

NEW STATE-OF-THE-ART SOLAR HYBRID POWER STATIONS FOR MARBLE BAR AND NULLAGINE

Using sunlight to generate electricity in two of the hottest towns in Australia makes sense. Combining nature's energy with leading edge technology means that renewable energy is accessible to even the most remote towns and communities.

Horizon Power is building two new state-of-the-art solar-diesel power stations in the inland Pilbara towns of Marble Bar and Nullagine to bring clean, green energy to the region, using proven technology on a scale not yet seen in this country.

The project

The power stations at Marble Bar and Nullagine incorporate technology which converts energy provided by the sun. The technology being applied provides the highest solar penetration possible, with 65 per cent of the day time load to be met from solar energy. The power stations have diesel generation combined with the latest short-term energy storage system to ensure reliability and quality of power supply.

The solar farms in Marble Bar and Nullagine comprise solar panels which track the sun throughout the day. These solar farms are the largest of their type in Australia, consisting of 1350 solar panels in Marble Bar and 900 in Nullagine.

The energy storage system will temporarily store excess energy from the solar panels. The energy stored will be used to stabilise power quality between the diesel power station and solar panels when there are sunlight fluctuations, such as during periods of cloud cover.

The solar energy systems will generate over 1048 MWh (or 1 GWh) of renewable electricity per year, which is 30 per cent of the towns' annual energy demand. This will result in savings of 35 to 40 per cent of diesel fuel and 1,100 tonnes of greenhouse gas emissions every year. The new power stations will also be significantly quieter than the current power stations, which have been operating since 1973, and are no longer compliant.

Project partners

The \$27.7million project is supported by \$4.9 million of Australian Government funding through the Renewable Remote Power Generation Program. The Program is implemented in Western Australia by the State's Office of Energy.

Horizon Power's project partners are SunPower Australia and the Darwin-based Powercorp. SunPower has provided the solar panels and Powercorp has provided the energy storage and control systems.

SunPower was recently acknowledged for its T20 solar tracker technology with the WA Sustainable Energy Association's Sustainable Developers award.

Keeping the Marble Bar and Nullagine communities informed

Horizon Power has engaged closely with the Marble Bar and Nullagine communities including the Shire of East Pilbara, traditional custodians of the land, Aboriginal heritage monitors, local businesses, local schools and community groups.

Horizon Power funded Role Models WA, headed by former basketball champion Ricky Grace, to visit the Marble Bar and Nullagine school children to provide motivational and recreational activities and to assist Horizon Power in delivering to the children education about the new power stations and energy safety.

Horizon Power recently completed power network upgrades in the town-based Aboriginal communities of Marble Bar and Nullagine - Goodabinya and Irrungadji. This work was carried out under the Town Reserves Regularisation Project funded by the WA Department of Housing. This includes upgrades of internal house wiring, connection to a new payment method for power and education about energy safety and retail information.

Horizon Power also carried out energy assessments for all residents in Goodabinya and Irrungadji under the Home Energy Efficiency Engagement and Refit program.

This program, recently awarded the WA Sustainable Energy Association's Regional and Community Initiatives award, is being carried out in 14 Aboriginal communities in regional Western Australia with funding from the Office of Energy's, Hardship Energy Program (HEP). The assessments assist residents with a better understanding of their energy use and practical advice is provided on ways to save money by reducing energy use.

Community information sessions are also being held in both towns to explain the project and the benefits for communities.

Horizon Power will erect signage in the towns to explain the significance of the power stations' projects to tourists visiting the region.

