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July 2, 2024

ELECTRONIC FILING

Mr. Adam J. Teitzman, Commission Clerk
Office of Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850

In re: Petition for Rate Increase by Tampa Electric Company	DOCKET NO. 20240026-EI
In re: Petition for approval of 2023 Depreciation and Dismantlement Study, by Tampa Electric Company	DOCKET NO. 20230139-EI
In re: Petition to implement 2024 Generation Base Rate Adjustment provisions in Paragraph 4 of the 2021 Stipulation and Settlement Agreement, by Tampa Electric Company	DOCKET NO. 20230090-EI

Dear Mr. Teitzman:

Attached for filing on behalf of Tampa Electric Company in the above-referenced docket is the Rebuttal Testimony of Lori Cifuentes and Exhibit No. LC-2.

Thank you for your assistance in connection with this matter.

(Document 7 of 14)

Sincerely,

J. Jeffry Wahlen

cc: All parties

JJW/ne
Attachment

BEFORE THE

FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 20240026-EI

PETITION FOR RATE INCREASE

BY TAMPA ELECTRIC COMPANY

REBUTTAL TESTIMONY AND EXHIBIT

OF

LORI CIFUENTES

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

REBUTTAL TESTIMONY

OF

LORI CIFUENTES

Q. Please state your name, address, occupation, and employer.

A. My name is Lori Cifuentes. My business address is 702 North Franklin Street, Tampa, Florida 33602. I am employed by Tampa Electric Company ("Tampa Electric" or the "company") as the Director Load Research and Forecasting.

Q. Are you the same Lori Cifuentes who filed direct testimony in this proceeding?

A. Yes.

Q. Have your title and duties and responsibilities changed since the company filed your prepared direct testimony on April 2, 2024?

A. No.

Q. What are the purposes of your rebuttal testimony?

A. My rebuttal testimony addresses observations and recommendations made by the Office of Public Counsel's witness David Dismukes related to the company's load forecast.

Q. Have you prepared an exhibit supporting your rebuttal testimony?

A. Yes. Rebuttal Exhibit No. LC-2, entitled "Rebuttal Exhibit of Lori Cifuentes," was prepared by me or under my direction and supervision. The contents of this rebuttal exhibit were derived from the business records of the company and are true and correct to the best of my information and belief. My rebuttal exhibit consists of the following seven documents:

Document No. 1	Detailed Calculations of Energy Efficiency Out-of-Model Adjustments
Document No. 2	Detailed Calculations of Electric Vehicle Charging Out-of-Model Adjustments
Document No. 3	Detailed Calculations of Private Rooftop Solar Out-of-Model Adjustments
Document No. 4	Florida Utilities 2010-2027

		Residential Usage Per-Customer Growth Trends
Document No. 5		Florida Utilities - Usage Per-Customer Utility Survey
Document No. 6		Historical Forecast Accuracy
Document No. 7		Total Retail Energy Sale (June 2023-May 2024)

I. LOAD FORECAST

Q. Are the 2025, 2026, and 2027 base revenue adjustments of $12 million, $20 million, and $26 million projected by Mr. Dismukes reasonable?

A. No. Mr. Dismukes erroneously suggests that the 2025, 2026, and 2027 base revenues are understated. His methodology for arriving at projected revenues for these years overlooks important facts, has severe shortcomings, and is inaccurate. Tampa Electric witness Jeff Chronister explains why the Florida Public Service Commission ("Commission") should not consider incremental 2026 and 2027 revenues in the calculation of the company's proposed subsequent year adjustments. My rebuttal testimony explains why the amounts of Mr. Dismukes's proposed revenue adjustments are incorrect.

Q. Mr. Dismukes argues that the company's reliance on the out-of-model adjustment to its energy sales forecast that includes revisions for changes in energy efficiency, electric vehicle charging, and private rooftop solar is inappropriate. Do you agree?

A. No. The company's statistical models do not have explanatory variables that capture the future conservation, electric vehicle charging, and customer-owned rooftop solar impacts on future energy sales. For that reason, the company considers the impact of these three factors on the energy sales forecast outside the model.

The company relies on the energy sales forecast for purposes other than rate case proceedings. For example, the forecast is used for generation planning, transmission system planning, and by the Florida Reliability Coordinating Council ("FRCC") for statewide reliability assessments. It is critical to the company's long-term planning that adjustments related to future conservation, electric vehicle charging, and rooftop solar be captured. Removing these three adjustments and ignoring their impacts on future load growth can be detrimental to the company's ability to provide reliable

service to its customers and would impede our ability to plan appropriately for future generation and infrastructure needs.

Q. On pages 8 and 9 of his testimony, Mr. Dismukes argues that the company's reliance on the out-of-model adjustment to its sales forecast that includes revisions for changes in energy efficiency is inappropriate. Do you agree?

A. No. The conservation and demand-side management adjustments are standard industry practice. The company and all Florida utilities with company-sponsored conservation programs make similar adjustments. Additionally, these adjustments can be seen in the Ten Year Site Plans filed with the Commission annually pursuant to Rule 25-22.071, Florida Administrative Code.

Q. On page 9 of his testimony, Mr. Dismukes characterizes the company's Demand Side Management ("DSM") goals that support the company's energy efficiency adjustments as being nearly three times the size as the prior period DSM goals. Do you agree with this characterization?

A. No. Projected conservation saving estimates are not based

on the DSM goals filings cited in Mr. Dismukes's testimony on page 9. The program savings that are the basis for the conservation savings adjustments are from actual DSM savings data found within the company's 2022 DSM Annual Report filed on March 1, 2023, with the Commission pursuant to Rule 25-17.0021, Florida Administrative Code.

Q. Do you agree with Mr. Dismukes assertion that the inclusion of out-of-model adjustments to the company's sales forecast for increases in electric vehicle adoption is inappropriate?

A. No. Incorporating electric vehicle projections into the energy forecasts is standard industry practice. The company, as well as many Florida utilities, make similar adjustments. These adjustments are discussed in the Ten Year Site Plans filed with the Commission annually pursuant to Rule 25-22.071, Florida Administrative Code.

Q. Is the company's adjustment for electric vehicle growth reasonable?

A. Yes. The company's projected impact of electric vehicle charging on retail energy sales is reasonable. The assumptions used come from reputable sources such as the

(1) National Renewable Energy Laboratory ("NREL") that specializes in research and development of renewable energy; and (2) the U.S. Energy Information Administration ("EIA"), a principal agency of the U.S. Federal Statistical System and part of the U.S. Department of Energy, responsible for collecting, analyzing, and disseminating energy information.

