

Coral Bay Wind Diesel System - Information Sheet

Coral Bay has one of the most environmentally friendly power supplies in WA, and possibly Australia.

It is a combination of wind turbines, innovative flywheel energy storage system and modified diesel generators.

Electricity from this advanced power station, a short distance south of the town, is distributed through Coral Bay by an underground network.

The power station was officially launched in August 2007.

Previously, the community's power was generated by privately owned diesel generators. In April 2005, the WA Government approved the 'regularisation' of the Coral Bay power supply – Verve Energy to build, own and operate the wind diesel generation and Horizon Power to distribute and retail the electricity.

How Does it Work?

The power station is designed to control the wind turbines and diesel generators automatically, so that as much wind energy is possible is produced while maintaining voltage and frequency.

At times the wind turbines can be delivering more than 90% of the town's electricity.

An operator can run the station manually if required, and at least two of the modified diesel generators, which can operate at low loads for long periods of time without damaging the machines, must be running at all times.

An innovative feature of this power station is a flywheel energy storage system. It provides short term energy storage (a buffer) to smooth the



Wind turbine being lowered.

fluctuating wind turbine output. Excess wind energy can be captured and put back into the system when there is not enough wind energy. This reduces the number of diesel generators required to be on and helps maintain the power quality.

System performance

System performance is excellent. When the wind is strong, up to 100% of the electricity is generated from wind energy. On average, more than 60% of Coral Bay's electricity is being generated each year by the wind turbines, making the Coral Bay wind diesel power station one of the most advanced in the World.

This innovative technology reduces greenhouse gas emissions by 1300 tonnes a year, because less fuel (500,000 litres) is used in the diesel power station.

Specifications

Major Item	Description	How many
Diesel Generators	Powercorp Detroit Series 60 320kW containerised "low load" diesel (LLDs) generators	7
Wind turbines	Vergnet GEV-MP 275kW wind turbines - 55m tower tilt-up, - 2 x 16m fibre glass blades - 120 m ³ concrete foundations	3
Flywheel energy storage	Powercorp Powerstore 500kW	1
Fuel supply	81,000L bulk tanks 2000L day service tank	2 1

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Wind farm.

Watching the wind turbines

You may see:

1. The wind turbines laid on the ground. This can be done to protect the turbines from bad weather especially cyclones; or for scheduled maintenance to be done.
2. Turbines stopped, when it is still windy. There are a number of reasons why a turbine will stop. Usually, unless there is severe damage, it will restart automatically although the operator can reset it.
3. The turbine head turning. The turbine head is free to turn into the wind to maximise the amount of energy generated.
4. The turbine head rotating one revolution. The turbine are programmed to run periodic tests of its functions and to notify the operator if adjustment is needed.
5. The turbine head rotating more than one revolution. When the head has rotated three times, the turbine stops and untwists the cables in the tower. The power cables are hardwired into the head of the wind turbine.

Funding arrangements and acknowledgements

The project was granted \$2.76 million by the Australian Government through the Renewable Remote Power Generation Program. The Program is implemented by the State's Sustainable Energy Development Office in Western Australia. A \$1.2 million grant from the Renewable Energy Development Initiative (REDI) has also contributed to the development of the Coral Bay high penetration wind diesel system.



Diesel power station.

More information

Please see the Diesel and Wind Systems website:
www.daws.com.au

Contacts

The Coral Bay Wind Diesel Power Station is owned and operated by Verve Energy. Horizon Power owns and operates the distribution network and retail electricity to customers.

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