



# **Wind Power Operational and Market Report Week of Feb 10, 2008 to Feb 16, 2008**

Monday, February 25, 2008

## 1.0 Purpose

Around the world, interest in wind development as a source of renewable energy continues to grow. In Alberta, wind power is part of the diverse mix of generation sources that supplies the growing electricity demands of Albertans. As the amount of wind power on a system grows, so do the operational challenges.

Wind can start, stop or change at any moment. Today wind power is backed up by coal, gas, hydro generation facilities or the interconnections to BC and Saskatchewan using Alberta's competitive electricity markets.

The purpose of the weekly report is to provide industry with graphs and tables that illustrate aspects such as:

- Wind generation versus system load
- Regional diversity of wind generation
- Wind generation in the energy market
- Wind generation forecasts versus actual wind generation

The forecast information comes from the Wind Power Forecasting Pilot Project. The intent is to capture weekly wind power events and break them down from a forecasting perspective in order to educate AESO stakeholders on the capabilities of wind power forecasting. More information about this project can be found on our website at <http://www.aeso.ca/gridoperations/13825.html>.

The AESO anticipates that this report will continue to improve and any feedback is appreciated and feedback can be emailed to AESO stakeholder relations at [stakeholder.relations@aeso.ca](mailto:stakeholder.relations@aeso.ca).

## 2.0 Wind Generation Statistics

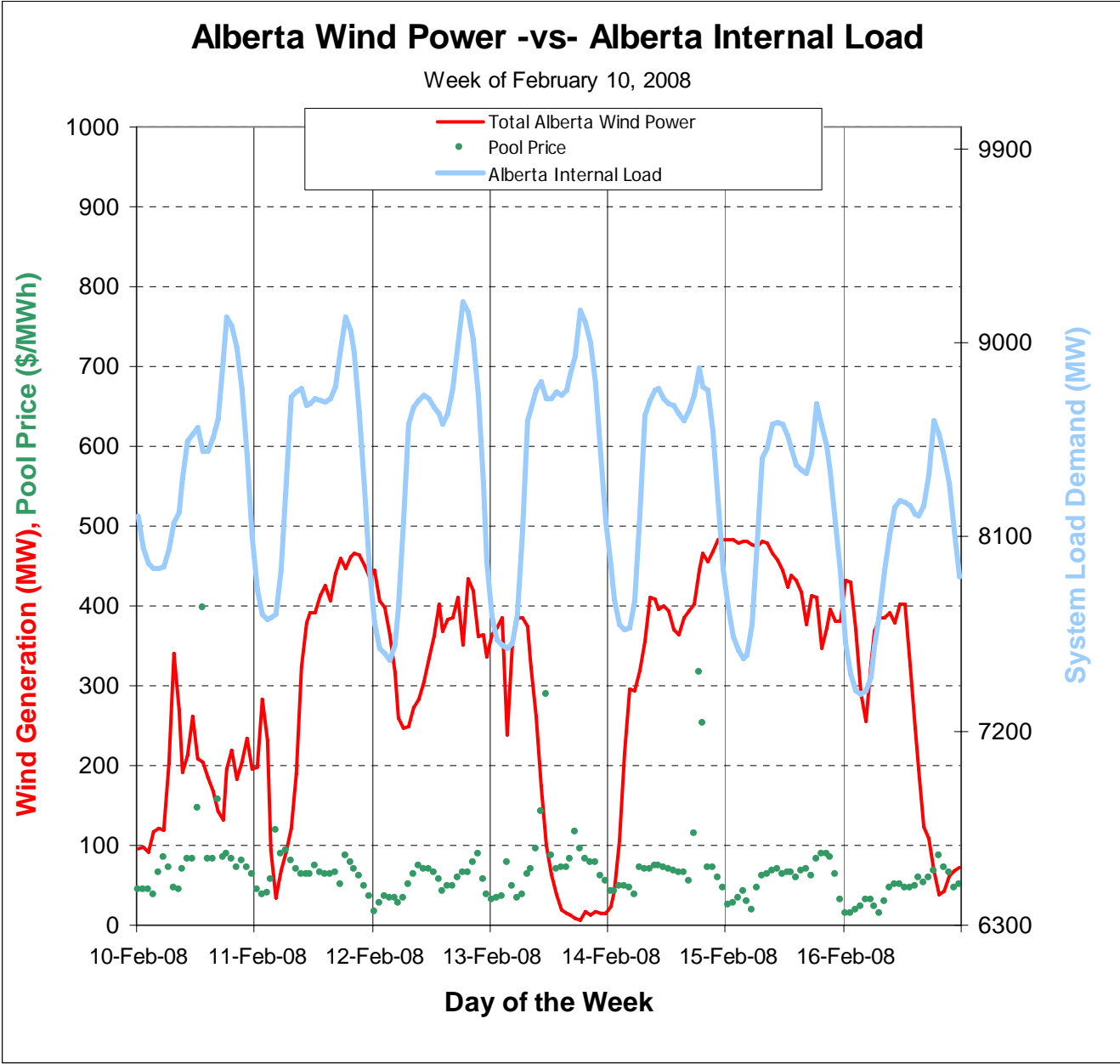
The purpose of this table is to provide daily production statistics as well as any wind power curtailment that occurred. The weekly average capacity factor<sup>1</sup> was 59.28%.