Q. Mr. Dismukes criticizes the company's energy efficiency, electric vehicle charging, and customer-owned solar energy adjustments as being unsupported by the evidence. What is your response to this criticism?

A. I disagree. The detailed calculations and assumptions for the company's conservation, electric vehicle charging, and rooftop solar energy forecasts were provided in response to Staff's First Request for Production of Documents, Nos. 6, 7, and 8, Bates stamped pages (BS30330), (BS30331) and (BS30332); and the calculations are summarized in Document Nos. 1 through 3 of my rebuttal exhibit.

Q. Mr. Dismukes contends that the company's sales and usage per customer ("UPC") forecast are inconsistent with historic trends, specifically, the decline of 3.9 percent

in 2024. Do you agree that this decline is unreasonable and inappropriate?

A. No. Mr. Dismukes has failed to see that this disruption in the trend is the transition from actual data for years when weather was hotter than normal to years that the energy sales and UPC are based on normal weather. Because load forecasters are not able to predict future weather, they rely on what is referred to as "normal" or "expected" weather in terms of degree-days. Accordingly, projections for 2024 and beyond are based on normal degree-days. This trend is consistent with many other Florida utilities.

Document No. 4 of my rebuttal exhibit illustrates the company's drop in UPC in 2024 on a residential basis, which is the most weather sensitive sector, compared to the other Florida utilities. The first graph compares the company to the other nine utilities in Florida, and the second graph compares the utilities that serve load in central and southern Florida territories. The latter shows stronger similarities amongst the utilities, which is caused by the hotter temperatures in the mid to southern region of Florida. These graphs show that the decline in 2024 is reasonable and appropriate, as are the 2025 test year and subsequent years.

Q. Mr. Dismukes contends that the company's sales forecast is understated and should be based on the 2013 to 2023 average historical growth rate of 1.2 percent. Do you agree?

A. No. Suggesting that a forecast be based on a historical trend is overly simplified and unreasonable. This methodology ignores the impacts that weather, conservation, electric vehicle charging, and rooftop solar have on energy sales. If Mr. Dismukes's proposed methodology was reasonable, there would be no need for the sophisticated forecasting software and regression methods that are used by all load forecasters.

Q. Mr. Dismukes prepared an analysis of the annual changes in UPC for 166 Southeastern Investor-Owned Utilities over a 14-year period. Do you think his analysis is reasonable?

A. No. Mr. Dismukes's comparison to Southeastern utilities is not reasonable for several reasons. First, the demand for electricity in the Southeastern region is different from the demand for electricity in Tampa Electric's service area. The Southeastern region relies more on gas heating compared to Tampa Electric customers' reliance on electric heating. Second, weather patterns between the

Southeastern region and Tampa are not the same. Tampa experiences milder winters and in some years much hotter spring, summer, and fall temperatures. The analysis was repeated using only the Florida utilities, and the results were very different. Document No. 5 of my rebuttal exhibit shows the results of this analysis.

Q. Do you agree with Mr. Dismukes's characterization that forecasted sales have been lower than actual sales in every year over the past decade raises serious questions about the reliability and integrity of the forecasts?

A. No. The reliability and integrity of the forecasts is based on more than a variance between actual and projected energy sales forecasts. To assess the accuracy and reliability of the forecasting models and the resulting energy sales forecasts, the variances should be calculated using weather-normalized sales. Weather-normalizing is the statistical adjustment of actual energy sales to reflect what energy sales would have been under normal weather conditions, the same weather conditions assumed when projecting these energy sales. Weather-normalizing is the standard practice when assessing forecast reliability.

In addition, the forecasts used by Mr. Dismukes are outdated. The forecasts he used for the years 2013 to 2020 were taken from documents in the company's 2013 rate case proceeding and are very outdated. For example, the forecast for 2020 was completed in 2013, which makes it seven years old. The company has had six opportunities since then to refine the forecast for 2020.

Document No. 6 of my rebuttal exhibit shows the correct method for assessing model and forecast performance. The ten-year average results of the variance assessment for customers one-year-out is -0.1 percent and for two-years-out is -0.3 percent. The ten-year average results of the variance assessment for energy sales one-year-out is 0.8 percent and for two-years-out is also 0.8 percent. These weather-normalized variances support the reliability and integrity of the forecasts.

Q. How accurate have the most current projections, which were the basis for the 2025 through 2027 revenue estimates, been over the past twelve months?

A. The current retail energy sales projections for June 2023 through May 2024 are 0.8 percent above budget, in part due to higher temperatures over the summer months in 2023.

Removing the impacts of weather, normalized sales are 0.6 percent below budget. The company's forecast accuracy is high, and the company's 2025 and subsequent year forecasts are very reasonable and appropriate. Document No. 7 of my rebuttal exhibit illustrates the accuracy of the company's energy sales forecast over the past twelve months.

II. SUMMARY

Q. Please summarize your rebuttal testimony.

A. My rebuttal testimony addressed the statements made by witnesses Dismukes. I demonstrated that the company's projected 2025, 2026, and 2027 retail energy sales and base revenues are appropriate and reasonable.

Witness Dismukes's proposed methodology and assumptions for arriving at projected revenues for 2025 to 2027 overlooks important facts, has severe shortcomings, and is inaccurate. He erroneously suggested that the company use forecasting methods that are not consistent with accepted industry best practices. In addition, based on the accuracy of the energy sales projections over the past twelve months, the energy sales projections for 2024 and beyond are appropriate and reasonable and consistent

with other Florida utilities. For these reasons, I disagree with witness Dismukes's analysis and recommended increases in base revenues of $12 million in 2025, $20 million in 2026, and $26 million in 2027.

Q. Does this conclude your rebuttal testimony?

A. Yes.

TAMPA ELECTRIC COMPANY
DOCKET NO. 20240026-EI
WITNESS: CIFUENTES

REBUTTAL EXHIBIT

OF

LORI CIFUENTES

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Detailed Calculations of Conservation/Energy Efficiency Out-of-Model Adjustments

RESIDENTIAL PROGRAMS

(A) Year-End New Participants [1]

	DuctRepair	EnergyStar	EnergyStar Multi-Family	EnergyStar Pool Pump	EnergyStar Therm	Low Income	Heating/ Cooling	Ceiling Insulation	Window Replacement	Educate	Energy Planner
2022	420	708	0	1193	1403	9159	2643	425	1051	2488	341
2023	750	1000	500	1000	1500	6500	500	1500	1000	750	1000
2024	750	1000	500	1000	1500	6500	500	1500	1000	750	1000
2025	750	1000	500	1500	1500	6500	500	1500	1000	750	1000
2026	750	1500	500	1500	2000	6500	500	1500	1000	750	1000
2027	750	1500	500	1500	2000	6500	500	1500	1000	750	1000

