BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO

*** * * * ***

IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF COLORADO FOR APPROVAL OF ITS 2024-2028 CLEAN HEAT PLAN.	**)** **)** **)** **)**	**PROCEEDING NO. 23A-0392EG**

DIRECT TESTIMONY AND ATTACHMENTS OF JOHN M. GOODENOUGH
ON

BEHALF OF

PUBLIC SERVICE COMPANY OF COLORADO

August 1, 2023

BEFORE THE PUBLIC UTILITIES COMMISSION
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Attachment JMG-2	Initial Gas Customer and Sales High Forecast
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DIRECT TESTIMONY AND ATTACHMENTS OF JOHN M. GOODENOUGH

I. INTRODUCTION, QUALIFICATIONS, PURPOSE OF TESTIMONY, AND RECOMMENDATIONS

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is John M. Goodenough. My business address is 1800 Larimer Street, Denver, Colorado 80202.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT POSITION?

A. I am employed by Xcel Energy Services Inc. ("XES") as Director of Sales, Energy, and Demand Forecasting. XES is a wholly owned subsidiary of Xcel Energy Inc. ("Xcel Energy") and provides an array of support services to Public Service Company of Colorado ("Public Service" or the "Company") and the other utility operating company subsidiaries of Xcel Energy on a coordinated basis.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I am testifying on behalf of Public Service.

Q. PLEASE SUMMARIZE YOUR RESPONSIBILITIES AND QUALIFICATIONS.

A. I am responsible for the development of forecasted sales data and economic indicators for Public Service and the other Xcel Energy utility operating companies, and the presentation of this information to Xcel Energy's senior management, other Xcel Energy departments, and externally to various regulatory and reporting agencies. I also am responsible for Xcel Energy's Load Research function, which designs, maintains, monitors, and analyzes electric load research samples in the Xcel Energy operating companies' service territories. Additionally, I am responsible for developing and implementing forecasting, planning, and load analysis studies for regulatory proceedings. A description of my qualifications, duties, and responsibilities is included at the end of my Direct Testimony in my Statement of Qualifications.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. The purpose of my Direct Testimony is to present and describe the Company's initial gas customer count and sales forecast and our methodology for developing that initial forecast, which includes both a reference (base) forecast, and high and low variations of that base forecast, per Colorado Public Utilities Commission ("Commission") Rule 4731. These forecasts are provided as part of the Company's Clean Heat Plan Application and the initial base forecast provides a baseline to determine the throughput reductions in each of the Clean Heat portfolios modeled by Energy and Environmental Economics ("E3").

My testimony focuses on the initial forecast information specified by Rule 4731(a), which goes beyond information ordinarily included as part of a customer

count/sales forecast. Some of that initial forecast information was therefore prepared by other groups within the Company or is presented by other Company witnesses. By way of example, as part of sales forecasting, I do not address system-wide capacity requirements, as mentioned in Rule 4731(a). That exercise is conducted by others within the Company, though I do provide that information here as I describe later in my Direct Testimony. Similarly, as part of sales forecasting I also do not engage in a greenhouse gas emissions analysis. Company witness Ms. Lauren Quillian addresses in her Direct Testimony these emission reductions issues as a function of the Clean Heat Plan Emissions Calculation Guidance and Clean Heat Plan Calculation Workbook.

It is also important to understand these forecasts take significant time to prepare, and the initial forecasts I present here were completed before the Commission's Clean Heat rules were finalized and adopted. We therefore present to the best of our ability the information and categorization of data set forth in Rule 4731(a), though it is not practicable to discretely present some of that information in this initial Clean Heat Plan filing, given when the Clean Heat rules were finalized, and the required timing of this filing. For instance, at this time we do not have a sales forecast that is or can be disaggregated by geographical segmentation other than system-wide.[1] That said I would emphasize that this is the Company's first Clean Heat Plan Application, for the initial action period, and it takes time for long-

[1] Rule 4731(1)(a)(B) provides examples of disaggregated forecasts, but also allows for "other geographical segmentation, as appropriate."

standing forecasting methodologies for a gas system as large as the Company's to evolve.

Finally, I would note that the "portfolio" forecasts specified by Rule 4731(c) are essentially a function of the modeling performed by E3, as each portfolio models reductions in throughput from reduced sales (reduced from the initial base forecast I present), attributable to increased Demand Side Management ("DSM") and Beneficial Electrification ("BE"). The various portfolios modeled by E3 are based on the model's objective function to reduce emissions at the lowest cost to achieve to the Clean Heat targets. The emission reduction measured selected by the model to meet these goals are then translated to a corresponding reduction in sales and throughput within a given portfolio. E3 witness Mr. Aas discusses this in more detail in his Direct Testimony and supporting attachments. In addition, Company witness Ms. Quillian presents the confirmation of the projected emissions reductions associated with each portfolio, as I previously noted.

Q. ARE YOU SPONSORING ANY ATTACHMENTS AS PART OF YOUR DIRECT TESTIMONY?

A. Yes, I am sponsoring the following Attachments JMG-1 through JMG-3:

- Attachment JMG-1: Initial Gas Customer and Sales Base Forecast;
- Attachment JMG-2: Initial Gas Customer and Sales High Forecast; and
- Attachment JMG-3: Initial Gas Customer and Sales Low Forecast.

Q. HOW IS YOUR DIRECT TESTIMONY ORGANIZED?

A. First, I provide information on historical gas customer counts and dekatherm ("Dth") gas throughput trends. Next, I present the base customer count and Dth

sales forecasts, as well as system-wide capacity forecast information. Following that, I discuss the Company's methodology for forecasting customer count and Dth throughput. In the final section of my testimony, I discuss forecast sensitivities (i.e., high and low initial forecast scenarios).

