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CITY OF BOULDER ENERGY FUTURE PROJECT:

Xcel Retail Rate Forecast

This document provides an overview, tutorial and description of the results that appear on the “Xcel Retail Rate Forecast” tab in the Financial Forecast Tool (FFT). The details of this tutorial are intended to give the user a basic understanding of the various inputs and calculations performed within the rate forecast spreadsheets, and how that data is utilized within the FFT itself.

The values that appear for “Customer (\$/month),” “Energy (\$/kWh)” and “Demand (\$/kW)” are not the same as the base rates that appear in Xcel Energy’s currently effective tariffs. Instead, the values on the “Xcel Retail Rate Forecast” tab represent a 20-year estimate of combined base rates, non-base rates (riders)ⁱ and taxes. The forecast uses the base rates and non-base rates [in effect today](#) for the average customer in each rate classⁱⁱ and estimates future changes based on published forecasts of future coalⁱⁱⁱ and natural gas prices,^{iv} Xcel’s generation mix and changes in the [US Consumer Price Index](#). The “ECA (\$/kWh)” values represent an estimate of Xcel’s future fuel cost adjustment, plus taxes.

It is important to note that the results on the “Xcel Retail Rate Forecast” tab are not the product of a comprehensive class cost of service study and rate design process specific to Boulder. That is because Xcel’s rates in effect today were designed based on a class cost of service study and rate design process for the entire Xcel service territory, which produces values representative of the average Xcel customer in each class instead of the average customer within Boulder city limits. To comply with the charter metrics on rate comparability, the FFT uses an estimate of Xcel’s rates over 20 years to evaluate the ability of the municipal utility to collect sufficient revenues using Xcel’s rates to recover its expenses.

Understanding the “Xcel Retail Rate Forecast” tab:

Below is a glossary of key terms and acronyms used through the document.

The “Xcel Retail Rate Forecast” spreadsheet tab in the FFT contains up to four types of values for each customer class:

- **Customer Charge:** Also known as the “Service and Facility” charge, this is the fixed monthly charge each customer pays to connect to the grid as well as additional costs associated with metering, billing and customer service as well as the pilot energy assistance program fee. The values listed also include applicable taxes.^v
- **Energy Charge:** The values listed include the base energy charge as well as all non-base rates (riders) billed on a \$/kWh basis. The values listed also include taxes.
- **Demand Charge:** The values listed include the base demand charge as well as all non-base rates (riders) billed on a \$/kW basis. The values listed also include taxes.

- **Electric Commodity Adjustment (ECA):** The values listed include only the cost of fuel plus applicable taxes, billed on a \$/kWh basis.

The following charges are included within each of the four values described above:

- **Customer Charge:**
 - Service and Facility charge
 - Pilot Energy Assistance Program charge
 - General Rate Schedule Adjustment
 - Renewable Energy Standard Adjustment
 - Taxes (sales and utility occupation)
- **Energy Charge:**
 - Base energy charge
 - Purchased Capacity Cost Adjustment (for Residential (R) and Commercial (C) class only)
 - Clean Air-Clean Jobs Act Adjustment (for R and C class only)
 - Demand-Side Management Cost Adjustment (for R and C class only)
 - Transmission Cost Adjustment (for R and C class only)
 - Climate Action Plan tax
 - General Rate Schedule Adjustment
 - Renewable Energy Standard Adjustment
 - Taxes (sales and utility occupation)
- **Demand Charge:**
 - Base demand charge (not applicable to R and C class)
 - Purchased Capacity Cost Adjustment (for Residential Demand (RD), Secondary General (SG), Primary General (PG) and Transmission General (TG) class only)
 - Clean Air-Clean Jobs Act Adjustment (for RD, SG, PG, TG class only)
 - Demand-Side Management Cost Adjustment (for RD, SG, PG, TG class only)
 - Transmission Cost Adjustment (for RD, SG, PG, TG class only)
 - General Rate Schedule Adjustment
 - Renewable Energy Standard Adjustment
 - Taxes (sales and utility occupation)
- **Electric Commodity Adjustment (ECA):**
 - Annual average of quarterly ECA, estimated using average monthly kWh consumption for each rate class
 - Taxes (sales and utility occupation)

Energy and demand charges are also included in the tab with seasonal variation to reflect changes in cost between summer and winter. The value for the Electric Commodity Adjustment is an average of the four quarterly ECA amounts for each year.

