WINDORAH SOLAR FARM – A BEACON OF SUNLIGHT

Windorah has been chosen by Ergon Energy as the site for an innovative solar energy trial using new technology.

- Work began in September 2007 on the construction of a solar farm on the outskirts of the tiny outback Queensland town, population 100. When completed, the facility will be capable of powering the entire town during sunshine hours - a first for Australia.
- The Windorah solar farm will consist of five mirrored dishes 13.7 metres across, each supported on a concrete base and steel mast structure with a total height of 14.5 metres.
- The mirrors reflect and concentrate sunlight on to high-capacity solar cells in a central point at the front of the mirror. Each dish generates approximately 35kW of electricity, depending on season, time of day and cloud cover.
- The solar farm is expected to generate about 360,000 kilowatt hours (kWh) each year.
- This will save approximately 100,000 litres of diesel fuel which would otherwise have been used in the town's diesel generators.
- The solar farm's uniqueness will make it a magnet for visitors and alternative energy enthusiasts.

The benefits

- *The solar farm will be visually impressive and create a unique Windorah landmark.*
- *It will promote and advance solar technology, and Windorah will be seen as a world leader in solar power and sustainable energy generation.*
- *The solar equipment is silent, so when it is operating at full capacity there will be no noise from the power station.*
- *It will reduce the town's reliance on expensive diesel generation, resulting in lower operating costs and reduced greenhouse gas emissions. The reduced power station operating hours will also give the generators a longer life.*
- *The solar farm won't mean downgrading the town's electricity supply system. The diesel generators will remain fully functional and capable of meeting the town's full electricity needs, as they will be in use every night and on cloudy days when the dishes aren't generating. However turning them off for several hours every day will definitely increase their life.*

For information about the project contact:

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How a solar farm works

- The five mirror dishes are located on Ergon Energy land next to the existing power station about one km outside the town on the Diamantina Developmental Rd. They are aligned north-south and separated to avoid them shading each other in the early morning and late afternoon.
- Each dish contains 112 mirrors, each 1100mm x 1100mm.
- Like giant sunflowers, the dishes face and follow the sun so that as much sunlight as possible falls on the mirrors. They face the exact location of sunrise, and begin to produce electricity from first light. At the end of the day, the dishes track back around to the east ready for the next day's operation.
- The mirrors concentrate the sun 500 times onto a panel of high-efficiency, satellite-quality photo-voltaic (PV) cells which convert the sun's energy into electricity and feed it into the town's electricity network.
- While the solar farm is producing power, the town's diesel generators will be switched off or operate at reduced output. At night, or when there is too much cloud for the dishes to generate power, the generators will seamlessly be brought back online to supply the town's full demand.
- The system will also include batteries to cope with brief cloud cover without having to start up the generators.
- Modern controls and communications equipment allow for remote monitoring and control of the entire operation, as well as manual operation on site. The control room will be next to the existing power station enclosure, and the entire facility will be fully fenced.

The technology

- Solar concentrator technology is a new way of generating electricity directly from the sun.
- The PV cells have an efficiency of 35%. This represents world-leading efficiency in production technology, and contrasts with 10-12% operating efficiency from conventional flat-plate PV cells.

Why is Ergon Energy doing a trial?

- The aim is to find a viable alternative to diesel generation for communities remote from the electricity grid.
- Windorah was chosen as the community is the right size for a trial of this kind and it has a relatively new power station with technology that is able to interact with the solar farm.
- The project will take about two years to complete and is expected to be supplying the town with electricity by the end of 2008.
- Solar Systems of Victoria won the contract to build the facility.

A solar farm in South Australia similar to the one being built in Windorah

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