



Attorneys and Counselors at Law  
123 South Calhoun Street  
P.O. Box 391 32302  
Tallahassee, FL 32301  
P: (850) 224-9115  
F: (850) 222-7560  
[ausley.com](http://ausley.com)

April 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

Re: Docket 20240026-EI; Petition for Rate Increase by Tampa Electric Company

Dear Mr. Teitzman:

Attached for filing on behalf of Tampa Electric Company in the above-referenced docket is the Direct Testimony of Lori Cifuentes and Exhibit No. LC-1.

A portion of Exhibit No. LC-1 contains proprietary confidential business information and is being filed simultaneously under separate cover with an accompanying Request for Confidential Classification.

Thank you for your assistance in connection with this matter.

(Document 11 of 32)

Sincerely,

A handwritten signature in blue ink, appearing to read 'J. Jeffry Wahlen', with a long horizontal flourish extending to the right.

J. Jeffry Wahlen

cc: All parties

JJW/ne  
Attachment



**BEFORE THE  
FLORIDA PUBLIC SERVICE COMMISSION**

**DOCKET NO. 20240026-EI  
IN RE: PETITION FOR RATE INCREASE  
BY TAMPA ELECTRIC COMPANY**

**PREPARED DIRECT TESTIMONY AND EXHIBIT  
OF  
LORI CIFUENTES**

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1                                   **BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

2                                   **PREPARED DIRECT TESTIMONY**

3                                   **OF**

4                                   **LORI CIFUENTES**

5  
6   **Q.**   Please state your name, business address, occupation, and  
7           employer.

8  
9   **A.**   My name is Lori Cifuentes. My business address is 702 North  
10           Franklin Street, Tampa, Florida 33602. I am employed by  
11           Tampa Electric Company ("Tampa Electric" or the "company")  
12           as Director Load Research and Forecasting in the Regulatory  
13           Affairs department.

14  
15   **Q.**   Please describe your duties and responsibilities in that  
16           position.

17  
18   **A.**   My present responsibilities include the management of Tampa  
19           Electric's customer, peak demand, energy sales, and revenue  
20           forecasts, as well as management of Tampa Electric's Load  
21           Research program and other related activities.

22  
23   **Q.**   Please provide a brief outline of your educational  
24           background and business experience.

25

1     **A.**    In 1986, I received a Bachelor of Science degree in  
2            Management Information Systems from the University of South  
3            Florida. In 1992, I received a Master of Business  
4            Administration degree from the University of Tampa. In  
5            October 1987, I joined Tampa Electric as a Generation  
6            Planning Technician, and I have held various positions  
7            within the areas of Generation Planning, Load Forecasting,  
8            and Load Research. In November 2018, I was promoted to my  
9            current postion.

10  
11            Outside of Tampa Electric, I am also actively involved in  
12            several forecasting-related organizations. I am actively  
13            involved in the Electric Utilities Forecaster Forum  
14            ("EUFF"), which is an organization made up of electric  
15            utility forecasters from across the nation that meet twice  
16            a year to discuss forecasting issues and challenges. I held  
17            the position of President of the EUFF from 2008-2014. In  
18            addition, from 2009-2014 I was the chairperson for the  
19            Florida Reliability Coordinating Council, Inc.'s ("FRCC")  
20            Load Forecast Working Group and coordinated the review of  
21            Florida utilities' load forecasting methodologies and  
22            demand and energy forecasts that support the Peninsular  
23            Florida Load and Resource Plan and reliability assessments.

24  
25     **Q.**    What are the purposes of your direct testimony?

1 **A.** The purposes of my direct testimony are (1) to describe  
2 Tampa Electric's load forecasting process; (2) to describe  
3 the methodologies and assumptions used for the forecast;  
4 and (3) to present the load forecast used in Tampa  
5 Electric's test year budget that supports its request for  
6 a base rate increase. Additionally, I will demonstrate how  
7 the forecasts are appropriate and reasonable.

8  
9 **Q.** Have you prepared an exhibit to support your direct  
10 testimony?

11  
12 **A.** Yes. I am sponsoring Exhibit No. LC-1 consisting of 11  
13 documents, prepared under my direction and supervision.  
14 The contents of my exhibit were derived from the business  
15 records of the company and are true and correct to the best  
16 of my information and belief. My exhibit consists of the  
17 following documents:

18  
19 Document No. 1 List of Minimum Filing Requirement  
20 Schedules Sponsored or Co-Sponsored by  
21 Lori Cifuentes  
22 Document No. 2 Comparison of 2021 Forecast Versus  
23 Current Forecast of Customer Growth  
24 and Energy Sales  
25 Document No. 3 Economic Assumptions Average Annual

1		Growth Rate
2	Document No. 4	Billing Cycle Based Degree Days
3	Document No. 5	Customer Forecast
4	Document No. 6	Per-Customer Energy Consumption
5	Document No. 7	Retail Energy Sales
6	Document No. 8	Per-Customer Peak Demand
7	Document No. 9	Peak Demand
8	Document No. 10	Firm Peak Demand
9	Document No. 11	Firm Peak Load Factor

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**Q.** Are you sponsoring any sections of Tampa Electric's Minimum Filing Requirement ("MFR") Schedules?