Daily Alberta Wind Generation Statistics										
497MW of Wind Power Currently Operational										
	Wind Generation (MWh/MW) Statistics								Curtailment Statistics	
Date	Average Off-Peak Wind Gen (MWh)	Off-Peak Capacity Factor	Average On-Peak Wind Gen (MWh)	On-Peak Capacity Factor	Average Daily Wind Gen (MWh)	Minimum Wind Generation	Maximum Wind Generation	Average Wind Gen During High Load Hour (MWh)	Number of Hours	Number of Affected Wind Power Facilities
10-Feb-08	130	26.23%	210	42.18%	183	85	357	183	0	0
11-Feb-08	179	36.09%	389	78.35%	319	21	482	459	0	0
12-Feb-08	347	69.75%	355	71.42%	352	228	465	403	0	0
13-Feb-08	312	62.76%	92	18.42%	165	3	419	12	0	0
14-Feb-08	222	44.75%	412	82.96%	349	19	487	413	0	0
15-Feb-08	467	94.03%	421	84.72%	436	331	489	425	0	0
16-Feb-08	318	64.01%	226	45.55%	257	25	463	49	0	0

<sup>1</sup> Capacity factor is determined by averaging the hourly capacity factors which are calculated as: Average Hourly Wind generation/Total installed capacity \*100

