

Near Term Wind Forecasting

Presentation to Wind Integration Standing Committee
February 20, 2008

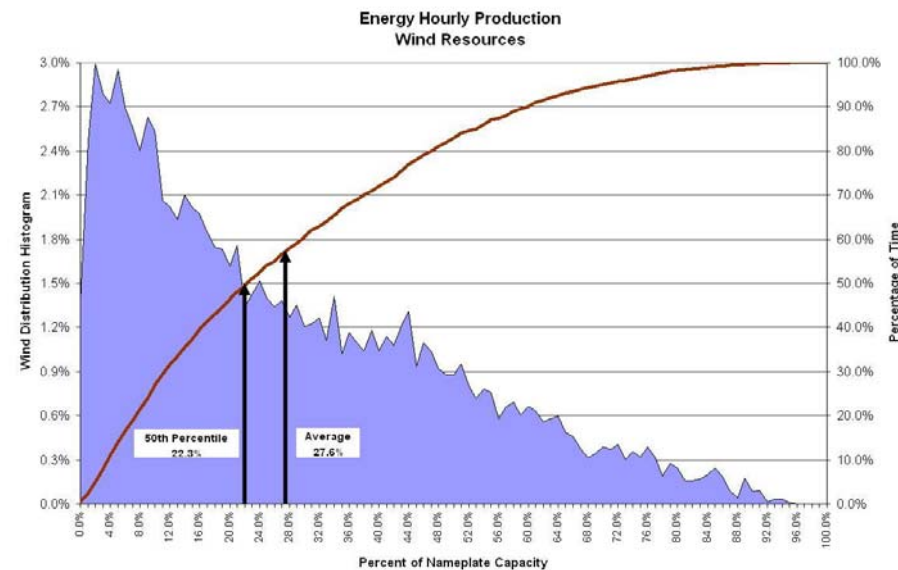
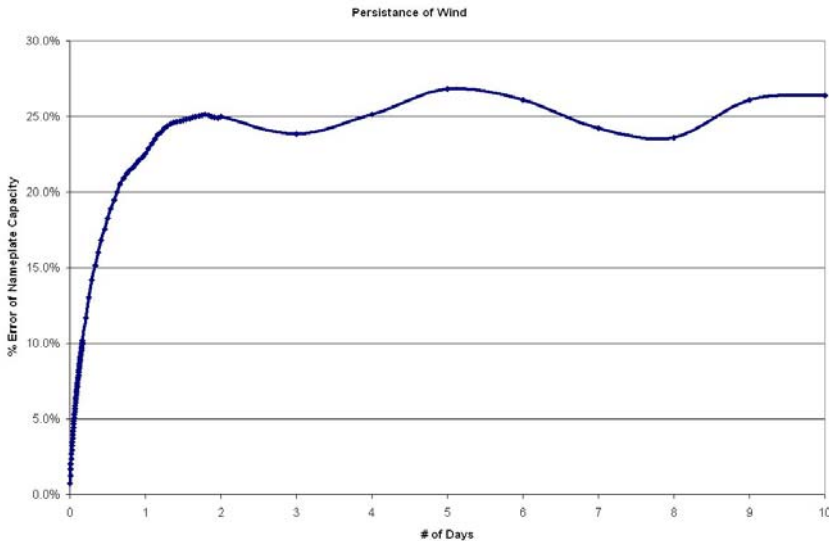


