

**BEFORE THE  
FLORIDA PUBLIC SERVICE COMMISSION**

**DOCKET NO. 160021-EI  
FLORIDA POWER & LIGHT COMPANY  
AND SUBSIDIARIES**

**IN RE: PETITION FOR RATE INCREASE BY  
FLORIDA POWER & LIGHT COMPANY  
AND SUBSIDIARIES**

**DIRECT TESTIMONY & EXHIBITS OF:**

**ROSEMARY MORLEY**

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**MARCH 15, 2016**

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1 I. INTRODUCTION

2

3 **Q. Please state your name and business address.**

4 A. My name is Rosemary Morley, and my business address is Florida Power &  
5 Light Company, 700 Universe Boulevard, Juno Beach, Florida 33408.

6 **Q. By whom are you employed and what is your position?**

7 A. I am employed by Florida Power & Light Company (“FPL” or the  
8 “Company”) as the Director of Resource Assessment and Planning.

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

10 A. I am responsible for overseeing the development of FPL’s peak demand,  
11 energy, customer and economic forecasts, as well as the Company’s integrated  
12 resource plan, including quantifying the need for future resource additions.

13 **Q. Please describe your educational background and professional  
14 experience.**

15 A. I hold a Bachelor of Arts (“B.A.”) degree with honors in economics from the  
16 University of Maryland and a Master of Arts (“M.A.”) degree in economics  
17 from Northwestern University. In 2005, I received a Doctorate in Business  
18 Administration (“D.B.A.”) from Nova Southeastern University. I began my  
19 career with FPL in 1983 as an Assistant Economist. I have since held a  
20 variety of positions in the forecasting, planning, and regulatory areas. I  
21 assumed the position of Director of Load Forecasting in 2007 and was  
22 promoted to my current position in 2015. I am a member of the National

1 Association for Business Economics and am certified as a Six Sigma Black  
2 Belt.

3 **Q. Are you sponsoring any exhibits in this case?**

4 A. Yes. I am sponsoring the following exhibits:

- 5 • Exhibit RM-1 MFRs and Schedules Sponsored and Co-sponsored by
- 6 Rosemary Morley
- 7 • Exhibit RM-2 Weather-normalized Retail Delivered Sales per
- 8 Customer
- 9 • Exhibit RM-3 Summary of FPL's Historical and Forecasted Sales
- 10 • Exhibit RM-4 Change in Typical Bill vs. Other Consumer Costs

11 **Q. Are you sponsoring or co-sponsoring any Minimum Filing Requirements**  
12 **("MFRs") filed in this case?**

13 A. Yes. Exhibit RM-1 shows my sponsorship and co-sponsorship of MFRs.

14 **Q. What is the purpose of your testimony?**

15 A. The purpose of my testimony is to describe FPL's load forecasting process,  
16 identify the underlying methodologies and assumptions, and present the  
17 results of FPL's forecasts. These forecasts include net energy for load, retail  
18 delivered sales, peak demands, and customers and sales by revenue class.

19 **Q. Please summarize your testimony.**

20 A. My testimony begins by providing an overview of FPL's load forecast. The  
21 load forecast presented in this case is FPL's official forecast for all planning  
22 purposes, including resource planning. FPL's load forecasting process relies  
23 on statistically sound methods and inputs from leading industry experts.

1           Moreover, FPL has developed a record of providing accurate, reliable  
2           forecasts in recent rate cases. In fact, actual weather-normalized net energy  
3           for load for the 2013 test year was within 0.35% of FPL's forecasted net  
4           energy for load projected in the last rate case.

5  
6           My testimony then addresses the specifics of FPL's forecast of customers and  
7           sales. Overall, FPL's forecast shows moderate customer and sales growth.  
8           The number of customers is expected to grow at a compound annual rate of  
9           1.5% a year between 2015 and 2020, comparable to, but up slightly from the  
10          1.4% increase experienced in 2015. With this steady growth, significant  
11          cumulative increases in the number of customers are expected. By 2020, the  
12          cumulative increase in customers since 2013 is expected to reach more than  
13          one-half million.