**A.** Yes. I sponsor or co-sponsor the MFR Schedules shown in Document No. 1 of my exhibit.

**FORECAST OVERVIEW**

**Q.** Please summarize the forecast results.

**A.** In my direct testimony, I present forecasts that reflect the recent growth trends in the company's service territory. Tampa Electric's sales trends are consistent with the sales trends of other utilities in Florida.

The company expects customer growth to increase at an

1 average annual growth rate ("AAGR") of 1.4 percent over  
2 the next ten years (2024-2033); however, we project the  
3 average customer use to decline during that period. Since  
4 2014, per-customer consumption has declined at an AAGR of  
5 0.6 percent, and we expect it to decline at an AAGR of 0.5  
6 percent (0.4 percent excluding the volatile Phosphate  
7 sector) over the next ten years. Given the forecasts for  
8 1.4 percent customer growth and 0.5 percent average per-  
9 customer use decline, the company expects retail energy  
10 sales to increase at an AAGR of 0.9 percent during the  
11 forecast horizon (1.0 percent excluding the volatile  
12 Phosphate sector).

13  
14 **Q.** Please explain the company's experience with load growth  
15 and customer growth since the last base rate proceeding was  
16 filed in 2021.

17  
18 **A.** Document No. 2 of my exhibit shows the trends in customer  
19 growth and retail energy sales compared to the projections  
20 from the company's last base rate proceeding and for the  
21 forecasts presented in my direct testimony.

22  
23 The company's experience over the past three years has been  
24 slightly stronger customer growth for the first few years  
25 and has currently aligned again with the projections in the



1 company's last base rate proceeding. Customer growth on an  
2 actual basis averaged 2.0 percent over the past three years  
3 versus 1.6 percent that was projected for that period in  
4 the last base rate proceeding. This uptick was due to a  
5 surge in new multi-family, condominiums, and apartments,  
6 which peaked in 2022 at over 3 percent growth and has  
7 moderated to 1.7 percent in recent months. Energy sales  
8 over the past 3 years averaged 1.7 percent versus the  
9 projection of 1.0 percent for this period in the last base  
10 rate proceeding. The increase of 0.7 percent is primarily  
11 due to very warm weather. During this period, the company's  
12 annual peak demand increased from 4,393 MW to 4,669 MW, or  
13 by an average of 3.1 percent per year.

14  
15 The projected average annual growth rates from 2024-2027  
16 are similar to the last base rate proceeding. Customer  
17 growth is slightly stronger at 1.6 percent versus 1.3  
18 percent and energy sales are also projected to be slightly  
19 stronger at 0.8 percent versus 0.7 percent. The process  
20 Tampa Electric uses to prepare its load forecast and the  
21 steps it has taken to ensure the forecast is reasonable  
22 are discussed later in my testimony.

23  
24 **Q.** Please describe the level of inflation experienced since  
25 the last base rate proceeding was filed in 2021.

1 **A.** The recent levels of inflation experienced were  
2 significantly higher than what was expected in 2021. In the  
3 last rate proceeding, the consumer price index ("CPI") was  
4 projected to be 2.5 percent in 2021 and 2.8 percent in 2022.  
5 What occurred was an increase in the CPI of 4.7 percent in  
6 2021 and 8.0 percent in 2022, declining to 4.1 percent in  
7 2023. This represents a 17 percent increase in the average  
8 prices paid by consumers over the past three years. Levels  
9 this high have not been experienced in over 40 years.

10

11 **TAMPA ELECTRIC'S FORECASTING PROCESS, METHODOLOGIES AND**  
12 **ASSUMPTIONS**

13 **Q.** Please describe Tampa Electric's load forecasting process.

14

15 **A.** Tampa Electric uses econometric models and Statistically  
16 Adjusted End-use Forecasting ("SAE") models, which are  
17 integrated to develop projections of customer growth,  
18 energy consumption, and peak demands. The econometric  
19 models measure past relationships between economic  
20 variables, such as population, employment, and customer  
21 growth. The SAE models, which incorporate an end-use  
22 structure into an econometric model, are used for  
23 projecting average per-customer consumption. These models  
24 have consistently been used by Tampa Electric since 2003,  
25 and the modeling results have been submitted to the Florida

1 Public Service Commission ("Commission") for review and  
2 approval in past regulatory proceedings. MFR Schedule F-5,  
3 which I co-sponsor, provides a more detailed description  
4 of the forecasting process.

