NOTICE OF CONFIDENTIALITY
AN ATTACHMENT TO THIS TESTIMONY HAS BEEN FILED UNDER SEAL

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO

* * * * *

IN THE MATTER OF ADVICE NO. 1029-GAS OF PUBLIC SERVICE COMPANY OF COLORADO TO REVISE ITS COLORADO PUC NO. 6-GAS TARIFF TO INCREASE JURISDICTIONAL BASE RATE REVENUES, IMPLEMENT NEW BASE RATES FOR ALL GAS RATE SCHEDULES, AND MAKE OTHER PROPOSED TARIFF CHANGES EFFECTIVE FEBRUARY 29, 2024	)))))))) PROCEEDING NO. 24AL-____G)))))

DIRECT TESTIMONY AND ATTACHMENTS OF JOHN M. GOODENOUGH

ON

BEHALF OF

PUBLIC SERVICE COMPANY OF COLORADO

NOTICE OF CONFIDENTIALITY
AN ATTACHMENT TO THIS TESTIMONY HAS BEEN FILED UNDER SEAL

Confidential:
Attachment JMG-2C

January 29, 2024

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO

* * * * *

IN THE MATTER OF ADVICE NO. 1029-GAS OF PUBLIC SERVICE COMPANY OF COLORADO TO REVISE ITS COLORADO PUC NO. 6-GAS TARIFF TO INCREASE JURISDICTIONAL BASE RATE REVENUES, IMPLEMENT NEW BASE RATES FOR ALL GAS RATE SCHEDULES, AND MAKE OTHER PROPOSED TARIFF CHANGES EFFECTIVE FEBRUARY 29, 2024	)))))))) PROCEEDING NO. 24AL-____G)))))

DIRECT TESTIMONY AND ATTACHMENTS OF JOHN M. GOODENOUGH

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Attachment JMG-3	Weather Normalization of 12 Months Ended September 30, 2023 Throughput

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO**

* * * * *

IN THE MATTER OF ADVICE NO. 1029-GAS OF PUBLIC SERVICE COMPANY OF COLORADO TO REVISE ITS COLORADO PUC NO. 6-GAS TARIFF TO INCREASE JURISDICTIONAL BASE RATE REVENUES, IMPLEMENT NEW BASE RATES FOR ALL GAS RATE SCHEDULES, AND MAKE OTHER PROPOSED TARIFF CHANGES EFFECTIVE FEBRUARY 29, 2024	))))))) **PROCEEDING NO. 24AL-____G**)))))

DIRECT TESTIMONY AND ATTACHMENTS OF JOHN M. GOODENOUGH

1   **I.   INTRODUCTION, QUALIFICATIONS, AND PURPOSE OF TESTIMONY**

2 **Q.   PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3 A.   My name is John M. Goodenough. My business address is 1800 Larimer Street,

4   Denver, Colorado 80202.

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

6 A.   I am employed by Xcel Energy Services Inc. ("XES") as Director, Sales, Energy

7   and Demand Forecasting. XES is a wholly-owned subsidiary of Xcel Energy Inc.

8   ("Xcel Energy") and provides an array of support services to Public Service

9   Company of Colorado ("Public Service" or the "Company") and the other utility

10   operating company subsidiaries of Xcel Energy on a coordinated basis.

11 **Q.   ON WHOSE BEHALF ARE YOU TESTIFYING IN THE PROCEEDING?**

12 A.   I am testifying on behalf of Public Service.

1 **Q. PLEASE SUMMARIZE YOUR RESPONSIBILITIES AND QUALIFICATIONS.**

2 A. I am responsible for the development of forecasted sales data and economic

3 indicators for Public Service and the other Xcel Energy utility operating companies

4 and the presentation of this information to Xcel Energy's senior management, other

5 Xcel Energy departments, and externally to various regulatory and reporting

6 agencies. I also am responsible for Xcel Energy's Load Research function, which

7 designs, maintains, monitors, and analyzes electric load research samples in the

8 Xcel Energy operating companies' service territories. Additionally, I am

9 responsible for developing and implementing forecasting, planning, and load

10 analysis studies for regulatory proceedings. A description of my qualifications,

11 duties, and responsibilities is included at the end of my Direct Testimony in my

12 Statement of Qualifications.

13 **Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?**

14 **A.** The purpose of my Direct Testimony is to:

15 • describe the historical gas customer counts and dekatherm ("Dth")
16   Throughput trends for Public Service's service territory;

17 • present and support the Company's gas customer count and Dth
18   Throughput forecast for the test year ended December 31, 2023 ("Test
19   Year" or "2023 Test Year"), and provide the actual customer count and Dth
20   Throughput data for the 12 months ended September 30, 2023; and

21 • provide a description of the methodology the Company uses to weather
22   normalize historical gas Dth Throughput for the purpose of calculating rates,
23   which is consistent with the Colorado Public Utilities Commission's
24   ("Commission") decision with regard to weather normalization in the
25   Company's 2020 gas rate case, Proceeding No. 20AL-0049G ("2020

1   Combined Gas Rate Case") and the Company's 2022 gas rate case,
2   Proceeding No. 22AL-0046G ("2022 Combined Gas Rate Case").[1]

3 **Q. WHAT IS INCLUDED IN "DTH THROUGHPUT" FOR PURPOSES OF YOUR**

4 **DIRECT TESTIMONY?**

5 A.   Public Service provides both gas sales and transportation services. Gas sales

6   involves the sale of natural gas procured by Public Service to its end-use

7   customers.   Transportation service allows Public Service's non-residential

8   customers to purchase their gas directly from a producer or marketer and transport

9   that gas across Public Service's system to their end-use facilities.   "Dth

10   Throughput" includes all deliveries of gas on Public Service's system to end users

11   located in Colorado, including both end-use sales of gas (*i.e.*, gas sales) to Public

12   Service customers as well as gas transportation volumes delivered by Public

13   Service in Colorado that are subject to the Commission's jurisdiction.

14 **Q. DOES PUBLIC SERVICE PROVIDE TRANSPORTATION SERVICE THAT IS**

15 **NOT SUBJECT TO COMMISSION JURISDICTION?**

16 A.   Yes. Public Service also provides a small amount of gas transportation service

17   that is subject to the jurisdiction of the Federal Energy Regulatory Commission