II. HISTORICAL CUSTOMER COUNTS AND DTH THROUGHPUT TRENDS

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. The purpose of this section of my Direct Testimony is to provide a summary of trends in class-level customer counts and Dth throughput over the past 10 years. These trends put the base, high, and low forecasts in context.

Q. PLEASE DISCUSS TRENDS IN THE COMPANY'S CUSTOMER COUNTS.

A. Over the past 10 years, from 2012 through 2022, sales gas customer counts grew at an average annual rate of 1.1 percent. Over this period, average annual sales customer counts increased by 144,681 customers, with the residential class (142,446 customers, or 1.1 percent average annual growth) driving the change. Non-residential sales customer counts increased by 2,235 during this period, which represents an average annual growth rate of 0.2 percent. Table JMG-D-1 shows 2022 customer counts by customer type as well as the change and average growth rates as compared to 2012.

Table JMG-D-1: Customer Counts and Growth by Customer Type

	Residential	Non-Residential	Total
2012 Counts	1,213,606	100,081	1,313,687
2022 Counts	1,356,052	102,316	1,458,368
Change from 2012	142,446	2,235	144,681
Average Growth	1.1%	0.2%	1.1%

Q. PLEASE DISCUSS THE COMPANY'S GAS DTH SALES TRENDS.

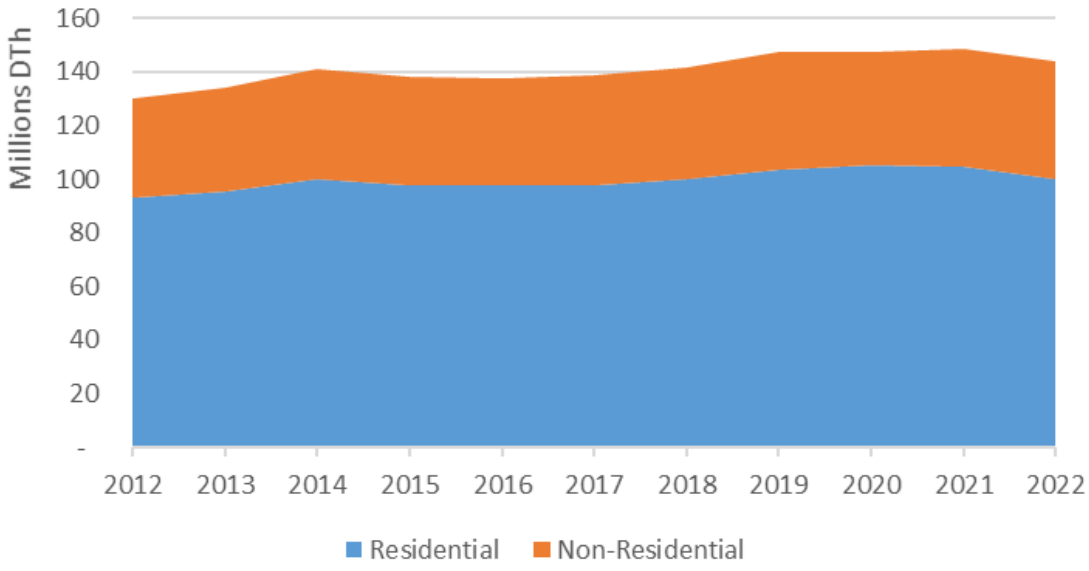
A. Over the past ten years, from 2012 through 2022, sales throughput, on a weather-adjusted basis, grew at an average annual rate of 1.0 percent. Residential sales grew at an average rate of 0.7 percent and non-residential sales grew at an

average annual rate of 1.7 percent. Table JMG-D-2 shows 2022 sales by customer type and the average growth rates as compared to 2012. Figure JMG-D-1 shows the historical sales broken into the residential and non-residential customer types.

Table JMG-D-2: Weather Adjusted Sales and Growth by Customer Type

	Residential	Non-Residential	Total
2012 Sales (Dth)	92,940,993	37,287,402	130,228,395
2022 Sales (Dth)	99,851,595	44,100,391	143,951,986
Dth Change	6,910,602	6,812,990	13,723,592
Average Growth	0.7%	1.7%	1.0%

Figure JMG-D-1: WA Sales by Customer Type



Q. HOW DO THE 2015 ACTUAL SALES USED TO SET THE BASELINE COMPARE TO WEATHER-ADJUSTED SALES IN 2015?

A. Actual sales in 2015 were 7.5 million Dth, or about 5.5 percent, lower than weather-adjusted sales in 2015, due to significantly warmer than normal temperatures. There were 5,479 heating degree days (HDDs) in 2015 compared to a normal of

5,975 HDDs. The 5,479 HDDs in 2015 is also significantly below the current 10-year normal of 5,721 HDDs.

Q. WITH REGARD TO CLEAN HEAT COMPLIANCE, HOW DOES THE USE OF ACTUAL, RATHER THAN WEATHER-ADJUSTED, SALES IMPACT THE EMISSIONS REDUCTION TARGET?

A. It increases the target.

III. BASE CUSTOMER COUNT, DTH SALES, AND SYSTEM-WIDE CAPACITY FORECASTS

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. The purpose of this section of my Direct Testimony is provide and discuss the Company's base customer count and Dth sales forecasts provided to E3. I will focus on forecasts through 2028, as well through 2050. I provide this Initial Gas Customer and Sales Forecast as Attachment JMG-1 to my Direct Testimony. As noted earlier, I also present the system-wide capacity forecast (peak day throughput) forecast.