(B) Mid-Year New Participants = (Prior Year + Current Year)/2

	DuctRepair	EnergyStar	EnergyStar Multi-Family	EnergyStar Pool Pump	EnergyStar Therm	Low Income	Heating/ Cooling	Ceiling Insulation	Window Replacement	Educate	Energy Planner
2023	585	854	250	1097	1452	7830	1572	963	1026	1619	671
2024	750	1000	500	1000	1500	6500	500	1500	1000	750	1000
2025	750	1000	500	1250	1500	6500	500	1500	1000	750	1000
2026	750	1250	500	1500	1750	6500	500	1500	1000	750	1000
2027	750	1500	500	1500	2000	6500	500	1500	1000	750	1000

(C) Energy savings (kwh/participant) [1]

	DuctRepair	EnergyStar	EnergyStar Multi-Family	EnergyStar Pool Pump	EnergyStar Therm	Low Income	Heating/ Cooling	Ceiling Insulation	Window Replacement	Educate	Energy Planner
2023	696	5378	1460	3162	262	1932	394	673	235	366	1156
2024	696	5378	1460	3162	262	1932	394	673	235	366	1156
2025	696	5378	1460	3162	262	1932	394	673	235	366	1156
2026	696	5378	1460	3162	262	1932	394	673	235	366	1156
2027	696	5378	1460	3162	262	1932	394	673	235	366	1156

(D) Incremental Energy savings (kwh) = (B) x (C)

	DuctRepair	EnergyStar	EnergyStar Multi-Family	EnergyStar Pool Pump	EnergyStar Therm	Low Income	Heating/ Cooling	Ceiling Insulation	Window Replacement	Educate	Energy Planner	Total Incremental Savings	Cumulative Incremental Savings
2023	407,160	4,592,812	365,000	3,467,133	380,293	15,126,594	619,171	647,763	240,993	592,554	775,098	**27,214,570**	
2024	522,000	5,378,000	730,000	3,162,000	393,000	12,558,000	197,000	1,009,500	235,000	274,500	1,156,000	**25,615,000**	25,615,000
2025	522,000	5,378,000	730,000	3,952,500	393,000	12,558,000	197,000	1,009,500	235,000	274,500	1,156,000	**26,405,500**	**52,020,500**
2026	522,000	6,722,500	730,000	4,743,000	458,500	12,558,000	197,000	1,009,500	235,000	274,500	1,156,000	**28,606,000**	**80,626,500**
2027	522,000	8,067,000	730,000	4,743,000	524,000	12,558,000	197,000	1,009,500	235,000	274,500	1,156,000	**30,016,000**	**110,642,500**

(1) Source: 2022 DSM Annual Report, filed on March 1st 2023, with the Commission pursuant to Rule 25-17.0021, Florida Administrative Code.

Detailed Calculations of Conservation/Energy Efficiency Out-of-Model Adjustments

COMMERCIAL & INDUSTRIAL PROGRAMS

(A) Year-End New Participants [1]

	Cooling	Chillers	Occ Sensors	Cond-Ltg	Non-Cond Ltg	ConsValue	Facility EMS	Thermostat	VFD	Standby	DMD Resp
2022	56	0	15	131	100	0	5	137	21	0	12
2023	10	5	15	100	100	1	5	25	250	0	1
2024	10	5	15	100	100	1	5	25	250	0	1
2025	10	5	15	100	100	1	5	25	250	0	1
2026	10	5	15	100	100	1	5	25	250	0	1
2027	10	5	15	100	100	1	5	25	250	0	1

(B) Mid-Year New Participants = (Prior Year + Current Year)/2

	Cooling	Chillers	Occ Sensors	Cond-Ltg	Non-Cond Ltg	ConsValue	Facility EMS	Thermostat	VFD	Standby	DMD Resp
2023	33	2.5	15	115.5	100	0.5	5	81	135.5	0	6.5
2024	10	5	15	100	100	1	5	25	250	0	1
2025	10	5	15	100	100	1	5	25	250	0	1
2026	10	5	15	100	100	1	5	25	250	0	1
2027	10	5	15	100	100	1	5	25	250	0	1

(C) Energy savings (kwh/participant) [1]

	Cooling	Chillers	Occ Sensors	Cond-Ltg	Non-Cond Ltg	ConsValue	Facility EMS	Thermostat	VFD	Standby	DMD Resp
2023	3,090	17,863	233,533	74,436	47,835	19,244	301,689	66,908	6,093	10,700	30,298
2024	3,090	17,863	233,533	74,436	47,835	19,244	301,689	66,908	6,093	10,700	30,298
2025	3,090	17,863	233,533	74,436	47,835	19,244	301,689	66,908	6,093	10,700	30,298
2026	3,090	17,863	233,533	74,436	47,835	19,244	301,689	66,908	6,093	10,700	30,298
2027	3,090	17,863	233,533	74,436	47,835	19,244	301,689	66,908	6,093	10,700	30,298

(D) Incremental Energy savings (kwh) = (B) x (C)

	Cooling	Chillers	Occ Sensors	Cond-Ltg	Non-Cond Ltg	ConsValue	Facility EMS	Thermostat	VFD	Standby	DMD Resp	Total Incremental Savings	Cumulative Incremental Savings
2023	101,970	44,658	3,502,995	8,597,358	4,783,500	9,622	1,508,445	5,419,548	825,602	0	196,937	24,990,634	
2024	30,900	89,315	3,502,995	7,443,600	4,783,500	19,244	1,508,445	1,672,700	1,523,250	0	30,298	20,604,247	20,604,247
2025	30,900	89,315	3,502,995	7,443,600	4,783,500	19,244	1,508,445	1,672,700	1,523,250	0	30,298	20,604,247	**41,208,494**
2026	30,900	89,315	3,502,995	7,443,600	4,783,500	19,244	1,508,445	1,672,700	1,523,250	0	30,298	20,604,247	**61,812,741**
2027	30,900	89,315	3,502,995	7,443,600	4,783,500	19,244	1,508,445	1,672,700	1,523,250	0	30,298	20,604,247	**82,416,988**

(1) Source: 2022 DSM Annual Report, filed on March 1st 2023, with the Commission pursuant to Rule 25-17.0021, Florida Administrative Code.