18   ("FERC") rather than the Commission.   This transportation service involves

19   deliveries of gas to interconnections with interstate pipelines for subsequent

---

[1] In the 2020 Combined Gas Rate Case, a historical test year ended September 30, 2019 ("2019 HTY") with certain known and measurable adjustments was approved by the Commission and agreed to by the parties as part of a comprehensive settlement ("2020 GRC Settlement"). As part of that settlement, the parties agreed to a 10-year weather normalization adjustment to test year revenue that included the test year weather normalization data in the 10-year period ended September 30, 2019. Decision No. R20-0673 at p. 25, ¶¶ 71-72. In the 2022 Combined Gas Rate Case, the Commission approved the Company's 10-year weather normalization approach that included the test year data in the 10-year period, consistent with its decision in the 2020 Combined Gas Rate Case. Decision No. C22-0642 at p. 68, ¶¶ 230-233.

1   delivery outside of Colorado. My Direct Testimony only addresses the Public

2   Service intrastate gas business, which is subject to the Commission's jurisdiction.

3   The Dth Throughput numbers I present do not reflect the FERC-jurisdictional

4   transportation services that Public Service provides.

5 **Q.   ARE YOU SPONSORING ANY ATTACHMENTS AS PART OF YOUR DIRECT**

6   **TESTIMONY?**

7 A.   Yes, I am sponsoring Attachments JMG-1 through JMG-3, which are as follows:

8   • Attachment JMG-1: Monthly 12 Months Ended September 30, 2023 and
9   2023 Test Year Gas Customer Counts and Dth Throughput by Class

10   • Attachment JMG-2C: Confidential 12 Months Ended September 30, 2023
11   and 2023 Test Year Gas Customer Counts and Dth Throughput by Tariff
12   Rate Schedule Level

13   • Attachment JMG-2 Public Version of 12 Months Ended September 30,
14   2023 and 2023 Test Year Gas Customer Counts and Dth Throughput by
15   Tariff Rate Schedule Level; and

16   • Attachment JMG-3: Weather Normalization of 12 Months Ended
17   September 30, 2023 Dth Throughput.

1   II.   **HISTORICAL CUSTOMER COUNT AND DTH THROUGHPUT TRENDS**

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

3 A.   The purpose of this section of my Direct Testimony is to provide relevant

4   background regarding historical customer counts, sales, and Dth Throughput

5   trends, focusing on the five years from 2017 through 2022. For the purposes of

6   this discussion, the weather-normalized sales and use per customer values are

7   calculated using the Company's standard weather-normalization process, which

8   assumes normal weather is based on a 10-year average exclusive of the year

9   being adjusted. These historical trends help put the remainder of my Direct

10   Testimony, which discusses actual and forecasted sales and customer counts for

11   the 2023 Test Year, in context.

12 **Q.   WHY THE FOCUS ON 2017 THROUGH 2022?**

13 A.   When analyzing historical customer counts, sales, and Dth Throughput trends, we

14   typically focus on the most recent five full years of actual data. Here, we are using

15   five full years of actual data for 2017 through 2022.[2] While I discuss 2023 trends

16   later in my Direct Testimony, historical trends are thus focused on the years of

17   2017 through 2022.

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

19 A.   Total gas customer counts in the Company's service territory averaged 1,466,160

20   customers per month in 2022. Total customer counts increased an average of

21   16,035 customers per year for the 2017 through 2022 time period, for an average

---

[2] At the time the Company conducted its semi-annual forecasting process, actual results for October through December 2023 were not available.

1   annual growth rate of 1.1 percent. The largest class of customers is the Residential

2   class, which averaged 1,356,052 customers per month during 2022 and

3   represents 92.5 percent of total customer counts. The average growth rate for

4   Residential customer counts was 1.2 percent, or 15,645 additions, per year during

5   the time period of 2017 through 2022. This increase in Residential customer

6   counts represents more than 97 percent of the Company's total customer count

7   growth during this time period. Commercial customer counts averaged growth of

8   0.3 percent, or 324 additions, per year during the time period of 2017 through

9   2022.[3] The number of Transportation customers increased 0.9 percent, or 67

10   additions, per year during the time period of 2017 through 2022.

11   Table JMG-D-1 provides a summary of the historical customer count

12   statistics from 2017 through 2022.

13
14

TABLE JMG-D-1
Historical Customer Count Statistics

Historical Customer Count Statistics								
	2017 Avg Customer Counts	2018 Avg Customer Counts	2019 Avg Customer Counts	2020 Avg Customer Counts	2021 Avg Customer Counts	2022 Avg Customer Counts	% of 2022 Total Customers	5-year Compound Annual Growth Rate
Residential	1,277,828	1,293,327	1,309,901	1,326,398	1,341,725	1,356,052	92.5%	1.2%
Commercial	100,700	100,916	101,309	101,680	102,000	102,316	7.0%	0.3%
Transportation	7,458	7,783	7,938	7,976	7,944	7,792	0.5%	0.9%
Total	1,385,985	1,402,026	1,419,148	1,436,054	1,451,669	1,466,160	100.0%	1.1%

---

[3] Unless otherwise noted, the term "Commercial sales" includes Commercial Gas Service Small, Commercial Gas Service Large, Commercial Gas Outdoor Lighting Service, Interruptible Industrial Gas Service, Firm Gas Transportation Service Small (Backup Sales and Interruptible TFS Sales), Firm Gas Transportation Service Large (Backup Sales and Interruptible TFL Sales), Interruptible Gas Transportation Service (Interruptible TI Sales), and Interdepartmental sales.

1 **Q. WHAT FACTORS HAVE BEEN DRIVING RESIDENTIAL CUSTOMER COUNT**

2 **GROWTH SINCE 2017?**

3 A. Residential customer counts are highly correlated with population. The increase

4 in the number of residential customers over the past five years is the result of

5 increasing population at the aggregated metropolitan statistical area ("MSA") level

6 for the MSAs included in the Company's gas service territory (calculated as the

7 sum of the Denver, Boulder, Fort Collins, Pueblo, and Grand Junction MSAs).

