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## Wind Power From Way, Way Down

Stewart Taggart  09.11.01 | 2:00 AM

**SYDNEY, Australia --** It's windy and about as far from a power grid as you can get. It's Antarctica --- and it could be ideal for wind power.

Over the next year and a half, Australia plans to build three 300-kilowatt wind turbines at its Mawson research station, the biggest wind power complex ever built on the continent. It will provide a major testing ground for ramped-up alternative energy in the toughest environment on earth.

"Turbines have never been installed in such a windy and cold place before," says Peter Magill, project chief engineer for the Australian Antarctic Division. "This will be a whole new ballgame for the technology."

Mawson sits on a roughly quarter-mile square promontory of exposed rock on the very edge of the Antarctic continent. It's on the receiving end of "katabatic" winds flowing virtually uninterrupted down the ice fields to the sea from the center of the continent.

"From nearly 3,000 meters in altitude (9,000 feet) at the South Pole, the katabatic flow is like a river," says Dave Adams, project leader for PowerCorp in Darwin in Australia's Northern Territory, the contractor that will install the units. "Mawson sits right in the path of its flow."

The three turbines to be installed at Mawson will be built by Bremen, Germany, wind turbine manufacturer Enercon, and specially modified for Antarctic conditions. These will include special metals for the deep cold, and sealing off sensitive parts to guard them against the fine, wind-driven snow of the Antarctic.

Mawson's energy demand is about 700 kilowatts, split equally between electricity and heating, Magill said. Since the three turbines together have a capacity of 900 kilowatts, they could satisfy all the station's energy needs under ideal conditions, he said.

However, the turbines normally shut down when winds hit 65 mph or more. Wind speeds at Mawson have been recorded as high as 150 mph, making it one of the windiest places on the Antarctic continent, Magill said. Under normal circumstances, however, Mawson's average wind speed is 27 mph.

Later this year, foundations will be dug for the three turbines. The turbines themselves will be installed in January or February 2003. After that, the key will be to see just how much of the station's power the turbines can provide. At present, Mawson's generator burns about 700,000 liters of diesel fuel per year. This must be shipped in and offloaded from supply ships to the station through hoses that sometimes spill fuel into the ocean.

"If we can reduce the diesel resupply needs of the station down to every four to five years, rather than every one year as at present, we can reduce those risks of oil spills and pollution," Magill said.

Mawson houses up to 50 scientists during the Antarctic summer and about 20 during the winter. Australia also maintains two other similarly staffed stations on the Antarctic mainland, called Casey and Davis stations. Australia also operates a research station on Macquarie Island, located roughly midway between Antarctica and the southern Australian state of Tasmania.

Mawson's windmills, when they're finally up and running in 2003, won't be the first on the continent. Since 1985, a 3-kilowatt wind turbine has been powering communications gear at Black Island, a communications station 20 miles from the U.S. research base at McMurdo.

Germany has a 20-kilowatt turbine at its Neumayer Station, and a 10-kilowatt wind turbine has been in operation at Casey for about the past five years, Magill said.

But the three wind turbines together providing up to 900 kilowatts of power brings the scale of alternative energy on the continent into an entirely new realm.