

# Improving wind forecasts by mechanically combining predictions

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The Intergovernmental Panel on Climate Change (IPCC, 2007) places considerable importance on many key (climate change) mitigation technologies and practices being currently commercially available, including renewable power produced by wind. As the September/October 2007 edition of Eco-Generation magazine points out, “wind power ... can make rapid in-roads into reducing greenhouse emissions – and there is no reason this technology can’t make a serious contribution to Australia’s energy needs in the coming years.”

The planning accompanying the production of such power is greatly enhanced by accurate wind forecasts. A twelve-month "real-time" trial of a methodology utilised to generate Day-1 to Day-7 forecasts, by mechanically integrating judgmental (human) and automated predictions, was conducted between 20 August 2005 and 19 August 2006 (Stern, 2007).

The present paper reports on the accuracy of the wind component of forecasts so generated, specifically the Day-1 forecasts of wind for Melbourne Apt. These were produced by combining automated predictions (based upon NWP model synoptic data), with the official Melbourne Apt Terminal Aerodrome Forecast (TAF).

It was found that the percent variance of wind speed explained by the 9am and 3pm Day-1 forecasts from 27 December 2005, when *combined* wind forecasts were first generated, up until the conclusion of the trial on 19 August 2006, was lifted from 47.5% (TAF) to 54.3%. Similarly, it was found that the percentage correct forecasts of wind direction (within half an octant) was lifted from 68.3% (TAF) to 71.2%.

Combined predictions continue to be generated and, since 20 August 2006, forecasts have also been produced for beyond Day-7 (Day-8 to Day-10). Figure 1 presents the wind forecast component of one such prediction.

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Day & Date	9am Wind/ 3pm Wind Melb Apt (km/hr)
Mon-10-9-2007	N 45 N 35
Tue-11-9-2007	WSW 25 S 25
Wed-12-9-2007	SW 8 S 15
Thu-13-9-2007	N 25 N 25
Fri-14-9-2007	N 45 N 35
Sat-15-9-2007	N 35 NW 35
Sun-16-9-2007	N 35 NW 35
Mon-17-9-2007	W 25 W 25
Tue-18-9-2007	N 25 N 25
Wed-19-9-2007	N 35 NW 35

**Figure 1** Extract from the Melbourne Apt graphical forecast generated on Sun-9-9-2007.