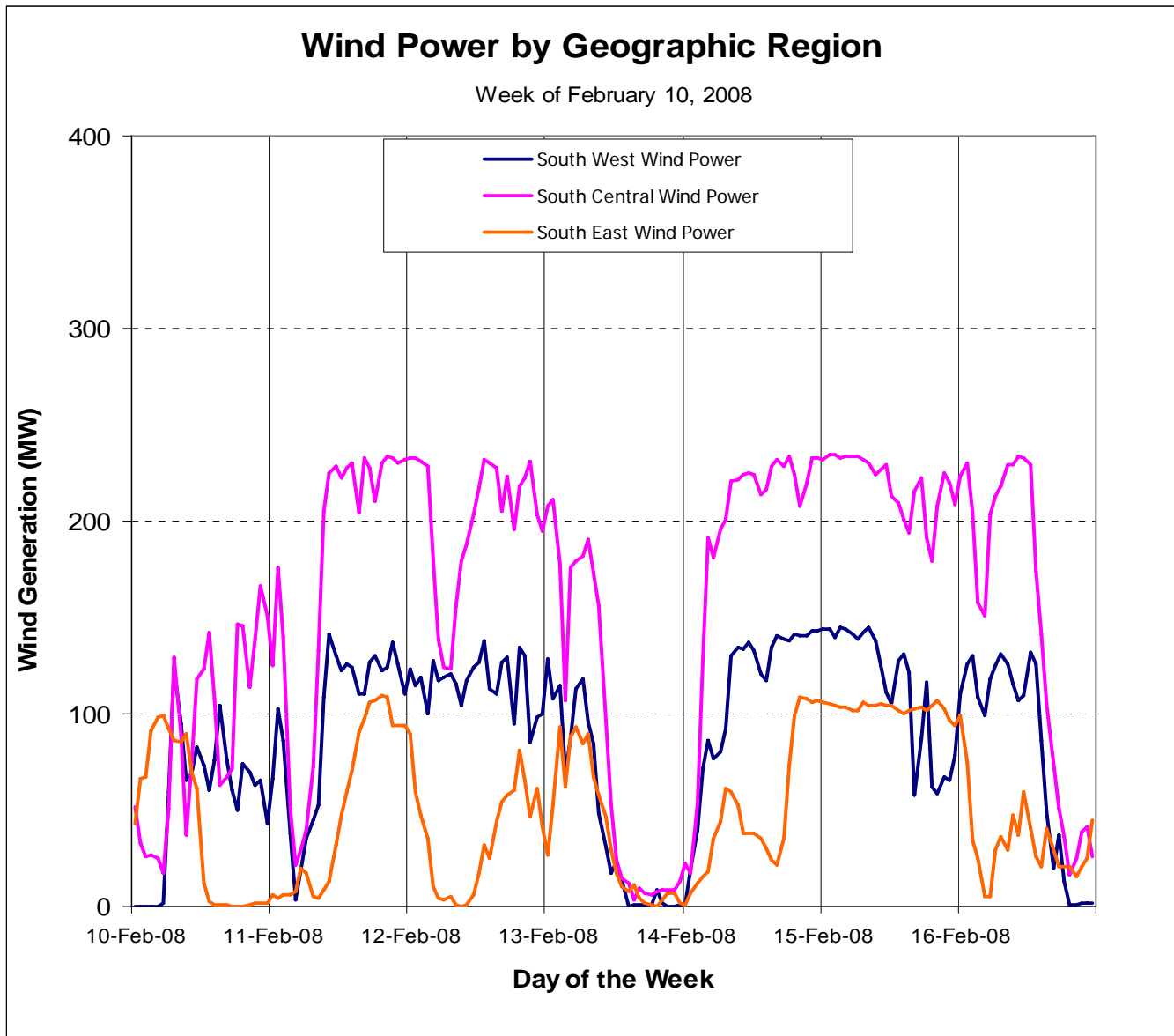
### 3.0 Wind Generation and System Load

The purpose of the graph is to illustrate how wind power varies with system load and the hourly pool price.



## 4.0 Wind Diversity in Alberta

The purpose of this graph is to illustrate how wind power varies in the different regions of Alberta.



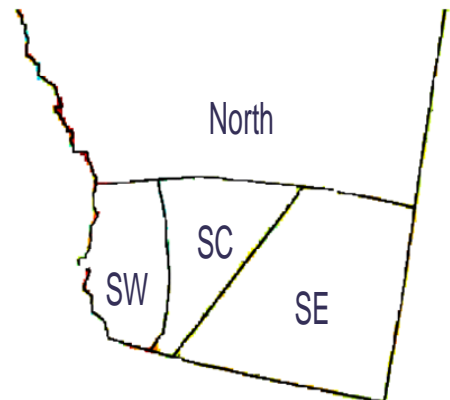
### Wind Regions:

