BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 20210034-EI
IN RE: PETITION FOR RATE INCREASE
BY TAMPA ELECTRIC COMPANY

DIRECT TESTIMONY AND EXHIBIT
OF
LORRAINE L. CIFUENTES

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

PREPARED DIRECT TESTIMONY

OF

LORRAINE L. CIFUENTES

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

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

Q. Please describe your duties and responsibilities in that position.

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

Q. Please provide a brief outline of your educational background and business experience.

A. In 1986, I received a Bachelor of Science degree in Management Information Systems from the University of South Florida. In 1992, I received a Master of Business Administration degree from the University of Tampa. In October 1987, I joined Tampa Electric as a Generation Planning Technician, and I have held various positions within the areas of Generation Planning, Load Forecasting, and Load Research. In November 2018, I was promoted to Director, Load Research and Forecasting.

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

Q. What are the purposes of your direct testimony?

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

Q. Have you prepared an exhibit to support your direct testimony?

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

Document No. 1	List of Minimum Filing Requirement Schedules Sponsored or Co-Sponsored by Lorraine L. Cifuentes
Document No. 2	Comparison of 2013 Forecast Versus Current Forecast of Customer Growth and Energy Sales

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

Q. Are you sponsoring any sections of Tampa Electric's Minimum Filing Requirements ("MFR") schedules?

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

FORECAST RESULTS

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. The company sales trends are consistent with the sales trends of other utilities in Florida.

The company expects customer growth to increase at an average annual growth rate ("AAGR") of 1.3 percent over the next ten years (2021-2030); however, we project the average customer use to decline during that period. Since 2011, per-customer consumption has declined at an AAGR of 0.9 percent, and we expect it to decline at an AAGR of 0.5 percent (0.4 percent excluding the volatile Phosphate sector) over the next ten years. Given the forecasts for 1.3 percent customer growth and 0.5 percent average per-customer use decline, the company expects retail energy sales to increase at an AAGR of 0.8 percent during the forecast horizon.

Q. Please explain the company's experience with load growth and customer growth since the last base rate proceeding was filed in 2013.

A. The company's experience over the past eight years has not been very different from the projections in the company's last base rate proceeding. Customer growth on an actual basis averaged 1.7 percent versus the projection of 1.5 percent. Consumption per-customer declined at the same rate that was projected in the last rate proceeding (-0.7 percent AAGR) for an overall annual average increase in energy sales of 1.0 percent versus the projection of 0.8 percent. During

this period, the company's annual peak demand increased from 3,892 MW to 4,255 MW, or by an average of 1.1 percent per year.

Although actual energy sales have been in line with the projections of the last base rate proceeding on average, 2020 is an exception. The unprecedented COVID-19 pandemic had a negative impact on energy sales starting in March 2020 and bottoming out around May 2020. Since then, there has been some improvement, but energy sales are still not back to normal levels. We expect conditions to continue to improve but not return to a more normal level until a vaccine is widely available. I discuss the impacts of COVID-19 in greater detail later in my direct testimony.

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

The average annual growth rates over the forecast horizon (2021-2030) for customers and energy sales are 1.3 percent and 0.8 percent, respectively. The process Tampa Electric uses to prepare its load forecast and the steps it has taken to ensure the forecast is reasonable are discussed

later in my testimony.

Q. What were the impacts of COVID-19 on energy sales in 2020?

A. Between March and December, residential energy sales volumes were approximately 2.2 percent above normal as the result of COVID-19. As more household members worked and attended school from home, there was an increased demand in appliance loads. The Shelter-In-Place order issued in April 2020 by Governor DeSantis, which mandated people to stay home and non-essential businesses to close, had adverse effects on the non-residential sectors. Between March and December, Commercial, Industrial, and Governmental/Public Authorities sector energy sales volumes decreased below normal levels by an estimated six percent, four percent, and four percent, respectively. In total, the COVID-19 impact to energy sales is a decline of approximately 1.4 percent from expectations.