8 **Q. PLEASE DISCUSS THE COMPANY'S GAS DTH THROUGHPUT TRENDS**

9 **FROM 2017 THROUGH 2022.**

10 A. Table JMG-D-2 provides a summary of the historical Dth Throughput statistics by

11 customer class from 2017 through 2022. After normalizing for weather – a process

12 I explain further below – the Company's total gas sales have increased an average

13 of 0.7 percent per year over the past five years.[4] Residential sales have averaged

14 annual growth of 0.4 percent and Commercial sales have increased at an average

15 rate of 1.6 percent over the 2017 through 2022 time period. Total Transportation

16 volumes, which are composed of both third-party Transportation and

17 Transportation for Public Service's electric generation, have increased at an

18 average annual rate of 2.2 percent during the time period of 2017 through 2022.

19 Dth Throughput (weather-normalized sales plus Transportation volumes) has

20 increased at an average annual rate of 1.4 percent over the past five years, driven

21 mostly by growth in the Transportation sector.

---

[4] The 2017 to 2022 Dth sales discussed in this section of my Direct Testimony have been weather normalized using 10-year average normal weather.

1 **TABLE JMG-D-2**
2 **Historical Dth Throughput Statistics**

Historical Dth Throughput Statistics								
	2017 Dth Throughput	2018 Dth Throughput	2019 Dth Throughput	2020 Dth Throughput	2021 Dth Throughput	2022 Dth Throughput	% of 2022 Dth Throughput	5-year Compound Annual Growth Rate
Residential	98,259,267	98,389,566	100,553,992	103,793,048	103,542,564	99,919,475	36.0%	0.3%
Commercial	41,036,373	41,109,723	42,813,597	41,576,972	43,675,453	44,329,087	16.0%	1.6%
Total Sales	**139,295,640**	**139,499,289**	**143,367,588**	**145,370,020**	**147,218,016**	**144,248,561**	**51.9%**	**0.7%**
Transportation	119,760,842	141,732,059	150,518,881	147,641,441	136,153,198	133,598,068	48.1%	2.2%
Total Throughput	**259,056,482**	**281,231,348**	**293,886,469**	**293,011,461**	**283,371,214**	**277,846,629**	**100.0%**	**1.4%**

3 **Q.   WHAT IS THE PRIMARY CONTRIBUTOR TO THE INCREASE IN**

4 **RESIDENTIAL SALES FROM 2017 TO 2022?**

5 A.   The primary contributor to the increase in Residential sales from 2017 to 2022 was

6 growth in customer counts, partially offset by an average 0.8 percent decline in

7 use per customer over this same period, as shown in Figure JMG-D-1.

8 **FIGURE JMG-D-1**
9 **Residential Use Per Customer Trends**
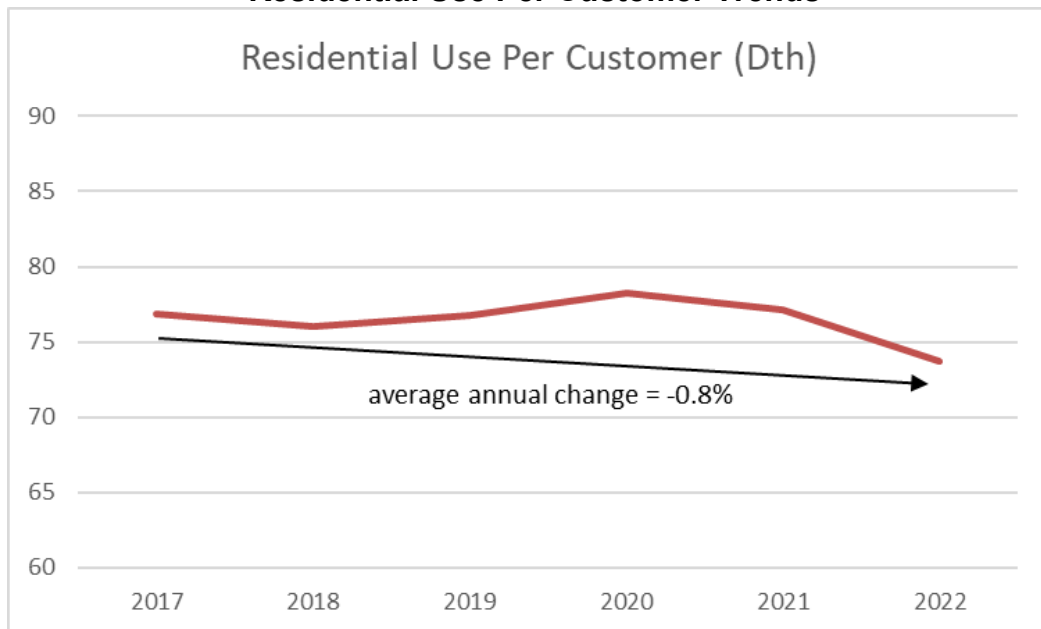
1 **Q.** **WHAT WERE THE DRIVERS OF COMMERCIAL SALES GROWTH FROM 2017**

2 **TO 2022?**

3 A. The growth in Commercial sales generally was driven by an increase in the

4 average use per customer, which increased 1.3 percent, combined with customer

5 growth of 0.3 percent.

6 **Q.** **WHAT WAS THE PRIMARY DRIVER OF THE ANNUAL CHANGES IN**

7 **TRANSPORTATION SECTOR VOLUMES FROM 2017 TO 2022?**

8 A. The primary driver of annual changes in the total Transportation sector volumes

9 were changes in gas transported for electric generation. The amount of gas used

10 for electric generation is dependent on several factors, such as gas prices and the

11 dispatch of other types of generation, including renewables.

1   **III.**   <u>**CUSTOMER COUNT AND DTH THROUGHPUT FORECASTS**</u>

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

3 A.   The purpose of this section of my Direct Testimony is to provide the Company's

4   2023 Test Year customer count and Dth Throughput forecasts for the Residential,

5   Commercial, and Transportation customer classes. The 2023 forecasts consist of

6   actual data through September 30, 2023, and forecasted data for October through

7   December 31, 2023. The gas customer count and Dth Throughput forecasts

8   contained in Attachment JMG-1 are used by Company witness Mr. Arthur P.