5  
6 **Q.** Which assumptions were used in the base case analysis of  
7 customer growth?

8  
9 **A.** The primary economic drivers for the customer forecast are  
10 Hillsborough County population estimates, Hillsborough  
11 County Commercial and Manufacturing employment, building  
12 permits, and time-trend variables. The population forecast  
13 is the starting point for developing the customer and  
14 energy projections. The population forecast is based upon  
15 the projections of the University of Florida's Bureau of  
16 Economic and Business Research ("BEBR"). The company  
17 supplements these sources with Moody's Analytics  
18 projections of employment by major sectors and residential  
19 building permits. These economic growth projections drive  
20 the forecasted number of customers in each sector. For  
21 example, an increase in the number of households results  
22 in a need for additional services, restaurants, and retail  
23 establishments. Additionally, projections of residential  
24 building permits are a good indicator of expected increases  
25 or decreases in local construction activity. Similarly,

1 commercial and industrial employment growth is a good  
2 indicator of expected activity in those respective sectors.  
3 The ten-year historical and forecasted average annual  
4 growth rates for these economic indicators are shown in  
5 Document No. 3 of my exhibit.

6  
7 **Q.** Which assumptions were used in the base case analysis of  
8 energy sales growth?

9  
10 **A.** Customer growth and per-customer consumption growth are  
11 the primary causes for growth in energy sales. The company  
12 bases the average per-customer consumption for each revenue  
13 class on the SAE modeling approach. The SAE models have  
14 three components. The first component includes assumptions  
15 of the long-term saturation and efficiency trends in end-  
16 use equipment. The second component captures changes in  
17 economic conditions, such as increases in real household  
18 income, changes in number of persons per household, the  
19 price of electricity, and how these factors affect a  
20 residential customer's consumption level. I provide a  
21 complete list of the critical economic assumptions used in  
22 developing these forecasts in Document No. 3 of my exhibit.  
23 The third component captures the seasonality of energy  
24 consumption. Heating and cooling degree day assumptions  
25 allocate the appropriate monthly weather impacts and are

1 based on Monte Carlo simulations for weather patterns over  
2 the past 20 years. Historical and projected heating and  
3 cooling degree days are shown in Document No. 4 of my  
4 exhibit. MFR Schedules F-7 and F-8 provide a description  
5 and the historical and projected values of each assumption  
6 used in the development of the 2025 test year retail energy  
7 sales.

8  
9 **Q.** Which assumptions were used in the base case analysis of  
10 peak demand growth?

11  
12 **A.** Peak demand growth is affected by long-term appliance  
13 trends, economic conditions, and weather conditions. The  
14 end-use and economic conditions are integrated into the  
15 peak demand model from the energy sales forecast. The  
16 weather variables are heating and cooling degree days at  
17 the time of the peak, for the 24-hour period of the peak  
18 day, and the day prior to the peak day. Weather variables  
19 provide seasonality to the monthly peaks. By incorporating  
20 both temperature variables, the model accounts for cold or  
21 heat buildup that contributes to determining the peak day  
22 demand. Temperature assumptions are based on an analysis  
23 of 20 years of peak day temperatures. For the peak demand  
24 forecast, the design temperature at the time of winter and  
25 summer peaks is 31 and 92 degrees Fahrenheit, respectively.

1 **Q.** Does Tampa Electric assess the reasonableness of these base  
2 case assumptions?

3

4 **A.** Yes. The company evaluates the reasonableness of base case  
5 economic assumptions by comparing the historical average  
6 annual growth rates to the projected average annual growth  
7 rates for the forecast period. In addition, the company  
8 compares each economic data series to an alternate source  
9 and evaluates it for consistency. Tampa Electric uses the  
10 Office of Economic and Demographic Research (a research  
11 arm of the Florida Legislature), the U.S. Energy  
12 Information Administration, and the University of Central  
13 Florida's Institute for Economic Forecasting as alternate  
14 sources for comparisons. I found that the projections  
15 between the sources vary slightly, but the timing of the  
16 expected economic rebounds is consistent. Therefore, it is  
17 reasonable to conclude that the Moody's Analytics economic  
18 growth assumptions for Hillsborough County are also  
19 reasonable.

20

21 **Q.** Were the forecasts for population growth also evaluated  
22 for reasonableness?

23

24 **A.** Yes, the company evaluated the forecasts for population  
25 growth for reasonableness by comparing county and state

1 level projections and evaluating them for consistency. The  
2 company also compared the Moody's Analytics and BEBR  
3 population forecasts and evaluated them for consistency.  
4 The BEBR 2025 population growth projections are slightly  
5 higher than Moody's. BEBR's growth rates are closely  
6 aligned with Tampa Electric's recent customer growth  
7 levels. However, to improve the alignment even further, a  
8 slight upward adjustment of 0.2 percent was made to BEBR's  
9 population growth projections. This adjustment accounts  
10 for the surge in the multi-family sector that the company  
11 experienced in 2022.