TAMPA ELECTRIC'S FORECASTING PROCESS

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

A. Tampa Electric uses econometric models and Statistically Adjusted End-use Forecasting ("SAE") models, which are integrated to develop projections of customer growth,

energy consumption, and peak demands. The econometric models measure past relationships between economic variables, such as population, employment, and customer growth. The SAE models, which incorporate an end-use structure into an econometric model, are used for projecting average per-customer consumption. These models have consistently been used by Tampa Electric since 2003, and the modeling results have been submitted to the Commission for review and approval in past regulatory proceedings. MFR Schedule F-5, which I co-sponsor, provides a more detailed description of the forecasting process.

Q. Which assumptions were used in the base case analysis of customer growth?

A. The primary economic drivers for the customer forecast are Hillsborough County population estimates, Hillsborough County Commercial and Manufacturing employment, building permits, and time-trend variables. The population forecast is the starting point for developing the customer and energy projections. The population forecast is based upon the projections of the University of Florida's Bureau of Economic and Business Research ("BEBR"). We supplement these sources with Moody's Analytics projections of employment by major sectors and residential building

permits. These economic growth projections drive the forecasted number of customers in each sector. For example, an increase in the number of households results in a need for additional services, restaurants, and retail establishments. Additionally, projections of residential building permits are a good indicator of expected increases or decreases in local construction activity. Similarly, commercial and industrial employment growth is a good indicator of expected activity in those respective sectors. The ten-year historical and forecasted average annual growth rates for these economic indicators are shown in Document No. 3 of my exhibit.

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

A. Customer growth and per-customer consumption growth are the primary drivers for growth in energy sales. We base the average per-customer consumption for each revenue class on the SAE modeling approach. The SAE models have three components. The first component includes assumptions of the long-term saturation and efficiency trends in end-use equipment. The second component captures changes in economic conditions, such as increases in real household income, changes in number of persons per household, the

price of electricity, and how these factors affect a residential customer's consumption level. I provide a complete list of the critical economic assumptions used in developing these forecasts in Document No. 3 of my exhibit. The third component captures the seasonality of energy consumption. Heating and cooling degree day assumptions allocate the appropriate monthly weather impacts and are based on Monte Carlo simulations for weather patterns over the past 20 years. Historical and projected heating and cooling degree days are shown in Document No. 4 of my exhibit. MFR Schedules F-7 and F-8 provide a description and the historical and projected values of each assumption used in the development of the 2022 test year retail energy sales.

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

A. Peak demand growth is affected by long-term appliance trends, economic conditions, and weather conditions. The end-use and economic conditions are integrated into the peak demand model from the energy sales forecast. The weather variables are heating and cooling degree days at the time of the peak, for the 24-hour period of the peak day, and the day prior to the peak day. Weather variables

provide seasonality to the monthly peaks. By incorporating both temperature variables, the model accounts for cold or heat buildup that contributes to determining the peak day demand. Temperature assumptions are based on an analysis of 20 years of peak day temperatures. For the peak demand forecast, the design temperature at the time of winter and summer peaks is 31 and 92 degrees Fahrenheit, respectively.

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

A. Yes. We evaluate the base case economic assumptions by comparing the historical average annual growth rates to the projected average annual growth rates for the forecast period. In addition, we compare each economic data series to an alternate source and evaluate it for consistency. The alternate sources Tampa Electric uses for comparisons are the Office of Economic and Demographic Research, which is part of the Florida Legislature, the U.S. Energy Information Administration, and the University of Central Florida's Institute for Economic Forecasting. I found that the projections between the sources vary slightly, but the timing of the expected economic rebounds is consistent. Therefore, it is reasonable to conclude that the Moody's Analytics economic growth assumptions for Hillsborough

County are also reasonable.