9   Freitas to calculate retail base revenue for the 2023 Test Year. In addition to

10   providing the 2023 Test Year forecasts, I also discuss the sales and customer

11   counts for the 12 months ended September 30, 2023.

12 **Q.**   **WAS THE METHODOLOGY USED TO DEVELOP THE FORECASTS FOR**

13   **OCTOBER THROUGH DECEMBER 31, 2023 CONSISTENT WITH THE**

14   **METHODOLOGY USED IN PRIOR CASES?**

15 A.   Yes.

16 **Q.**   **WHAT IS PUBLIC SERVICE'S FORECAST OF GAS CUSTOMER COUNTS**

17   **AND DTH THROUGHPUT FOR THE 2023 TEST YEAR?**

18 A.   Attachment JMG-1 summarizes the monthly number of gas customers and gas

19   Dth Throughput for the Residential, Small Commercial, Large Commercial,

20   Interdepartmental, and total Transportation customer classes for the 12 months

21   ended September 30, 2023, and the 2023 Test Year. Total gas customer counts

22   for the 2023 Test Year are projected to average 1,481,792 per month and Dth

23   Throughput is projected to be 288,368,645 Dth.

1 Q. **HOW DOES PUBLIC SERVICE'S 2023 TEST YEAR GAS CUSTOMER COUNT**

2 **GROWTH COMPARE WITH HISTORICAL CUSTOMER COUNT GROWTH?**

3 A. The average number of total gas customers is expected to increase 1.1 percent

4 from 2022 levels, or 15,632 customers, during 2023. This growth is slightly lower

5 than the trend over the past five years, when the Company added 16,035

6 customers per year on average.

7 Q. **WHAT IS PUBLIC SERVICE'S FORECAST OF GAS DTH THROUGHPUT FOR**

8 **THE 2023 TEST YEAR?**

9 A. Table JMG-D-3 below provides the Company's weather-normalized Dth

10 Throughput and annual growth rates by class by year, as compared to 2022, for

11 the 12 months ended September 30, 2023, and the 2023 Test Year.

12 Residential sales are projected to decline 0.1 percent in 2023 as use per

13 customer continues to decline, as shown in Figure JMG-D-1 above. Commercial

14 sales are expected to see continued strength in 2023 and end the year with a 6.9

15 percent increase as compared to 2022 due to increased use per customer. Total

16 gas sales to Public Service customers are expected to increase 2.1 percent in

17 2023 compared to 2022 weather-normalized gas sales.

18 Separately, total Transportation volumes are expected to increase in 2023.

19 The projected increase is primarily due to projected lower gas prices. As a result,

20 total gas Dth Throughput (sales plus Transportation volumes) is expected to

21 increase 3.3 percent in 2023 as compared to 2022 actual volumes.

1 **TABLE JMG-D-3**
2 **Weather-Normalized Throughput/Volumes by Class (Dth)**

Weather-Normalized Throughput by Class			
	2022 Actual Throughput (Dth)	12 months ended Sept 2023 Throughput (Dth)	2023 Test Year Throughput (Dth)
Residential	99,919,475	99,783,240	99,858,986
% Change vs 2022		*-0.1%*	*-0.1%*
Commercial	44,329,087	46,548,969	47,400,578
% Change vs 2022		*5.0%*	*6.9%*
Total Sales	**144,248,561**	**146,332,209**	**147,259,564**
% Change vs 2022		*1.4%*	*2.1%*
Transportation	133,598,068	139,918,379	141,109,081
% Change vs 2022		*4.7%*	*5.6%*
Total Throughput	**277,846,629**	**286,250,588**	**288,368,645**
% Change vs 2022		*3.0%*	*3.8%*

3 **Q.   DID PUBLIC SERVICE PREPARE A FORECAST AT THE TARIFF RATE**

4 **SCHEDULE LEVEL OF DETAIL?**

5 A.   Yes. The tariff rate schedule level of detail is needed to appropriately estimate

6 sales revenues. For example, the Residential customer class of service is an

7 aggregation of two rate schedules: Residential Gas Service and Residential Gas

8 Outdoor Lighting Service. Attachment JMG-2C provides the 2023 Test Year

9 customer count and Dth Throughput forecast by month at the tariff rate schedule

10 level of detail. Table JMG-D-4 provides the rate schedule to customer class

11 mapping.

1 **TABLE JMG-D-4**
2 **Rate Schedule to Customer Class Mapping**

Customer Class	Rate Schedules within Customer Class
Residential	º Residential Gas Service º Residential Gas Outdoor Lighting Service
Commercial	º Commercial Gas Service Small º Commercial Gas Service Large º Commercial Gas Outdoor Lighting Service º Interruptible Industrial Gas Service º Firm Gas Transportation Service Small (Backup Sales/Interruptible TFS Sales) º Firm Gas Transportation Service Large (Backup Sales/Interruptible TFL Sales) º Interruptible Gas Transportation Service (Interruptible TI Sales)
Public Service Electric Transportation	º Firm Gas Transportation Service Large º Interruptible Gas Transportation Service
Third-Party Transportation	º Firm Gas Transportation Service Small º Firm Gas Transportation Service Large º Interruptible Gas Transportation Service

3 **Q. HOW WAS THE TARIFF RATE SCHEDULE LEVEL FORECAST DERIVED**

4 **FROM THE CLASS LEVEL DATA?**

5 A. Monthly tariff rate schedule sales and customer count allocation factors were

6 developed based on tariff rate schedule level sales and customer count data

7 obtained from Company billing system reports. The monthly tariff rate allocation

8 factors were based on several years of historical actual data, and these allocation

9 factors were then applied to the class level forecasts to derive the tariff rate

10 schedule level forecasts. The Transportation forecast is developed at the rate

11 schedule level of detail, so no additional derivation for that service is necessary.

1   IV.   **WEATHER NORMALIZATION OF TEST YEAR THROUGHPUT**

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

3   A.   The purpose of this section of my Direct Testimony is to explain the Company's

4   weather normalization methodology and its application to the revenues in this

5   proceeding.

