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July 19, 2010

PUBLIC SERVICE COMMISSION



Mr. Alex Hofschulte  
Office of Energy Security  
85 7<sup>th</sup> Place East, Suite 500  
St. Paul, MN 55101-2198

**RE: Nature of Docket: Resource Plan**  
**Docket No. E-017/RP-10-623**

Dear Mr. Hofschulte:

Attached to this electronic response please find Otter Tail Power Company's response to the Minnesota Office of Energy Security's information request numbers 4, 7 and 8 in the above-referenced docket.

If you have any questions, regarding these responses, please contact me at 218 739-8417 or [bhdraxten@otpco.com](mailto:bhdraxten@otpco.com).

Yours very truly,

/s/ BRIAN DRAXTEN  
Brian Draxten  
Manager Resource Planning

wao  
Attachments  
By electronic filing, email and U.S. mail  
c: Adam J. Heinen  
Hwikwon Ham  
Steve Rakow  
Chris Davis

5 PU-10-346 Filed: 7/20/2010 Pages: 11  
Response to the MN Office of Energy security's info  
request no. 4, 7 and 8

OTTER TAIL POWER COMPANY  
Docket No. E017/RP-10-623

Response to: Office of Energy Security  
Analyst: Adam J. Heinen, Hwikwon Ham, Steve Rakow, Chris Davis  
Date Received: 7/9/2010  
Date Due: 7/19/2010  
Date of Response: 07/19/2010  
Responding Witness: Brian Draxten, Manager Resource Planning - (218) 739-8417

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Information Request No: MN-OES-4

Subject: Integrated Resource Plan (IRP) Forecasting  
Reference: Initial IRP Filing, Section 3: Forecast Section

In the above reference, Otter Tail discusses the various forecasts, and accompanying data, that it uses to project sales and demand in its IRP filing. The OES notes that Otter Tail filed a general rate case in Docket No. E017/GR-10-239 on April 2, 2010. Based on its review of the resource plan and the general rate case, the OES observes that the Company uses regression analyses to estimate sales in both proceedings. Given the use of statistical analyses in both proceedings, please provide the following:

- a. a list of any, and all, variables that Otter Tail uses in both its IRP filing and its rate case filing;
- b. a full discussion explaining why Otter Tail uses the variables discussed in part a. in both its IRP filing and its rate case filing;
- c. a full list of variables only used by Otter Tail in its IRP filing;
- d. a full list of variables only used by Otter Tail in its rate case filing;
- e. a full discussion explaining why it only uses the variables listed in part c. in its IRP filing; and
- f. a full discussion explaining why it only uses the variables listed in part d. in its rate case filing.

If this information has already been provided in written comments or in response to an earlier OES information request, please identify the specific testimony cite(s) or OES information request number(s).

RESPONSE

OTP did not file a forecast test year in Docket No. E017/GR-10-239. The only regression models used were for the incremental weather normalization adjustment to the

historic test year sales which is different than forecasting company and jurisdictional sales over many years.

a. Variables that Otter Tail uses in both its IRP filing and its rate case filing;

- heating degree days per day
- cooling degree days per day
- month dummies (February through December)

b. Why Otter Tail uses the variables in part a in both its IRP filing and its rate case filing;

The dependent variable in all models is the log of kWh per month. The biggest drivers of sales variations across months are due to regular seasonal patterns (captured by the month dummies) and weather. Therefore, both the weather normalization models and the long-term forecasting models include these factors.

c. Variables only used by Otter Tail in its IRP filing (in sales forecast);

- Log of customer count (residential model only)
- Log of transportation and warehousing employment (unclassified model only)
- Log of total retail sales (streetlights model only)
- Log of real gross domestic product (large commercial and small commercial models only)
- Log of electricity prices (farm and small commercial models only)
- "late" which is a dummy variable in the streetlights model only that accounts for a large change in the level of sales that is not accounted for by other variables.

d. Variable only used by Otter Tail in its rate case filing;

A time trend variable, by itself and interacted with a summer dummy variable. The interaction variable allows for load to grow at a different rate in summer months than non-summer months, which can be important if there's been a change in the air conditioning penetration rate during the sample period.

e. Why Otter Tail uses the variable listed in part c in its IRP filing;

In the weather-normalization models, the only variables that are used are the coefficients on CDDs per day and HDDs per day. (They are applied to the difference between actual and normal weather for the test year to weather normalize actual sales.) In this context, this approach accounts for long-term changes in the level of sales. The two time-trend variables accomplish this task.

The story differs for the long-term forecast models. In these models, we are interested in the drivers of changes in usage over time. We tested a variety of variables for each customer class to determine a variable (*e.g.*, GDP) that appeared to affect long-term sales levels for that class. The driver (or drivers) differed by customer class. This resulted in a more intuitively satisfying model for forecasting long-term changes in sales over time. That is, if we were to use only a time trend, the assumption going forward would be that the future sales would continue to change at the same rate as occurred in the sample period. This is not necessarily the case when simple time trend variables are replaced with driver variables. For example, if GDP is a relevant driver, the effect of changes in economic conditions on sales in the forecast period will depend on the forecast of GDP, which may be expected to change at a different rate than it did during the historical period.