12  
13 **Q.** Please describe the historical accuracy of Tampa Electric's  
14 retail customer and energy sales forecasts.

15  
16 **A.** Since the last rate proceeding in 2021, the average  
17 accuracy of the customer forecasts has been remarkable;  
18 the three-year average accuracy is 0.2 percent below the  
19 actuals.

20  
21 The average accuracy of per-customer consumption over the  
22 past three years was 3.0 percent below the actuals,  
23 primarily due to the hotter weather in recent years.  
24 However, when adjusting for weather, the average per-  
25 customer consumption forecasts have been on target at 0.1

1           percent.

2

3           The resulting average accuracy of the retail energy sales  
4           forecasts is 3.2 percent below actuals and 0.1 percent  
5           below actual consumption when weather adjusted.

6

7           **Q.**    Have Tampa Electric's forecasting models used in developing  
8           the customer, demand, and energy forecasts been reviewed  
9           for reasonableness?

10

11          **A.**    Yes. In 2009 and 2013 Itron, Inc. ("Itron") reviewed Tampa  
12          Electric's forecasting models and assumptions. During each  
13          review, Itron concluded that the forecast models were  
14          theoretically sound. Since then, Tampa Electric has not  
15          made any significant changes to its forecasting models and  
16          equations.

17

18          In May of each year, Tampa Electric and the other Florida  
19          utilities meet with the Florida Reliability Coordinating  
20          Council ("FRCC") to review each utility's forecasting  
21          methodologies, assumptions, and results for  
22          reasonableness. This is done to ensure that the aggregated  
23          utility forecasts are reasonable for the long-term  
24          assessments within FRCC's region - peninsular Florida (the  
25          geographic area of Florida east of the Apalachicola River).



1 During these meetings, Tampa Electric presents its  
2 forecasting models, assumptions, and results for the FRCC's  
3 review. Since 2010, the FRCC has determined the company's  
4 forecasting models to be reasonable for use.

5  
6 **BILLING DETERMINANTS**

7 **Q.** The methodology and forecasts described in your direct  
8 testimony are on a customer class basis, so how are these  
9 forecasts converted to a tariff rate schedule basis for  
10 rate design analysis?

11  
12 **A.** The company converts the output of our customer class  
13 models to the tariff rate schedules by conversion models  
14 which use billing determinant distribution factors.

15  
16 **Q.** Please explain the term billing determinants.

17  
18 **A.** The term billing determinants refers to parameters to which  
19 prices are applied to derive billed revenues. For example,  
20 billing determinants include: (1) the number of customers  
21 (*i.e.*, bills) to which the customer charges are applied;  
22 (2) the amount of energy or kilowatt-hours ("kWh") sold to  
23 which the energy charges are applied; and (3) the amount  
24 of demand or kilowatts ("kW") to which the demand charges  
25 are applied. Billing determinants also include the number

1 of units to which any additional charges, discounts, and/or  
2 penalties are applied.

3

4 **Q.** How are billing determinant distribution factors derived?

5

6 **A.** The first step is to calculate the historical distribution  
7 factors (e.g., the percentage of total residential class  
8 customers and energy that are in each residential rate  
9 schedule). Next, the company analyzes the trends in these  
10 percentages for each rate schedule and bases the future  
11 distribution factors on the most recent trends. Similarly,  
12 the company bases rate schedules that have billing demand  
13 charges on historical load factors.

14

15 **Q.** How are these billing determinants used?

16

17 **A.** The forecasted billing determinants are applied to current  
18 and proposed rates to calculate the base revenues from the  
19 sale of electricity for the 2025 test year. Tampa Electric  
20 witness Jordan Williams discusses this process in his  
21 direct testimony.

22

23 **TAMPA ELECTRIC'S FORECAST RESULTS**

24 **Q.** How many customers does Tampa Electric serve?

25

1 **A.** Tampa Electric served an average of 834,144 retail  
2 customers in 2023. Tampa Electric's current number of  
3 customers is shown in Document No. 5 of my exhibit.

4  
5 **Q.** What is Tampa Electric's projected customer growth?  
6

7 **A.** Customer growth in 2023 was 1.8 percent, while projections  
8 for 2024 and 2025 are 1.7 percent. The company projects an  
9 average annual increase of 12,899 (1.4 percent) new  
10 customers over the next ten years (2024-2033). The  
11 historical and projected number of customers are shown in  
12 Document No. 5 of my exhibit.