IESO – Near Term Forecasting

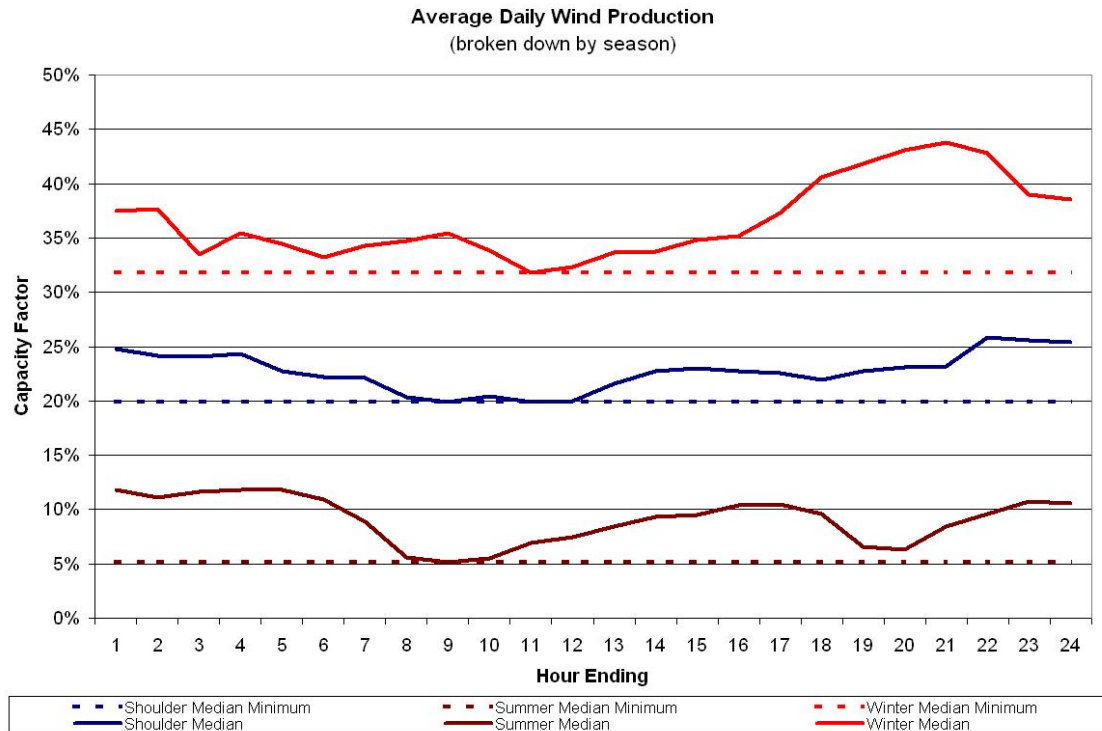
- Publishes System Status Reports (SSR) and Security and Adequacy Assessment (SAA) Reports
- hourly resolution (0 to 14 days out), daily resolution (15 to 33 days)
- provide a snapshot of expected condition of ICG and IAM
- ensure that equipment outages do not impact the reliability of the IESO-controlled grid
- report the status of generation, load, transmission, ancillary services

- 1) Historical Hourly Wind Production Characteristics
- 2) Review Proposed Methodology
- 3) Impact of using the Daily Median Minimum versus Daily Variable Trend
- 4) Near Term Forecasting with Historical or Simulated 10-Year Values
- 5) Results and Procedure for Near Term Forecasting of Wind Resources
- 6) Next Steps

Historical Wind Production in Ontario



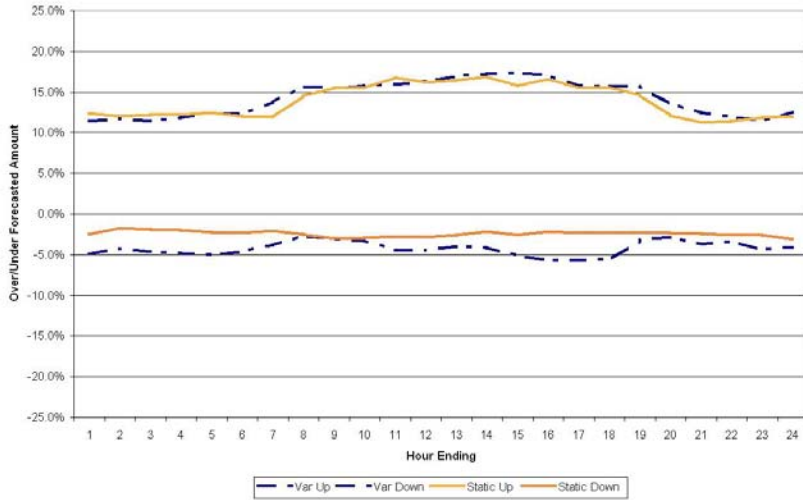
- Current wind conditions lose influence on wind production past 36 to 48 hours
- Near term forecasting of wind resources needs to remain applicable through to end of near term forecasting period (33 days)
- Median values equally split probability of over / under forecasting
- Breaking down forecasts seasonally, factors in variations seen in production through out the calendar year



