Docket No. 20000-___-ER-11
Witness: Peter C. Eelkema

BEFORE THE WYOMING PUBLIC SERVICE COMMISSION

ROCKY MOUNTAIN POWER

Direct Testimony of Peter C. Eelkema

December 2011

Q. Please state your name, business address and present position with PacifiCorp dba Rocky Mountain Power ("the Company").

A. My name is Peter C. Eelkema, my business address is 825 N.E. Multnomah, Suite 600, Portland, Oregon 97232, and my present position is Lead/Senior Consultant, Load and Revenue Forecasting.

Qualifications

Q. Briefly describe your education and business experience.

A. I received an undergraduate degree in Economics from San Jose State University in San Jose, California. I also received a PhD in Economics from the University of Kansas.

From September 1989 to October 1993, I was a Managing Research Economist at the Kansas Corporation Commission. From October 1993 to March 1996, I was an Economist at the Nevada Office of Advocate for Customers of Public Utilities. From March 1996 to March 1998, I was a Senior Economist, Forecasting, at Sierra Pacific Power/Nevada Power Company, and from March 1998 to January 2005, I was a Staff Economist, Forecasting at Sierra Pacific Power/Nevada Power Company. From January 2005 to May 2008, I was a Consultant, Load and Revenue Forecasting at PacifiCorp. I was promoted to my current position in May 2008.

Q. Please describe your current duties.

A. I am the senior consultant of the Load and Revenue Forecasting group. The Load and Revenue Forecasting group is responsible for the development of the test year kilowatt-hour ("kWh") sales, number of customers, system loads, and system

peaks for the Company's six retail jurisdictions.

Q. Have you previously testified before a regulatory commission?

A. Yes. I have testified before the Idaho Public Utilities Commission, the Public Service Commission of Utah, the Wyoming Public Service Commission, the Nevada Public Service Commission, and the Kansas Corporation Commission.

Purpose and Summary of Testimony

Q. Please explain the purpose of your testimony in this proceeding.

A. The purpose of my testimony is to explain how the Company developed the forecasts of the number of customers, kWh sales at the meter ("sales"), and system loads and system peak loads at the system input level ("loads"), and number of bills for the 12-month period ending March 31, 2013. The Company produces these forecasts for all six states in which the Company serves retail customers to develop jurisdictional allocation factors, forecasted revenues, and net power costs. In addition to the class level forecasts for bills and sales, the Company has developed a forecast of bills and kWh sales by rate schedule for Wyoming.

Q. How are the forecasts utilized in preparation of this general rate case?

A. The forecasted loads for the 12 months ending March 2013 were used by Company witness Mr. Gregory N. Duvall to calculate net power costs, and by Company witness Mr. Brian S. Dickman to calculate the revenue requirement and jurisdictional allocation factors. Additionally, forecasted sales by rate schedule are used by Company witnesses Mr. William R. Griffith and Mr. C. Craig Paice to allocate costs between customer classes and to design rates which correctly reflect

the cost of service. The sum of energy by rate schedule ties to the forecasted energy by customer class.

Q. Please provide a summary of the forecasted energy sales.

A. Table 1 provides the forecasted energy sales for the test period for total Company and Wyoming.

Table 1, Test Period Sales Forecast (MWh)

	April 2012 to March 2013	
	Total Company	Wyoming
Residential	15,823,546	1,076,028
Commercial	16,717,116	1,583,754
Industrial	19,772,850	6,686,198
Irrigation	1,214,929	20,020
Public Authority	405,350	-
Lighting	141,280	11,750
Total	54,075,070	9,377,750

Q. How is your testimony organized?

A. My testimony is organized as follows:

- I describe the major changes in forecast assumptions and data used to produce the forecast.
- I describe the forecasting process for the residential, commercial, irrigation, lighting, and industrial customer classes.
- I describe the hourly load forecasting process.
- I describe the rate schedule forecasting process.
- I give a summary of results where I compare the sales forecast used in the 2010 Wyoming general rate case to the sales forecast for the current rate case.
- Finally, I compare the weather normalized base period sales to the test

year forecasted sales and compare how well the forecast used in the 2010 Wyoming general rate case is tracking actual sales for the first 10 months of 2011.