Detailed Calculations of Conservation/Energy Efficiency Out-of-Model Adjustments

Final Conservation Adjustments

	Residential	Commercial/ Industrial	**Total**
	(kWh)	(kWh)	**(kWh)**
2025	52,020,500	41,208,494	**93,228,994**
2026	80,626,500	61,812,741	**142,439,241**
2027	110,642,500	82,416,988	**193,059,488**

Detailed Calculations of Electric Vehicle Charging Out-of-Model Adjustments

RESIDENTIAL ELECTRIC VEHICLE CHARGING CALCULATIONS

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
	TEC Residential Customers	ITRON's # of Vehicles per HH	# of Vehicles per HH, Calibrated to TECO Service area 2022 Actual Vehicles/HH	Estimated Total # of All Vehicles in TEC's service area	Incremental New Vehicles [All Types]	Scrappage Rate as a % of stock vehicles	Number of Existing Vehicles Replaced
2021	713,135	2.08	2.53	1,803,369		4.2%	75,741
2022	729,334	2.07	2.52	1,837,072	33,703	4.9%	90,017
2023	743,743	2.06	2.51	1,867,168	30,096	5.1%	95,226
2024	756,662	2.06	2.50	1,892,904	25,736	5.3%	100,324
2025	768,927	2.05	2.49	1,916,688	23,784	5.3%	101,584
2026	780,711	2.04	2.49	1,940,193	23,505	5.3%	102,830
2027	792,033	2.04	2.48	1,962,584	22,391	5.3%	104,017

	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)
	U.S. EV Sales as a % of All NEW car Sales	Current EV Market Potential (Estimate of Total Annual Car Sales)	Incremental Count of EVs in TEC's service area	Cumulative EV Counts	Weighted kWh/EV per Year	Residential EV Charging (kWh)	Incremental Residential EV Charging (kWh)	Cumulative Incremental Residential EV Charging (kWh)
2021	3.4%			10,807	3,772	40,768,666		
2022	5.0%	123,720	6,230	17,037	3,908	66,573,225	25,804,559	
2023	9.5%	125,322	11,873	28,910	3,931	113,640,753	47,067,528	
2024	13.9%	126,060	17,537	46,447	3,954	183,661,900	70,021,147	70,021,147
2025	15.8%	125,368	19,816	66,262	3,976	263,446,708	79,784,808	**149,805,955**
2026	17.6%	126,335	22,196	88,458	3,996	353,446,042	89,999,334	**239,805,289**
2027	19.4%	126,408	24,503	112,961	4,015	453,590,816	100,144,774	**339,950,064**

A Source: Residential customer forecast prepared in 2022 for 2023 and beyond
B Source: ITRON forecast assumption received Spring 2023, EV tab of SouthAtlanticResAEO2023_AdjforFL.xlsx file
C Source: ITRON forecast assumption received Spring 2023, EV tab of SouthAtlanticResAEO2023_AdjforFL.xlsx file
D (A) x (C)
E Current Year (D) - Previous Year (D)
F Source: History is from S&P Global Mobility, May 23, 2022. Projections are based on history.
G (D) x (F)
H Source: EIA, U.S. Table 38, Light-Duty Vehicle Sales by Technology Type
I (E) x (G)
J (H) x (I)
K Previous Year (K) + Current Year (J)
L (K) x (L)
O Previous Year (O) + Current Year (N)

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Detailed Calculations of Electric Vehicle Charging Out-of-Model Adjustments

PUBLIC ELECTRIC VEHICLE CHARGING CALCULATIONS

	(A)	(B)	(C)	(D)	(E)
	Total Number of Public Charging Stations	Average of 8 EV Public Charging Stations in TEC's service area (kWh)	Annual MWHs for Public Charging (kWh)	Incremetnal Annual MWHs for Public Charging (kWh)	Cumulative Incremetnal Annual MWHs for Public Charging (kWh)
2021	483	67,734	32,715,684		
2022	506	67,734	34,273,573	1,557,890	
2023	617	67,734	41,811,186	7,537,612	
2024	710	67,734	48,106,232	6,295,046	6,295,046
2025	810	67,734	54,840,373	6,734,141	**13,029,187**
2026	916	67,734	62,013,608	7,173,235	**20,202,422**
2027	1,028	67,734	69,625,938	7,612,330	**27,814,752**

A - Actual	Source: Program Manager / DOE's Alternative Fuel Data Center download for TEC's Zip Codes
A Projected	Source: Polynomial Regression Model
B	Source: Average of 8 EV Public Charging Stations in TEC's service area
C	(A) x (B)
D	Current Year (C) - Previous Year (C)
E	Previous Year (E) + Current Year (D)

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Detailed Calculations of Electric Vehicle Charging Out-of-Model Adjustments

ELECTRIC FLEET CHARGING CALCULATIONS

	INCREMENTAL COUNTS (1)					
	Transit Buses - Hart	Hillsborough County School Buses	Amazon Trucks	Other Fleet Electrification: Vans/Smaller Trucks	Other Fleet Electrification: Buses	TOTAL Incremental
2021	0	0	0	0	0	0
2022	0	0	0	0	0	0
2023	0	0	647	15	8	670
2024	5	25	227	0	0	257
2025	37	25	0	0	0	62
2026	37	75	0	0	0	112
2027	8	75	0	0	0	83

	CUMULATIVE COUNTS					
	Transit Buses - Hart	Hillsborough County School Buses	Amazon Trucks	Other Fleet Electrification: Vans/Smaller Trucks	Other Fleet Electrification: Buses	TOTAL Cumulative
2021	0	0	0	0	0	0
2022	0	0	0	0	0	0
2023	0	0	647	15	8	670
2024	5	25	874	15	8	927
2025	42	50	874	15	8	989
2026	79	125	874	15	8	1101
2027	87	200	874	15	8	1184

	CUMULATIVE ENERGY KWHs (1)					
	Transit Buses - Hart	Hillsborough County School Buses	Amazon Trucks	Other Fleet Electrification: Vans/Smaller Trucks	Other Fleet Electrification: Buses	
2021	45,617	34,290	34,290	43,680	34,290	
2022	45,617	34,290	34,290	43,680	34,290	
2023	45,617	34,290	34,290	43,680	34,290	
2024	45,617	34,290	34,290	43,680	34,290	
2025	45,617	34,290	34,290	43,680	34,290	
2026	45,617	34,290	34,290	43,680	34,290	
2027	45,617	34,290	34,290	43,680	34,290	

	CUMULATIVE ENERGY KWHs							
	Transit Buses - Hart	Hillsborough County School Buses	Amazon Trucks	Other Fleet Electrification: Vans/Smaller Trucks	Other Fleet Electrification: Buses	TOTAL Energy	Incremental Total Energy (KWH)	Cumulative Incremental Total Energy (KWH)
2021	-	-	-	-	-	-		
2022	-	-	-	-	-	-		
2023	-	-	22,185,536	655,200	274,319	23,115,055		
2024	228,083	857,246	29,969,333	655,200	274,319	31,984,181	8,869,126	8,869,126
2025	1,915,893	1,714,493	29,969,333	655,200	274,319	34,529,238	2,545,057	**11,414,183**
2026	3,603,704	4,286,232	29,969,333	655,200	274,319	38,788,788	4,259,550	**15,673,732**
2027	3,968,636	6,857,971	29,969,333	655,200	274,319	41,725,459	2,936,671	**18,610,404**