6   **Q.   HOW IS HISTORICAL DTH THROUGHPUT WEATHER NORMALIZED?**

7   A.   In order to exclude the impact of weather on the Company's throughput growth

8   calculations from year to year, the Company estimates the Dth impact of the

9   deviation from normal weather, or "weather-normalized" throughput.   The

10   Company uses actual and normal weather, along with the actual number of

11   customers and weather response coefficients, to conduct this weather

12   normalization of historical throughput. The weather normalization is performed for

13   both the Residential class and the Commercial class, as well as Public Service's

14   Transportation full rate Commercial customers.

15   The weather response coefficients are developed using regression models

16   with the class-level throughput as the dependent variable and monthly actual

17   weather as the explanatory variables. The weather variables are expressed as

18   Heating Degree Days ("HDD"), with a different variable defined for each month that

19   exhibits a statistically significant weather response. Each coefficient effectively

20   represents the monthly average Dth of weather response per HDD per customer.

21   The Company uses the MetrixND statistical software package to develop

22   the regression models. The weather response coefficients are updated annually

23   to incorporate the most recent year of actual throughput, actual customer counts,

1   and actual weather data. This annual update process results in coefficients that

2   reflect the current relationship between throughput and weather.

3   In the weather normalization regression models, each month's HDD are

4   used as individual variables (*i.e.*, January HDD, February HDD, etc.). This allows

5   each model to identify and quantify a unique weather response for each month,

6   which is appropriate because our customers' response to weather varies from

7   month to month.

8   The impact of the deviation from normal weather is calculated by multiplying

9   the weather response coefficient for a given month times the number of customers

10   in the month times the deviation in HDD from normal. This impact is then applied

11   to the actual billed sales to derive weather-normalized sales. If the weather is

12   warmer than normal, the normalization process results in weather-normalized gas

13   sales that are higher than actual sales. Conversely, if weather is colder than

14   normal, the normalization process results in weather-normalized gas sales that are

15   lower than actual sales.

16   **Q.   IS THIS WEATHER NORMALIZATION PROCESS A NEW PROCESS FOR THE**

17   **COMPANY?**

18   A.   No. The Company has been using this weather normalization methodology for

19   gas and electric sales for business analysis and internal and external reporting

20   purposes since 2001. It is also the same weather-normalization methodology used

21   in the Company's recent rate cases.[5]

---

[5] Proceeding Nos. 22AL-0530E, 22AL-0046G, 20AL-0049G, 19AL-0268E, 17AL-0363G, 15AL-0135G, 14AL-0660E, 12AL-1268G, and 11AL-947E.

1   While the weather normalization methodology has not changed, the normal

2   weather assumption changed consistent with the more recent gas rate case

3   outcomes of Proceeding Nos. 22AL-0046G and 20AL-0049G, as I explained

4   previously.   For the weather normalization of sales for the 12 months ended

5   September 30, 2023, the Company defined normal weather as the 10-year

6   average of historical weather from October 2013 through September 2023, that is,

7   the most recent 10-year period including the 12 months ended September 30,

8   2023.   For the 2023 Test Year, the Company's forecasted sales for October

9   through December 2023 use normal weather for October through December 2012

10   through 2022.

11 **Q.**   **DID THE COMPANY NORMALIZE DTH THROUGHPUT VOLUMES FOR**

12   **TRANSPORTATION FULL RATE COMMERCIAL CUSTOMERS?**

13 A.   Yes.   Similar to the Company's most recent gas rate case,[6] the Company also

14   weather normalized the Dth Throughput volumes for Transportation full rate

15   Commercial customers.   Such Transportation full rate Commercial customers can

16   choose to receive sales or transport volumes, and, therefore, exhibit weather

17   sensitivity similar to the Commercial sales customers.   The Company has identified

18   the transportation volumes for this group of Transportation full rate Commercial

19   customers and included this group in the weather normalization process.

---

[6] Proceeding No. 22AL-0046G.

1 **Q. DOES THE COMPANY WEATHER NORMALIZE HISTORICAL GAS**

2   **TRANSPORTATION VOLUMES DELIVERED TO LOCAL DISTRIBUTION**

3   **COMPANIES ("LDCS")?**

4 A.   No. The Company does not weather normalize LDC deliveries for any internal or

5   external reporting purposes. Third-party LDCs typically acquire gas supplies from

6   other sources. Therefore, Public Service's transportation of gas to these LDCs

7   can be driven by factors other than weather, and the statistical approaches used

8   to weather normalize other classes does not work well with the LDC deliveries.

9 **Q. WHAT ARE THE RESULTS OF THE WEATHER NORMALIZATION OF 2023**

10   **TEST YEAR SALES?**

11 A.   The nine months ended September 2023 actual HDD were 9.0 percent higher than

12   normal. The colder-than-normal winter weather resulted in weather-normalized

13   sales being lower than actual sales by 8,746,246 Dth, or 6.1 percent. The

14   workpapers supporting the weather normalization of the January to September

15   2023 actual sales are provided as Attachment JMG-3.

16 **Q. HOW DOES PUBLIC SERVICE EVALUATE THE VALIDITY OF ITS WEATHER**

17   **NORMALIZATION REGRESSION MODELS FOR HISTORICAL SALES?**

18 A.   The Company uses the coefficient of determination ("R-squared") test statistic,[7]

19   the t-statistic of each variable,[8] the Durbin-Watson ("DW") test statistic,[9] and

20   graphical inspection of each model's error terms (*i.e.*, actual less predicted).

---

[7] This test statistic is a measure of the quality of the model's fit to the historical data.

[8] The t-statistic is a measure of the statistical significance of each variable's individual contribution to the prediction model.

[9] This test statistic measures the presence of first-order autocorrelation, which refers to the correlation of the model's error terms for different time periods.

1 **Q. PLEASE DESCRIBE THE DATA AND DATA SOURCES THE COMPANY**

2   **RELIED ON TO DEVELOP ITS HISTORICAL SALES WEATHER**

3   **NORMALIZATION REGRESSION MODELS.**

4 A. The data used in the regression models include historical billing month sales and

5   monthly number of customers from Company billing system reports, number of

6   billing days in each month from Company meter ready schedules, and weather

7   variables based on weather data from NOAA measured at the DIA weather station.