14  
15          The forecasted growth rate in weather-normalized retail delivered sales is also  
16          consistent with recent trends. Weather-normalized retail delivered sales grew  
17          at a compound annual rate of 0.8% between 2011 and 2015. Weather-  
18          normalized retail delivered sales are forecasted to grow at a similar 0.7%  
19          compound annual rate between 2015 and 2017. The trend of positive sales  
20          growth is expected to continue through 2020, with a compound annual rate of  
21          0.7% projected between 2015 and 2020. The cumulative increase in retail  
22          delivered sales over time is expected to be significant. By 2020, the

1 cumulative increase in weather-normalized retail delivered sales since 2013 is  
2 expected to be close to 6,500 Gigawatt Hours (“GWh”).

3

4 My testimony next discusses the methodologies supporting FPL’s forecast of  
5 customers and sales by revenue class, along with FPL’s forecast of peak  
6 demands. These forecasts are consistent with the forecasts of total company  
7 sales and customers presented in this testimony. In addition, the forecasts of  
8 customers and sales by revenue class are based on sound statistical methods  
9 and inputs provided by industry experts. The same reliance on sound  
10 statistical methods and inputs provided by industry experts holds true for  
11 FPL’s forecast of peak demands. FPL’s forecasts of customers, sales, and  
12 peak demands rely on a consistent set of assumptions regarding weather, the  
13 economy, and other critical drivers.

14

15 My testimony concludes by presenting FPL’s inflation forecast. FPL relies on  
16 industry expert IHS Global Insight as the source for its inflation forecast. This  
17 forecast calls for moderate increases in the consumer price index (“CPI”).  
18 Between 2015 and 2020, CPI is projected to increase at a compound annual  
19 rate of 2.5% a year.

20

1 **II. GENERAL OVERVIEW**

2

3 **Q. Please describe the objective of FPL’s load forecasting process.**

4 A. The objective of FPL’s load forecast is to project future levels of customer  
5 growth, sales, and peak demands.

6 **Q. Please clarify how customer growth, sales and peak demands are defined.**

7 A. Customer growth is based on the net change in the total number of active FPL  
8 accounts and reflects the net impact of new service installations combined  
9 with other factors, including changes in the number of inactive accounts. Net  
10 energy for load, a measure of sales, takes into account the Megawatt Hours  
11 (“MWh”) FPL generates and the net flow of interchange sales into and out of  
12 the FPL system. Retail delivered sales, another measure of sales, removes the  
13 effect of losses and wholesale sales from net energy for load. Peak demands  
14 refers to the highest hourly integrated net energy for load in a given period,  
15 for example, a year or month.

16 **Q. What criteria have the Florida Public Service Commission (“FPSC” or**  
17 **“the Commission”) used in evaluating utilities’ load forecasts in recent**  
18 **years?**

19 A. In recent years, the FPSC has evaluated utilities’ load forecasts based on the  
20 use of statistically sound forecasting methods and reasonable input  
21 assumptions (e.g., Order Nos. PSC-16-0032-FOF-EI, PSC-14-0590-FOF-EI,  
22 PSC-13-0505-PAA-EI, PSC-12-0179-FOF-EI, PSC-12-0187-FOF-EI, PSC-  
23 09-0283-FOF-EI and PSC-08-0518-FOF-EI). The FPSC has also considered



1           whether a load forecast is applied consistently; that is, whether a load forecast  
2           used for one purpose, such as a rate filing, is the same forecast used for other  
3           purposes, such as generation planning (Order No. PSC-09-0283-FOF-EI).  
4           Lastly, the FPSC has considered a utility's record in terms of forecasting  
5           accuracy when evaluating load forecasts (Order No. PSC-16-0032-FOF-EI).