Detailed Calculations of Electric Vehicle Charging Out-of-Model Adjustments

Total Electric Vehicle Charging Adjustments

	Residential (KWH)	Public Charging (KWH)	Fleet (KWH)	Total (KWH)
2024	70,021,147	6,295,046	8,869,126	85,185,319
2025	149,805,955	13,029,187	11,414,183	**174,249,325**
2026	239,805,289	20,202,422	15,673,732	**275,681,444**
2027	339,950,064	27,814,752	18,610,404	**386,375,220**

Detailed Calculations of Rooftop Solar Out-of-Model Adjustments

RESIDENTIAL PRIVATE ROOFTOP SOLAR

CUSTOMER CALCULATION

	(A) EIA Penetration Rates	(B) Calibrated to TECO Penetration Rates	(C) TECO Household forecast	(D) Change in Households	(E) Incremental PV Customers	(F) Total Customers
2021			713,135			11,150
2022	29.9%	40.5%	729,334	16,199	6,567	17,717
2023	28.8%	55.0%	742,841	13,507	7,195	24,912
2024	33.0%	54.9%	757,081	14,240	7,822	32,734
2025	32.3%	54.9%	771,041	13,960	7,659	40,393
2026	31.9%	54.8%	784,787	13,746	7,532	47,926
2027	32.4%	54.7%	798,313	13,526	7,402	55,328

DEMAND CALCULATION

	(G) Incremental PV Customers	(H) kW_{DC}-per-Customer	(I) Conversion Factor from kW_{DC} to kW_{AC}	(J) kW_{AC}-per-Customer	(K) Incremental kW_{AC}	(L) Total kW_{AC}
2021	0	10.3	85.0%	8.8		89,401
2022	6,567	11.3	85.0%	9.6	62,820	152,221
2023	7,195	11.8	85.0%	10.0	71,948	224,169
2024	7,822	11.8	85.0%	10.0	78,223	302,392
2025	7,659	11.8	85.0%	10.0	76,590	378,982
2026	7,532	11.8	85.0%	10.0	75,322	454,305
2027	7,402	11.8	85.0%	10.0	74,025	528,330

GENERATION CALCULATION

	(M) Total kW_{AC}	(N) Number of Hours	(O) Average Capacity Factor	(P) Annual Generation (KWH)	(Q) Adjusted for Panel Degradation	(R) Adjusted Annual Generation (KWH)
2021	89,401	8,760	18%	140,966,709	0.996	140,402,842
2022	152,221	8,760	18%	240,022,031	0.996	239,061,943
2023	224,169	8,760	18%	353,470,133	0.996	352,056,252
2024	302,392	8,784	18%	478,118,635	0.996	476,206,160
2025	378,982	8,760	18%	597,579,395	0.996	595,189,077
2026	454,305	8,760	18%	716,347,681	0.996	713,482,290
2027	528,330	8,760	18%	833,069,974	0.996	829,737,694

A Source: Energy Information Adminstration ("EIA") Annual Energy Outlook 2023:
AEO2023_ref_bldgs_PV_US_2023-05-01.xlsx (Incremental PVs / Incremental Number of Households)
B Source: Adjusted to align with TECO actuals, interpolated to get back to EIA trend.
C Source: Residential customer forecast prepared in 2022 for 2023 and beyond
D Current Year (C) - Previous Year (C)
E (B) x (D)
F Previous Year (F) +Current Year (E)
G = (E)
H Source: Master Net Meter Customer List from Customer-Owned PV Program Manager
(based primarily on average single family installations)
I Source: Provided by TEC's PV program manager
J (H) x (I)
K (G) x (J)
L Previous Year (L) - Current Year (K)
M = (L)
N Number of hours in the year
O Source: Internal analysis using 83 private rooftop solar arrays.
Generation meters showed an average capacity factor of 18%
P (M) x (N) x (O)
Q Source: Provided by TEC's PV program manager
R (P) x (Q)

Detailed Calculations of Rooftop Solar Out-of-Model Adjustments

SMALL (General Service) COMMERCIAL PRIVATE ROOFTOP SOLAR

CUSTOMER CALCULATION

	(A) US EIA %Growth in Number of Commercial PV Systems	(B) TECO Cumulative Number of PVs	(C) Incremental Number of Customers
2021		109	
2022	17.3%	117	8
2023	17.0%	137	20
2024	11.3%	152	15
2025	7.4%	163	11
2026	2.9%	168	5
2027	3.1%	173	5

DEMAND CALCULATION

	(D) Incremental Number of Customers	(E) kW_{DC}-per-Customer	(F) Conversion Factor from kW_{DC} to kW_{AC}	(G) kW_{AC}-per-Customer	(H) Incremental kW_{AC}	(I) Total kW_{AC}
2021	0	29.6	85.0%	25.2		1,709
2022	8	13.9	85.0%	11.8	91	1,800
2023	20	19.7	85.0%	16.7	333	2,134
2024	15	19.7	85.0%	16.7	259	2,392
2025	11	19.7	85.0%	16.7	188	2,581
2026	5	19.7	85.0%	16.7	80	2,661
2027	5	19.7	85.0%	16.7	88	2,749

GENERATION CALCULATION

	(J) Total kW_{AC}	(K) Number of Hours	(L) Average Capacity Factor	(M) Annual Generation (KWH)	(N) Adjusted for Panel Degradation	(O) Adjusted Annual Generation (KWH)
2021	1,709	8,760	18%	2,695,373	0.996	2,684,592
2022	1,800	8,760	18%	2,838,967	0.996	2,827,611
2023	2,134	8,760	18%	3,364,143	0.996	3,350,687
2024	2,392	8,784	18%	3,782,726	0.996	3,767,595
2025	2,581	8,760	18%	4,069,466	0.996	4,053,188
2026	2,661	8,760	18%	4,195,969	0.996	4,179,185
2027	2,749	8,760	18%	4,335,096	0.996	4,317,755