13  
14 **Q.** How do Tampa Electric's projected customer growth rates  
15 compare with historical growth rates?  
16

17 **A.** Historical ten-year AAGR for customers is 1.9 percent and  
18 projected customer growth rates are 1.4 percent. This  
19 projected growth rate represents customer growth of 1.7  
20 percent in 2024, slowing to 1.2 percent by 2033. BEBR's  
21 population projections drive the lower projected growth  
22 rates. The moderation of growth rates over the forecast  
23 horizon is not uncommon; it is a consistent trend seen in  
24 the company's past Ten-Year Site Plans, as well as in other  
25 Florida utilities' Ten-Year Site Plans.

1 **Q.** Please describe Tampa Electric's energy sales forecast.

2

3 **A.** The primary cause of the increase in the energy sales  
4 forecast is customer growth. The impact of per-customer  
5 consumption, which is expected to decrease at an average  
6 annual rate of 0.5 percent over the next ten years  
7 (2024-2033), offsets some of the customer growth as shown  
8 in Document No. 6 of my exhibit. Combining the forecasted  
9 customer growth and per-customer consumption trends, Tampa  
10 Electric expects retail energy sales to increase at an  
11 average annual rate of 0.9 percent over the next ten years  
12 (2024-2033). I provide historical and forecasted energy  
13 sales in Document No. 7 of my exhibit.

14

15 **Q.** What are the primary causes of the projected decline in  
16 average usage?

17

18 **A.** The primary causes of declining average use are (1)  
19 improvements in end-use efficiency resulting from  
20 appliance and equipment replacement; (2) new end-use  
21 standards, such as the new lighting standards that are  
22 expected to continue to have a significant impact on  
23 residential sales; (3) economy-induced conservation;  
24 demand-side management ("DSM") program activity; and (4)  
25 the continued addition of rooftop solar panels.

1 **Q.** How do the 2025 test year projections for retail energy  
2 sales compare to the same year projections that were  
3 prepared and filed in Tampa Electric's 2021 base rate case?  
4

5 **A.** The current 2025 projection for energy sales growth is 0.7  
6 percent, compared to 0.8 percent in the projection for the  
7 year 2025 that was filed in the 2021 rate case.  
8

9 **Q.** What is Tampa Electric's peak demand forecast?  
10

11 **A.** Tampa Electric projects summer and winter peak usage per  
12 customer will decrease at an average annual rate of 0.3  
13 percent. Document No. 8 of my exhibit shows historical and  
14 forecasted peak usage per customer for summer and winter  
15 peaks. The increase in customers and the decrease in per-  
16 customer demand results in an average annual growth rate  
17 of 1.2 percent over the next ten years for the winter and  
18 0.9 percent for the summer peaks, as shown in Document No.  
19 9 of my exhibit. Summer and winter firm peak demands, which  
20 have been reduced by curtailable load such as load  
21 management and interruptible loads, are shown in Document  
22 No. 10 of my exhibit.  
23

24 **Q.** Are conservation and demand-side management impacts  
25 accounted for in the energy sales and peak demand

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forecasts?

**A.** Yes. Tampa Electric develops energy and demand forecasts for each conservation and DSM program. The aggregated incremental energy savings and demand impact projections are then subtracted from the forecasts.

**Q.** Are the impacts of rooftop solar generation accounted for in the energy sales and peak demand forecasts?

**A.** Yes. Tampa Electric's energy sales and peak demand forecasts include the impacts of rooftop solar generation.

**Q.** Are electric vehicle impacts accounted for in the energy sales and peak demand forecasts?

**A.** Yes. Tampa Electric's energy sales and peak demand forecasts include the impacts of electric vehicle charging.

**Q.** Has the company performed any sensitivity analyses on its load forecast?

**A.** Yes. The company tested the base case scenario for sensitivity to varying economic conditions and customer growth rates. The high and low peak demand and energy sales

1 scenarios represent an alternative to the company's base  
2 case outlook. The high scenario represents more optimistic  
3 economic conditions in the areas of customers, employment,  
4 and income. The low band represents less optimistic  
5 scenarios in the same areas. Compared to the base case,  
6 the expected customer and economic growth rates are 0.5  
7 percent higher in the high scenario and 0.5 percent lower  
8 in the low scenario.

9  
10 **Q.** Does Tampa Electric conclude that the forecasts of  
11 customers, energy sales, and demand are appropriate and  
12 reasonable?

13  
14 **A.** Yes. The customer, demand, and energy sales forecasts are  
15 based on assumptions developed by industry experts and are  
16 the most recent assumptions available at the time the  
17 forecasts were prepared. The company used theoretically  
18 and statistically sound methods that were previously  
19 reviewed and accepted by the Commission to develop the  
20 forecasts. In addition, the company compared the average  
21 annual growth rates for per-customer demand and energy  
22 usage for consistency with historical growth rates. We  
23 reviewed summer and winter load factors to ensure proper  
24 integration of the peak and energy models. The results show  
25 that the load factors are reasonable when compared to

1 historical years. The load factors are shown in Document  
2 No. 11 of my exhibit. The customer, energy sales, and  
3 demand forecasts are appropriate and reasonable for  
4 planning purposes.

