Wind Power Forecasting Pilot Project

Event Analysis

Jan 27

Reliable **Power**

Reliable **Markets**

Reliable **People**

Operations and Reliability

aeso
ALBERTA ELECTRIC SYSTEM OPERATOR

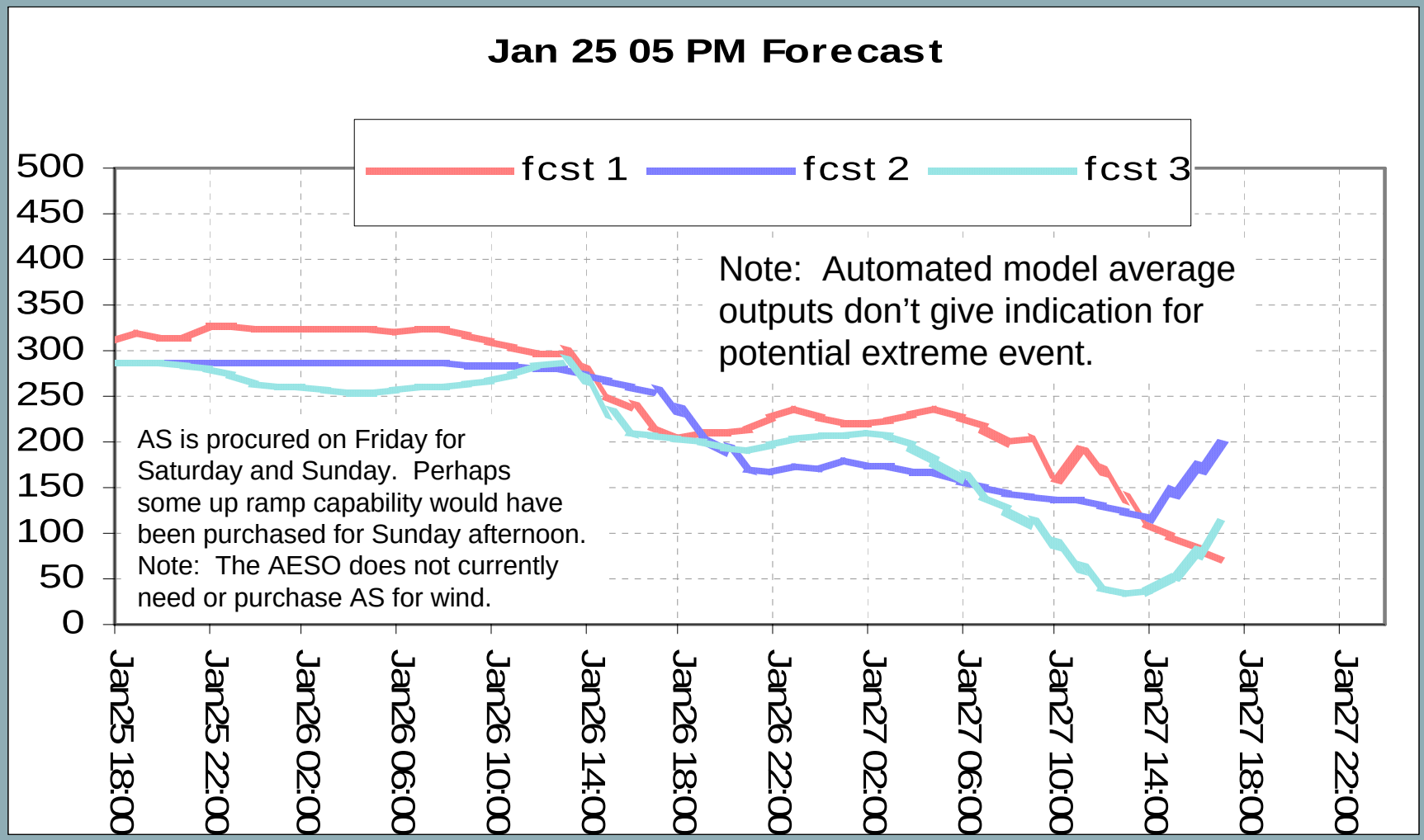
Email from AWS Friday Jan 25 530pm

It looks to us like Sunday may prove to be an interesting case. An extremely strong cold front is forecasted to move through the existing wind farm region roughly in the 2 to 6 PM MST period.