A Source: Energy Information Adminstration ("EIA") Annual Energy Outlook 2023: AEO2023_ref_bldgs_PV_US_2023-05-01.xlsx (Percent growth in Commercial PV systems)
B Actuals, Projected = (Last Actual x (1 + (A))
C Current Year (B) - Previous Year (B)
D = (C)
E Source: Master Net Meter Customer List from Customer-Owned PV Program Manager (based primarily on General Service (GS) rate installations)
F Source: Provided by TEC's PV program manager
G (E) x (F)
H (D) x (G)
I Previous Year (I) + Current Year (H)
J = (I)
K Number of hours in the year
L Source: Internal analysis using 83 private rooftop solar arrays. Generation meters showed an average capacity factor of 18%
M (J) x (K) x (L)
N Source: Provided by TEC's PV program manager
O (M) x (N)

Detailed Calculations of Rooftop Solar Out-of-Model Adjustments

LARGE (General Service Demand) COMMERCIAL PRIVATE ROOFTOP SOLAR

CUSTOMER CALCULATION

	(A) US EIA %Growth in Number of Commercial PV Systems	(B) TECO Cumulative Number of PVs	(C) Incremental Number of Customers
2021		103	
2022	17.3%	132	29
2023	17.0%	154	22
2024	11.3%	172	17
2025	7.4%	185	13
2026	2.9%	190	5
2027	3.1%	196	6

DEMAND CALCULATION

	(D) Incremental Number of Customers	(E) kW_{DC}-per-Customer	(F) Conversion Factor from kW_{DC} to kW_{AC}	(G) kW_{AC}-per-Customer	(H) Incremental kW_{AC}	(I) Total kW_{AC}
2021	0	64.7	85.0%	55.0		16,934
2022	29	171.2	85.0%	145.5	4,210	21,144
2023	22	139.2	85.0%	118.3	2,662	23,805
2024	17	139.2	85.0%	118.3	2,069	25,874
2025	13	139.2	85.0%	118.3	1,506	27,380
2026	5	139.2	85.0%	118.3	641	28,021
2027	6	139.2	85.0%	118.3	705	28,726

GENERATION CALCULATION

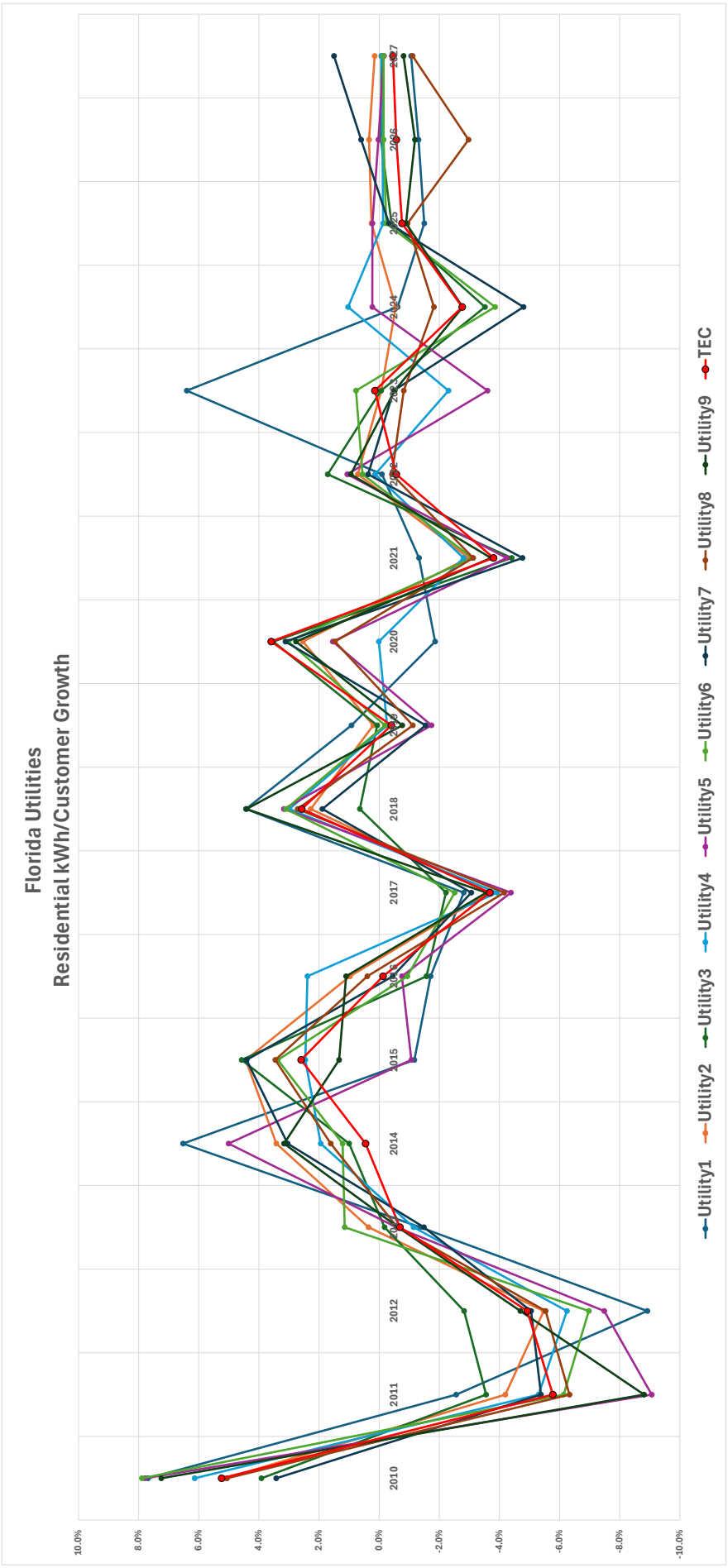
	(J) Total kW_{AC}	(K) Number of Hours	(L) Average Capacity Factor	(M) Annual Generation (KWH)	(N) Adjusted for Panel Degradation	(O) Adjusted Annual Generation (KWH)
2021	16,934	8,760	18%	26,701,043	0.996	26,594,239
2022	21,144	8,760	18%	33,339,262	0.996	33,205,905
2023	23,805	8,760	18%	37,535,986	0.996	37,385,842
2024	25,874	8,784	18%	40,910,099	0.996	40,746,459
2025	27,380	8,760	18%	43,172,277	0.996	42,999,588
2026	28,021	8,760	18%	44,183,174	0.996	44,006,442
2027	28,726	8,760	18%	45,294,945	0.996	45,113,765