5  
6 **SUMMARY**

7 **Q.** Please summarize your direct testimony.

8  
9 **A.** The population of Tampa Electric's service area will  
10 continue to grow at a steady pace over the forecast  
11 horizon. The company expects an average increase in  
12 customers of 1.4 percent a year, which is an increase of  
13 almost 116,094 by 2033. We expect per-customer demand and  
14 per-customer energy consumption to continue to decline over  
15 the next ten years. As a result, Tampa Electric projects  
16 retail energy sales will increase at an average annual rate  
17 of 0.9 percent (1.0 percent excluding the declining  
18 Phosphate sector) over the next ten years.

19  
20 We conducted reviews of actual energy sales results versus  
21 the company's most current forecast for the period June  
22 2023 to February 2024. After adjusting actual energy sales  
23 for weather, the forecast for energy sales was overstated  
24 by 0.9 percent. These results confirm that the company's  
25 forecast is a reliable representation of projected sales.



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This forecast is the same forecast used for the 2025 test year projections. Tampa Electric used industry "best practice" methods and appropriate and reasonable assumptions to develop our customer, energy sales, and demand forecasts, and they are reasonable for use in this proceeding.

**Q.** Does this conclude your direct testimony?

**A.** Yes, it does.

**EXHIBIT**

**OF**

**LORI CIFUENTES**

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LIST OF MINIMUM FILING REQUIREMENT SCHEDULES  
SPONSORED OR CO-SPONSORED BY LORI CIFUENTES

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F-06	Forecasting Models-Sensitivity of Output To Changes In Input Data

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MFR Schedule	Title
F-07	Forecasting Models - Historical Data
F-08	Assumptions

Tampa Electric Company  
Customer Forecast  
(12-Month Average)

	Actual		Prior Rate Case Forecast		Current Rate Case Forecast	
2005	635,747					
2006	653,705	2.8%				
2007	666,354	1.9%				
2008	667,266	0.1%				
2009	666,750	-0.1%				
2010	670,991	0.6%				
2011	675,799	0.7%				
2012	684,235	1.2%				
2013	694,734	1.5%				
2014	706,161	1.6%				
2015	718,713	1.8%				
2016	730,504	1.6%				
2017	744,690	1.9%				
2018	756,253	1.6%				
2019	771,960	2.1%				
2020	786,048	1.8%				
2021	802,049	2.0%	799,339	1.7%		
2022	819,766	2.2%	812,439	1.6%		
2023	834,144	1.75%	825,047	1.6%	834,022	1.74%
2024			837,099	1.5%	848,259	1.7%
2025			848,596	1.4%	862,443	1.7%
2026			859,362	1.3%	876,416	1.6%
2027			869,699	1.2%	890,177	1.6%
2006-2020		1.6%				
2021-2023		2.0%		1.6%		
2024-2027				1.3%		1.6%

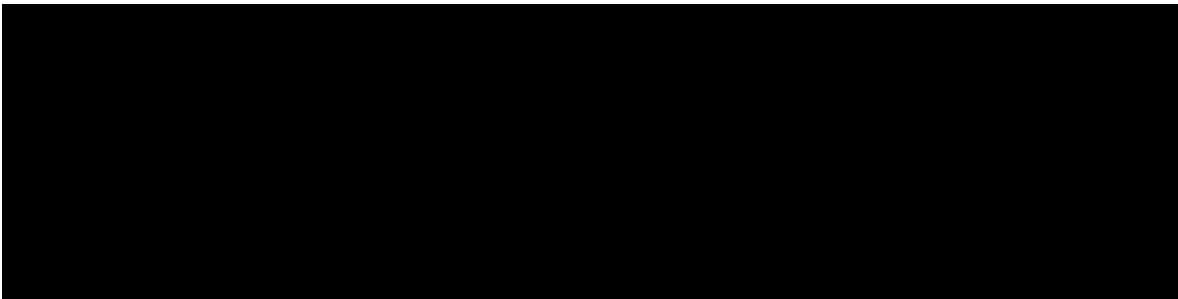
2023-2027

**Tampa Electric Company  
Total Energy Sales (GWH)**

	Actual		Prior Rate Case Forecast		Current Rate Case Forecast	
2005	18,915					
2006	19,025	0.6%				
2007	19,533	2.7%				
2008	18,990	-2.8%				
2009	18,774	-1.1%				
2010	19,213	2.3%				
2011	18,564	-3.4%				
2012	18,412	-0.8%				
2013	18,418	0.0%				
2014	18,526	0.6%				
2015	19,006	2.6%				
2016	19,235	1.2%				
2017	19,187	-0.2%				
2018	19,632	2.3%				
2019	19,784	0.8%				
2020	19,954	0.9%				
2021	20,093	0.7%	19,589	-1.8%		
2022	20,467	1.9%	19,781	1.0%		
2023	20,791	1.6%	19,972	1.0%	20,371	-0.5%
2024			20,116	0.7%	20,315	-0.3%
2025			20,270	0.8%	20,466	0.7%
2026			20,418	0.7%	20,651	0.9%
2027			20,572	0.8%	20,835	0.9%
2010-2020		0.4%				
2021-2023		1.7%		1.0%		
2024-2027				0.7%		0.8%