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

A. Yes. We compared county and state level projections and evaluated them for consistency. We also compared the Moody's Analytics and BEBR population forecasts and evaluated them for consistency. The BEBR 2022 population growth projections are slightly higher than Moody's. BEBR's growth rates are more aligned with Tampa Electric's recent customer growth levels.

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

A. Since the last rate proceeding in 2013, the average accuracy of the customer forecasts has been remarkable; the seven-year average accuracy is 0.1 percent below the actuals.

The average accuracy of per-customer consumption over the past seven years was 1.1 percent below the actuals, primarily due to hotter weather in recent years. However, when adjusting for weather, the average per-customer

consumption forecasts have been overstated by 1.0 percent on average.

The resulting average accuracy of the retail energy sales forecasts is 1.2 percent below actual use and 0.8 percent above actual consumption when weather adjusted.

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

A. Yes. In 2009 and 2013, Itron, Inc. ("Itron"), an industry leader that provides utility forecasting software and methodologies to more than 160 utilities and energy companies, reviewed Tampa Electric's forecasting models and assumptions. During each review, Itron concluded that the forecast models were theoretically sound with excellent model statistics and that the modeling errors were reasonable and consistent with other utilities. Since then, Tampa Electric has not made any significant changes to its forecasting models and equations.

TAMPA ELECTRIC'S FORECASTED GROWTH

Q. How many customers does Tampa Electric have?

A. Tampa Electric's current customer count is shown in Document No. 5 of my exhibit. Tampa Electric had an average of 786,048 retail accounts in 2020.

Q. What is Tampa Electric's projected customer growth?

A. Customer growth in 2020 was 1.8 percent, while projections for 2021 and 2022 are 1.7 percent and 1.6 percent, respectively. Tampa Electric projects an average annual increase of 11,013 (1.3 percent) new customers over the next ten years (2021-2030). Historical and projected customer counts are shown in Document No. 5 of my exhibit.

Q. How do Tampa Electric's projected customer growth rates compare with historical growth rates?

A. Historical ten-year AAGR for customers is 1.7 percent and projected customer growth rates are 1.3 percent. This projected growth rate represents customer growth of 1.7 percent in 2021, slowing to 1.0 percent by 2030. BEBR's population projections drive the lower projected growth rates. The moderation of growth rates over the forecast horizon is not uncommon; it is a consistent trend seen in the company's past Ten-Year Site Plans, as well as in other Florida utilities' Ten-Year Site Plans.

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

A. The primary driver of the increase in the energy sales forecast is customer growth. The impact of per-customer consumption, which is expected to decrease at an average annual rate of 0.5 percent over the next ten years (2021-2030), offsets some of the customer growth as shown in Document No. 6 of my exhibit. Combining the forecasted customer growth and per-customer consumption trends, we expect retail energy sales to increase at an average annual rate of 0.8 percent over the next ten years (2021-2030). I provide historical and forecasted energy sales in Document No. 7 of my exhibit.

Q. What are the primary drivers of the projected decline in average usage?

A. The primary drivers of declining average use are improvements in end-use efficiency resulting from appliance and equipment replacement; new end-use standards, such as the new lighting standards that are expected to have a significant impact on residential sales; economy-induced conservation; and demand-side management ("DSM") program activity.

Q. How do the 2022 test year projections for retail energy sales compare to the same year projections that were prepared and filed in Tampa Electric's 2013 base rate case?

A. The current 2022 projection for energy sales growth is 1.0 percent, compared to 1.1 percent in the projection for the year 2022 that was filed in the 2013 rate case.

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

A. We project summer and winter peak usage per customer will decrease at an average annual rate of 0.3 percent. Document No. 8 of my exhibit shows historical and forecasted peak usage per customer for summer and winter peaks. The increase in customers and the decrease in per-customer demand results in an average annual growth rate of 1.0 percent over the next ten years for both the winter and summer peaks, as shown in Document No. 9 of my exhibit. Summer and winter firm peak demands, which have been reduced by curtailable load such as load management and interruptible loads, are shown in Document No. 10 of my exhibit.