Q. PLEASE DISCUSS THE COMPANY'S FORECASTED CUSTOMER COUNTS.

From 2022 through 2028, the Company forecasts local distribution company ("LDC") sales customer growth to average 0.8 percent, which is slower growth than the 1.1 percent growth over the past ten years. This represents an addition of 70,098 customers. Residential customer counts make up most of the growth, averaging 0.8 percent and adding 68,327 customers. Non-residential customer counts are expected to increase by 1,771, representing an average growth rate of 0.3 percent.

From 2022 through 2050, the Company forecasts such customer growth to average 0.6 percent. This represents an addition of 252,620 customers. Residential customer counts make up most of the growth, averaging 0.6 percent and adding 245,403 customers. Non-residential customer counts are expected to increase by 7,218, representing an average growth rate of 0.2 percent. Table

JMG-D-3 shows customer additions and average customer growth by customer type over these time frames.

Table JMG-D-3: Customer Additions and Growth by Customer Type

	Residential	Non-Residential	Total
Additions through 2028	68,327	1,771	70,098
Average Growth	0.8%	0.3%	0.8%
Additions through 2050	245,403	7,218	252,620
Average Growth	0.6%	0.2%	0.6%

Q. WHY IS CUSTOMER GROWTH FOR THE RESIDENTIAL CLASS EXPECTED TO BE SLOWER THAN THE PREVIOUS TEN YEARS?

A. Residential customer counts are expected to be slower in the forecast for two main reasons. First, population in the gas service territory, which is the key economic driver for customer counts, is expected to slow. Second, market-driven, or naturally occurring electrification, is expected to slow gas customer growth as homes are built with electric appliances at a rate not seen in the past and customers replace gas appliances with electric appliances at the end of their useful life.

Q. PLEASE DISCUSS THE COMPANY'S FORECASTED GAS DTH THROUGHPUT.

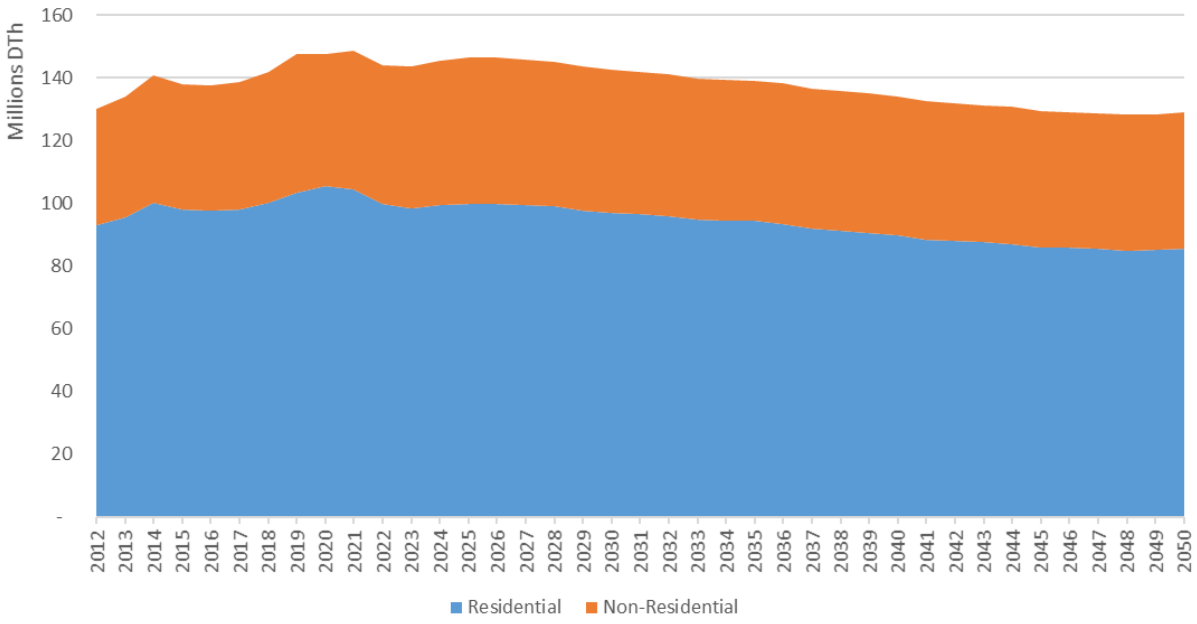
A. Total throughput is expected to be flat through 2028 and decline at an average rate of 0.2 percent through 2050. Through 2028, residential throughput declines are expected to be offset by non-residential gains, resulting in average sales growth of 0.1 percent. Longer-term throughput declines are primarily driven by the residential class. Table JMG-D-4 shows the average growth rates by customer

type through 2028 and 2050, and Figure JMG-D-2 adds the forecasted throughput to the data presented in Figure JMG-D-1. In this figure, the solid black line separates the historical and forecasted values.

Table JMG-D-4: Sales Growth by Customer Type

	Residential	Non-Residential	Total
Average Growth through 2028	-0.2%	0.8%	0.1%
Average Growth through 2050	-0.5%	-0.1%	-0.4%

Figure JMG-D-2: Sales by Customer Type



Q. WHY IS DTH THROUGHPUT GROWTH EXPECTED TO BE SLOWER THAN THE PREVIOUS TEN YEARS?

A. Throughput growth for gas sales service is expected to slow for several reasons. First, customer growth is expected to be slower than the previous ten years. Second, the intensity of usage of natural gas appliances is expected to decline due to efficiency gains and the impacts of building codes and standards. Finally, the

Company sponsored DSM and BE programs are expected to further reduce gas usage.