Figure 1 provides an example of how each value appears on the “Xcel Retail Rate Forecast” tab in the FTT.

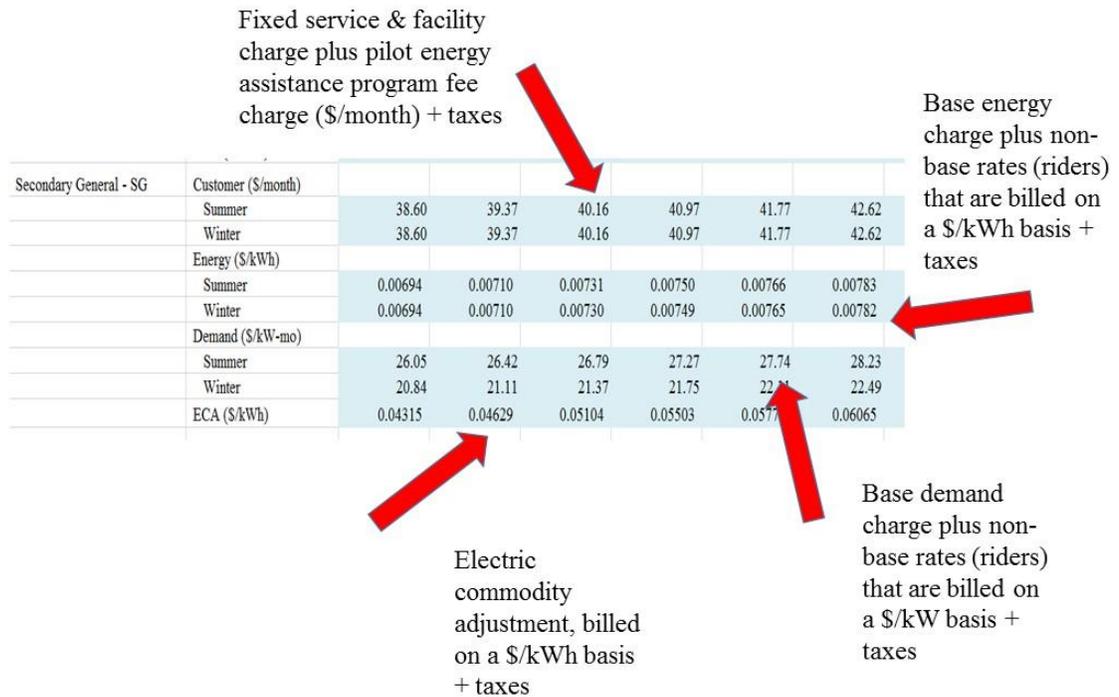


Figure 1: Snapshot of Xcel Retail Rate Forecast

The values in the “Xcel Retail Rate Forecast” tab are multiplied by the number of customers within that customer class, the energy consumption and the billing demand results in the “Load Forecast” tab to calculate the revenues found in the “Class Revenues-PSCo Rates” tab. A full accounting of the development of base rate and non-base rate forecasts for each customer class and rider is available [here](#).

The process of developing of Retail Rate Forecasts

Once the data associated with each customer class has been calculated, the next step is to develop a 20-year forecast of Xcel’s base and non-base rates. This is a challenging part of the exercise since many factors contribute to the development of rates and riders including changes in load growth, the impact of new technologies, and political negotiation about how to allocate costs between customer classes and how to most equitably recover utility costs (e.g. via fixed or variable costs). The best that can be done is to develop assumptions supported by transparent, credible sources.

That said, every utility utilizes a similar methodology to forecast these costs. The following approach was used to develop a 20-year forecast of Xcel's base and non-base rates:

Step 1: Establish a baseline of base rates and non-base rates (riders) in effect today, via [Xcel's published electric tariff](#).

Step 2: Determine average kilowatt-hour usage and kilowatt demand by customer class.

Average usage and demand figures are taken from [Xcel's 2016 Phase 2 Rate Case](#).