8   The weather data reflected the same billing days as the sales data.

9 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

10 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 Service Commission of Wisconsin, the Public Utility Commission of Texas, and the New Mexico Public Regulation Commission.

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO

* * * * *

IN THE MATTER OF ADVICE NO. 1029-GAS OF PUBLIC SERVICE COMPANY OF COLORADO TO REVISE ITS COLORADO PUC NO. 6-GAS TARIFF TO INCREASE JURISDICTIONAL BASE RATE REVENUES, IMPLEMENT NEW BASE RATES FOR ALL GAS RATE SCHEDULES, AND MAKE OTHER PROPOSED TARIFF CHANGES EFFECTIVE FEBRUARY 29, 2024

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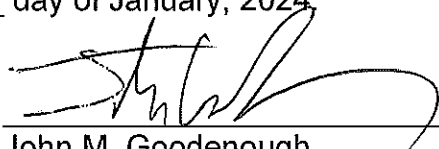
AFFIDAVIT OF JOHN M. GOODENOUGH
ON BEHALF OF
PUBLIC SERVICE COMPANY OF COLORADO
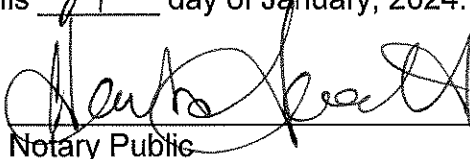
I, John M. Goodenough, being duly sworn, state that the Direct Testimony and attachments were prepared by me or under my supervision, control, and direction; that the Direct Testimony and attachments are true and correct to the best of my information, knowledge and belief; and that I would give the same testimony orally and would present the same attachments if asked under oath.

Dated at Denver, Colorado, this 24th day of January, 2024.

John M. Goodenough
Director, Sales, Energy and Demand
Forecasting

Subscribed and sworn to before me this _24th_ day of January, 2024.

Notary Public
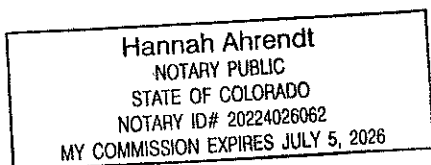
My Commission expires _July 5, 2026_

Public Service Company of Colorado
Gas Customer Counts and Dth Throughput
12 months of actuals ending September 30, 2023 + 3 months
 of forecast October 2023 - December 2023

	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Oct-22-Sep-23	2023 Test Year
														Forecast			
Customer Counts																	
Residential	1,359,795	1,361,605	1,363,264	1,365,557	1,366,755	1,368,042	1,369,061	1,370,663	1,371,124	1,371,812	1,372,380	1,372,694	1,374,609	1,376,027	1,377,426	1,367,729	1,371,346
Small Commercial	101,176	101,417	101,603	101,763	101,857	101,898	101,822	101,717	101,692	101,619	101,619	101,526	101,579	101,753	101,889	101,642	101,728
Large Commercial	1,030	1,037	1,039	1,036	1,034	1,035	1,034	1,136	1,137	1,143	1,142	1,143	1,139	1,141	1,143	1,079	1,105
Interdepartmental	6	6	6	6	6	6	6	6	6	5	5	5	6	6	6	6	6
Total Sales Customers	1,462,007	1,464,065	1,465,912	1,468,362	1,469,652	1,470,981	1,471,923	1,473,522	1,473,959	1,474,579	1,475,146	1,475,368	1,477,333	1,478,927	1,480,464	1,470,456	1,474,185
Total Transportation Customers	7,744	7,736	7,729	7,710	7,697	7,678	7,678	7,641	7,599	7,570	7,496	7,488	7,576	7,574	7,582	7,647	7,607
Total Customers	1,469,751	1,471,801	1,473,641	1,476,072	1,477,349	1,478,659	1,479,601	1,481,163	1,481,558	1,482,149	1,482,642	1,482,856	1,484,909	1,486,501	1,488,046	1,478,104	1,481,792
Weather Normalized Billing Month Gas Throughput (Dth)																	
Residential	3,748,677	8,755,668	13,722,976	18,202,885	13,961,168	15,821,525	9,151,132	6,688,117	3,433,077	2,141,229	2,172,892	1,983,894	3,747,417	8,174,002	14,381,649	99,783,240	99,858,986
Small Commercial	1,449,952	2,709,928	4,875,215	6,367,302	5,126,427	5,715,730	3,532,137	2,612,547	1,501,005	1,008,512	1,064,113	824,552	1,561,108	2,895,752	4,975,565	36,787,421	37,184,750
Large Commercial	403,625	675,830	1,150,323	1,427,651	1,258,342	1,394,511	1,009,474	804,019	502,076	402,459	324,302	378,002	492,807	933,927	1,250,985	9,730,615	10,178,555
Interdepartmental	(4,156)	739	697	5,872	2,942	2,597	2,799	(2,479)	163	272	245	21,242	48	892	2,681	30,932	37,273
Total Sales	5,598,099	12,142,165	19,749,211	26,003,709	20,348,879	22,934,364	13,695,542	10,102,204	5,436,321	3,552,472	3,561,551	3,207,690	5,801,380	12,004,572	20,610,880	146,332,209	147,259,564
Total Transportation	9,608,471	9,810,091	12,508,365	14,808,878	15,855,337	12,607,247	12,580,905	9,641,645	9,212,613	9,915,434	12,082,137	11,287,256	10,758,316	10,779,235	11,580,076	139,918,379	141,109,081
Total Throughput	########	21,952,256	32,257,576	40,812,588	36,204,217	35,541,610	26,276,448	19,743,849	14,648,934	13,467,906	15,643,688	14,494,946	16,559,696	22,783,807	32,190,956	286,250,588	288,368,645

Public Service Company of Colorado
Gas Customer Counts and Dth Throughput by Tariff Rate Schedule
12 months of actuals ending September 30, 2023 + 3 months
of forecast October 2023 - December 2023