Q. WHAT ARE THE IMPACTS OF MARKET-DRIVEN ELECTRIFICATION ON THE BASE FORECAST?

A. Market-driven electrification is the expected continuation of historical trends the Company has seen, outside of Company sponsored programs. In particular, the Company makes assumptions on the rate of all-electric homes that comprise its customer growth as well as residential customer decision-making in replacing gas appliances with electric ones at the end of an appliance's useful life. Thus, the impact of market-driven electrification is primarily a reduction in customer counts and also a reduction in throughput to customers that remain on the gas system but have fewer gas appliances. Table JMG-D-5 summarizes the market-driven electrification impacts on customer counts and throughput in 2028 and 2050 in the base forecast.

Table JMG-D-5: Impacts of Market-Driven Electrification on Residential Forecast

	Res Customer Counts	Residential Sales (Dth)
2028	(17,835)	(1,238,392)
percent	-1.2%	-1.2%
2050	(83,707)	(4,473,171)
percent	-5.0%	-5.0%

Q. WHAT ARE THE IMPACTS OF THE COMPANY'S DSM AND BE PROGRAMS ON THE BASE FORECAST?

A. Table JMG-D-6 shows the impact of the Company's DSM programs on Dth throughput for residential and non-residential customers as well as total sales. Overall, the Company's DSM programs are expected to lower sales throughput by 3.5 percent in 2028 and 10.0 percent in 2050. Table JMG-D-7 shows the impact of the Company's BE programs. Beneficial electrification is expected to lower sales throughput by 1.6 percent in 2028 and 14.5 percent in 2050.

Table JMG-D-6: Impacts of DSM on Sales Forecast (Dth)

	Residential	Non-Residential	Total
2028	(4,317,144)	(1,021,541)	(5,338,685)
percent	-4.2%	-2.2%	-3.5%
2050	(11,072,214)	(3,283,149)	(14,355,363)
percent	-11.5%	-7.0%	-10.0%

Table JMG-D-7: Impacts of BE on Sales Forecast (Dth)

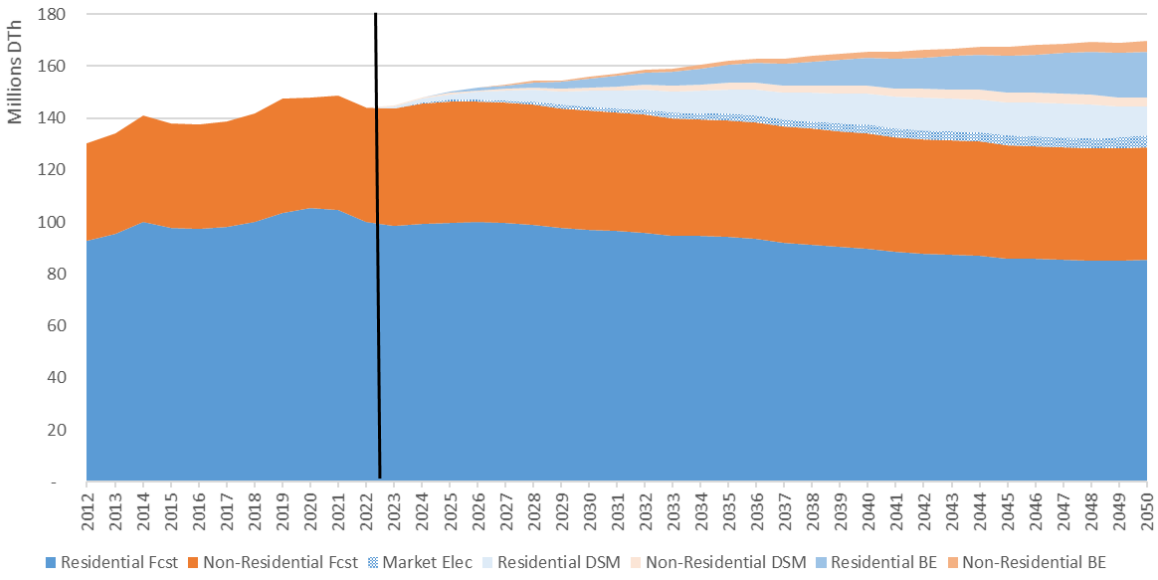
	Residential	Non-Residential	Total
2028	(1,951,735)	(438,975)	(2,390,710)
percent	-1.9%	-0.9%	-1.6%
2050	(17,757,474)	(4,178,522)	(21,935,996)
percent	-17.2%	-8.8%	-14.5%

Q. WHAT IS THE CUMULATIVE IMPACT OF MARKET ELECTRIFICATION, DEMAND SIDE MANAGEMENT, AND BENEFICIAL ELECTRIFICATION ON THE COMPANY'S BASE FORECAST?

A. Figure JMG-D-3 shows the impacts of market electrification, DSM, and BE on the Company's base sales forecast. Specifically, the darker shaded areas in the

Figure depict the residential and non-residential sales forecast, while the lighter shaded areas show reductions to the forecast due to market electrification, DSM, and BE. By 2028, the reductions add up to 8,967,787 Dth, or 5.8 percent of the forecast. By 2050, the reductions add up to 40,764,529 Dth, or 24.0 percent of the forecast. Note that these reductions do not include the impact of efficiency gains or the Company's historical DSM programs, which are already embedded in the forecasts themselves.