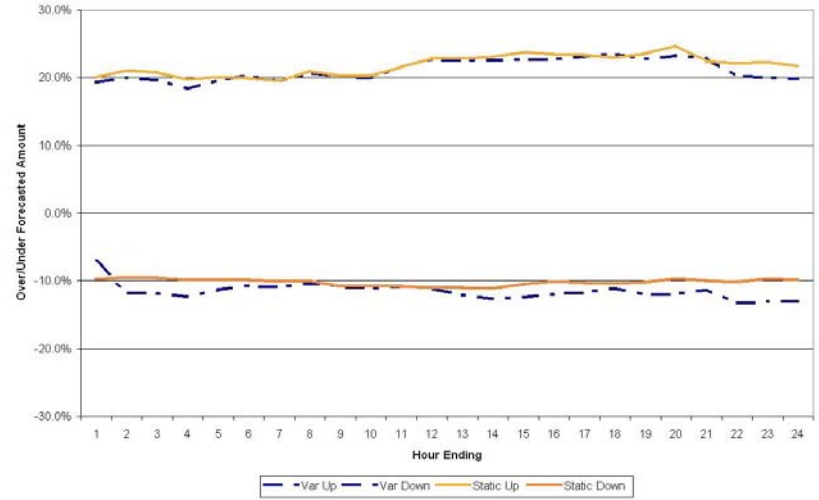
- Proposed methodology uses a median production factor (a ratio of produced energy to installed capacity) that is representative of seasonal trends
- Simple to implement, update, and re-calculate based on expected outages in the wind fleet (one value per season)

Projected Performance of Variable or Flat Trend in Near Term Forecasts

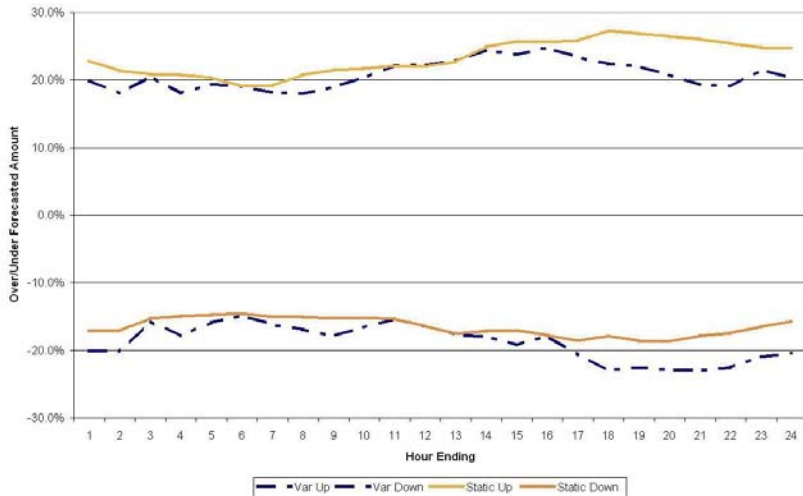
Summer Season - Over/Under Forecasting using Variable and Flat Trend



Shoulder Season - Over/Under Forecasting using Variable and Flat Trend



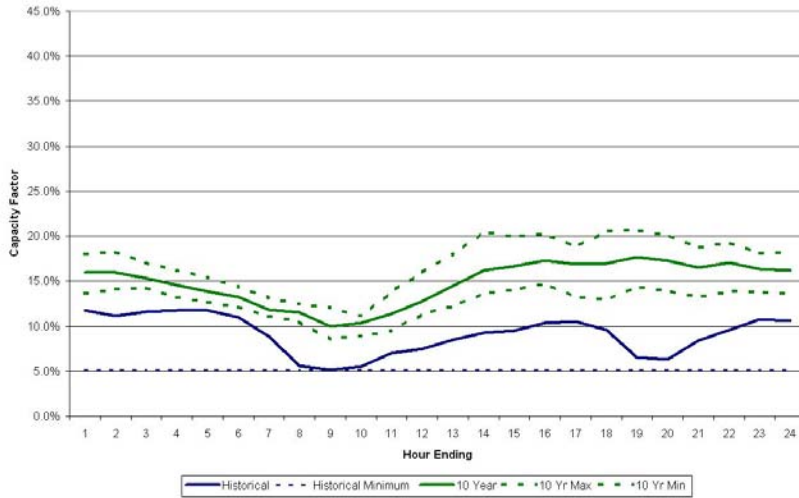
Winter Season - Over/Under Forecasting using Variable and Flat Trend