Q. Are conservation and demand-side management impacts accounted for in the energy sales and peak demand 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 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, we included electric vehicles in the energy sales and peak demand forecasts.

Q. Does the forecast include the expected impacts of the COVID-19 pandemic? If so, what methodology was used?

A. Yes, our forecast includes the impacts of the COVID-19 pandemic in energy consumption per-customer. An out-of-model adjustment factor was used to capture the short-term behavioral changes that the economic data cannot fully explain, including customer-specific behavioral changes

such as staying at home and decisions to close or open educational institutions and non-essential businesses. We applied the adjustment factors to August 2020 through December 2021 data. By the 2022 test year, these factors are no longer included, and we capture the remaining impacts of COVID-19 in the projected economic variables just as any effects from other economic upturns or downturns would be captured.

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

A. Yes. We tested the base case scenario for sensitivity to varying economic conditions and customer growth rates. The high and low peak demand and energy sales scenarios represent an alternative to the company's base case outlook. The high scenario represents more optimistic economic conditions in the areas of customers, employment, and income. The low band represents less optimistic scenarios in the same areas. Compared to the base case, the expected customer and economic growth rates are 0.5 percent higher in the high scenario and 0.5 percent lower in the low scenario.

Q. Does Tampa Electric conclude that the forecasts of

customers, energy sales, and demand are appropriate and reasonable?

A. Yes. The customer, demand, and energy sales forecasts are based on assumptions developed by industry experts and are the most recent assumptions available at the time the forecasts were prepared. We used theoretically and statistically sound methods that were previously reviewed and accepted by the Commission to develop the forecasts. In addition, we compared the average annual growth rates for per-customer demand and energy usage for consistency with historical growth rates. We reviewed summer and winter load factors to ensure proper integration of the peak and energy models. The results show that the load factors are reasonable when compared to historical years. The load factors are shown in Document No. 11 of my exhibit. The customer, energy sales, and demand forecasts are appropriate and reasonable for planning purposes.

BILLING DETERMINANTS

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

A. We convert the output of our customer class models to the tariff rate schedules by conversion models which use billing determinant distribution factors. The exception is the Interruptible Service rate schedules; since they are forecasted at the customer level there is no need to apply distribution factors.

Q. Please explain the term billing determinants.

A. Billing determinants are the parameters to which prices are applied to derive billed revenues. They include 1) the number of customers (*i.e.,* bills) to which the customer charges are applied, 2) the amount of energy or kilowatt-hours ("kWh") sold to which the energy charges are applied, and 3) the amount of demand or kilowatts ("kW") to which the demand charges are applied. They also include the number of units to which any additional charges, discounts, and/or penalties are applied.

Q. How are billing determinant distribution factors derived?

A. The first step is to calculate the historical distribution factors (e.g., the percentage of total residential class customers and energy that are in each residential rate schedule). Next, we analyze the trends in these percentages

for each rate schedule and base the future distribution factors on the most recent trends. Similarly, we base rate schedules that have billing demand charges on historical load factors.

Q. How are these billing determinants used?

A. We apply the forecasted billing determinants to current and proposed rates to calculate the base revenues from the sale of electricity for the 2022 test year. Tampa Electric witness William R. Ashburn discusses this process in his direct testimony.

SUMMARY

Q. Please summarize your direct testimony.

A. The population of Tampa Electric's service area will continue to grow at a steady pace over the forecast horizon. The company expects an average increase in customers of 1.3 percent a year, which is an increase of almost 112,402 by 2030. We expect per-customer demand and energy consumption to continue to decline over the next ten years. As a result, we project retail energy sales will increase at an average annual rate of 0.8 percent (0.9 percent excluding the declining Phosphate sector) over the

next ten years.

We conducted reviews of actual energy sales results versus the company's most current forecast for the period August 2020 to February 2021 and the forecast for energy sales was 0.2 percent above actual energy sales adjusted for weather. These results confirm that the company's forecast is a reliable representation of projected sales. This forecast is the same forecast used for the 2022 test year projections. We 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.