**Economic Assumptions  
Average Annual Growth Rates**

	Hillsborough County	Residential Real Price of Electricity (\$/MWH)	Hillsborough County Real Household Income	Hillsborough County Persons Per Household	Hillsborough County Commercial Real Gross Output (Millions)	Hillsborough County Manufacturing Real Gross Output (Millions)	Hillsborough County Government Real Gross Output (Millions)	Hillsborough County Commercial Employment (Thousands)	Hillsborough County Manufacturing Employment (Thousands)	Hillsborough County Construction Permits (Number of Units)
2014	1,307	\$61.80	\$104,932	2.6	\$56,798	\$12	\$7,959	504	26.1	6,795
2015	1,331	\$62.40	\$109,043	2.6	\$59,363	\$12	\$7,867	526	25.7	7,698
2016	1,358	\$61.00	\$109,978	2.6	\$62,213	\$12	\$8,033	547	26.9	9,787
2017	1,386	\$59.00	\$113,045	2.6	\$64,551	\$12	\$8,160	556	28.2	10,737
2018	1,417	\$57.70	\$115,592	2.6	\$67,865	\$12	\$7,834	568	28.5	10,422
2019	1,447	\$56.10	\$119,439	2.6	\$71,001	\$13	\$7,840	586	29.4	12,168
2020	1,467	\$52.80	\$126,895	2.6	\$70,361	\$13	\$8,178	567	28.2	13,347
2021	1,497	\$51.50	\$131,040	2.6	\$77,830	\$13	\$8,418	600	28.7	11,646
2022	1,527	\$57.10	\$124,333	2.6	\$82,786	\$13	\$8,361	641	30.7	11,298
2023	1,557	\$63.50	\$126,064	2.6	\$86,245	\$13	\$8,498	664	31.8	14,055
2024	1,585	\$68.60								
2025	1,613	\$67.20								
2026	1,640	\$65.75								
2027	1,667	\$64.51								
2028	1,693	\$63.40								
2029	1,718	\$62.16								
2030	1,743	\$60.93								
2031	1,766	\$59.73								
2032	1,788	\$58.56								
2033	1,809	\$57.41								



**Average Annual Growth Rates**

2014-2023	2.0%	0.3%	2.1%	0.0%	4.8%	1.1%	0.7%	3.1%	2.2%	8.4%
2024-2033	1.5%	-2.0%								

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**Tampa Electric Company  
Billing Cycle Based Degree-Days**

	<u>Heating Degree Days</u>	<u>Cooling Degree Days</u>
2003	605	3,736
2004	547	3,490
2005	534	3,469
2006	499	3,513
2007	381	3,849
2008	420	3,523
2009	457	3,823
2010	1003	3,643
2011	575	3,844
2012	243	3,944
2013	408	3,780
2014	555	3,484
2015	357	4,290
2016	350	4,152
2017	177	4,349
2018	409	4,292
2019	309	4,263
2020	279	4,518
2021	333	4,210
2022	241	4,575
2023	296	4,443
2024	431	3,936
2025	431	3,936
2026	431	3,936
2027	431	3,936
2028	431	3,936
2029	431	3,936
2030	431	3,936
2031	431	3,936
2032	431	3,936
2033	431	3,936

**Average Annual Degree Days**

2003-2023	428	3,961
2024-2033	431	3,936

**Tampa Electric Company  
Customer Forecast**  
(12-Month Average)

	<u>Number of Customers</u>
2014	706,161
2015	718,713
2016	730,504
2017	744,690
2018	756,253
2019	771,960
2020	786,048
2021	802,049
2022	819,766
2023	834,144
2024	848,259
2025	862,443
2026	876,416
2027	890,177
2028	903,622
2029	916,707
2030	929,383
2031	941,449
2032	953,093
2033	964,353

**Average Annual Growth Rates**

2014-2023	1.9%
2024-2033	1.4%

**Average Absolute Growth**

2014-2023	14,220
2024-2033	12,899

**Tampa Electric Company  
Per-Customer Energy Consumption  
(kWh/Customer)**

	Total Retail	Total Excluding Phosphate
2014	26,234	25,191
2015	26,445	25,534
2016	26,331	25,433
2017	25,764	24,766
2018	25,960	24,986
2019	25,628	24,621
2020	25,385	24,517
2021	25,052	23,942
2022	24,967	23,879
2023	24,925	23,863
2024	23,949	23,163
2025	23,730	22,977
2026	23,562	22,821
2027	23,406	22,677
2028	23,270	22,552
2029	23,158	22,451
2030	23,067	22,370
2031	23,000	22,312
2032	22,951	22,272
2033	22,915	22,243