Summary of Changes in Forecast Assumptions

Q. Does this forecast employ the same methodology as presented to the Wyoming Public Service Commission in the 2010 general rate case?

A. Yes.

Q. Please provide a general overview of the methodology.

A. In summary, this methodology consists of first developing a forecast of monthly sales by customer class and monthly peak load by state. This sales forecast becomes the basis of the load forecast (energy at the generator) by adding line losses. The monthly loads are then spread out to each hour based on the peak load forecast and typical hourly load patterns to produce the hourly load forecast.

Q. Please summarize major updates in data used to produce the forecast.

A. There are eight notable updates in data inputs compared to the forecast prepared in the 2010 general rate case. In each of these eight updates, the Company used the most recent available information.

1. Updated the historical data period used to develop the monthly retail sales forecasts to January 1997 through July 2011. The historical data period used to develop the model driven portion of industrial monthly sales is from January 2002 through July 2011;

2. Updated the historical data period used to develop the monthly peak forecasts to include January 1997 through December 2010;

3. Updated the economic drivers from IHS Global Insight for each of the Company's jurisdictions (this was updated with the June 2011 release for all states except for Utah which was updated with the August 2011 release);

4. Updated the forecast of existing large customer usage based on August 2011 data;

5. Updated the forecast of new and expanding large customer usage based on August 2011 data;

6. Updated the time period used to define normal weather to the 20-year time period of 1991-2010;

7. Updated the line loss calculation from the five-year period ending December 2009 to the five-year period ending December 2010;

8. Updated the hourly sales by customer class used in the model by adding 2010 hourly data and dropping 2005 hourly data; and

9. Updated the residential use per customer per day model with revised appliance saturation and efficiency results.

Q. Before continuing, please explain why the data ending date varies from December 2010 to August 2011.

A. The model was estimated in August 2011. At that time the most recent available monthly sales data ended in July 2011; the most recent available hourly data (which is used to estimate the peak) ended in December 2010; the most recent available county level economic drivers (which is used in all jurisdictions except Utah) from IHS Global Insight was released in June 2011; the most recent

available state level economic drivers (which is used in Utah) from IHS Global Insight was released in August 2011; and the most recent available large customer (existing, new, and expanding) forecast was finished in August 2011.

Forecasts for Non-Industrial Customer Classes

Q. How are monthly sales forecasts developed by customer class?

A. The monthly sales forecasts are developed as a product of two separate forecasts: (1) the number of customers; and (2) sales per customer. The Company uses this methodology for all customer classes except for the industrial customer class.

Q. How are the forecasts for number of customers developed?

A. The Company forecasts all customer classes using regression models based on the January 1997 to July 2011 time period. For the residential and commercial classes, the major economic driver of the forecasted number of customers is IHS Global Insight's population or number of households. For irrigation and street lighting classes, the number of customers is fairly static and the forecast is developed using regression models without any economic drivers.

Q. How is average use per customer for customer classes forecasted?

A. The Company models sales per customer for the residential class through a Statistically Adjusted End-use ("SAE") model, which combines the end-use modeling concepts with traditional regression analysis techniques. Major drivers of the SAE-based residential model are heating and cooling related variables, end-use information such as equipment shares, saturation levels and efficiency trends, and economic drivers such as household size, income and energy price.

For the commercial class, sales per customer are forecasted using

regression analysis techniques with employment as the major economic driver in addition to weather-related variables.

For irrigation and lighting classes, sales per customer are forecast through regression analysis techniques using binary variables.

Industrial Class Forecasts

Q. How does the Company forecast sales for the industrial customer class?

A. The industrial customers are separated into three categories: (1) existing customers that are tracked by the Customer and Community Managers ("CCMs"); (2) new large customers or expansions by existing large customers which are also tracked by the CCMs; and (3) industrial customers that are not tracked by the CCMs. Customers are tracked by the CCMs if they have a peak load of one megawatt or more at a single site.

The Company develops the forecast for the first two categories through the data gathered by the CCM assigned to each customer. The CCMs have ongoing direct contact with large customers and are in the best position to know about the customer's plans for changes in business processes, which might impact their energy consumption. The portion of the industrial forecast related to new large customers and expansion by existing large customers is also developed based on information provided by the customers to the CCMs. This information would include forecasted load factors and the size and timing of expansions. The CCMs also provide the probability of the project occurrence.