TAMPA ELECTRIC COMPANY
DOCKET NO. 20210034-EI
WITNESS: CIFUENTES

EXHIBIT

OF

LORRAINE L. CIFUENTES

Table of Contents

DOCUMENT NO.	TITLE	PAGE
1	List of Minimum Filing Requirement Schedules Sponsored or Co-Sponsored by Lorraine L. Cifuentes	25
2	Comparison of 2013 Forecast Versus Current Forecast of Customer Growth and Energy Sales	27
3	Economic Assumptions Average Annual Growth Rate	29
4	Billing Cycle Based Degree Days	30
5	Customer Forecast	31
6	Per-Customer Energy Consumption	32
7	Retail Energy Sales	33
8	Per-Customer Peak Demand	34
9	Peak Demand	35
10	Firm Peak Demand	36
11	Firm Peak Load Factor	37

LIST OF MINIMUM FILING REQUIREMENT SCHEDULES

SPONSORED OR CO-SPONSORED BY LORRAINE L. CIFUENTES

MFR Schedule	Title
C-33	Performance Indices
C-34	Statistical Information
C-35	Payroll and Fringe Benefit Increases Compared to CPI
C-36	Non-Fuel Operation and Maintenance Expense Compared to CPI
C-40	O&M Compound Multiplier Calculation
E-11	Development of Coincident and Non-Coincident Demands for Cost Study
E-12	Adjustment To Test Year Revenue
E-15	Projected Billing Determinants - Derivation
E-16	Customers by Voltage Level
E-17	Load Research Data
E-18	Monthly Peaks
E-19a	Demand and Energy Losses
E-19b	Energy Losses
E-19c	Demand Losses
F-05	Forecasting Models
F-06	Forecasting Models-Sensitivity of Output To

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

Tampa Electric Company
Customer Forecast

	Actual		Prior Rate Case Forecast		Current Rate Case Forecast	
2002	590,199					
2003	604,901	2.5%				
2004	619,536	2.4%				
2005	635,747	2.6%				
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%	683,952	1.2%		
2013	694,734	1.5%	692,125	1.2%		
2014	706,161	1.6%	701,415	1.3%		
2015	718,713	1.8%	712,504	1.6%		
2016	730,504	1.6%	724,281	1.7%		
2017	744,690	1.9%	735,481	1.5%		
2018	756,253	1.6%	746,489	1.5%		
2019	771,960	2.1%	757,528	1.5%		
2020	786,048	1.8%	768,510	1.4%	786,048	1.8%
2021			778,819	1.3%	799,337	1.7%
2022			788,686	1.3%	812,436	1.6%
2023			798,322	1.2%	825,047	1.6%
2024			807,766	1.2%	837,099	1.5%
2003-2012		1.5%				
2013-2020		1.7%		1.5%		
2021-2024				1.3%		1.6%

Tampa Electric Company
Total Energy Sales (GWH)

	Actual		Prior Rate Case Forecast		Current Rate Case Forecast	
2002	17,925					
2003	18,230	1.7%				
2004	18,437	1.1%				
2005	18,915	2.6%				
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%	18,550	-0.1%		
2013	18,418	0.0%	18,202	-1.9%		
2014	18,526	0.6%	18,370	0.9%		
2015	19,006	2.6%	18,550	1.0%		
2016	19,235	1.2%	18,793	1.3%		
2017	19,187	-0.2%	19,039	1.3%		
2018	19,632	2.3%	19,287	1.3%		
2019	19,784	0.8%	19,529	1.3%		
2020	19,954	0.9%	19,749	1.1%	19,954	0.9%
2021			19,963	1.1%	19,589	-1.8%
2022			20,189	1.1%	19,781	1.0%
2023			20,413	1.1%	19,972	1.0%
2024			20,650	1.2%	20,116	0.7%
2003-2012		0.3%				
2013-2020		1.0%		0.8%		
2021-2024				1.1%		0.2%