Figure JMG-D-3: Forecast with Market Electrification, DSM, BE



Q. EARLIER YOU MENTIONED THAT YOU ARE PRESENTING THE SYSTEM-WIDE CAPACITY FORECAST. PLEASE EXPLAIN.

A. The Company's separate Gas Resource Planning department prepares forecasts of how much gas supply and associated upstream resources are needed for residential and commercial customers on the coldest days in the winter, using peak

load information and linear regression techniques.[2] At the highest level, this is a planning concept that is intended to capture the greatest potential demand at a given temperature. Thus, consistent with Rule 4731(a)(I), the Company's system-wide sales capacity forecast through the winter of 2033/2034 is reflected in Table JMG-D-8 below:[3]

Table JMG-D-8: System Wide Sales Capacity Forecast (Dth)

SEASON	RESIDENTIAL	COMMERCIAL	TOTAL PEAK
DEC 2023-FEB 2024	1,392,482	517,781	1,910,263
DEC 2024-FEB 2025	1,396,614	526,353	1,922,968
DEC 2025-FEB 2026	1,408,756	527,698	1,936,454
DEC 2026-FEB 2027	1,385,223	563,952	1,949,175
DEC 2027-FEB 2028	1,389,572	573,090	1,962,661
DEC 2028-FEB 2029	1,393,067	583,118	1,976,185
DEC 2029-FEB 2030	1,425,233	564,438	1,989,671
DEC 2030-FEB 2031	1,429,310	573,848	2,003,157
DEC 2031-FEB 2032	1,432,684	583,960	2,016,644
DEC 2032-FEB 2033	1,435,355	594,812	2,030,167
DEC 2033-FEB 2034	1,469,613	574,040	2,043,653

[2] This forecasting is separate from the "design day" gas capacity planning that is undertaken by gas operations and the Company's Integrated System Planning organization to determine gas system capacity expansion needs.
[3] The Company's forecast does not extend beyond the winter of 2033/2034.

IV. CUSTOMER COUNT AND DTH SALES FORECASTING METHODOLOGY

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR DIRECT TESTIMONY?

A. The purpose of this section of my Direct Testimony is to explain the forecasting methodology used to prepare the customer count and Dth sales forecasts included within my Direct Testimony.

A. Customer Count and Dth Sales Forecast

Q. WHAT IS THE SOURCE OF THE CUSTOMER COUNT AND DTH SALES FORECAST YOU ARE PRESENTING IN THIS CASE?

A. The customer count and Dth sales forecast was based on actual data through December 2022. As noted earlier, the forecast was completed in the Spring of 2023. The regression modeling technique discussed next relied on fifteen years of monthly actual data ending in December 2022, which was the most current month available at the time the forecasting process began.

Q. PLEASE DESCRIBE IN GENERAL TERMS THE METHODS USED BY THE COMPANY TO FORECAST DTH THROUGHPUT AND CUSTOMER COUNTS.

A. The preparation of the Dth throughput and customer count forecast utilizes a combination of econometric and statistical forecasting techniques and analyses. The primary forecasting technique used is regression modeling developed within a statistical software package.[4] Regression models are designed to identify and quantify the statistical relationship between historical sales or customer counts, and a set of independent predictor variables, such as historical economic and

[4] Metrix ND 4.7, Copyright © 1997-2016, Itron, Inc., http://www.itron.com.

demographic indicators, historical natural gas prices, and historical weather. Once this relationship is defined, a forecast is developed by simulating the relationship over the forecast period using projected levels of the independent predictor variables.

Regression techniques are very well known and proven methods of forecasting and are commonly accepted by forecasters throughout the utility industry. This method provides reliable, accurate projections, accommodates the use of predictor variables, such as economic or demographic indicators and weather, and allows clear interpretation of the model. The Company has been using these types of forecasting models for more than twenty-five years.

Q. PLEASE PROVIDE A MORE DETAILED DESCRIPTION OF HOW THE VOLUMETRIC FORECASTS WERE DEVELOPED FOR THE RESIDENTIAL AND THE COMMERCIAL SECTORS.

A. Public Service's Residential sales forecast is calculated by multiplying average use per customer times the number of customers. The Residential average use per customer and Commercial sector forecasts were developed using a Statistically-Adjusted End-Use ("SAE") modeling approach. An SAE model is an econometric model that incorporates end-use concepts. The SAE method entails specifying natural gas use as a function of end-use variables (heating and other) and monthly weather impacts on natural gas sales.

The heating end-use variable is an index that incorporates economic indicators, natural gas prices, and heating appliance efficiency trends. It is defined as the product of a heating appliance index variable, which indicates relative

saturation and efficiency of the stock of heating appliances, and a heating utilization variable, which reflects how the stock is utilized. The heating appliance index variable reflects both changes in saturation resulting from end-use competition, and improvements in heating appliance efficiency standards. The heating utilization variable is designed to capture natural gas consumption driven by the use of the heating appliance stock. For the Residential sector, the primary factors that impact heating appliance use are natural gas prices, household income, average household size, and monthly weather as measured by Heating Degree Days. For the Commercial sector, the utilization of the stock of heating equipment is a function of natural gas prices, business activity (as measured by service territory Gross Metropolitan Product ("GMP")), and weather.

The "other" end-use variable is developed in the same manner as the heating end-use variable. The appliance index variable reflects the changes in saturation of other gas appliances (such as water heaters, dryers, and cooking appliances), and the average efficiency of the existing stock of appliances based on seasonal usage. The utilization variable is designed to capture natural gas consumption of other appliances driven by the use of the appliance stock. For the Commercial sector, the primary factors that impact the use of other appliances are natural gas prices, business activity (as measured by service territory GMP), and the number of billing days in a month.

The Residential average use and the Commercial sector forecast models were estimated by regressing monthly natural gas usage by class on the end-use variables and other variables such as billing days, trend variables, and monthly

seasonal variables. The regression models effectively calibrated the end-use concepts to actual monthly usage.

Q. WHAT METHODOLOGY WAS USED TO DEVELOP THE REMAINDER OF THE CUSTOMER COUNT AND DTH SALES FORECAST?

A. Regression models provided the foundation to forecast customer counts for the Residential and the Commercial customer classes, with service territory population used as the explanatory variable. In all the models, at least fifteen years of monthly historical data was used to conduct the regression analysis. The modeled relationships were simulated over the forecast period using projected levels of the independent predictor variables.