An additional reason for the disparity between the weather normalization and long-term forecasting models is that there are many more weather normalization models. That is, those models are estimated for each rate group (there are 38 for Minnesota), whereas the long-term forecasting models were estimated using customer categories defined in Minnesota Administrative Rules section 3610.0310. While the amount of effort required to customize each of the long-term forecasting models seemed reasonable (given the interest in the drivers of long-term sales changes), it did not seem reasonable to conduct the same customization for all of the rate-group level models. Therefore, we applied a common model to all rate groups that contained the elements of greatest import and interest.

- f. Why Otter Tail only uses the variable listed in part d in its rate case filing;
- See the response to part e above.

OTTER TAIL POWER COMPANY  
Docket No. E017/RP-10-623

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Responding Witness: Brian Draxten, Manager Resource Planning - (218) 739-8417

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Information Request No: MN-OES-7

Subject: Demand Forecast Models  
Reference: Initial IRP Filing, Section 3: Forecast Section, Page 9

In the above reference, Otter Tail provides a brief discussion of the various weather data sources used in its Demand Forecast Model. In this discussion, the Company mentions two separate weather data sources (Otter Tail monitoring stations and High Plains Regional Climate Center). Given the two data sources, please provide a detailed explanation of why Otter Tail uses two separate weather data sources in its analysis.

If this information has already been provided in written comments or in response to an earlier OES information request, please identify the specific testimony cite(s) or OES information request number(s).

RESPONSE:

Five ultimate weather variables are used as inputs in Otter Tail's Demand Forecast Model: Summer Months Temperature Humidity Index Buildup (sthbuildup), Swing Months Temperature Humidity Index Buildup (swthbuildup), Winter Fargo Wind Speed (wfaws), Winter Heating Degree Day Buildup (whddbuidup), and Swing Month Cooling and Heating Degree Buildup (swcddhddbuidup).

Otter Tail has weather recording stations (Otter Tail Monitoring Stations) at several different locations throughout its service territory. Otter Tail Monitoring Stations are only able to record dry bulb temperatures. They are not able to record relative humidity or wind speed. Otter Tail Monitoring Stations are used to obtain dry bulb readings to calculate the whddbuidup and swcddhddbuidup weather variables.

Data obtained from the High Plains Regional Climate Center is used for measures of relative humidity and wind speed, which are used to calculate sthbuildup, swthbuildup, and wfaws. Fargo is used as a proxy for the system average since data in proximity to Otter Tail's Monitoring Stations is not available from the High Plains Regional Climate Center.

OTTER TAIL POWER COMPANY  
Docket No. E017/RP-10-623

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Responding Witness: Brian Draxten, Manager Resource Planning - (218) 739-8417

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Information Request No: MN-OES-8

Subject: Integrated Resource Plan (IRP) Forecasts and Rate Case Forecast

Please provide for any, and all, comparable forecasts, or weather-normalization calculations, in Otter Tail's IRP and Rate Case a comparison between the forecasts for any common time periods. In addition, if there are any differences, please provide an explanation fully explaining each, and any, difference(s).

If this information has already been provided in written comments or in response to an earlier OES information request, please identify the specific testimony cite(s) or OES information request number(s).

RESPONSE:

The IRP forecast is not comparable to the weather normalization that was conducted for the Rate Case. In the Rate Case, Otter Tail used estimated weather coefficients (on cooling and heating degree day variables) to adjust test year (2009) sales for the difference between actual and normal weather conditions. Therefore, the resulting values aren't a "forecast" per se. Rather, they are an adjustment of historical values. Alternatively, the IRP forecasting models produce forward-looking sales values assuming forecast values for the independent variables (including normal weather conditions). The first year that is forecast in these models is 2010, which is after the Rate Case test year.

## CERTIFICATE OF SERVICE

**RE: Resource Plan  
Docket No. E017/RP-10-623**

I, Wendi A. Olson, hereby certify that I have this day served a copy of the following, or a summary thereof, on Dr. Burl W. Haar, and Sharon Ferguson by e-filing and all other persons on the attached service list by electronic service or by First Class mail.

**Otter Tail Power Company  
Response to Office of Energy Security Information Request Numbers 4, 7 and 8**

Dated this 19th day of July, 2010.

/s/ WENDI A. OLSON  
Wendi A. Olson, Regulatory Assistant  
Otter Tail Power Company  
215 South Cascade Street  
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(218) 739-8699

Docket No. E017/RP-10-623  
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Peter	Beithon	pbeithon@otpcoc.com	Otter Tail Power Company	P.O. Box 496 215 South Cascade Street Fergus Falls, MN 565380496	Electronic Service	No	OFF_SL_10-623_RP-10-623
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Shane	Henriksen	shane.henriksen@enbridge.com	Enbridge Energy Company, Inc.	1409 Hammond Ave FL 2 Superior, WI 54880	Electronic Service	No	OFF_SL_10-623_RP-10-623
Mark	Holsten	mark.holsten@dnr.state.mn.us	Department of Natural Resources	500 Lafayette Road St. Paul, MN 55155	Electronic Service	No	OFF_SL_10-623_RP-10-623
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Randy	Kramer		Water and Soil Resources Board	1501 Second Avenue South Wheaton, MN 56296	Paper Service	No	OFF_SL_10-623_RP-10-623

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Darrell	Nitschke		North Dakota Public Service Commission	600 E. Boulevard Avenue Bismarck, ND 585050480	Paper Service	No	OFF_SL_10-623_RP-10-623

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