South West (SW) Total Installed = 212.3MWs

South Central (SC) Total Installed = 176.2 MWs

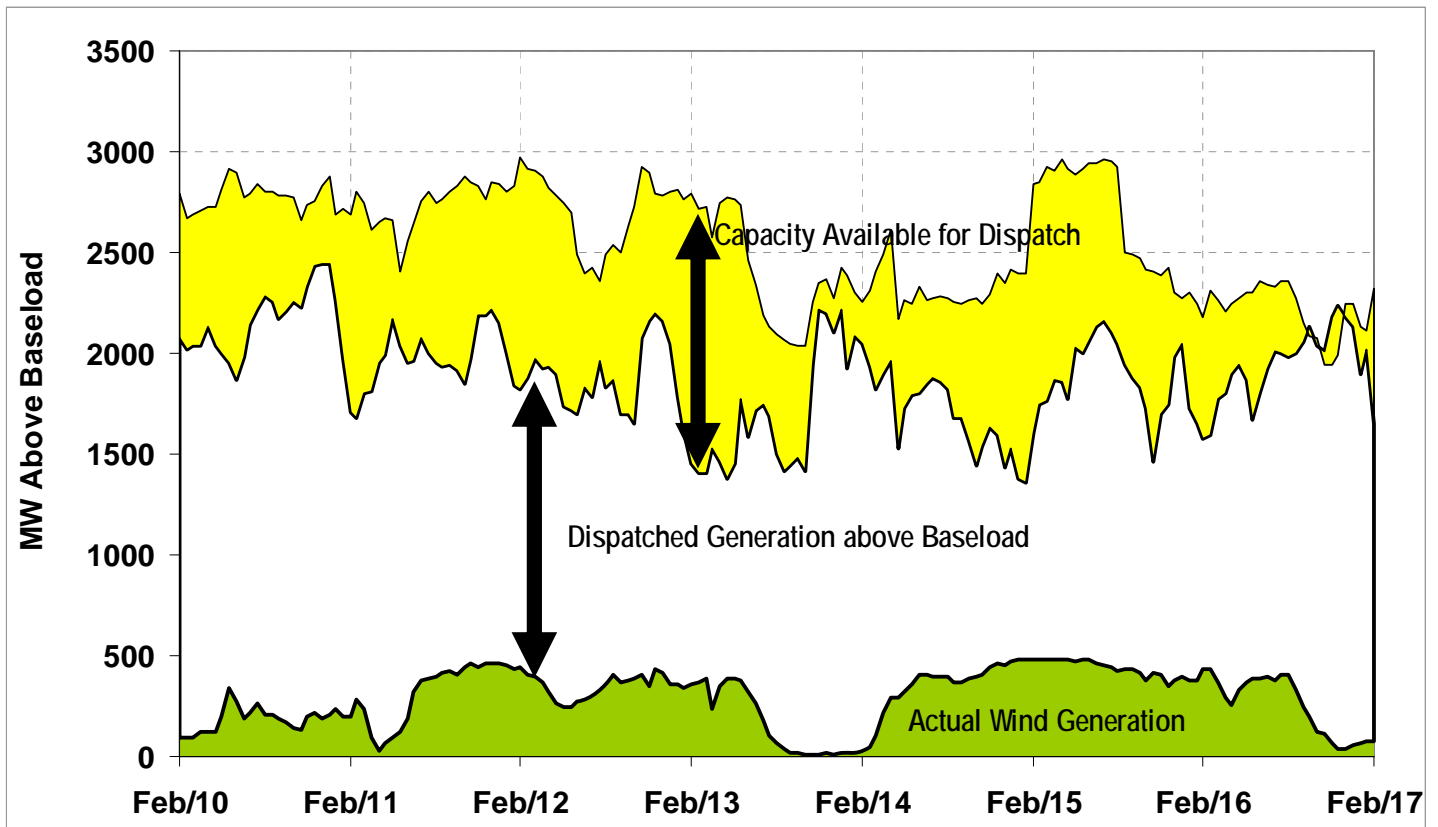
South East (SE) Total Installed = 110 MWs

There are currently no operational wind facilities in the North.



## 5.0 Generation Supply & Market Dispatch above Baseload Gen (\$0 Offer)

The Purpose of this graph is to demonstrate the variable flexibility that exists in the market place to accommodate wind.



- Based-load generation is the amount of generation from coal, gas or hydro that is either zero dollar offered, Transmission Must Run, small non-dispatchable or behind-the fence industrial generation. This can vary hourly and range between 4500 MW and 6000 MW throughout the year.
- **Note:** The Dispatched Generation above Baseload represents the head room before supply surplus conditions occur.
- **Capacity Available for Dispatch:** Includes unloaded capacity from regulating reserves as well as the amount of offered generation capacity that is not dispatched into the electricity markets.
- **Dispatched Generation above Baseload:** Includes generation produced from the regulating and contingency reserves as well as the amount of non-zero dollar generation dispatched from the energy market merit order.
- **Actual Wind Generation:** The measured amount of all wind generation in Alberta.