- a. Usage and demand is further refined by season, by service type and by time-of-use. For example:
 - i. Residential customers pay inclining block rates in the summer (i.e. the \$/kWh base energy charge increases after consumption exceeds 500 kWh). Therefore, the residential bill calculation must account for usage below and above 500 kWh in the summer month but not in winter months, when residential customers pay the same flat \$/kWh base energy charge for all consumption.
 - ii. Large commercial and industrial customers (customer classes Secondary General and Primary General) pay one flat \$/kWh base energy charge but pay two separate \$/kW base demand charges: one for distribution and one for generation and transmission. The price per kW for each demand charge also differs between winter and summer. Separately, the largest industrial customers – class Transmission General – pay no distribution \$/kW demand charge because these customers take electric service at transmission voltage.
 - iii. Large commercial and industrial customers also pay an electric commodity adjustment (ECA, or fuel charge) that varies by time-of-use. The percentage of peak and off-peak usage by customer class is published in [annual ECA filings](#).

Step 3: Multiply usage and demand by published base rates, then apply non-base rates (riders) and taxes to determine a total bill.

Step 4: Separate results into customer charge (\$/month, base and non-base energy charges (\$/kWh) and base and non-base demand charges (\$/kW) plus taxes for use on the "Xcel Retail Rate Forecast" tab in the FFT.

After calculating baseline year results, base rates and non-base rates are forecast for the period 2017 to 2037 using fuel cost and generation mix data provided in Xcel's 2016 Electric Resource Plan. This includes estimates of prices for coal and natural gas as well as changes in the US Consumer Price Index. The data and assumptions used to calculate a forecast for each customer class can be found in the [corresponding spreadsheets](#).

In each rate class spreadsheet, the yellow highlighted values shown on the "Summary" tab are the annual results (from each annual tab) included in the "Xcel Retail Rate Forecast" tab of the FFT. Data and assumptions for each non-base rate, as well as for fuel costs and the CPI, are pulled directly from the

“Riders” spreadsheet. Within the tab for each rider, cell notes (red triangles in column E) are provided with source data for 2015 and 2016 Public Utilities Commission filings. Users can hover over those triangles to see that additional information. These source files are also available in the “Supporting Documentation” folder.

The forecasts of base rates and non-base rates are only as good as the underlying data. In all cases, the data is taken from Xcel Energy filings (2016 Phase 2 Rate Case, 2016 Electric Resource Plan as well as filings for each individual rider) or from other publicly available sources (Energy Information Administration and US Bureau of Labor Statistics). In every instance, the most up-to-date and verifiable data have been used. That said, users interested in modifying the results are welcome to use alternate data sources, if desired. Users are also encouraged to submit verified updates to the base assumptions with justification for the use of different source data.

ⁱ Non-base rates (riders) include: Demand-Side Management Cost Adjustment, Purchased Capacity Cost Adjustment, Transmission Cost Adjustment and Clean Air-Clean Jobs Act. These riders are billed on a \$/kWh basis for the Residential (R), Commercial (C), Metered Street Light (MSL) and Street Light (SL) classes and on a \$/kW basis for all other classes. Additionally, the General Rate Schedule Adjustment and the Renewable Energy Standard Act are billed on a percentage basis.

ⁱⁱ The average customer in each customer class is defined as the average customer per class across the entire Xcel Energy system in Colorado, not the average Boulder customer. Xcel Energy has not provided the city with sufficient data to determine average usage within each customer class within Boulder city limits. To calculate the average customer in each customer class, staff divided the total annual usage for each customer class by the total number of customers in the class as published in the 2016 Phase II Rate Case (PUC docket #16AL-0048E in [Attachment DRB-2](#)). Note that the 2016 rate case relies on 2013 Xcel Energy customer data. This data has been escalated to estimated 2018 customer counts and usage data using escalation factors included on the “Load Forecasts (Assumptions)” tab of the financial forecast tool.

ⁱⁱⁱ Forecast coal prices are drawn from historical and estimated prices contained in the DOE Energy Information Administration [Annual Energy Outlook 2016](#) as well as coal prices from the technical inputs to PSCo’s 2016 Electric Resource Plan (PUC Docket #16A-0138E – [Attachment A, Table 6](#)).

^{iv} Forecast natural gas prices are drawn from historical and estimated prices contained in the technical inputs to PSCo’s 2016 Electric Resource Plan (PUC Docket #16A-0138E – [Modeling Assumptions A, Table 6](#)). This includes the price differential between the Cheyenne Hub and Henry Hub as well as Xcel’s long-term natural gas price forecasts

^v Taxes included are the Utility Occupation Tax (billed as a percentage of the total bill), sales tax (billed as a percentage of the total bill) and the Climate Action Plan tax (billed on a \$/kWh basis for all customers).