

Wind Power

Harnessing Tasmania's Wind Energy Resource

Hydro Tasmania's King Island Wind Farm



K I N G I S L A N D

Background

Lying in the path of prevailing westerly winds, King Island has world-class resources for the generation of wind power.

King Island residents have enjoyed the benefits of wind generation since 1998, when the island's first renewable energy from the three wind turbines on Huxley Hill began to power their homes, schools, farms and businesses.

The Huxley Hill Wind Farm was the second commercial wind farm to be established in Australia.

Since then, the three 250kW Nordex wind turbines have generated about 18 percent of the island's electricity needs, with the balance generated from a diesel-fired power station.

From that beginning, Hydro Tasmania then began investigating ways to further increase the contribution of renewable energy to the island's power requirements including mini-hydro, wave power, co-generation and pump storage. The investigations identified additional wind energy as the best option.

Working with the community

During the planning and development stages of the wind farm, Hydro Tasmania has consulted widely with the local community and other stakeholders.

Before the first site work began, extensive field surveys and impact assessments gathered data on a range of issues including Aboriginal and European heritage, social, economic, visual, flora and fauna values.

Wind Farm Expansion

Hydro Tasmania expanded the wind farm in 2003 with the addition of two new 850kW Vestas turbines, a state-of-the-art 200kW Vanadium Redox Battery and an innovative control system.

The expanded Huxley Hill Wind Farm provides a total installed capacity of about 2.5 MW of wind generation.



Vanadium Redox Battery System with the tanks containing electrolyte in the foreground and a bank of cell stacks at the far end of the building.



Nordex wind turbine in front of diesel power station.



Hydro Tasmania
the renewable energy business

This is a significant contribution to the island's current maximum demand of about 3 MW. The wind farm expansion will reduce annual diesel consumption on the island by more than a million litres and result in renewable energy contributing about 50 percent of the island's energy requirements and reducing greenhouse gas emissions by about 4600 tonnes.

The wind farm expansion has received significant funding from the Australian Government through the Australian Greenhouse Office's Renewable Remote Power Generation Program, which is administered by the Tasmanian Office of Energy, and the Renewable Energy Commercialisation Program.

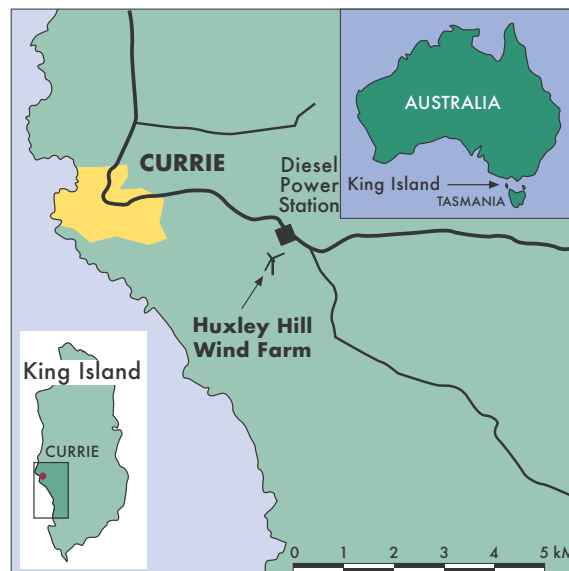
Fact File

2 Vestas V52 wind turbines	<ul style="list-style-type: none"> • 850 kW output • 60 metres tall • Rated wind speed of about 50 km/hour • 52 metre rotor diameter
3 Nordex N29 wind turbines	<ul style="list-style-type: none"> • 250 kW output • 29 metres tall • Rated wind speed of about 50 km/hour • 29.7 metre rotor diameter
Vanadium Redox Battery	<ul style="list-style-type: none"> • 55,000 litres of electrolyte contained in four plastic tanks • Six Sumitomo cell stacks • Energy storage of 200kW for four hours • Peak short-term output of 400kW
Control System	<ul style="list-style-type: none"> • Allen Bradley Programmable Logic Controller based system • Custom programming to control wind turbines, diesel generators and battery • Maximises power system usage of available wind energy.

Innovations

A drawback of wind power is the fact that it is limited by the variability of the wind. The Huxley Hill Wind Farm incorporates a large-flow Vanadium Redox battery, which helps to smooth out the variability of the wind by storing excess wind energy and releasing it back into the system in a controlled way. It is the first time that this battery technology has been used in Australia and the first application worldwide of using Vanadium Redox Battery technology to assist in harnessing additional renewable energy for a remote power system.

An innovative central computer-controlled system optimises the efficiency of the wind farm and maintains power system stability by balancing power production between the wind turbines, diesel generators and the battery.



Power from the wind

Wind turbines have been powering machinery for over 2000 years. Generating electricity from the wind is a recent and fast growing industry in Australia and around the world.

Tasmania has a world class wind resource and Hydro Tasmania is harnessing this resource with the development of a number of large scale wind farms on mainland Tasmania.

This new renewable energy will help reduce the nation's emissions of greenhouse gases and earn renewable energy certificates that are available under the Federal Government's legislated Mandatory Renewable Energy Target. The MRET is a scheme which is designed to encourage the development of additional renewable energy above 1997 levels.

Interested in learning more?

For further information please visit www.hydro.com.au or www.vestas.com.



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Australian Government
Australian Greenhouse Office