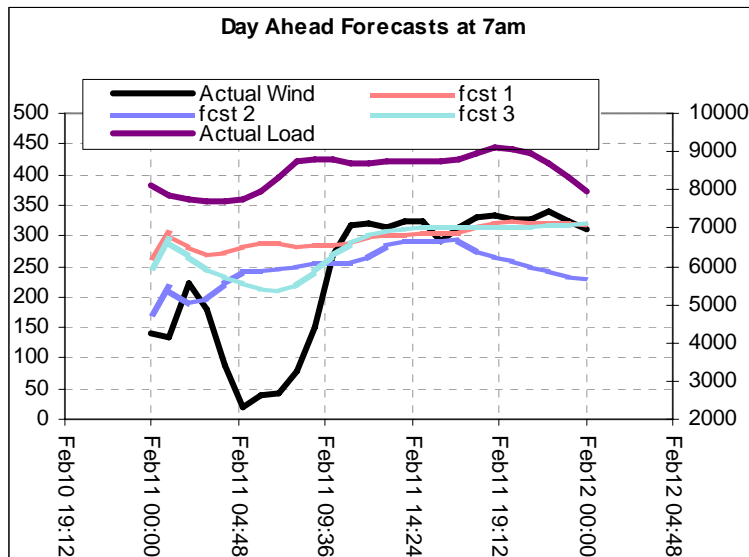
## 6.0 Wind Power Forecasting Pilot Project

The purpose of this section is to introduce stakeholders to wind power forecasts. The intent is to identify some of the weekly events, and break them down from a forecasting perspective.

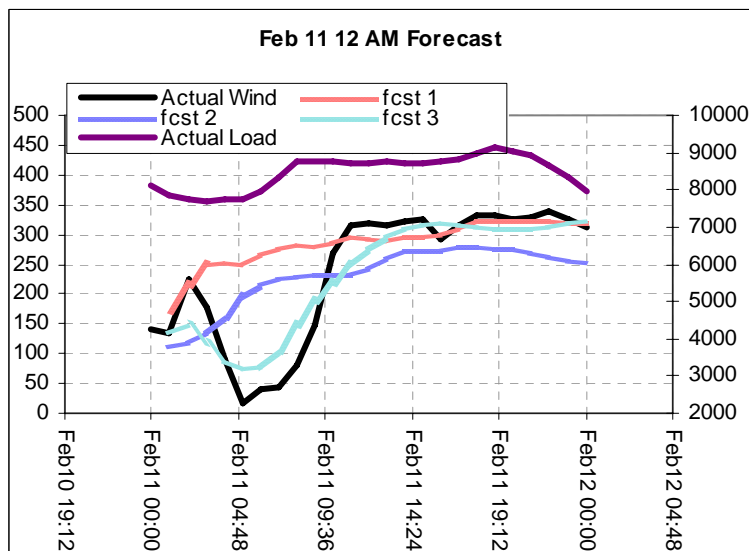
**Note: the total capacity in the pilot is 350 MW and not the 497 MW currently connected to the Alberta system.**

### 6.1 Event 1

Event 1 is a ramp down of 200 MWs followed by a ramp up of 300 MWs on Feb. 11.



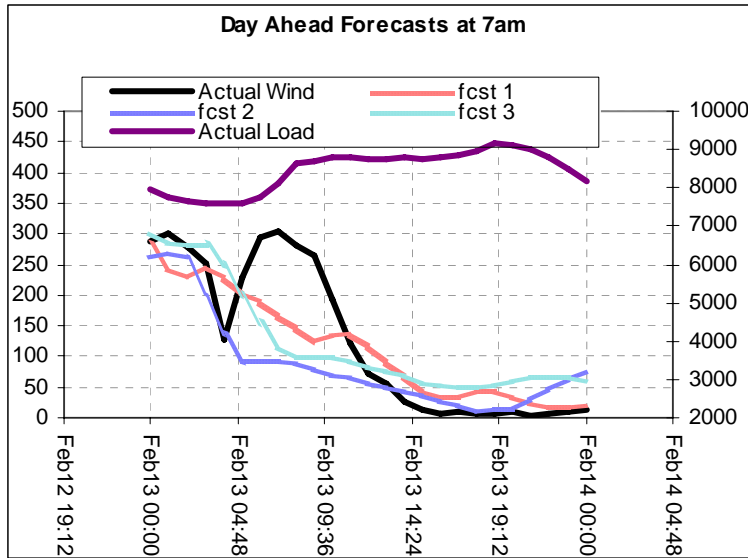
These are the forecasts delivered at 7am on Feb 10 for Feb 11.