Q. WHO PROVIDES THE ECONOMIC FORECASTS USED IN THE COMPANY'S MODELING?

A. To develop the customer count and sales forecasts, the Company relies on historical and forecasted economic and demographic variables that are obtained from IHS Markit, Inc. ("IHS Markit") a respected economic forecasting firm frequently relied on by forecasting professionals and by the Company since the 1990s.

Q. WERE ANY ADJUSTMENTS MADE TO THE FORECAST MODEL RESULTS?

A. Yes. The Residential customer forecast was adjusted to account for market-driven, or naturally occurring, electrification and the resulting loss of customers. The Residential and the Commercial sales forecast results were adjusted to reflect the expected impact of DSM and BE programs as developed by the Company.

V. CUSTOMER COUNT AND SALES FORECAST SENSITIVITIES

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. The purpose of this section of my Direct Testimony is to provide and discuss the high and low forecast sensitivities the Company developed relative to customer count and sales as specified by Rule 4731(a)(I).

Q. HOW DID THE COMPANY DEVELOP FORECAST SENSITIVITIES?

A. The Company developed a high and low forecast sensitivity. Both sensitivities are built on the same framework as the base case with a few assumption changes. The high forecast sensitivity was developed by assuming faster economic growth, lower market electrification, and lower BE impacts as compared to the base case. The low forecast sensitivity assumes slower economic growth and a higher impact from market electrification, DSM and BE as compared to the base case. The high forecast sensitivity is found in Attachment JMG-D-2 to my Direct Testimony, and the low forecast sensitivity is found in Attachment JMG-D-3 to my Direct Testimony.

Q. WHAT ARE THE RESULTS OF THE HIGH FORECAST SENSITIVITY?

A. Table JMG-D-9 and Table JMG-D-10 show the expected growth in customer counts and sales through 2028 and 2050 based on the high forecast sensitivity. In the high case, gas customer growth is expected to average 0.9 percent through 2028 and 0.7 percent through 2050, when compared to 2022 values. Sales growth is expected to average 0.4 percent through 2028 and be flat through 2050. Figure JMG-D-4 shows the high case sales forecast through 2050.

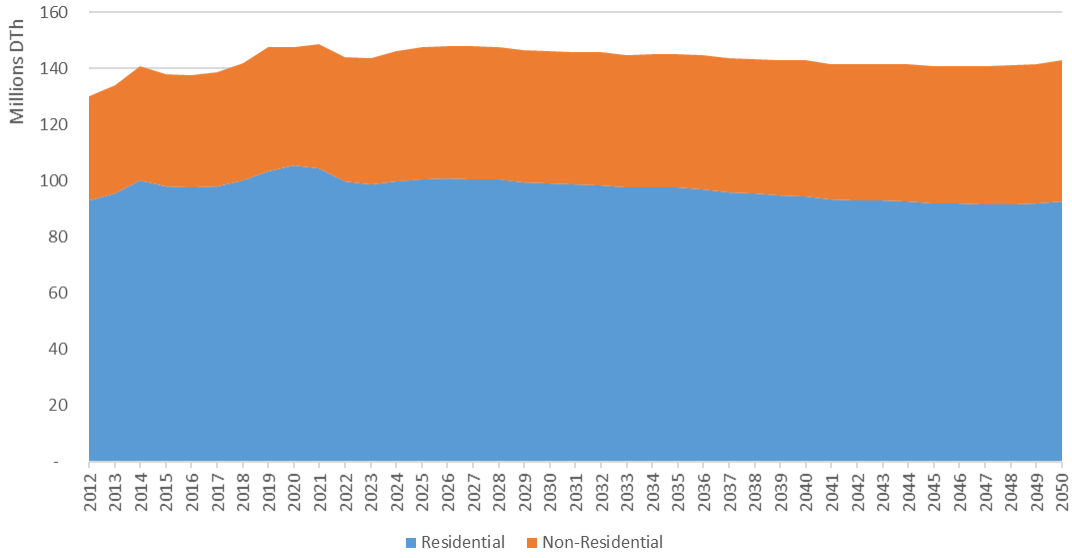
Table JMG-D-9: Customer Additions and Growth by Customer Type

	Residential	Non-Residential	Total
Additions through 2028	78,998	1,791	80,790
Average Growth	0.9%	0.3%	0.9%
Additions through 2050	289,292	7,235	296,527
Average Growth	0.7%	0.2%	0.7%

Table JMG-D-10: Sales Growth by Customer Type

	Residential	Non-Residential	Total
Average Growth through 2028	0.1%	1.2%	0.4%
Average Growth through 2050	-0.3%	0.5%	0.0%

