Wind Turbines and Energy Management

at Australia's Mawson Station

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Background

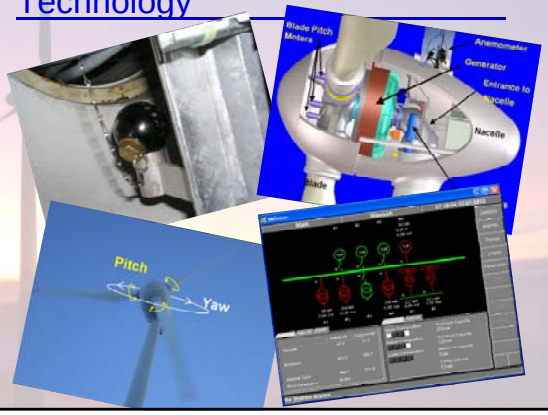
- Original power system used diesel cogeneration to supply electrical and heat energy to the station
- Katabatic winds
- Wind turbines commissioned in summer 2002/2003

Background

Technology

- Two 300 kW Enercon turbines
- Switchboard and control system upgraded
- New electric boiler runs central heating when excess wind power available
- Boiler power electronics act as a regulator to absorb the power fluctuations common in small wind turbine grids.

Technology



Maintenance & Reliability

- Maintenance undertaken by 3 electricians during summer and 2 during winter
- No major breakdowns
- Average annual turbine availability > 98%

Maintenance & Reliability

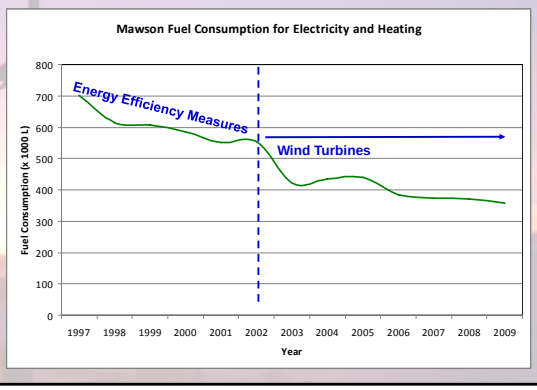
Operation

- One diesel generator runs constantly to aid frequency control and provide spinning reserve
- 90% wind energy contribution in favourable winds
- 39% best yearly average wind contribution
- 35% total wind contribution since commissioning

Fuel Savings

- Fuel savings > 200 000 L per year
- Best annual fuel saving 243 000 L
- Reduced CO_2 emissions
- Cost savings

Fuel Savings



Recent Work

- "Smart Grid" power control system being installed over winter 2010
- Initial monitoring and testing in parallel with existing control system
- Investigation of the new system's energy management capabilities with a view to increasing wind contribution and achieving better energy efficiency