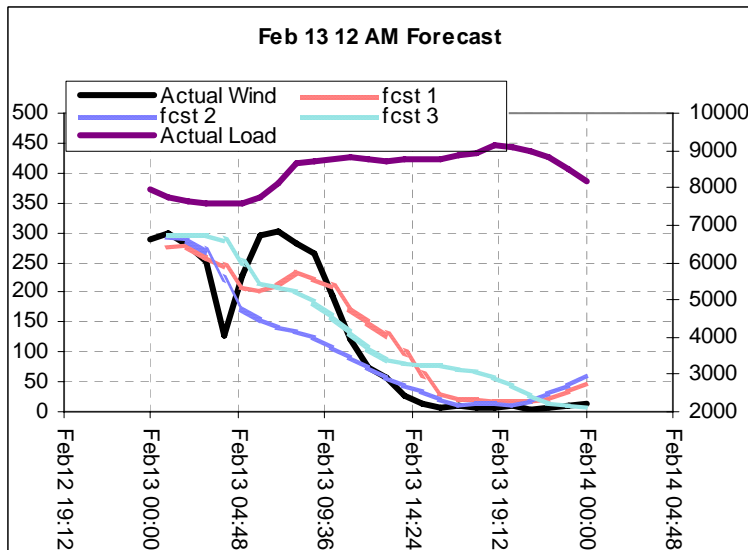
These are the forecasts delivered at 12am on Feb 11.

## 6.2 Event 2

Event 2 is a ramp down of wind power of 300 MWs on Feb. 13.



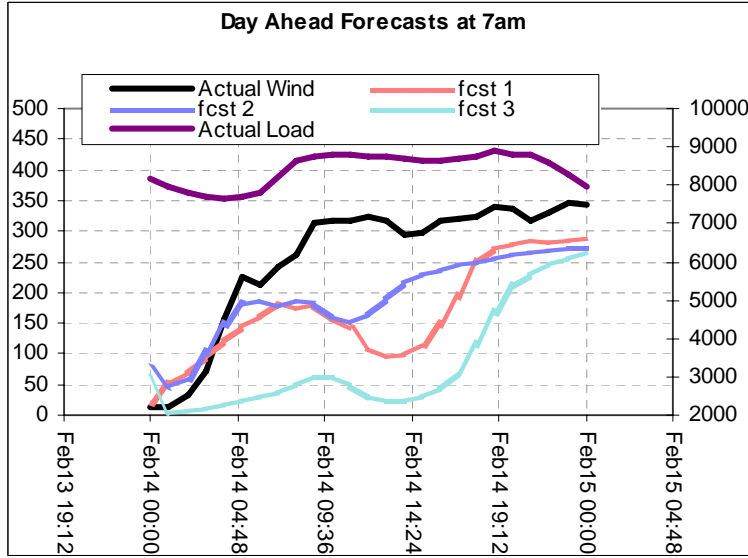
These are the forecasts delivered at 7am on Feb 12 for Feb 13.



