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Forecast Area

The REU Load Forecast is developed for the REU Service Territory. There are no Direct Access or Community Choice Aggregations within the REU Service Territory; the assumption is this will persist throughout the forecast period. Additionally, it is assumed that there will be no Departed Load or Local Private Supply in the forecast period.

Energy Forecasting Method

The REU Energy Forecast is developed using a bottom-up modeling approach. Residential class sales are forecasted as the product of the customer and use per customer model forecasts. Commercial class sales are forecasted directly using monthly sales models.

The class-level forecasts are segmented into heating, cooling, and base load component outputs and then integrated into a monthly model of system energy. This results in a system energy forecast that comprehensively integrates the driving factors of energy usage.

Peak Forecasting Method

The REU Peak Forecast is developed using outputs from the system energy forecast and peak-producing weather conditions.

Customer Forecasts

Class Sales Forecasts are developed for the following customer classes:

- Residential (R)
    - Standard
    - Energy Discount
    - Master Metered
- Small Commercial (C)
- Large Commercial and Industrial (I)

Economic and Demographic Inputs

The economic variables selected drive class-level sales forecasts. Table 1 below illustrates the economic variables selected to drive each class-level model, including:

The list below defines the table mnemonics:

- Households
- Pop (Population)
- Emp (Non-Farm Employment)
- HHS (Household Size – People per Household)
- Real Price (Real Electric Price)

A red box indicates the variable was used in the customer model, a yellow box indicates it was used to drive the sales model, and the black box indicates it was used to drive both the customers and sales models.

Table 1: Economic Variables

Inputs	R	C	I
HH	X		
Pop		X	
Emp		X	X
HHS	X		
Real Price	X	X	X

In addition to economic inputs, the Residential Use/Customer model also uses end-use inputs. The end-use inputs were developed through the interaction of saturation and efficiency indices.

Economic Data Sources

The list below defines the raw data source for the economic inputs:

- Population (Woods & Poole Economics, Inc.)
- Non-Farm Employment (Woods & Poole Economics, Inc.)
- CPI (Woods & Poole Economics, Inc.)

Household Size is inferred based on Population and REU Residential Customers. Households historically align with REU Residential Customers and are inferred based on the Population and Household Size in the forecast.

End-Use Data Sources

End-Use Saturation and Efficiency trends were developed based on the EIA's Annual Energy Outlook End-Use Forecast for the Pacific Region.

Load Modifier Impacts

The REU Load Forecasting process integrates load-modifying forecasts of Solar PV, Energy Efficiency, and Electric Vehicles. Building Electrification is incorporated into the REU Load Forecast; however, its impacts are not disaggregated from the forecast.

Photovoltaic (PV)

The Solar PV Forecast involves first projecting Solar Adoption in terms of Capacity (KW). Next, a Capacity Factor value is applied to convert the capacity forecast into sales (KWh).

Energy Efficiency

The assumption inherent in the load forecasting models is the energy efficiency program impacts are to maintain their historical pace in the forecast period.

Electric Vehicles (Light and Medium/Heavy Duty)

The Electric Vehicle Forecast involves first projecting the number of Electric Vehicles, then using an estimate of KWh/EV/Day that is applied to convert to a sales forecast (kWh).

Forecast Reasonableness

The forecast integrates economic, demographic, prices and energy efficiency, and climate change assumptions. Forecast reasonableness is assessed based on its alignment with recent weather-normalized (WN) growth rates for REU, as well as national and regional projected growth rates from industry surveys.

Historical Forecast Performance

The methods described above have been implemented successfully at other utilities throughout California and the rest of the United States. In 2016, REU updated its load forecasting approach to be consistent with this industry standard practice. Table 2 depicts the WN Forecast variance since the inception of the new framework.

Table 2: Weather Normalized Forecast Variance

Year	WN Forecast Variance (WN Actual - Forecast)
2020	0.5%
2021	3.2%
2022	-2.1%

Weather Adjustment Procedures

The REU weather adjustment process uses data inputs from the Redding Airport weather station. Monthly Heating and Cooling Degree-Day variables (HDDs and CDDs) are used to adjust the weather-sensitive class forecasts for normal weather. Normal Monthly HDDs and CDDs were computed over a 10-year calculation range of 2013 – 2022.

Monthly Peak Forecasts are adjusted based on the weather occurring on the day of the peak and two prior days. Monthly Peak HDDs and CDDs are developed by extracting the maximum and average temperature on the day of the peak and two prior days. Cooling Peaks are projected using CDDs defined based on Effective Temperature (50% Average Temperature and 50% Maximum Temperature), while Heating Peaks are projected using HDDs defined based on Average Temperature. Normal Monthly Peak HDDs and CDDs are computed over a 10-year calculation range of 2013 – 2022.

Forecast Calibration Procedures

The forecast models use ordinary least square regression algorithms to calibrate to historical energy and peak values and estimate model input parameters.

Energy and Peak Loss Estimates

REU System Energy and Peak are forecasted directly. The assumption implicit in the models is the historical average monthly loss factors for energy and peak remain constant throughout the forecast period.

Economic and Demographic Projections

Economic and demographic projections were sourced from Woods & Poole Economics, Inc. to ensure the highest level of accuracy in light of COVID-19 pandemic and the resulting rise in remote work. These projections were deemed integral for navigating the complex economic changes as a consequence of the pandemic and the subsequent variabilities in population movements and employment trends.