A Source: Energy Information Adminstration ("EIA") Annual Energy Outlook 2023: AEO2023_ref_bldgs_PV_US_2023-05-01.xlsx (Percent growth in Commercial PV systems)
B Actuals, Projected = (Last Actual x (1 + (A))
C Current Year (B) - Previous Year (B)
D = (C)
E Source: Master Net Meter Customer List from Customer-Owned PV Program Manager (based primarily on General Service Demand (GSD) rate installations)
F Source: Provided by TEC's PV program manager
G (E) x (F)
H (D) x (G)
I Previous Year (I) + Current Year (H)
J = (I)
K Number of hours in the year
L Source: Internal analysis using 83 private rooftop solar arrays. Generation meters showed an average capacity factor of 18%
M (J) x (K) x (L)
N Source: Provided by TEC's PV program manager
O (M) x (N)

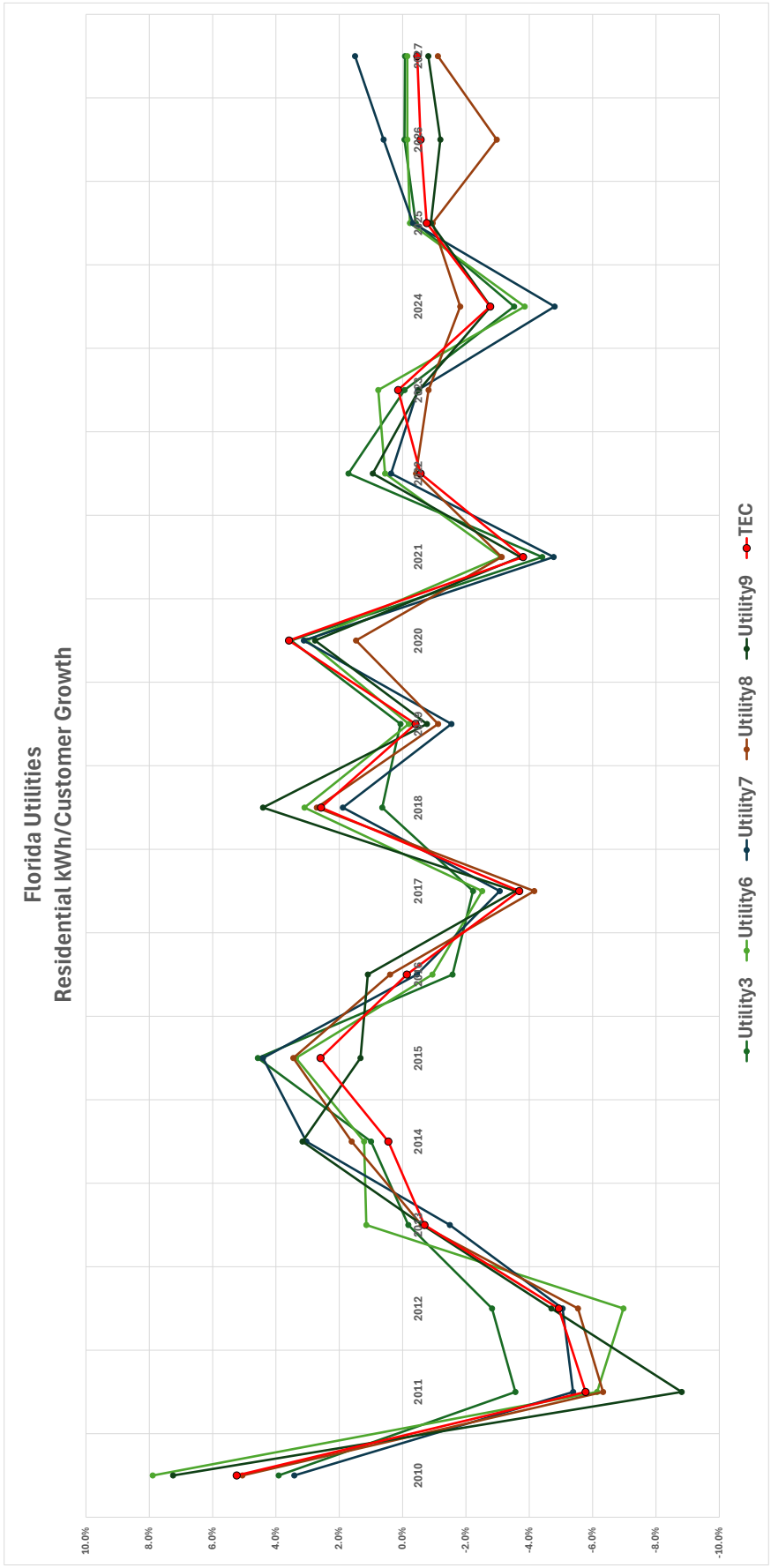
Detailed Calculations of Rooftop Solar Out-of-Model Adjustments

	Residential PV Generation (kWh)	Commercial PV Generation (kWh)	TOTAL PV Generation (kWh)	Incremental PV Generation (kWh)	Cumulative Incremental PV Generation (kWh)
2021	140,402,842	29,278,831	169,681,673		
2022	239,061,943	36,033,516	275,095,459		
2023	352,056,252	40,736,529	392,792,781		
2024	476,206,160	44,514,054	520,720,214	127,927,433	127,927,433
2025	595,189,077	47,052,776	642,241,853	121,521,639	**249,449,072**
2026	713,482,290	48,185,627	761,667,917	119,426,064	**368,875,136**
2027	829,737,694	49,431,521	879,169,215	117,501,298	**486,376,434**

All Florida Utilities



Central and Southern Florida Utilities



Florida Utilities - Usage per-Customer Utility Survey

Total Usage-per-Customer Growth

	Number of Utilities with Growth > TECO	Number of Utilities with Growth <= TECO	Percent of Utilities with Growth <= TECO
2009			
2010			
2011			
2012			
2013			
2014	9	0	0%
2015	7	2	22%
2016	3	6	67%
2017	4	5	56%
2018	7	2	22%
2019	6	3	33%
2020	3	6	67%
2021	3	6	67%
2022	9	0	0%
2023	3	6	67%
Total	**54**	**36**	**40%**

Residential Usage-per-Customer Growth

	Number of Utilities with Growth > TECO	Number of Utilities with Growth <= TECO	Percent of Utilities with Growth <= TECO
2009			
2010	5	4	44%
2011	5	4	44%
2012	2	7	78%
2013	6	3	33%
2014	9	0	0%
2015	5	4	44%
2016	4	5	56%
2017	6	3	33%
2018	6	3	33%
2019	5	4	44%
2020	0	9	100%
2021	6	3	33%
2022	9	0	0%
2023	2	7	78%
Total	**70**	**56**	**44%**

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Historical Forecast Accuracy