	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Oct-22-Sep-23	2023 Test Year
Customer Counts														Forecast			
Residential (RG)	1,359,777	1,361,587	1,363,246	1,365,539	1,366,737	1,368,024	1,369,043	1,370,645	1,371,106	1,371,794	1,372,362	1,372,676	1,374,591	1,376,009	1,377,408	1,367,711	1,371,328
Residential (RGL)	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Small Commercial (CSG)	101,165	101,406	101,592	101,752	101,846	101,887	101,811	101,706	101,681	101,608	101,608	101,515	101,574	101,748	101,884	101,631	101,718
Small Commercial (IG)																	
Large Commercial (CLG)	1,030	1,037	1,039	1,036	1,034	1,035	1,034	1,136	1,137	1,143	1,142	1,143	1,133	1,135	1,137	1,079	1,104
Interdepartmental	6	6	6	6	6	6	6	6	6	5	5	5	6	6	6	6	6
Total Sales Customers	1,462,007	1,464,065	1,465,912	1,468,362	1,469,652	1,470,981	1,471,923	1,473,522	1,473,959	1,474,579	1,475,146	1,475,368	1,477,333	1,478,928	1,480,464	1,470,456	1,474,185
TF Full Small	6,090	6,081	6,058	6,041	6,031	6,018	6,014	5,980	5,943	5,918	5,845	5,840	5,856	5,855	5,852	5,988	5,933
TF Full Large	1,489	1,490	1,506	1,504	1,505	1,505	1,510	1,508	1,501	1,497	1,497	1,494	1,516	1,515	1,526	1,501	1,507
Other	165	165	165	165	161	155	154	153	155	155	154	154	203	204	204	158	168
Total Transportation Customers	7,744	7,736	7,729	7,710	7,697	7,678	7,678	7,641	7,599	7,570	7,496	7,488	7,576	7,574	7,582	7,647	7,607
Total Customers	1,469,751	1,471,801	1,473,641	1,476,072	1,477,349	1,478,659	1,479,601	1,481,163	1,481,558	1,482,149	1,482,642	1,482,856	1,484,909	1,486,502	1,488,046	1,478,104	1,481,792
Weather Normalized Billing Month Gas Throughput (Dth)																	
Residential (RG)	3,748,640	8,755,638	13,722,939	18,202,841	13,961,130	15,821,486	9,151,095	6,688,084	3,433,042	2,141,192	2,172,853	1,983,860	3,747,379	8,173,972	14,381,608	99,782,800	99,858,541
Residential (RGL)	37	30	37	44	38	39	37	32	35	37	39	34	38	30	41	440	444
Small Commercial (CSG)	1,411,685	2,644,709	4,773,864	6,255,226	4,991,776	5,588,983	3,428,920	2,510,731	1,438,577	954,835	1,019,891	778,042	1,532,568	2,840,412	4,890,080	35,797,239	36,230,041
Small Commercial (CGL)	4	4	4	4	4	4	4	2	3	4	4	4	4	4	4	44	45
Small Commercial (IG)																	
Small Commercial (TFS)	12,235	23,801	47,455	65,682	72,177	65,080	57,955	44,471	21,013	22,661	16,340	23,077	6,001	13,822	19,666	471,946	427,944
Large Commercial (CLG)	362,986	602,160	1,031,930	1,198,932	985,360	1,162,802	776,934	627,168	435,397	342,378	271,163	290,529	440,681	871,445	1,165,040	8,087,740	8,567,828
Large Commercial (TF)	27,458	51,907	86,864	181,550	247,905	198,487	208,360	165,836	57,741	45,735	39,836	51,085	25,636	43,209	57,590	1,362,763	1,322,970
Large Commercial (TI)	13,181	21,763	31,530	47,169	25,077	33,222	24,180	11,015	8,938	14,346	13,303	36,388	26,490	19,273	28,356	280,112	287,757
Interdepartmental	(4,156)	739	697	5,872	2,942	2,597	2,799	(2,479)	163	272	245	21,242	48	892	2,681	30,932	37,273
Total Sales	5,598,099	12,142,165	19,749,211	26,003,709	20,348,879	22,934,364	13,695,542	10,102,204	5,436,321	3,552,472	3,561,551	3,207,690	5,801,380	12,004,572	20,610,880	146,332,209	147,259,564
TF Full Small	323,272	581,806	1,019,087	1,270,833	1,236,313	1,117,372	1,044,139	817,750	480,898	331,447	272,164	267,123	439,286	779,531	707,429	8,762,204	8,764,285
TF Full Large	1,358,412	1,803,196	2,609,546	2,965,342	3,003,731	2,643,309	2,687,565	2,234,313	1,690,817	1,390,901	1,278,777	1,341,530	1,689,704	2,361,798	3,229,134	25,007,440	26,516,922
TF Full Large (other)	234,077	552,853	1,281,988	1,558,072	1,427,354	1,475,411	1,323,913	863,803	469,280	267,367	160,773	198,746	1,126,384	855,021	1,002,811	9,813,637	10,728,935
TF Disc	5,845,343	5,494,731	5,314,729	7,054,144	7,783,791	5,868,276	5,874,586	4,063,546	5,082,556	6,830,472	8,073,751	7,713,753	6,133,817	5,660,809	5,665,111	74,999,678	75,804,612
TI Full Rate	1,847,367	1,377,505	2,283,014	1,960,487	2,404,149	1,502,878	1,650,703	1,662,233	1,489,061	1,095,247	2,296,672	1,766,104	1,369,126	1,122,076	975,591	21,335,420	19,294,327
Total Transportation	9,608,471	9,810,091	12,508,365	14,808,878	15,855,337	12,607,247	12,580,905	9,641,645	9,212,613	9,915,434	12,082,137	11,287,256	10,758,316	10,779,235	11,580,076	139,918,379	141,109,081
Total Throughput	15,206,570	21,952,256	32,257,576	40,812,588	36,204,217	35,541,610	26,276,448	19,743,849	14,648,934	13,467,906	15,643,688	14,494,946	16,559,696	22,783,807	32,190,956	286,250,588	288,368,645