Questions and Answers

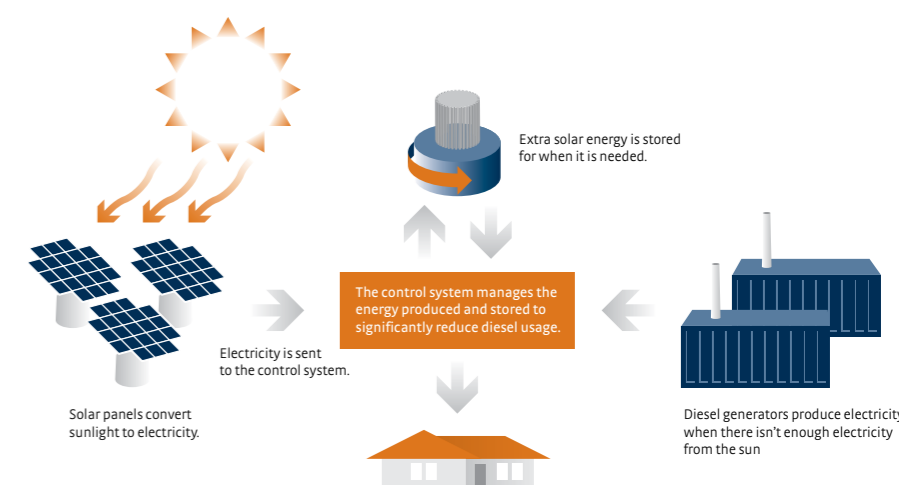
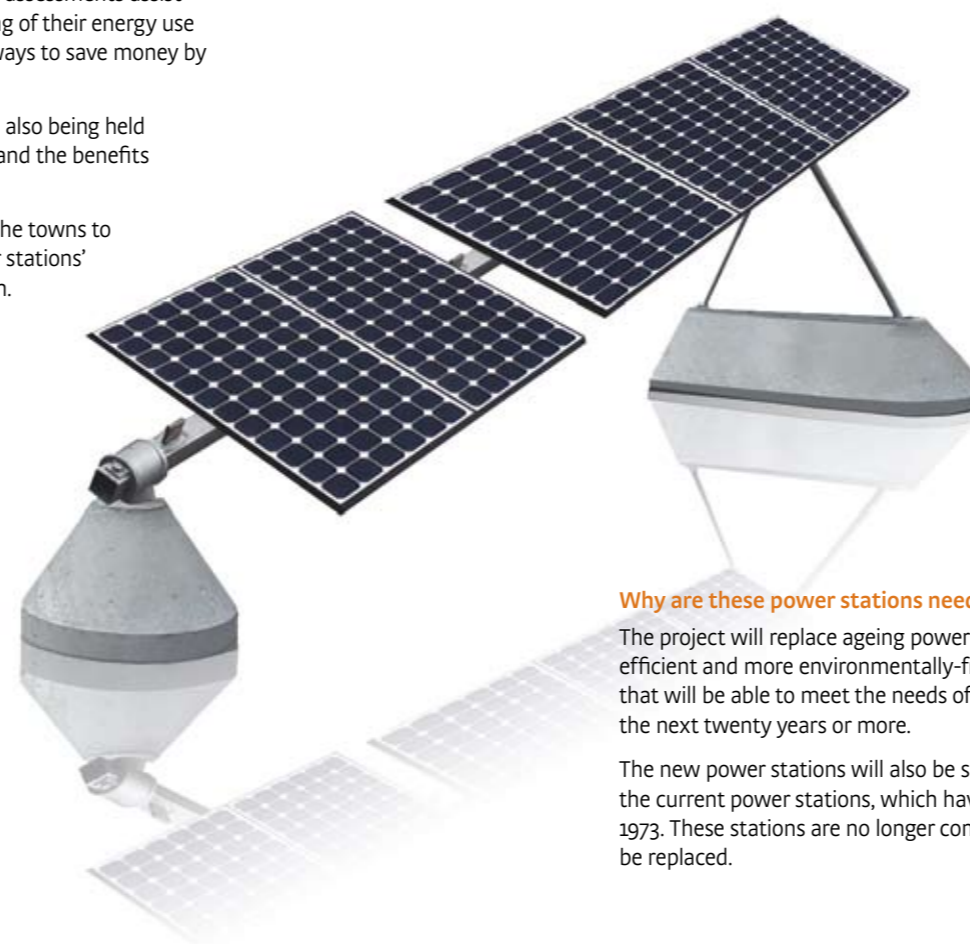
What does a power station do?

A power station operates by converting one form of energy, diesel fuel, wind energy or solar radiation into electrical energy. In a diesel power station, diesel fuel engines convert the energy in diesel fuel into mechanical energy by rotating a shaft in the engine. This shaft is connected to a generator which in turn converts the mechanical energy into electrical energy. In a solar system, solar radiation from the sun is converted into electrical energy by the interaction of photons of light and the crystals in the material used to make the solar panels.

This electrical energy is then sent via power electronics through wires to a distribution network to households and businesses where it is used.

How will these power stations work?

During the day, the solar modules will capture the solar radiation from the sun, converting it to electrical energy. This energy is sent directly to the distribution network. At certain times the solar modules will produce more energy than the local system can use so this excess energy will be diverted to the flywheel (a large spinning mass) where it will be stored as mechanical (kinetic) energy. When electricity production from the solar farm drops or demand from the local network increases the energy stored in the flywheel will be released into the network. In order to ensure power reliability and stability a diesel power station will operate in conjunction with each solar farm. A specially designed control system will manage electricity produced from both the diesel power station and solar farm to maximise energy from the solar modules, thus significantly reducing diesel usage.



Why are these power stations needed?

The project will replace ageing power stations with modern, efficient and more environmentally-friendly power stations that will be able to meet the needs of local communities for the next twenty years or more.

The new power stations will also be significantly quieter than the current power stations, which have been operating since 1973. These stations are no longer compliant and needed to be replaced.

How big are the solar farms?

The solar farm will cover an area of 4700m² in Marble Bar and 5100m² in Nullagine. The modules themselves are tilted to track the sun, are a few metres off the ground and are 2.5 metres wide. They are a modern design and are an impressive presentation of the latest technology.

How much did this project cost?

The project cost \$27.7 million. Horizon Power's analysis of the investment associated with installing the solar-diesel stations shows that the hybrid renewable solution delivers better value than equivalent diesel-only generation over the 20 year life of the asset.





Reducing our carbon footprint

This project will set a new standard in regional and remote supply of electricity by innovatively combining conventional diesel generation with state of the art renewable energy options.

Solar power is an abundant, reliable, clean source of energy. Horizon Power is committed to using the sun's power to lessen our carbon footprint and improve our environment for the future.

Horizon Power was recently honoured with two WA Sustainable Energy Association awards for its work in promoting renewable technology and community initiatives. It won the Excellence and Innovation award for its suite of renewable technologies and projects, including the Marble Bar and Nullagine power stations project. The energy efficiency assessments carried out in 14 Aboriginal communities across the State was awarded the Community and Regional Initiatives award.

For further information:

If you would like further information about this project please contact Horizon Power's Public Affairs team, on 6310 1571 during business hours or email phillippa.brown@horizonpower.com.au

Project facts at a glance

The new power stations will:

- Generate 1048 MWh of solar energy per year
- Provide 65 per cent of day time energy demand from solar power
- Save 1100 tonnes of greenhouse gas emissions per year
- Save between 35-40% diesel consumption per year (405, 000 litres of fuel per year)
- Provide 30 per cent of the annual energy for both towns