6   **Q.   Does FPL's load forecast rely on statistically sound methods?**

7   A.   Yes, FPL's load forecast was developed using statistically sound methods.  
8           FPL relies on econometrics as the primary tool for forecasting customer  
9           growth, net energy for load, and peak demands. An econometric model is a  
10          numerical representation, obtained through statistical estimation techniques,  
11          of the degree of relationship between a dependent variable, e.g., the level of  
12          net energy for load, and the independent (explanatory) variables. A change in  
13          any of the independent variables will result in a corresponding change in the  
14          dependent variable. On an historical basis, econometric models have proven  
15          to be highly effective in explaining changes in the level of customer or load  
16          growth. FPL has consistently relied on econometric models for various  
17          forecasting purposes, and the modeling results have been reviewed and  
18          accepted by this Commission in past proceedings.

19   **Q.   Does FPL's load forecast incorporate reasonable input assumptions?**

20   A.   Yes, FPL's load forecast incorporates reasonable input assumptions. FPL has  
21          found that population growth, weather, the economy, and energy efficiency  
22          codes and standards are the primary drivers of future electricity needs.  
23          Accordingly, the models used to forecast customer growth, net energy for

1 load, and peak demand rely on independent variables representing these  
2 various drivers. FPL relies on leading industry experts for projections of these  
3 independent variables. Demographic and economic projections are from IHS  
4 Global Insight, a leading economic forecasting firm. The impact from energy  
5 efficiency codes and standards is provided by ITRON, a leading consultant on  
6 energy issues.

7 **Q. Is reliance on leading industry experts for specific inputs into the load  
8 forecast an accepted industry practice within your field?**

9 A. Yes.

10 **Q. Is the load forecast supported in this proceeding FPL's official load  
11 forecast for all business purposes?**

12 A. Yes. The load forecast supported in this proceeding is the Company's official  
13 forecast for all planning and budgeting purposes. Consequently, it is the same  
14 forecast utilized for generation planning purposes. More specifically, the load  
15 forecasting models supported in this proceeding are the same models used to  
16 develop an updated load forecast for the Company's most recent need  
17 determination filing (Order No. PSC-16-0032-FOF-EI at p. 23) as an updated  
18 assumption.

19 **Q. Please explain how the load forecasting models supported in this  
20 proceeding were utilized in the Company's most recent need  
21 determination.**

22 A. In filing for the Okeechobee Need Determination, the Company relied on the  
23 2015 Ten Year Site Plan load forecast, which was the Company's official load

1 forecast at the time the filing was made. However, in responding to  
2 discovery in November 2015, the Company relied on the more recent October  
3 2015 load forecast. The evidence presented to the Commission in the  
4 Okeechobee Need Determination docket was updated to reflect this October  
5 2015 load forecast.

6 **Q. Are there any differences between the load forecast supported in this**  
7 **proceeding and the October 2015 load forecast utilized in the Okeechobee**  
8 **Need Determination proceeding?**

9 A. With the exception of a new price of electricity projection, which I discuss  
10 later in my testimony, the models and assumptions incorporated into the  
11 October 2015 load forecast are identical to those utilized in the load forecast  
12 supported in the current proceeding.

13 **Q. How does FPL's load forecast compare with recent trends?**

14 A. Consistent with recent trends, FPL's load forecast shows moderate customer  
15 and sales growth over the 2015 to 2020 time period. The number of  
16 customers is expected to grow at a compound annual rate of 1.5% a year  
17 between 2015 and 2020, comparable to, but up slightly from the 1.4%  
18 increase experienced in 2015. While there were some year-to-year  
19 fluctuations, weather-normalized retail-delivered sales grew at a 0.8%  
20 compound annual rate between 2011 and 2015. Weather-normalized retail-  
21 delivered sales are forecasted to grow at a similar 0.7% compound annual rate  
22 between 2015 and 2020.

