Minutes of the
Northwest Power Planning Council's

Demand Forecasting Advisory Committee

Held at the Council's Offices
851 SW Sixth Ave., Suite 1100, Portland, OR
October 31, 2002

The third meeting of the Demand Forecasting Advisory Committee (DFAC) for the Council's 5th power plan was called to order at 9:40 AM by chair Terry Morlan. There were 9 persons in attendance.

These minutes are not intended to reflect exactly what was said at the meeting, but rather what the Council staff heard as the basic advice during the meeting.

Attendance:

Members	Visitors
Ham Nguyen, PGE	Charlie Grist, NPPC
Robin Adams, Resource Strategies Inc.	Dick Watson, NPPC
Reed Davis, Pacificorp	Michael Schilmoeller, NPPC
Ken Corum, NPPC	
Jon Hirsch, BPA	
Terry Morlan, NPPC	

Welcome and Introductions:

After a round of introductions, the agenda (Attachment 1) was approved as drafted.

Approval of Minutes for April 18 Meeting:

The minutes of the July 31, 2002 meeting of the DFAC (Attachment 2) were approved with one minor editorial correction.

Comments on the Draft Demand Forecast Paper:

Council staff noted that no comments were received on the draft forecast paper as a result of the public comment period. DFAC members were asked if they had any additional comments or suggestions on the draft forecast. There were none, with the understanding that most of the meeting today would be devoted to examining the DSI assumptions for the forecast.

Discussion of Revised DSI Forecast:

This agenda item started with a briefing from DFAC member Robin Adams. He used a PowerPoint presentation (Attachment 3) to describe current status and recent developments in the world aluminum markets and the implications for Pacific Northwest aluminum smelters. The following discussion is a summary of the main points of the presentation.

Aluminum is considered a growth industry in terms of world demand for the product. Transportation is expected to be a growing market. Packaging is expected to be a growing sector worldwide and construction, while cyclical, is expected to grow in developing countries, especially China. There are competing products so growth is dependent on maintenance of a competitive price for aluminum. Aluminum demand is expected to grow at 3 to 3.5 percent.

Electricity is a key driver of aluminum competitiveness. In a typical new smelter electricity, priced at about the industry average for smelters of $20 per megawatt-hour, accounts for about 21 percent of aluminum costs. The costs of alumina and carbon account for about 27 percent of costs, but these are commodities and plants will face about the same costs for these components with some differentials due to transportation costs. Capital is the single largest cost component for a new plant, accounting for 29 percent of cost. The cost of capital can vary depending on the perceived risk of investing in specific countries.

The U.S. share of world aluminum production has declined from over 50 percent in 1960 to 21 percent in 2001. The production shares of China, the Middle East and Africa have been increasing rapidly.

A modest surplus of aluminum developed in 2001 because of an economic recession. It was smaller than in past cycles because of large production cuts in the Pacific Northwest and Brazil due to hydroelectric power shortfalls. The outlook is for the market to continue in surplus through 2004 due to rapid production capacity growth, especially in China. Cheap coal resources in the interior of China are driving aluminum development there. Therefore, prices are expected to remain weak for at least a couple more years.

Historically, aluminum prices have been volatile. However, they display a downward trend over time. Aluminum is a commodity. During periods of surplus, prices fall to the variable or avoidable cost of a swing smelter. During balanced markets the prices tends toward a level sufficient to induce required investment. During a shortage the price can rise well above variable costs in order to ration demand out of the market; that is, it becomes an auction for available supply. Alumina is also a commodity and it is increasingly being contractually linked to aluminum prices.

Turning to the implications for Pacific Northwest smelters, it was noted that Northwest smelters tend to fall toward the upper end of the world spectrum of smelting costs. The best plant in the region is more expensive than about 70 percent of the other plants in the

world. High costs in the region reflect the small size of plants and their pots, obsolete Soderberg technology in 5 plants, inland location of 3 plants, and electricity prices about double the world average ($17 to $18) for aluminum smelters. In spite of high operating costs, Northwest smelters may have an advantage in low capital cost of as much as $70 million a year over a new greenfield plant. Power prices at $25 can eat up $33 million of that advantage, but at $35 could eliminate it completely. The penalty for higher labor cost should be less than $15 million a year, but could be over $28 million with restrictive work rules or bad management practices.

A simple analysis of smelter profitability was presented that showed how different smelter groups in the region would fare under different aluminum and electricity prices. The best smelters in the region could operate long term with aluminum prices of $1400 per tonne and electricity prices near $34 per megawatt-hour. Given the volatility of aluminum markets, a plant needs to be able to make enough money when aluminum prices are $1400 to cover its losses for two years of aluminum prices at $1200. For a short time these best smelters could operate with electricity prices at $36 at the same aluminum price.

Smelters that are in the middle of the regional cost range need electricity prices between $25 and $30 to operate at $1400 aluminum prices, and will likely be swing plants. They will tend to close during periods of low aluminum prices. The highest cost plants in the region would need electricity prices near $20 to operate long run. Even short-term these plants would need electricity prices in the low $20 range to operate. Therefore, these plants are candidates for permanent closure. It was noted, however, that an inefficient plants bought for a very low price could provide a cost-effective option for some companies to produce during very tight aluminum markets.