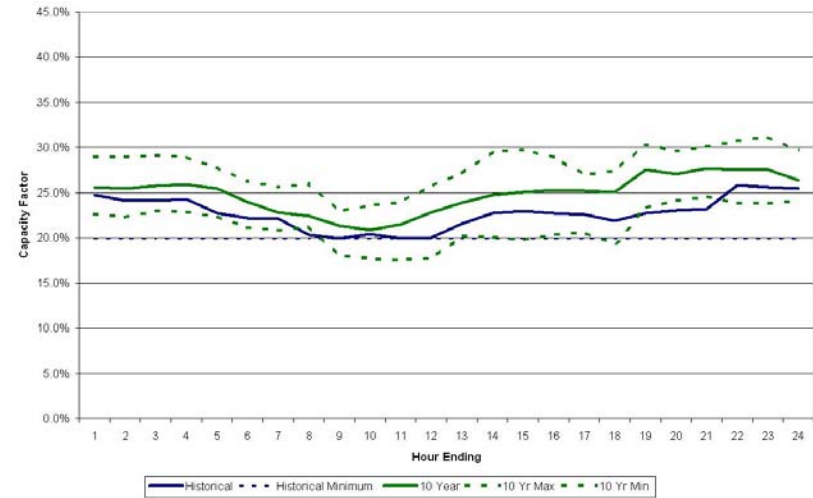
- By using the minimum of the daily median trend, we increase the frequency that we under forecast (conservative approach)
- The difference in the average over/under forecast amounts are not that significant

Median Values Based on Historical or Simulated Data

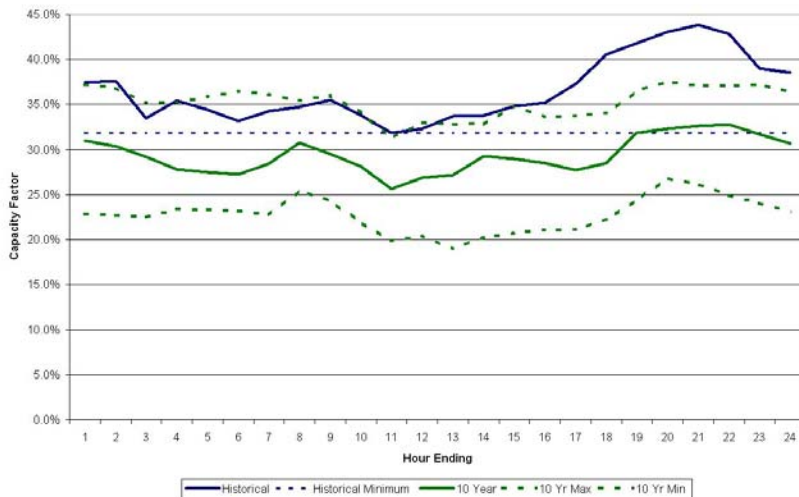
Daily Summer Energy Production Trends



Daily Shoulder Energy Production Trends



Daily Winter Energy Production Trends



- Proposed median values are based on actual production values of the existing wind fleet (September 2006 onwards)
- Historical data so far lines up with 10-year simulated data for the shoulder season
- Comparison has historical summer data under producing, winter data at high end of simulated range

	Near Term Forecast Production Factor	Hourly Forecasted Production Amount*	Daily Forecasted Production Amount*
Summer	5.0%	23.6 MWh	566.4 MWh
Shoulder	20.0%	94.2 MWh	2260.8 MWh
Winter	32.0%	150.7 MWh	3616.8 MWh

- Update values upon the conclusion of each of the shoulder seasons (twice a year)
- Median values to be based on the minimum median of each season, using historical data (starting September 2006 to the present)

*Based on an installed capacity of 471 MW and no units on outage

- Standing Committee approval
- Continue to track performance of proposed methodology and fine-tune where appropriate
- Collect historical results and compare with simulated values, explore possibility of using both data sets when they converge
- Targeted Implementation - March 2008