1 **Q. Does FPL have a record of providing accurate, reliable load forecasts in**  
2 **recent rate cases?**

3 A. Yes. FPL has established a record of providing accurate, reliable forecasts in  
4 recent rate cases. In the last rate case, FPL forecasted net energy for load of  
5 112,201 GWh for the year 2013. The actual weather-normalized net energy  
6 for load in 2013 was 111,806 GWh. Thus, FPL's projection in the last rate  
7 case was within 0.35% of the actual weather-normalized net energy for load  
8 for the year. This represents a high degree of forecasting accuracy and  
9 supports FPL's forecasting methodology. As discussed later in my testimony,  
10 FPL's methodology for forecasting net energy for load in the last rate case is  
11 fundamentally the same methodology used in this proceeding.

12 **Q. Are actual weather-normalized sales the appropriate gauge of forecasting**  
13 **accuracy?**

14 A. Yes. Actual weather-normalized sales are a better reflection of trends in  
15 electricity usage than the unadjusted level of actual sales, which may be  
16 influenced by erratic and unpredictable weather fluctuations. Quite simply,  
17 actual weather-normalized sales are based on the average weather conditions  
18 experienced for a given month based on historical data. Likewise, forecasted  
19 electricity sales are based on the assumption of normal weather conditions;  
20 that is, the weather conditions that have occurred on average historically. A  
21 variance analysis comparing actual weather-normalized sales with forecasted  
22 sales creates an "apples to apples" comparison. As a result, it is standard  
23 industry practice to use actual weather-normalized sales in determining

1 forecasting accuracy. For example, electric utilities in Florida have routinely  
2 relied on weather-normalized sales variances in their rate filings consistent  
3 with the FPSC's policy that rates be based on weather-normalized sales  
4 (Order No. PSC-11-0103-FOF-EI).

5 **Q. How did actual weather conditions in 2013 compare with normal weather**  
6 **conditions?**

7 A. While cooling degree hours in 2013 were very close to the historical averages  
8 used to determine normal weather, heating degree days were substantially  
9 below the historical averages used to determine normal weather. Taking into  
10 account both cooling degree hours and heating degree days, actual weather  
11 conditions in 2013 were mild relative to normal weather conditions. Due to  
12 milder than normal weather conditions, the unadjusted actual level of 2013 net  
13 energy for load was lower than the weather-normalized actual net energy for  
14 load for that year. The unadjusted actual level of net energy for load in 2013  
15 was 111,655 GWh versus the weather-normalized actual net energy for load  
16 of 111,806 GWh for that year.

17 **Q. Is FPL's method of computing weather-normalized actual sales consistent**  
18 **with standard industry practice?**

19 A. Yes. FPL relies on a 20-year history in order to determine normal weather  
20 patterns. This is the same time period utilized by Gulf Power and Tampa  
21 Electric Company in their most recent rate proceedings. It should also be  
22 noted that the 20-year horizon is also the same period utilized to determine  
23 weather conditions in FPL's load forecast. Thus, the method of computing

1 weather-normalized actual sales is consistent with the weather outlook  
2 assumed in the load forecast.

3 **Q. Has the Commission approved FPL's load forecast in other recent cases?**

4 A. Yes. The Commission approved FPL's load forecast in Order Nos. PSC-16-  
5 0032-FOF-EI, PSC-13-0505-PAA-EI, PSC-11-0293-FOF-EU and PSC-12-  
6 0187-FOF-EI. While FPL's load-forecasting process continues to reflect  
7 refinements over time, the load forecast in those prior proceedings reflects the  
8 same general methodology and drivers incorporated into the current load  
9 forecast.

10 **Q. How was FPL's 2013 load forecast used in the last rate case?**

11 A. The Commission-approved settlement in the last rate case implemented a  
12 change in rates based on the test year billing determinants derived from FPL's  
13 load forecast.