The winds will be from the N or NE in the existing wind farm area once the farms are in the very cold air. However, much warmer air with fairly strong WSW winds will be present above this cold air immediately after it moves into the region. This will setup a condition in which there is a highly stable atmosphere with large vertical wind shear above the existing wind farm region for a number of hours.

The ability to predict the correct amount of vertical mixing of winds will be severely tested by the complex and rapidly changing vertical structure of the atmosphere on Sunday. This case has the potential to produce significant downward on/or upward ramps whose timing and amplitude may be very difficult to forecast, perhaps even a few hours ahead (due to the uncertainly in the evolution of vertical mixing - i.e. turbulence).

Next 48 hour forecast as seen at 5pm Friday Jan 25



EPS forecasts - Microsoft Internet Explorer provided by AESO

http://81.169.134.174/mseps/aeso/forecasts/

EPS forecasts

PLATON -

Presentation Form:
- Full EPS
- Mean/Min/Max
- Probabilities
- Map with fc&obs

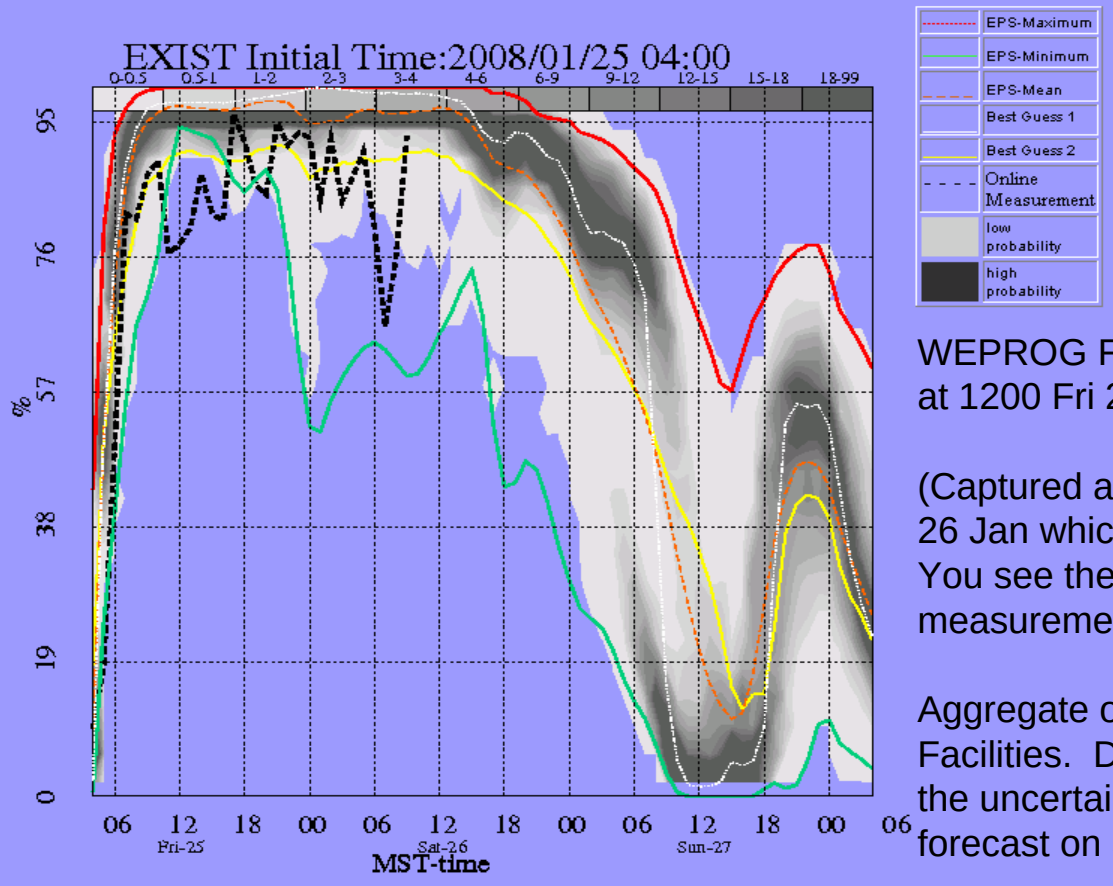
Area:
- AESO
- CE
- EXIST
- FUTURE
- SC
- SE
- SW

Start of Forecast:
21/01/2008: 00 06 12 18
22/01/2008: 00 06 12 18
23/01/2008: 00 06 12 18
24/01/2008: 00 06 12 18
25/01/2008: 00 06 12 18
26/01/2008: 00 06

Fields :
- day 1 - 3 ramp rate
- day 1 - 3 wind power

HELP: Info about the EPS setup and how to use the menu

MS-EPS-MEAN-Field: Wind Power - Forecast Start: 2008012512 +00H - Valid Date: 2008/01/25 05H MST



WEPROG Forecast delivered at 1200 Fri 25 Jan.