Figure JMG-D-4: Sales by Customer Type



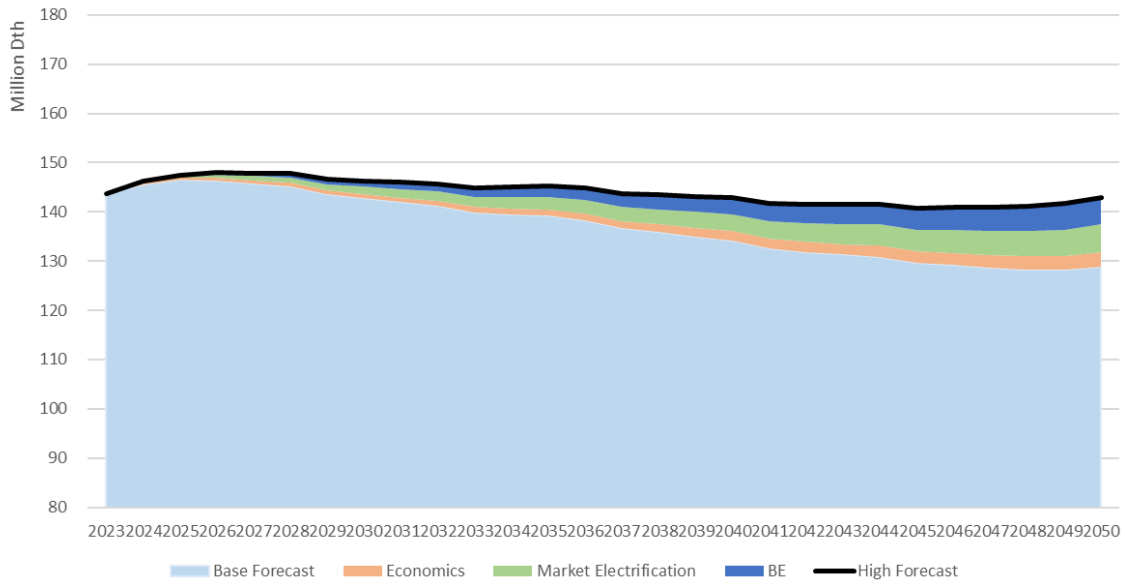
Q. HOW DOES THE HIGH FORECAST DIFFER FROM THE BASE FORECAST?

A. By 2050, customer counts are 2.6 percent higher and throughput is 10.8 percent higher when compared to the base forecast.

As discussed above, the key differences between the base and high forecasts are the assumptions about economic growth, pace of market electrification, and impacts of BE programs. Figure JMG-D-5 compares the base

and high sales forecasts. In the Figure, the light blue area represents the base forecast, the shaded areas show the impacts of the different assumptions, and the solid black line represents the high case scenario.

Figure JMG-D-5: Sales Comparison, Base vs. High



Q. WHAT ARE THE RESULTS OF THE LOW FORECAST SENSITIVITY?

A. Table JMG-D-11 and Table JMG-D-12 show the expected growth in customer counts and sales through 2028 and 2050 based on the low forecast sensitivity. In the low case, gas customer growth is expected to average 0.7 percent through 2028 and 0.5 percent through 2050, when compared to 2022 values. Sales are expected to be flat through 2028 and average a 0.6 percent decline through 2050. Figure JMG-D-6 shows the low case sales forecast through 2050.

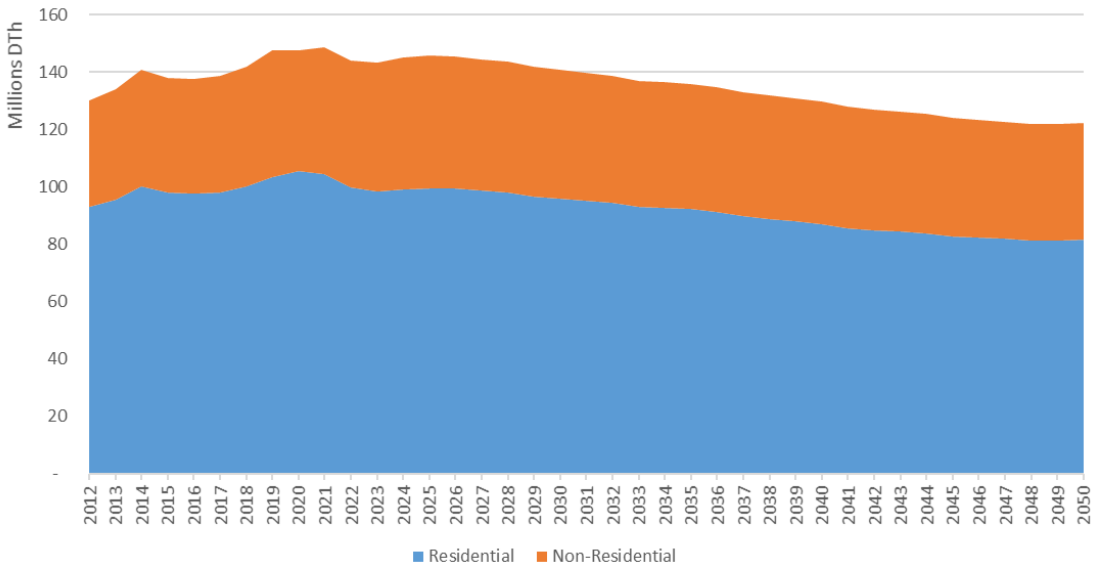
Table JMG-D-11: Customer Additions and Growth by Customer Type

	Residential	Non-Residential	Total
Additions through 2028	61,133	1,781	62,914
Average Growth	0.7%	0.3%	0.7%
Additions through 2050	214,063	7,221	221,284
Average Growth	0.5%	0.2%	0.5%

Table JMG-D-12:Sales Growth by Customer Type

	Residential	Non-Residential	Total
Average Growth through 2028	-0.3%	0.6%	0.0%
Average Growth through 2050	-0.7%	-0.3%	-0.6%