2022-2023 PSCo Gas Residential　　　　　　　　　　　　　　　　**2022-2023 PSCo Gas Total**

Line No.	Year	Months	Actual HDD	10-yr Normal HDD	HDD Coefficent	Customers	Bill Mo. Sales	WN Bill Mo. Sales	Bill Mo. Sales Impact	Total Act	Total WN
4	2023	Jan	1,179	1,074	0.011459	1,365,557	19,834,628	18,202,885	1,631,744	32,706,211	30,234,013
5	2023	Feb	1,046	889	0.011247	1,366,755	16,387,271	13,961,168	2,426,103	28,404,461	24,585,981
6	2023	Mar	1,042	967	0.010450	1,368,042	16,905,193	15,821,525	1,083,669	28,387,734	26,692,448
7	2023	Apr	651	561	0.008966	1,369,061	10,254,379	9,151,132	1,103,246	19,220,025	17,424,447
8	2023	May	369	410	0.007790	1,370,663	6,250,951	6,688,117	(437,166)	12,441,791	13,156,746
9	2023	Jun	124	142	0.007264	1,371,124	3,249,632	3,433,077	(183,445)	7,287,532	7,607,874
10	2023	Jul	23	11	0.000000	1,371,812	2,141,229	2,141,229	0	5,274,548	5,274,548
11	2023	Aug	2	3	0.000000	1,372,380	2,172,892	2,172,892	0	5,112,248	5,112,248
12	2023	Sep	15	26	0.000000	1,372,694	1,983,894	1,983,894	0	4,795,101	4,795,101
13	Total		4,452	4,083			79,180,069	73,555,918	5,624,151	143,629,651	134,883,405
14	Difference										(8,746,246)
15	% Difference			9.0%							-6.1%
16											

2022-2023 PSCo Gas Small Commercial

Line No.	Year	Months	Actual HDD	10-yr Normal HDD	HDD Coefficent	Customers	Bill Mo. Sales	WN Bill Mo. Sales	Bill Mo. Sales Impact
22	2023	Jan	1,179	1,074	0.046279	101,763	6,858,412	6,367,302	491,110
23	2023	Feb	1,046	889	0.046968	101,857	5,881,458	5,126,427	755,030
24	2023	Mar	1,042	967	0.044314	101,898	6,058,008	5,715,730	342,277
25	2023	Apr	651	561	0.037963	101,822	3,879,554	3,532,137	347,417
26	2023	May	369	410	0.032442	101,717	2,477,439	2,612,547	(135,109)
27	2023	Jun	124	142	0.034068	101,692	1,437,193	1,501,005	(63,812)
28	2023	Jul	23	11	0.000000	101,619	1,008,512	1,008,512	0
29	2023	Aug	2	3	0.000000	101,619	1,064,113	1,064,113	0
30	2023	Sep	15	26	0.000000	101,526	824,552	824,552	0
31	Total		4,452	4,083			29,489,240	27,752,326	1,736,914
32									
33									

2022-2023 PSCo Gas Large Commercial

Line No.	Year	Months	Actual HDD	10-yr Normal HDD	HDD Coefficent	Customers	Bill Mo. Sales	WN Bill Mo. Sales	Bill Mo. Sales Impact
39	2023	Jan	1,179	1,074	0.850825	1,036	1,519,570	1,427,651	91,919
40	2023	Feb	1,046	889	0.862415	1,034	1,399,080	1,258,342	140,737
41	2023	Mar	1,042	967	0.801218	1,035	1,457,369	1,394,511	62,858
42	2023	Apr	651	561	0.721520	1,034	1,076,526	1,009,474	67,052
43	2023	May	369	410	0.483674	1,136	781,523	804,019	(22,496)
44	2023	Jun	124	142	0.000000	1,137	502,076	502,076	0
45	2023	Jul	23	11	0.000000	1,143	402,459	402,459	0
46	2023	Aug	2	3	0.000000	1,142	324,302	324,302	0
47	2023	Sep	15	26	0.000000	1,143	378,002	378,002	0
48	Total		4,452	4,083			7,840,906	7,500,836	340,070

2022-2023 TF Full Small (Billing Month)

Line No.	Year	Month	Actual HDD	10-yr Normal HDD	HDD Coefficient	Customers	TF Sm Bill Mo. Sales	WN Bill Mo. Sales	Impact
4	2023	Jan	1,179	1,074	0.188272	6,041	1,389,437	1,270,833	118,604
5	2023	Feb	1,046	889	0.243877	6,031	1,468,444	1,236,313	232,131
6	2023	Mar	1,042	967	0.208166	6,018	1,212,330	1,117,372	94,958
7	2023	Apr	651	561	0.224640	6,014	1,165,560	1,044,139	121,421
8	2023	May	369	410	0.242005	5,980	758,498	817,750	(59,252)
9	2023	Jun	124	142	0.278330	5,943	450,431	480,898	(30,467)
10	2023	Jul	23	11	0.000000	5,918	331,447	331,447	0
11	2023	Aug	2	3	0.000000	5,845	272,164	272,164	0
12	2023	Sep	15	26	0.000000	5,840	267,123	267,123	0
13	Total		4,452	4,083			7,315,434	6,838,039	477,395
14									
15									

2022-2023 TF Full Large (Billing Month)

Line No.	Year	Month	Actual HDD	10-yr Normal HDD	HDD Coefficient	Customers	TF Lg Bill Mo. Sales	WN Bill Mo. Sales	Impact
16									
17									
21	2023	Jan	1,179	1,074	0.885124	1,504	3,104,164	2,965,342	138,822
22	2023	Feb	1,046	889	1.113477	1,505	3,268,209	3,003,731	264,478
23	2023	Mar	1,042	967	0.977609	1,505	2,754,834	2,643,309	111,525
24	2023	Apr	651	561	1.152734	1,510	2,844,006	2,687,565	156,441
25	2023	May	369	410	0.986888	1,508	2,173,381	2,234,313	(60,932)
26	2023	Jun	124	142	1.541484	1,501	1,648,200	1,690,817	(42,617)
27	2023	Jul	23	11	0.000000	1,497	1,390,901	1,390,901	0
28	2023	Aug	2	3	0.000000	1,497	1,278,777	1,278,777	0
29	2023	Sep	15	26	0.000000	1,494	1,341,530	1,341,530	0
30	Total		4,452	4,083			19,804,002	19,236,286	567,716