The third category of industrial customers, smaller industrial customers, are more homogeneous and are modeled using regression analysis with trend and

economic variables. Employment is used as the major economic driver.

The total industrial sales forecast is developed by aggregating the forecast for the three industrial customer categories.

Q. Why do you forecast industrial sales using a different methodology than the other customer classes?

A. This class is modeled differently because of the diverse makeup of the customers within the class. In the industrial class, there is no "typical" customer. Large customers have very diverse usage patterns and power requirements. It is not unusual for the entire class to be strongly influenced by the behavior of one customer or a small group of customers. A recent example of how one customer's decision can affect the industrial class sales is the decision of a large Wyoming industrial customer to move from a "buy-all, sell-all" contract for their generation to a self-generation contract.

In contrast, customer classes that are made up of mostly smaller, homogeneous customers are best forecasted as a use per customer multiplied by number of customers. Those customer classes are generally composed of many smaller customers that have similar behaviors and usage patterns. No small group of customers, or single customer, influences the movement of the entire class. This difference for large industrial customers requires the different processes for forecasting sales.

Hourly Load Forecast

Q. Please outline how you develop the hourly load forecast.

A. After the Company develops the forecasts of monthly energy sales by customer

class, we develop a forecast of hourly loads in two steps.

First, monthly and seasonal peaks are forecasted for each state. The monthly peak model uses historic peak load and peak-producing weather for each state, and incorporates the impact of weather on peak loads through several weather variables which drive heating and cooling usage. These weather variables include the average temperature on the peak day and lagged average temperatures. The peak forecast is based on average monthly historical peak-producing weather for the period 1991-2010.

Second, hourly loads are forecasted for each state from hourly load models using state-specific hourly load data and daily weather variables. The hourly loads are developed using a model that incorporates the 20-year average temperatures, a typical weather pattern for each year, and day-type variables such as weekends and holidays. The hourly loads are adjusted for line losses and calibrated to monthly and seasonal peaks.

Q. How are monthly system coincident peaks derived?

A. After the Company develops the hourly load forecasts for each state, hourly loads are aggregated to the total system level. The system coincident peaks can then be identified as well as the contribution of each jurisdiction to those monthly peaks.

Forecasts by Rate Schedule

Q. Are there any additional forecasts that you created for this proceeding?

A. Yes. As mentioned earlier, Mr. Griffith and Mr. Paice require two additional forecasts that are based on the kWh sales forecast and the forecasted number of customers. Once the kWh sales forecast is complete, it must be applied to

individual rate schedules to forecast kWh sales by rate schedule. In addition, the forecasted number of customers must be expressed in number of bills.

Q. How are rate schedule level forecasts produced?

A. This forecast is carried out in several steps. The first step is to calculate the ratio of sales by rate schedule to sales by customer class. Then, using regression analysis, the ratio is projected for the test period. The third and final step to produce the forecast is to multiply the ratio by the customer class sales to produce the sales by rate schedule.

Q. How is the number of bills for each schedule forecasted?

A. Similar to the rate schedule sales forecast, the rate schedule bill forecast is carried out in several steps. First, the Company calculates the ratio of bills by rate schedule to bills by customer class. Second, we forecast this ratio for the test period based on the regression results. Third, the ratio is multiplied by the customer class bills to produce the bills by rate schedule.

Summary of Results

Q. How does the sales forecast for the 12 months ending March 31, 2013, compare to the weather normalized MWh sales for the 12 months ending June 30, 2011, base period?

A. Table 2 shows that for the total Company, test period forecasted sales are 0.1 percent higher than weather normalized sales for the historical base period. Table 3 shows that for Wyoming, forecasted test period sales are 3.7 percent less than weather normalized sales in the base period.