Figure JMG-D-6: Throughput by Customer Type



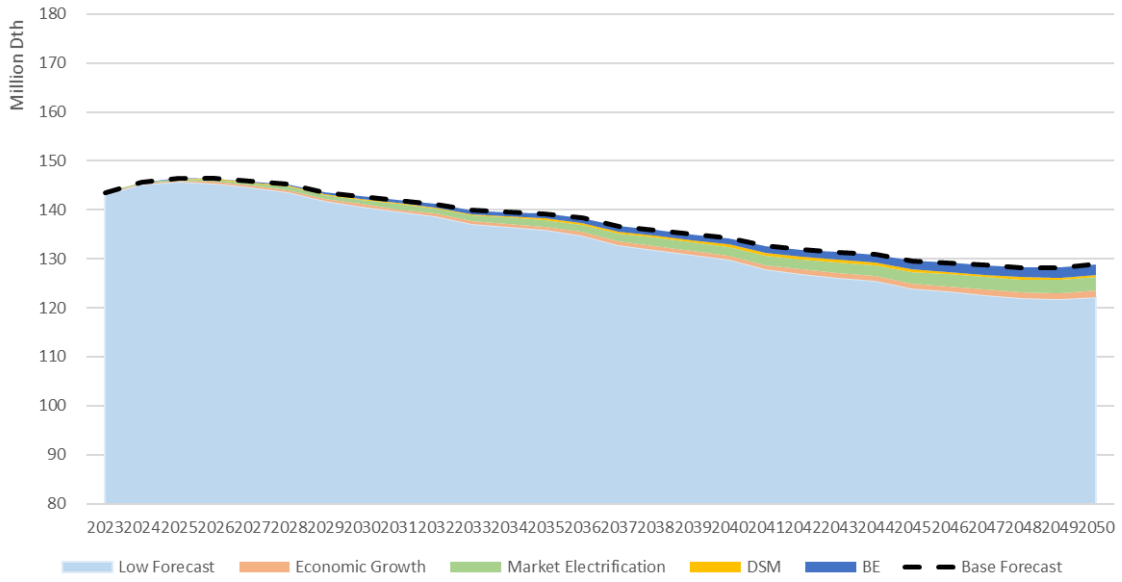
Q. HOW DOES THE LOW FORECAST DIFFER FROM THE BASE FORECAST?

A. By 2050, customer counts are 1.8 percent lower and throughput is 5.1 percent lower when compared to the base forecast.

As discussed above, the key differences between the base and low forecasts are the assumptions about economic growth, pace of market electrification, and impacts of DSM and BE programs. Figure JMG-D-7 compares

the base and low sales forecasts. In the Figure, the light blue area represents the low forecast, the shaded areas show the impacts of the different assumptions, and the dashed black line represents the base scenario.

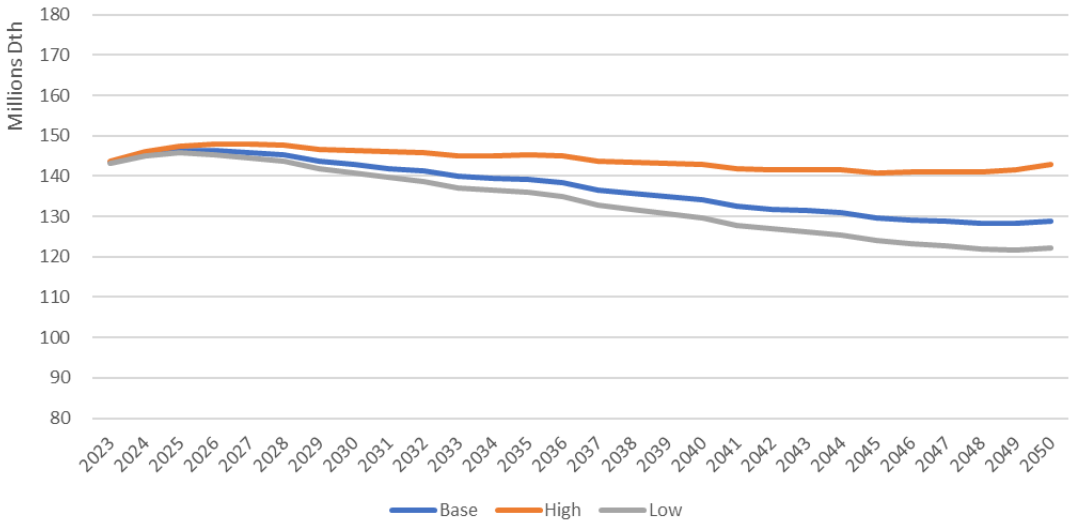
Figure JMG-D-7: Sales Comparison, Base vs. Low



Q. CAN YOU PROVIDE A GRAPHIC THAT SHOWS THE BASE, HIGH, AND LOW SALES FORECASTS IN COMPARISON TO EACH OTHER?

A. Yes, please see Figure JMG-D-8.

Figure JMG-D-8: Total Sales



Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

Statement of Qualifications

John M. Goodenough

As the Director, Sales, Energy, and Demand Forecasting at Xcel Energy, I am responsible for developing load analysis and energy sales forecasting policies, proposals, and strategies to meet corporate financial planning, budgeting, and internal earnings forecasting requirements as well as to support the Company's regulatory objectives and comply with regulatory requirements. I am also responsible for the development and presentation of load research and forecasted data for Xcel Energy's operating companies and reporting historical and statistical information to various regulatory agencies and others. I have been in this role since May 2022, after joining Xcel Energy as the Manager, Energy Forecasting in October 2019.

Prior to Xcel Energy, I worked as a Manager, Energy and Revenue Forecasting and Analysis at Arizona Public Service for three years. Other previous roles include Energy Markets Specialist at Southern California Edison, Principal Analyst at Baltimore Gas and Electric, and Regulatory Affairs Analyst at Pepco Holdings, Inc.

I graduated from the University of Delaware with a Doctor of Philosophy degree in Economics. I also hold a Master of Arts degree in Economics from the University of Delaware and a Bachelor of Arts degree in Economics from the University of Maryland.

I have testified before the Colorado Public Utilities Commission, the Minnesota Public Utilities Commission, the Public Utility Commission of Texas, and the New Mexico Public Regulation Commission.