**Average Annual Growth Rates**

2014-2023	-0.6%	-0.6%
2024-2033	-0.5%	-0.4%

**Average Absolute Growth**

2014-2023	-146	-148
2024-2033	-115	-102

**Tampa Electric Company  
Retail Energy Sales  
(GWH)**

	<u>Total Retail</u>	<u>Total Excluding Phosphate</u>
2014	18,526	17,788
2015	19,006	18,351
2016	19,235	18,579
2017	19,187	18,443
2018	19,632	18,896
2019	19,784	19,006
2020	19,954	19,271
2021	20,093	19,202
2022	20,467	19,574
2023	20,791	19,905
2024	20,315	19,648
2025	20,466	19,816
2026	20,651	20,000
2027	20,835	20,186
2028	21,027	20,378
2029	21,229	20,581
2030	21,438	20,790
2031	21,653	21,005
2032	21,875	21,227
2033	22,098	21,450

**Average Annual Growth Rates**

2014-2023	1.3%	1.3%
2024-2033	0.9%	1.0%

**Average Absolute Growth**

2014-2023	252	235
2024-2033	198	200

**Tampa Electric Company  
Per-Customer Peak Demand  
(kW/Customer)**

	<u>Winter</u>	<u>Summer</u>
2014	4.67	5.74
2015	5.02	5.58
2016	4.69	5.65
2017	4.21	5.53
2018	5.35	5.34
2019	4.24	5.57
2020	4.50	5.41
2021	4.26	5.48
2022	4.56	5.35
2023	4.23	5.60
2024	5.32	5.17
2025	5.29	5.13
2026	5.28	5.09
2027	5.26	5.06
2028	5.24	5.03
2029	5.23	5.00
2030	5.22	4.98
2031	5.21	4.96
2032	5.20	4.94
2033	5.19	4.93

**Average Annual Growth Rates**

2014-2023	-1.1%	-0.3%
2024-2033	-0.3%	-0.5%

**Average Absolute Growth**

2014-2023	-0.05	-0.02
2024-2033	-0.01	-0.03

**Tampa Electric Company  
Peak Demand  
(MW)**

	<u>Winter</u>	<u>Summer</u>
2014	3300	4054
2015	3609	4013
2016	3424	4131
2017	3138	4115
2018	4044	4037
2019	3272	4298
2020	3538	4255
2021	3415	4393
2022	3735	4385
2023	3526	4669
2024	4513	4384
2025	4566	4421
2026	4625	4461
2027	4683	4501
2028	4739	4542
2029	4795	4584
2030	4850	4626
2031	4903	4668
2032	4954	4710
2033	5005	4752

**Average Annual Growth Rates**

2014-2023	0.7%	1.6%
2024-2033	1.2%	0.9%

**Average Absolute Growth**

2014-2023	25	68
2024-2033	55	41

Tampa Electric Company  
Firm Peak Demand  
(MW)

	<u>Winter</u>	<u>Summer</u>
2014	3079	3757
2015	3390	3784
2016	3171	3907
2017	2905	3905
2018	3883	3798
2019	3071	4079
2020	3290	4053
2021	3163	4108
2022	3473	4131
2023	3380	4385
2024	4292	4143
2025	4345	4182
2026	4404	4222
2027	4461	4261
2028	4517	4302
2029	4572	4343
2030	4626	4385
2031	4679	4427
2032	4729	4469
2033	4780	4511

**Average Annual Growth Rates**

2014-2023	1.0%	1.7%
2024-2033	1.2%	0.9%

**Average Absolute Growth**

2014-2023	33	70
2024-2033	54	41

**Tampa Electric Company  
Firm Peak Load Factor  
(%)**

	<u>Winter</u>	<u>Summer</u>
2014	68.7%	56.3%
2015	63.8%	57.2%
2016	69.2%	56.2%
2017	75.4%	56.1%
2018	57.7%	59.0%
2019	73.3%	55.2%
2020	69.2%	56.2%
2021	72.5%	55.8%
2022	67.3%	56.6%
2023	70.0%	54.0%
2024	54.0%	56.0%
2025	53.8%	55.9%
2026	53.5%	55.8%
2027	53.2%	55.7%
2028	53.1%	55.8%
2029	53.0%	55.8%
2030	52.9%	55.8%
2031	52.7%	55.7%
2032	52.8%	55.9%
2033	52.8%	55.9%

**Average Annual Growth Rates**

2014-2023	0.2%	-0.5%
2024-2033	-0.3%	0.0%
2014-2023	69%	56%
2024-2033	53%	56%