14

### 15 III. CUSTOMER GROWTH FORECAST

16

17 **Q. How many customers receive their electric service from FPL?**

18 A. FPL currently serves about 4.8 million customers. This represents a  
19 population of almost ten million Floridians. FPL's service area extends from  
20 St. Johns County in the north to Miami-Dade in the south, and westward to  
21 Manatee County. Thirty-five counties across the state are served wholly or  
22 partially by FPL.

23

1 **Q. What are the primary drivers of FPL's customer growth?**

2 A. FPL serves about one-half of the state's population. Thus, Florida's  
3 population growth is the primary driver of FPL's customer growth.

4 **Q. Have any other factors influenced FPL's customer growth in recent  
5 years?**

6 A. Yes. In recent years, FPL conducted a program utilizing smart grid  
7 technology to reduce the number of unknown usage ("UKU") premises. A  
8 UKU premise is a location where electricity is being consumed, but no active  
9 customer account exists. Under this program, FPL notified the occupants of  
10 these UKU premises that electric service would be terminated unless a valid  
11 customer account was opened for the premise at issue. In order to maintain  
12 electric service, many of the occupants of these UKU premises elected to open  
13 a customer account. The program began addressing the majority of UKU  
14 premises in the last half of 2013. The new customer accounts associated with  
15 UKU premises produced a one-time year-over-year increase in customer  
16 growth beginning in late 2013 and extending into 2014.

17 **Q. What has FPL's customer growth been in recent years?**

18 A. FPL's number of customers increased by 1.1% in 2013 and 1.8% in 2014,  
19 driven, in part, by the impact of smart grid technology described above. In  
20 2015, FPL's rate of customer growth returned to a more sustainable 1.4%.

21 **Q. Please explain the development of FPL's customer growth forecast.**

22 A. The growth of customers in FPL's service territory is forecasted using an  
23 econometric model. This econometric model uses Florida's population and an

1 indicator variable for the UKU program described above as explanatory  
2 variables. Florida's projected population growth is provided by IHS Global  
3 Insight.

4 **Q. Is the customer forecast based on an econometric model with excellent**  
5 **diagnostic statistics?**

6 A. Yes. One of the most important diagnostic statistics is a model's "goodness of  
7 fit." Goodness of fit refers to how closely the predicted values of a model  
8 match the actual observed values. The model used to forecast FPL's total  
9 number of customers has a strong goodness of fit as demonstrated by the  
10 model's adjusted R-squared of 99.98%. This means that 99.98% of the  
11 variability in the number of customers is explained by the model. In addition,  
12 the coefficients for all of the variables have the expected sign (+/-) and are  
13 statistically significant. This indicates that the variables influencing customer  
14 growth have been properly identified and their predicted impact is statistically  
15 sound. Finally, the model has a Durbin-Watson statistic of 2.015, which  
16 indicates the absence of significant autocorrelation. The absence of  
17 significant autocorrelation is a desirable quality in a well-constructed model.  
18 Overall, the model has excellent diagnostic statistics.

19 **Q. Does IHS Global Insight have a record of providing accurate population**  
20 **projections for Florida?**

21 A. Yes. Since 2010, IHS Global Insight's Florida population forecasts have  
22 averaged a forecasting variance of approximately 0.2%. This represents an  
23 excellent level of forecasting accuracy.



1 **Q. Could FPL's customer forecast be improved in any significant way by**  
2 **using a population forecast by county versus the state of Florida as a**  
3 **whole?**

4 A. No. As just discussed, FPL's customer model has an adjusted R-squared of  
5 99.98%. In other words, 99.98% of the variation in total customers is  
6 explained by FPL's customer model. This suggests that the variables  
7 incorporated into the current model, including population for the state of  
8 Florida as a whole, are appropriate.