Customer Forecast Variancas

First-Year-Out Forecast Variances

Year Forecast Completed	Forecast/ Actual Year	Forecast Customers	Actual Customers	Customer Variance
2012	2013	692,125	694,734	-0.4%
2013	2014	704,084	706,161	-0.3%
2014	2015	716,470	718,713	-0.3%
2015	2016	732,522	730,504	0.3%
2016	2017	743,711	744,690	-0.1%
2017	2018	760,058	756,253	0.5%
2018	2019	767,442	771,960	-0.6%
2019	2020	786,008	786,048	0.0%
2020	2021	799,339	802,049	-0.3%
2021	2022	815,178	819,766	-0.6%
2022	2023	835,584	834,144	0.2%
	10 Year Average			**-0.1%**

Second-Year-Out Forecast Variances

Year Forecast Completed	Forecast/ Actual Year	Forecast Customers	Actual Customers	Customer Variance
2011	2013	688,083	694,734	-1.0%
2012	2014	701,415	706,161	-0.7%
2013	2015	714,313	718,713	-0.6%
2014	2016	728,175	730,504	-0.3%
2015	2017	746,628	744,690	0.3%
2016	2018	756,919	756,253	0.1%
2017	2019	774,160	771,960	0.3%
2018	2020	781,530	786,048	-0.6%
2019	2021	799,616	802,049	-0.3%
2020	2022	812,439	819,766	-0.9%
2021	2023	828,917	834,144	-0.6%
	10 Year Average			**-0.3%**

Weather Normalized Energy Sales Forecast Variancas

First-Year-Out Forecast Variances

Year Forecast Completed	Forecast/ Actual Year	Forecast Energy Sales	Actual WN Energy Sales	Energy Sales Variance
2012	2013	18,202	18,366	-0.9%
2013	2014	18,352	18,641	-1.6%
2014	2015	18,630	18,352	1.5%
2015	2016	18,791	18,805	-0.1%
2016	2017	19,114	18,680	2.3%
2017	2018	19,544	18,913	3.3%
2018	2019	19,482	19,262	1.1%
2019	2020	19,524	19,161	1.9%
2020	2021	19,589	19,702	-0.6%
2021	2022	19,812	19,582	1.2%
2022	2023	19,975	20,186	-1.0%
	10 Year Average			**0.8%**

Second-Year-Out Forecast Variances

Year Forecast Completed	Forecast/ Actual Year	Forecast Energy Sales	Actual WN Energy Sales	Energy Sales Variance
2011	2013	19,158	18,366	4.3%
2012	2014	18,370	18,641	-1.5%
2013	2015	18,456	18,352	0.6%
2014	2016	18,874	18,805	0.4%
2015	2017	19,024	18,680	1.8%
2016	2018	19,325	18,913	2.2%
2017	2019	19,713	19,262	2.3%
2018	2020	19,634	19,161	2.5%
2019	2021	19,696	19,702	0.0%
2020	2022	19,781	19,582	1.0%
2021	2023	19,965	20,186	-1.1%
	10 Year Average			**0.8%**

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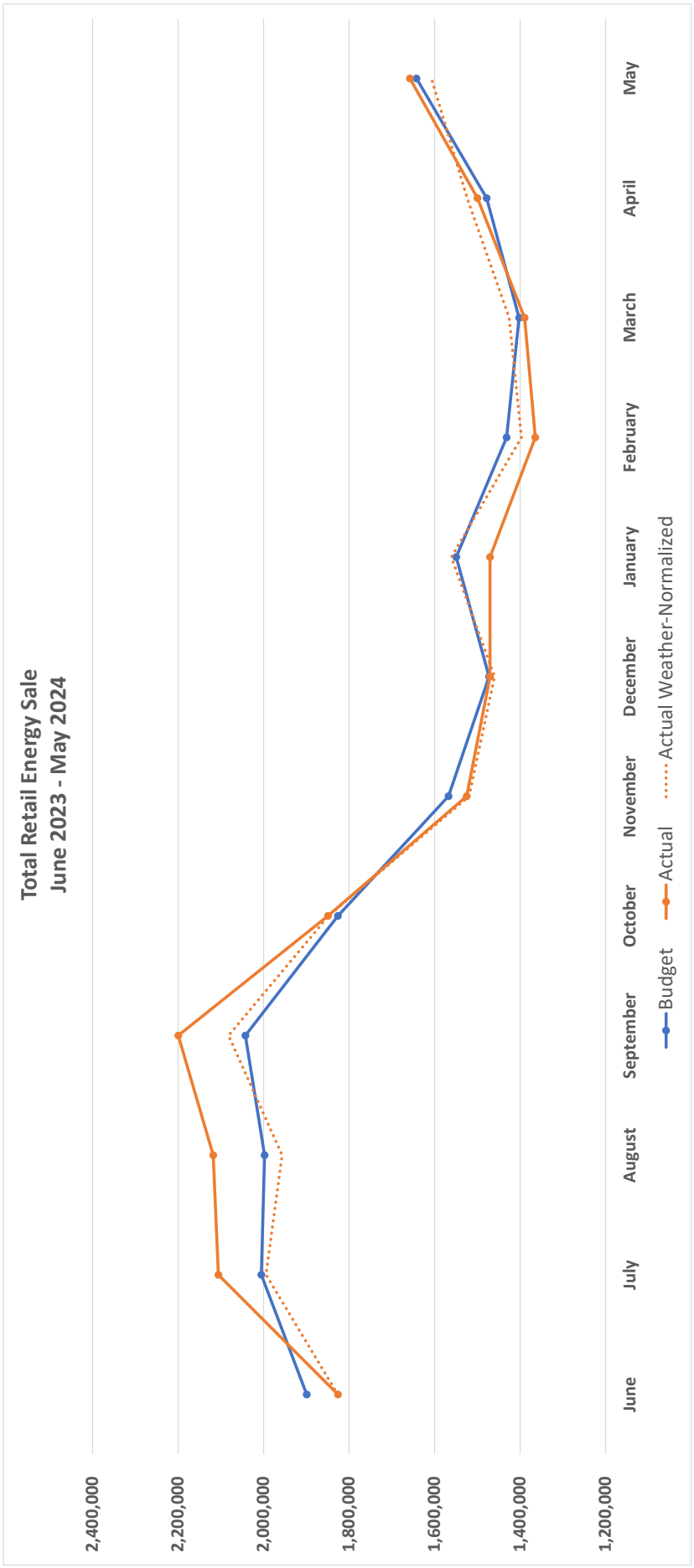

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that copies of the foregoing rebuttal testimony and exhibit have been served by posting on a shared document site, hand delivery of a USB drive or by electronic mail on this 2nd day of July, 2024 to the following:

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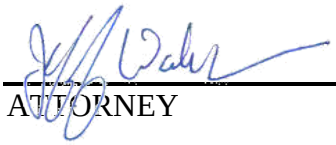

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