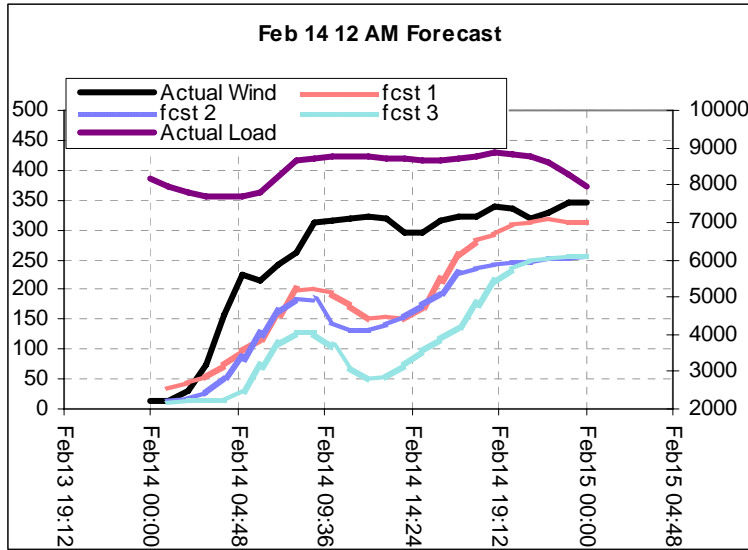
These are the forecasts delivered at 12am on Feb 13.

### 6.3 Event 3

Event 3 is ramp up of 300 MWs on Feb 14.



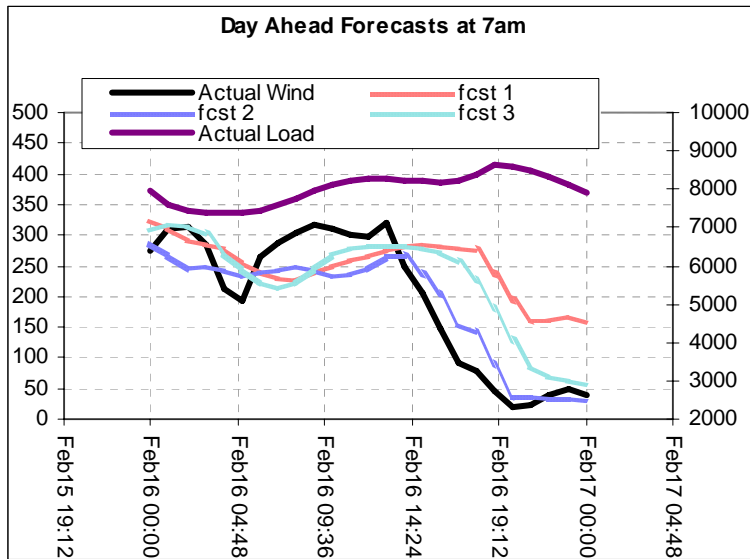
These are the forecasts delivered at 7am on Feb 13 for Feb 14.



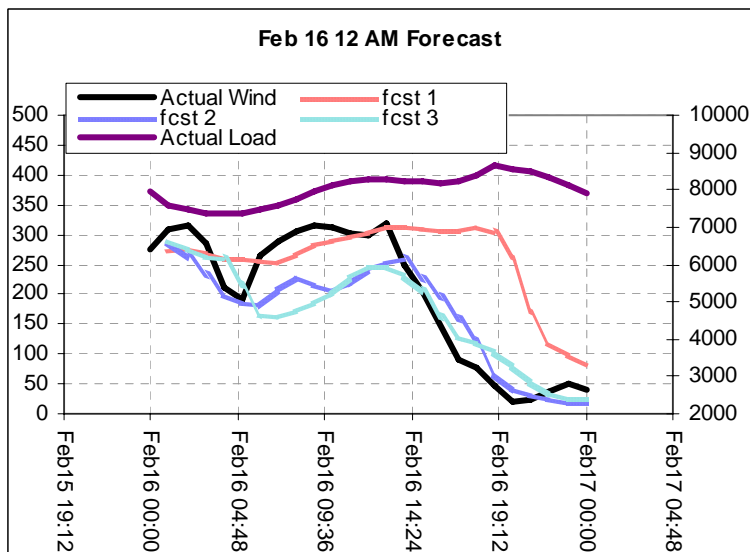
These are the forecasts delivered at 12am on Feb 14.

## 6.4 Event 4

Event 4 is a ramp down of 300 MWs on Feb 16.



These are the forecasts delivered at 7am on Feb 15 for Feb 16.



These are the forecasts delivered at 12am on Feb 16.