9 **Q. Are there any other factors favoring the use of a statewide population**  
10 **forecast as opposed to a population forecast by county?**

11 A. Yes. In the aggregate, the projected growth rates for the 35 counties served  
12 wholly or partially by FPL mirror the statewide projections. Actual statewide  
13 population figures, on the other hand, are available on a timelier basis relative  
14 to county-specific figures. It is also important to point out that in some cases  
15 FPL only serves a small portion of a county's population. Finally, the use of  
16 statewide population figures ensures consistency with the statewide economic  
17 projections that are incorporated into the sales forecast.

18 **Q. What rate of population growth is IHS Global Insight projecting?**

19 A. IHS Global Insight is projecting a 1.4% average annual increase in Florida's  
20 population between 2015 and 2020. This projected rate of growth is  
21 consistent with the 1.4% actual average annual growth experienced between  
22 2012 and 2015.

23

1 **Q. What is FPL's forecasted customer growth?**

2 A. FPL's number of customers is expected to grow by approximately 70,000 or  
3 1.5% in 2016 and 72,000 or 1.5% in 2017. In 2018, the number of customers  
4 is forecasted to grow by approximately 73,000 or 1.5%. With a steady rate of  
5 population growth, annual customer growth is also projected to average 1.5%  
6 between 2015 and 2020. Significant cumulative increases in the number of  
7 customers are expected. By 2017, the cumulative increase in customers from  
8 2013 is expected to reach more than 290,000, an increase of 6.3%. By 2019,  
9 the number of FPL customers is projected to surpass the five million mark,  
10 and by 2020, the cumulative increase in customers since 2013 is expected to  
11 reach over one-half million.

12 **Q. How do FPL's projected customer growth rates compare with the growth  
13 rates experienced in recent years?**

14 A. FPL's projected customer-growth rates are comparable to the growth rates  
15 experienced since 2012. Between 2012 and 2015, average annual customer  
16 growth was 1.4%, while the projected average annual growth between 2015  
17 and 2020 is comparable at 1.5%.

18 **Q. Is FPL's projected customer growth reasonable?**

19 A. Yes. FPL's projected customer growth incorporates population projections  
20 from IHS Global Insight, a leading economic forecasting firm with a strong  
21 record of reliable population projections. FPL's projected customer growth  
22 also relies on the forecasting methods previously reviewed and accepted by

1 the Commission, and is consistent with recent historical trends in customer  
2 growth.

3 **Q. What is FPL's forecast of new service accounts?**

4 A. FPL is projecting 57,000 new service accounts ("NSAs") in 2016 and 67,000  
5 NSAs in 2017. This represents an increase relative to the 48,000 NSAs  
6 recorded in 2015. The cumulative number of NSAs since 2013 is projected to  
7 be close to 220,000 by 2017. In 2018, NSAs are projected to reach 74,000.  
8 By 2020, the cumulative number of NSAs since 2013 is expected to reach  
9 more than 450,000. FPL's forecast of NSAs takes into account projected  
10 trends in construction activity and recent actuals.

11 **Q. Is FPL's forecast of NSAs consistent with its forecasted customer growth?**

12 A. Yes. FPL is projecting average annual customer growth of 72,000 between  
13 2015 and 2020 and average annual NSAs of 71,000 during the same period.  
14 This indicates that the forecasts of NSAs and customer growth are consistent  
15 over this time period.

16

#### 17 **IV. FORECAST OF NET ENERGY FOR LOAD**

18

19 **Q. What are the primary determinants of net energy for load?**

20 A. In addition to customer growth, the primary determinants of net energy for  
21 load include the economy, weather, and energy efficiency codes and  
22 standards. Accordingly, FPL forecasts net energy for load per customer using  
23 an econometric model with explanatory variables representing these factors.

1   **Q.    How are weather conditions incorporated into the net energy for load per**  
2       **customer model?**

3    A.    The weather variables included in the net energy for load per customer model  
4       are cooling degree hours using a base of 72 degrees and winter heating degree  
5       days using a base of 66 degrees. In addition, a second measure of heating  
6       degree days is included using a base of 45 degrees in order to capture the  
7       additional heating load resulting from sustained periods of unusually cold  
8       weather. As previously discussed, the forecast assumes normal weather  
9       conditions based on the historical average of the last twenty years.