REDACTED

TAMPA ELECTRIC COMPANY
DOCKET NO. 20210034-EI
EXHIBIT NO. LLC-1
WITNESS: CIFUENTES
DOCUMENT NO. 3
PAGE 1 OF 1
FILED: 04/09/2021

Economic Assumptions
Average Annual Growth Rates

	Hillsborough County Population (Millions)	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)
2011	1,243	$67.58	$114,149	2.6	$52,161	$3,304	7,990	461	23.5	4,004
2012	1,260	$64.04	$108,999	2.6	$54,024	$3,296	8,025	475	24.4	5,473
2013	1,282	$61.87	$104,374	2.6	$55,786	$3,480	8,019	489	25.0	7,242
2014	1,307	$61.80	$106,829	2.6	$57,456	$3,766	7,920	505	26.1	6,795
2015	1,331	$62.41	$111,500	2.6	$60,168	$3,832	7,769	528	25.6	7,698
2016	1,358	$61.03	$111,362	2.6	$63,152	$4,112	7,860	548	26.8	9,787
2017	1,386	$59.01	$113,826	2.6	$65,838	$4,366	7,955	562	27.6	10,737
2018	1,417	$57.75	$116,276	2.6	$68,478	$4,571	8,010	577	28.1	10,422
2019	1,451	$56.06	$115,686	2.6	$71,584	$4,708	8,097	594	29.0	12,168
2020	1,480	$54.31	$116,132	2.6	$66,534	$4,527	7,967	568	29.1	12,755
2021	1,509	[redacted]	$109,947	[redacted]						
2022	1,537		$112,694							
2023	1,565		$115,983							
2024	1,591		$117,871							
2025	1,616		$119,118							
2026	1,640		$120,943							
2027	1,663		$123,287							
2028	1,684		$126,102							
2029	1,705		$128,958							
2030	1,725		$131,802							
Average Annual Growth Rates										
2011-2020	2.0%	-2.4%	0.2%	0.1%	2.7%	3.6%	0.0%	2.4%	2.4%	13.7%
2021-2030	1.5%	-1.6%	2.0%	-0.6%	3.6%	1.9%	2.1%	2.2%	-0.1%	3.7%

Tampa Electric Company
Billing Cycle Based Degree-Days

	Heating Degree Days	Cooling Degree Days
2000	496	3,497
2001	613	3,505
2002	545	3,775
2003	687	3,545
2004	547	3,490
2005	532	3,467
2006	499	3,513
2007	381	3,906
2008	433	3,602
2009	458	3,825
2010	1000	3,642
2011	575	3,846
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	461	3,835
2022	461	3,835
2023	461	3,835
2024	461	3,835
2025	461	3,835
2026	461	3,835
2027	461	3,835
2028	461	3,835
2029	461	3,835
2030	461	3,835
	Average Annual Degree Days	
2000-2020	469	3,842
2021-2030	461	3,835

Tampa Electric Company
Customer Forecast

	Number of Customers
2011	675,799
2012	684,235
2013	694,734
2014	706,161
2015	718,713
2016	730,504
2017	744,690
2018	756,253
2019	771,960
2020	786,048
2021	799,337
2022	812,436
2023	825,047
2024	837,099
2025	848,596
2026	859,362
2027	869,699
2028	879,663
2029	889,277
2030	898,450

Average Annual Growth Rates

2011-2020	1.7%
2021-2030	1.3%

Average Absolute Growth

2011-2020	12,250
2021-2030	11,013

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

	Total Retail	Total Excluding Phosphate
2011	27,469	26,388
2012	26,909	25,576
2013	26,510	25,222
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	24,507	23,682
2022	24,348	23,589
2023	24,207	23,488
2024	24,031	23,388
2025	23,887	23,253
2026	23,759	23,133
2027	23,654	23,036
2028	23,584	22,972
2029	23,531	22,926
2030	23,472	22,874
Average Annual Growth Rates		
2011-2020	-0.9%	-0.8%
2021-2030	-0.5%	-0.4%
Average Absolute Growth		
2011-2020	-232	-208
2021-2030	-115	-90

