local electricity supplier.

The project cost AUD $7M, offset by a grant from the Australian and Northern Territory Governments under their Renewable Remote Power Generation Program.

The project will save 420,000 litres of diesel and 1550 tonnes of Greenhouse emissions each year.

The project won a prestigious Engineering Excellence award in 2005.

CONFIGURATION

The CS500 dishes are installed at all three locations, and each of the 30 dishes are equipped with 24% efficient silicon-based photovoltaic (PV) cells.

Each power station has a closed loop cooling system that rejects heat into the adjacent sewerage ponds. This arrangement provides additional evaporation from the ponds to reduce the need for overflow pumping.

The control system incorporates a large battery bank which smoothes the output profile from the power station. This protects the diesel generators from sudden changes in load, giving the generators time to react when a cloud passes in front of the sun.

Electricity is converted to grid-quality alternating current and exported to the local electricity grid, providing extra capacity and support to the diesel generators. The solar power stations

	CS500 units	Rated Output (kW)
Hermannsburg	8	192
Yuendumu	10	240
Lajamanu	12	288
Totals	**30**	**720**

SolarSystems

were designed to provide around 30% of the daytime electrical requirements of the community. In practice, when the community requirement is low the power stations have provided up to 50% of the daytime load.

ACHIEVEMENTS

This project enabled Solar Systems to develop the technology for improved performance and deployment:

- the control system was enhanced to improve versatility and provide more robust performance
- the PV receiver was redesigned to reduce the number of parts from 50 to 11, reducing the cost as well as improving quality and assembly time
- the time to source and fit out a control & electrical room has decreased from 14 weeks to 2 weeks
- the number of dishes lifted per day has increased from two (Hermannsburg) to six (Lajamanu)

The net effect is that the costs have fallen significantly over the course of the 40 dishes constructed to date. Together with improvements in cell efficiency, the cost per delivered unit of energy has fallen by over 60% in the last 5 years.

ENGINEERING EXCELLENCE AWARD WINNER

The project has received a prestigious award for engineering excellence in the 2005 Engineers Australia Excellence Awards.

The win follows from the Engineers Australia Northern Division Excellence Awards held in Darwin in August 2005. As well as winning the overall award, Solar Systems also won the John Wellard Sustainability award and the People's Choice award.

In accepting the awards, Solar Systems acknowledged the strong support received from the traditional landowners for the use of their land. As well, the project could not have proceeded without the Australian Greenhouse Office and Northern Territory Government and their programs to encourage renewable power generation.

As well as saving diesel costs and Greenhouse emissions, the programs have enabled Solar Systems to undertake further development of

the technology, increasing the cost-effectiveness of solar power.

Power and Water Corporation were also acknowledged for their far-sightedness in looking for renewable power sources to complement their existing diesel power supply equipment.

The project demonstrated that Solar Systems' world-leading technology can effectively deliver renewable electricity.

The national Excellence Awards is the premier annual event for Engineers Australia, showcasing the best in Australian engineering achievement. The Awards ceremony was held on 30 November 2005 at the Great Hall of Parliament House, Canberra with Dr Brendan Nelson, Australian Government Minister for Education, Science and Training delivering the keynote address.

Over 350 entrants to the 2005 awards were shortlisted to a diverse group of 45 projects. Solar Systems was one of six Excellence Award winners.