10   **Q.    Why is the net energy for load forecast based on normal weather**  
11       **conditions using the 20-year historical average?**

12   A.    Normal weather conditions are assumed in the net energy for load forecast in  
13       order to reflect the most likely weather conditions based on twenty years of  
14       historical data. In addition, the 20-year period for determining normal  
15       weather is also utilized in the annual summer and winter peak forecasts. As a  
16       result, using the 20-year historical average to estimate normal weather  
17       conditions for net energy for load forecast ensures consistency with the  
18       weather assumptions utilized in the long-term peak forecasts that help  
19       determine future resource needs. Accordingly, FPL has consistently relied on  
20       a twenty-year weather outlook in the last two rate cases and in its last five  
21       need determination filings.

22  
23

1 **Q. Please describe economic conditions in Florida in recent years.**

2 A. While the most recent recession, often referred to as the Great Recession, took  
3 an especially heavy toll on the state, Florida's economy has been consistently  
4 expanding for the last five years. This is most clearly illustrated in terms of  
5 job growth. Between 2007 and 2010, Florida lost more than 900,000 jobs,  
6 equivalent to a cumulative reduction of over 10%. Positive year-over-year job  
7 growth did not return until mid-2010, and the recovery in employment then  
8 gradually accelerated in 2011. The pace of job growth has since been on  
9 firmer footing, with progressively stronger employment growth experienced  
10 in 2012, 2013, and 2014. By April 2015, Florida had recovered all of the  
11 more than 900,000 jobs lost during the Great Recession. Indeed, the rate of  
12 job growth in 2015 was the state's highest since 2005.

13 **Q. Has Florida's economic expansion lagged in any respects?**

14 A. Yes. The state's labor force participation rate, defined as the percent of the  
15 population in the workforce, has been declining and, as of late 2015, was at its  
16 lowest rate in decades. In addition, there is concern that some of the  
17 employment growth in Florida has been concentrated in lower-paying  
18 industries. Both factors could hamper the state's long-term growth potential.

19 **Q. What economic outlook is assumed in FPL's energy use per customer  
20 model?**

21 A. FPL's economic assumptions are provided by leading economic forecasting  
22 firm, IHS Global Insight. Although IHS Global Insight's forecast shows  
23 positive gains in income and employment, some deceleration in the pace of

1 growth is evident in its projections. After expanding by 3.2% in 2014 and  
2 3.3% in 2015, the number of jobs in Florida is expected to grow by 2.6% in  
3 2016 and 2.0% in 2017. The lower rates of growth continue through 2020,  
4 with employment expected to increase at a compound annual rate of 1.8%  
5 between 2015 and 2020. A similar pattern is found in IHS Global Insight's  
6 forecast of real per capita income. After increasing at an estimated rate of  
7 3.2% in 2015, the state's real per capita income is expected to increase at a  
8 compound annual rate of 2.4% between 2015 and 2017. Between 2015 and  
9 2020, real per capita income is expected to increase at a compound annual rate  
10 of 2.1%.

11 **Q. What accounts for the forecasted deceleration in employment and income**  
12 **growth in Florida?**

13 A. According to IHS Global Insight, some deceleration in growth may be  
14 expected as the economic recovery matures. To an extent, the economic  
15 growth rates projected for the next few years represent a return to more  
16 normal rates of growth. In particular, the forecasted growth in real per capita  
17 income between 2015 and 2020 is comparable to the average growth rates  
18 experienced from the early 1990s through 2004.