Tampa Electric Company
Retail Energy Sales
(GWH)

	Total Retail	Total Excluding Phosphate
2011	18,564	17,832
2012	18,412	17,499
2013	18,418	17,522
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	19,589	18,929
2022	19,781	19,164
2023	19,972	19,378
2024	20,116	19,578
2025	20,270	19,732
2026	20,418	19,880
2027	20,572	20,034
2028	20,746	20,208
2029	20,925	20,387
2030	21,089	20,551
Average Annual Growth Rates		
2011-2020	0.8%	0.9%
2021-2030	0.8%	0.9%
Average Absolute Growth		
2011-2020	154	160
2021-2030	167	180

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

	Winter	Summer
2011	5.93	5.82
2012	5.14	5.69
2013	4.61	5.57
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	5.53	5.22
2022	5.49	5.19
2023	5.48	5.17
2024	5.46	5.15
2025	5.45	5.12
2026	5.43	5.10
2027	5.42	5.09
2028	5.41	5.08
2029	5.40	5.07
2030	5.40	5.06
	Average Annual Growth Rates	
2011-2020	-3.0%	-0.8%
2021-2030	-0.3%	-0.3%
	Average Absolute Growth	
2011-2020	-0.16	-0.04
2021-2030	-0.01	-0.02

Tampa Electric Company
Peak Demand
(MW)

	Winter	Summer
2011	4010	3931
2012	3517	3892
2013	3203	3873
2014	3300	4054
2015	3609	4013
2016	3424	4131
2017	3138	4115
2018	4044	4037
2019	3272	4298
2020	3538	4255
2021	4423	4173
2022	4463	4220
2023	4521	4267
2024	4571	4307
2025	4623	4348
2026	4669	4387
2027	4714	4426
2028	4760	4467
2029	4806	4507
2030	4851	4545

Average Annual Growth Rates

2011-2020	-1.4%	0.9%
2021-2030	1.0%	1.0%

Average Absolute Growth

2011-2020	-52	36
2021-2030	48	41

Tampa Electric Company
Firm Peak Demand
(MW)

	Winter	Summer
2011	3725	3699
2012	3237	3677
2013	2918	3614
2014	3079	3757
2015	3390	3784
2016	3171	3907
2017	2905	3905
2018	3883	3798
2019	3071	4079
2020	3290	4053
2021	4211	3956
2022	4255	4007
2023	4315	4056
2024	4371	4103
2025	4422	4143
2026	4468	4182
2027	4512	4221
2028	4558	4261
2029	4603	4301
2030	4648	4339
	Average Annual Growth Rates	
2011-2020	-1.4%	1.0%
2021-2030	1.1%	1.0%
	Average Absolute Growth	
2011-2020	-48	39
2021-2030	49	43

Tampa Electric Company
Firm Peak Load Factor
(%)

	Winter	Summer
2011	56.9%	57.3%
2012	64.9%	57.2%
2013	72.1%	58.2%
2014	68.7%	56.3%
2015	64.0%	57.3%
2016	69.2%	56.2%
2017	75.4%	56.1%
2018	57.7%	59.0%
2019	73.5%	55.4%
2020	69.2%	56.2%
2021	53.1%	56.5%
2022	53.1%	56.3%
2023	52.8%	56.2%
2024	52.5%	56.0%
2025	52.3%	55.8%
2026	52.2%	55.7%
2027	52.0%	55.6%
2028	52.0%	55.6%
2029	51.9%	55.5%
2030	51.8%	55.5%
	Average Annual Growth Rates	
2011-2020	2.2%	-0.2%
2021-2030	-0.3%	-0.2%