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IESO SENIOR MANAGEMENT UPDATE

To: Stakeholder Advisory Committee

Date: August 20, 2008

Subject: Briefing note on the Day-Ahead Forecast

Information Item

An analysis of the Day-Ahead Price Forecast for the month of July 2008 shows that it has performed better than the day-ahead predispach price for the same period. For July, the average absolute difference between day-ahead forecast price and the real-time price was \$17.35 / MW. For context the average absolute difference between real-time prices and the predistach price in July was \$21.94 / MW. The day-ahead market price in New York differed, in absolute value, from the real-time price by \$37.61 / MW for the month of July. An efficiency score shows that the use of the day-ahead price forecast would have led to more efficient decisions compared to use of the day-ahead pre-dispatch price. However, one month is a short period of time to evaluate the performance of the day-ahead price forecast. A detailed review will be produced in October this year and provided to the Stakeholder Advisory Committee for the October 30th meeting.

During its first month, the Day-Ahead Price Forecast page was the 12th most viewed page on the IESO website recording 4,918 hits for the month of July. Web traffic on July 23 was very high coinciding with high temperatures and humidity. The forecast for July 1 was the only day that it was unavailable, due to a problem with the tool.

A diverse cross-section of the electricity industry including traders, generators, commercial, industrial, and residential consumers have provided feedback. The majority look at the forecast daily. While a number of viewers are simply curious about the forecast, some are also using the forecast to make business decisions on whether to run back-up generation and shift or reduce their electricity consumption.

The Day-Ahead Price Forecast is available on the IESO website at www.ieso.ca/dapf.

Model Performance

There are three key metrics that are used to evaluate the performance of the model. These are;

1. Efficiency Score
2. Absolute Price difference
3. Mean Absolute Percentage Error.

Each one of these metrics is presented below.

Efficiency Score

The Efficiency Score calculates the number of hours in which the day-ahead price forecast would have led the user to make an inefficient decision¹. A model with a high score indicates that more inefficient decisions are likely if that model is used to make decisions. As a result, a low score is preferred to a high score. Table 1 below provides the efficiency scores for the IESO day ahead price forecast model compared to the alternative, the IESO day-ahead pre-dispatch price from the 4PM pre-dispatch schedule.

Table 1 Efficiency Score, July 2008

Efficiency Score	
Day-Ahead Price Forecast	Day-Ahead Pre-dispatch Price
7	25

Absolute Price Difference

This metric calculates the average absolute value of the difference between the price forecast and the actual price. A small value is preferred to a large value because it indicates the forecasted price is close to the actual price. Table 2 presents the results for the month of July 2008.

Table 2 Absolute Price Difference, July 2008

	Peak	Off-peak	All
Day-Ahead Pre-dispatch Price	\$28.48	\$10.10	\$21.94
Day-Ahead Price Forecast	\$21.30	\$9.40	\$17.35

Mean Absolute Percentage Error (MAPE)

This metric calculates the absolute price difference in each hour as a percentage of the actual price and it averages this value for the whole month. It provides a measure of the accuracy of the model. A low value is preferred to a high value. Table 3 presents the results for the month of July 2008.

Table 3 Mean Absolute Percentage Error (MAPE), July 2008

	Peak	Off-peak	All
Day-Ahead Pre-dispatch Price	35%	54%	41%
Day-Ahead Price Forecast	30%	41%	34%

¹ See Appendix A for a detailed discussion of this metric.

Appendix A

Efficiency Score

The efficiency score is based on the conditional probability that the forecasted price exceeds a specified value given that the actual price (HOEP) is below a threshold value. By definition it is an ex-post measure. Assume a consumer has a valuation for energy at \$70/MWh. Suppose the day-ahead the forecasted price for hour 14 is \$120/MWh. Clearly the consumer has an incentive to avoid consumption in hour 14. Assume that the actual price (HOEP) is \$65/MWh. Had the consumer used the forecasted price to avoid consumption in hour 14, he would have made an inefficient decision. At a price of \$65/MWh, the consumer should have consumed to get a surplus of \$5/MWh. The efficiency score quantifies the number of hours where such inefficient events occur at different threshold prices. The table below indicates the number of hours where incorrect decisions are likely for two models. For example, the day-ahead price forecast predicted a price above or equal to \$100 in 6 hours and the actual price (HOEP) turned out to be less than \$75 in those hours. In contrast, the day-ahead pre-dispatch price projected a price above or equal to \$100 in 18 hours and the actual price turned out to be less than \$75 in those hours.

Efficiency Score Calculations

	Day-ahead price forecast is above or equal to \$100 and HOEP is less than \$X	Day-ahead pre-dispatch price is above or equal to \$100 and HOEP is less than \$X
X<\$50	0	2
X<\$65	1	5
X<\$75	6	18