Table 2, Total Company Sales Comparison (MWh)

	July '10 to June '11 Actual	April '12 to March '13 GRC Forecast
Residential	16,007,051	15,823,546
Commercial	16,372,048	16,717,116
Industrial	19,872,685	19,772,850
Irrigation	1,180,247	1,214,929
Public Authority	423,434	405,350
Lighting	145,425	141,280
Total	54,000,890	54,075,070

Table 3, Wyoming Sales Comparison (MWh)

	July '10 to June '11 Actual	April '12 to March '13 GRC Forecast
Residential	1,071,443	1,076,028
Commercial	1,530,422	1,583,754
Industrial	7,098,961	6,686,198
Irrigation	21,111	20,020
Lighting	12,089	11,750
Total	9,734,026	9,377,750

Q. How does the sales forecast for the test period compare to the sales forecast used in the last general rate case?

A. Forecasted sales for the current test period (12 months ending March 2013) was compared to forecasted sales prepared for the 2010 Wyoming general rate case test period (12 months ending December 2011). As shown in Table 4, the total Company sales forecast has decreased by about 1.4 percent. And, as shown in Table 5, the Wyoming sales forecast has decreased by about 5.3 percent.

Table 4, Total Company Sales Forecast Comparison (MWh)

	Jan 2011 to Dec 2011 GRC Forecast Previous	April '12 to March '13 GRC Forecast Current
Residential	16,152,100	15,823,546
Commercial	16,867,590	16,717,116
Industrial	19,981,530	19,772,850
Irrigation	1,281,650	1,214,929
Public Authority	436,980	405,350
Lighting	140,690	141,280
Total	54,860,540	54,075,070

Table 5, Wyoming Sales Forecast Comparison (MWh)

	Jan 2011 to Dec 2011 GRC Forecast Previous	April '12 to March '13 GRC Forecast Current
Residential	1,105,708	1,076,028
Commercial	1,530,158	1,583,754
Industrial	7,230,254	6,686,198
Irrigation	19,690	20,020
Lighting	11,580	11,750
Total	9,897,390	9,377,750

Q. Please explain why the Company is forecasting a 1.4 percent decrease in system sales (Table 4) compared to the forecast used in the previous rate case.

A. The residential sales decrease is attributed to lower actual retail sales from economic slowdown and the impact of lighting efficiency changes resulting from federal lighting standards phasing out the sale of conventional incandescent light bulbs in favor of more efficient lighting. The reduction in commercial sales is largely driven by the continued effects of the recession. The reduction in industrial sales is largely driven by several industrial customers that chose to self generate some of their requirements rather than sell all their generation and purchase all their requirements from the Company. If these industrial customers had continued the "buy-all, sell-all" contract through the test period, system test

period forecast would be approximately 2.5 percent higher and system test period sales would have increased by approximately 1.0 percent from the 2010 GRC test period forecast.

Q. Please explain why the Company is forecasting a 5.3 percent decrease in Wyoming sales (Table 5) compared to the forecast used in the previous rate case.

A. This decrease is also largely driven by the one large Wyoming industrial customer that has chosen to self-generate some of their requirements rather than sell all their generation and purchase all their requirements from the Company. If this large industrial Wyoming customer had continued the "buy-all, sell-all" contract through the test period, Wyoming test period forecast would be approximately 6.9 percent higher and Wyoming test period sales would have increased by approximately 1.3 percent from the 2010 GRC test period forecast.

Q. How are the actual 2011 sales tracking with the previous forecast?

A. Tables 6 and 7 present how the actual 2011 sales are tracking with the previous forecast for the time period January through October 2011 for total company and Wyoming respectively. Table 6 shows that weather normalized total Company sales are tracking about 1.4 percent lower than the Company's previous forecast for the time period January to October 2011. Table 7 shows that weather normalized Wyoming sales are tracking about 2.7 percent lower than the previous forecast for the time period January to October 2011.

Table 6, Total Company Sales Forecast (MWh)

	Jan to Oct 2011	
	Actual	Previous GRC
Residential	12,879,471	13,089,916
Commercial	13,733,441	14,034,836
Industrial	16,495,848	16,525,408
Irrigation	1,220,638	1,267,070
Public Authority	341,651	371,580
Lighting	120,173	118,280
Total	44,791,223	45,407,090

Table 7, Wyoming Sales Forecast (MWh)

	Jan to Oct 2011	
	Actual	Previous GRC
Residential	846,819	888,510
Commercial	1,274,211	1,266,440
Industrial	5,809,565	5,992,030
Irrigation	22,019	19,520
Lighting	10,345	9,770
Total	7,962,959	8,176,270

Q. Do you consider the sales and load forecasts to be reasonable?

A. Yes.

Q. Does this conclude your direct testimony?

A. Yes.