(Captured at 0900 Sat 26 Jan which is why You see the actual online measurement.)

Aggregate of 7 existing Facilities. Demonstrates the uncertainty in the forecast on Sunday.

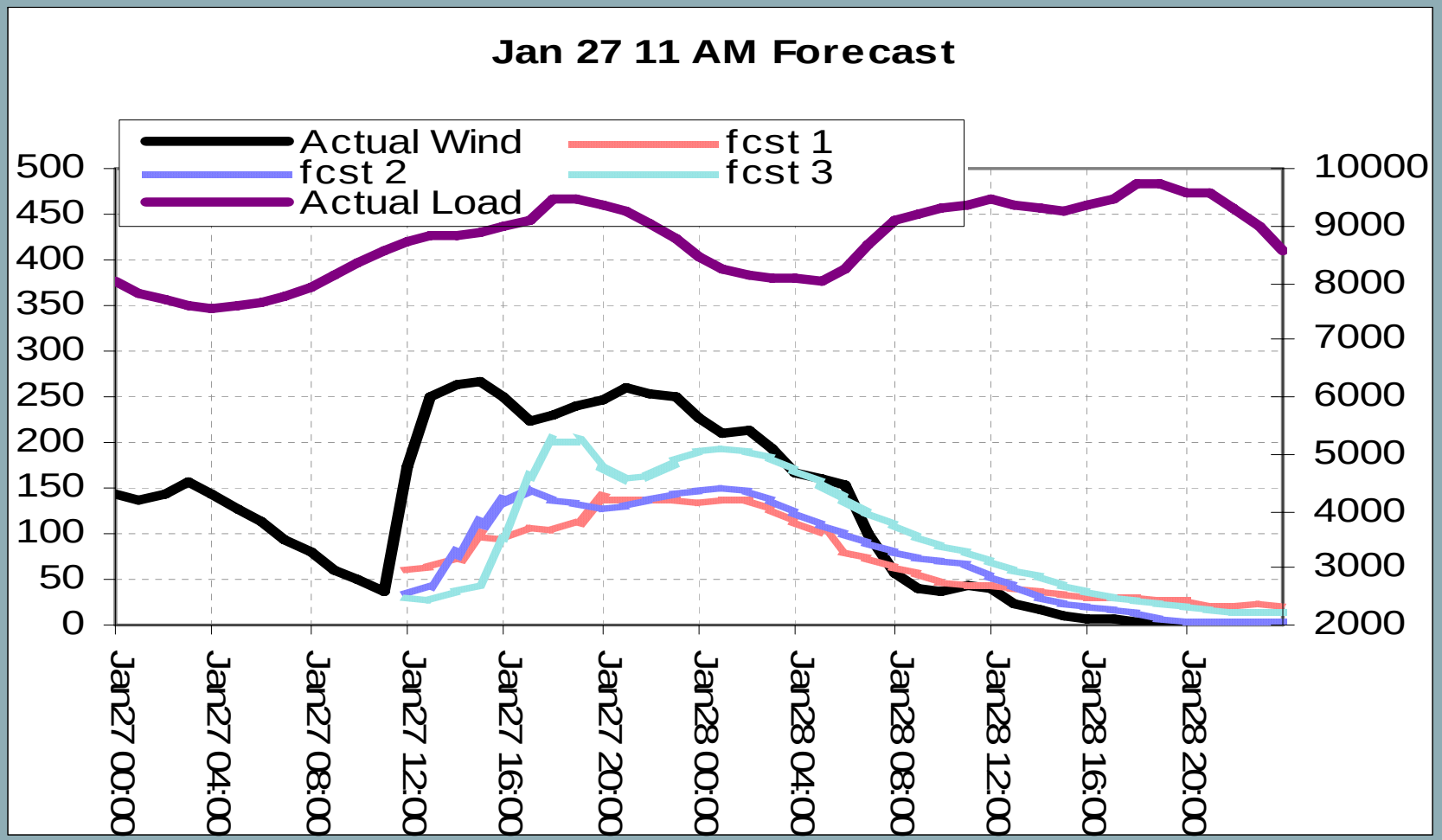
Done

Internet

100%

Start | Events - Microsoft Outlook | 3 Reminders | RE: Jan. 28 Event - Mes... | Event Analysis | EPS forecasts - Micro... | Microsoft PowerPoint - [J...

Forecasts delivered at 11am on Sunday Jan 27

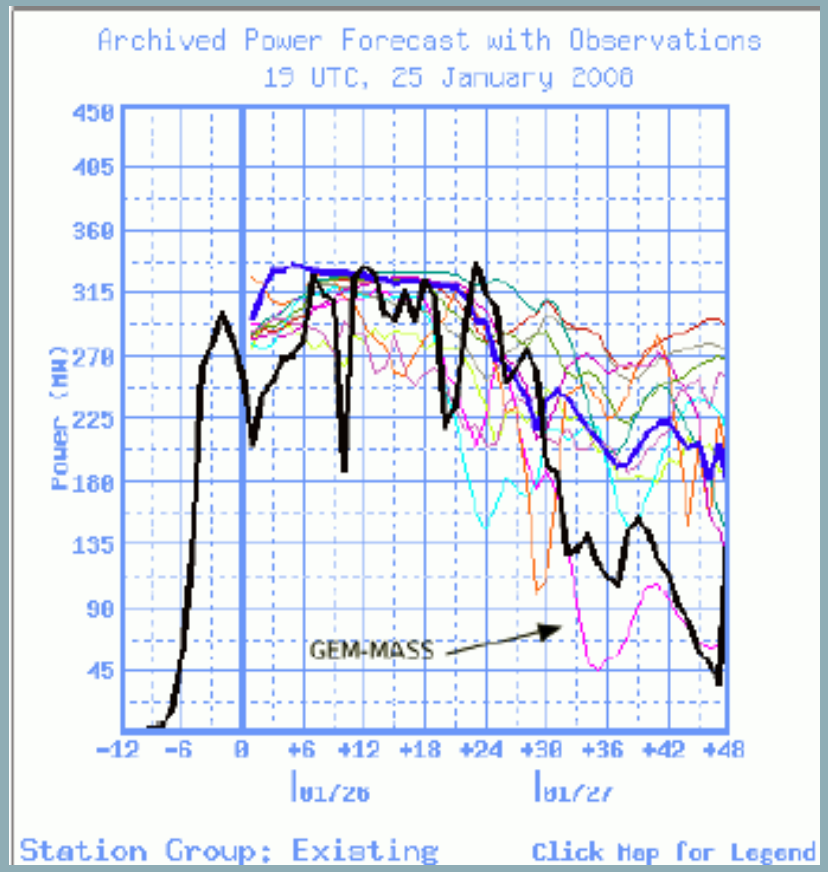


Forecaster Comments

- AWS – one ensemble member performed well, the GEM-MASS member, initialized with the Environment Canada GEM dataset (see next slide)
- Weighting of GEM-MASS member was high due to recent good performance by this member
- However, the weighting scheme is still conservative in order to minimize RSME
- Perhaps, a human forecaster looking at these forecasts and knowing the performance history would have put even more weight on the GEM-MASS forecast
- The challenge is to map these weather patterns with ensemble member performance and come up with a scheme that weights the correct one as heavy as possible in each case
- A large sample of forecast errors (several years) might help with this process.

AWS Ensemble Member Breakdown

- Black is observed
- Thick blue is optimized ensemble forecast



General Comments

- Perhaps a short description of the possible wind power ramping trend during the day and a general level of uncertainty in phase error (timing) associated with the forecasts would be beneficial to the system controller so as to be prepared
- Discussions with system controllers indicated that a heads up could be beneficial
- It seems as though the forecasters are able to characterize these events and predict the pattern
- A good idea of forecast uncertainty would be required to make the proper AS procurement decisions one or two days ahead. This will be important once wind power levels reach points where system controllers need additional resources