Individual plants were discussed in the context of critical electricity prices at aluminum prices of $1400. It was noted that the draft medium mid-Columbia electricity price forecast shown in the draft DSI paper (Attachment 4) of over $35 did not seem to be consistent with the proposed medium DSI demand forecast, which assumed four plants operating in the medium case. There are probably only one or two plants that could survive such electricity prices in the region.

There was substantial discussion of the possible value of interruptible DSI electricity contracts, either on a peak basis or on a bad water year basis. On peak interruption of aluminum smelters is a very recent possibility. It is being done in a Maryland plant. Peak electricity prices need to be in the area of $50 before this makes economic sense. There are efficiency and operational losses involved for the smelter, but the smelter has been able to save $5 to $6 dollars on its average electricity price. Research by Resource Strategies suggests a minimum value of $2 a megawatt-hour from average electricity price for peak hour interruptibility and $1.50 for dry year closure. However, this is an area that needs to be carefully researched in this region. Analysis needs to consider the cost and time required for shut downs longer than 4 to 6 hours.

Because the forecasted electricity price is crucial to the aluminum industry outlook, and the electricity price outlook depends on the natural gas price outlook, there was a discussion of the veracity of the Council's natural gas price forecast. Some DFAC members thought that the Council's natural gas price forecast might be high. The reasoning was based on the possibility of importing LNG to the east coast for around $3.50 and the netback to Canadian natural gas supplies. Several other possibilities for natural gas prices were discussed, but it was acknowledged that current natural gas price expectations could be too much influenced by recent events.

The proposal that low aluminum demands might occur in the high demand forecast case and vice versa was discussed. There was general agreement that electricity prices are probably the crucial deciding factor in whether aluminum plants can operate in the region. It is also agreed that natural gas and electricity prices are likely to be higher in a high economic growth case.

However, the point that the medium DSI demand forecast did not fit well with the medium electricity price forecast was raised again. The evidence presented earlier in the meeting would imply that at the medium electricity price of $35 to $40 is consistent with the lowest forecast of DSI demand, not the medium. It was suggested that the Council could incorporate a relationships between electricity prices, aluminum prices and DSI demand into power system risk and uncertainty analysis.

There was some discussion of how long an aluminum plant could remain shut down and still come back. It was considered likely that some of the region's smelters would have a hard time surviving until aluminum markets improve in 2005 or 2006. In some cases, a slice of low cost power may help the plants survive until aluminum markets improve.

It was noted that aluminum company expectations play a key role in this question. It was noted that it is possible that a Council forecast for electricity prices that stays above $35 per megawatt-hour might affect those expectations. It was also noted that a devaluation of the dollar by 30 percent would make a significant difference to the competitiveness of U.S. aluminum smelters. Many economic analysts currently believe that the dollar is over-valued.

Discussion of Future Council Forecasting Strategies

The committee turned to a discussion of forecasting methods and the Council's forecasting requirements. Council staff described three types of forecasting analysis that the Council needs: (1) a required 20-year forecast of electricity demand; (2) a 5-year demand forecast to assess resource adequacy; and (3) a winter ahead forecast of demand for reliability assessment.

Descriptions of forecasting approaches by utilities reflected similar requirements. Utilities are required by regulators to do long-term forecasts for IRP purposes. They also do 3 to 5 year forecasts, as well as day ahead, week ahead, and 30 to 60 days ahead. A general characterization of the methods used for different time periods is; end-use models

for long-term forecasts, econometric models by customer class for 3 to 5 year forecasts, and time series techniques for very short-term forecasts.

It was suggested that the Council needs to ask itself what it is fundamentally trying to do. Is it trying to influence expectations, or influence regulators, or influence utilities and independent power producers, or is it just producing useful data? Discussion indicated that many in the region use the Council's forecasts and analyses as guideposts.

There was a discussion about the need for the end use detail for efficiency assessment. There was some agreement that a general assessment of conservation potential should be sufficient, but that it was important to understand the effects of prices on demand and to understand the incentive effects of policies. It was regarded as an important problem that the demand side of the market is in the "regulated chain", while the supply side is in the "open market chain".

There was discussion of peak loads and the effects of time-of-day or real time pricing. Some did not expect such pricing to have a large effect unless consumers were provided with a way of easily responding to such signals.

The issue of forecasts affecting behavior was discussed. If the Council is able to highlight a potential supply problem, that may help prevent the problem from occurring.

The meeting came to a close at 3:10 P.M. Staff indicated that it was not clear when, or if, another DFAC meeting would be needed. If one is scheduled, plenty of forewarning will be given.

These minutes are an accurate and complete summary of the matters discussed and conclusions reached at the Demand Forecasting Advisory Committee meeting held on October 31, 2002.

Certified by: _____

Terry H. Morlan, Chairman

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