19 **Q. How are economic conditions incorporated into the net energy for load**  
20 **per customer model?**

21 A. The impact of the economy is captured through a composite variable based on  
22 Florida's real per capita income and the percent of the state's population that  
23 is employed. Thus, this composite economic variable encompasses two of the

1 primary drivers of the economy: employment and income levels. Florida's  
2 real per capita income and employment levels are provided by IHS Global  
3 Insight. This composite economic variable increased by 3.9% in 2014 and  
4 5.1% in 2015. Solid, but more modest increases of 3.2% and 3.0% are  
5 forecasted for 2016 and 2017, respectively. The composite economic variable  
6 is forecasted to increase at a compound annual rate of 2.4% between 2015 and  
7 2020.

8 **Q. How does FPL capture the impact that prices have on electricity**  
9 **consumption?**

10 A. FPL uses two variables for the impact that prices have on electricity  
11 consumption. One variable is based on increases in the real price of electricity  
12 over time while another variable is based on decreases in the real price of  
13 electricity over time. By using two different price variables, the net energy  
14 for load per customer model reflects the fact that consumers may have a  
15 proportionately different response to price increases than they do to price  
16 decreases.

17 **Q. What assumptions regarding clause adjustment factors are incorporated**  
18 **into FPL's price of electricity projections?**

19 A. FPL's price of electricity projections are based on the Company's fuel  
20 projections developed in January 2016. These are the same fuel projections  
21 incorporated into the mid-course correction filed in February 2016 and  
22 approved on March 1, 2016.

1 **Q. How does FPL capture the impact from energy efficiency codes and**  
2 **standards in its forecast?**

3 A. Estimates of savings from energy efficiency codes and standards are  
4 developed by ITRON, a leading expert in this field. These estimates include  
5 savings from federal and state energy efficiency codes and standards,  
6 including the 2005 National Energy Policy Act, the 2007 Energy  
7 Independence and Security Act, and the savings resulting from the use of  
8 compact fluorescent bulbs and light-emitting diodes (“LEDs”). The input  
9 from ITRON represents the savings from energy efficiency codes and  
10 standards based strictly on an engineering analysis of the equipment at issue.  
11 The net impact on usage, including any behavioral changes, is captured by  
12 applying the model coefficient to the input from ITRON. It should be noted  
13 that the impact from energy efficiency codes and standards as discussed here  
14 does not include the prospective impact from utility-sponsored demand-side  
15 management (“DSM”) programs. The impact of that incremental DSM is  
16 discussed later in my testimony.

17 **Q. Are any other variables included in the net energy for load per customer**  
18 **model?**

19 A. Yes. The net energy for load per customer model includes an indicator  
20 variable for leap year. The leap-year variable captures the fact that the extra  
21 day associated with leap year results in a higher level of net energy for load  
22 than would otherwise be the case.



1 **Q. How is the output from the net energy for load per customer model**  
2 **incorporated into the net energy for load forecast?**

3 A. The output from the net energy for load use per customer model is multiplied  
4 by the forecasted number of customers. The result is a preliminary estimate of  
5 net energy for load. Adjustments are then made to this preliminary estimate  
6 of the forecasted net energy for load in order to reflect factors not otherwise  
7 reflected in FPL's historical load level, but which are expected to affect future  
8 levels of net energy for load. These adjustments are made for changes in net  
9 energy for load resulting from wholesale sales, plug-in electric vehicles,  
10 distributed solar generation, DSM, and FPL's economic development tariffs.

11 **Q. Why are adjustments to FPL's net energy for load forecast made for**  
12 **wholesale requirements sales?**

13 A. FPL's net energy for load forecast is adjusted for wholesale loads served  
14 under full and partial requirements contracts that provide other utilities all or a  
15 portion of their load requirements at a level of service equivalent to the  
16 Company's own native load customers. Individual contracts to sell wholesale  
17 requirements sales may be initiated, terminated, modified, or expanded over  
18 time. As a result, the net energy for load forecast is adjusted for wholesale  
19 requirements sales in order to reflect changes in load not otherwise captured in  
20 FPL's historical load levels. Specific forecasts are developed for wholesale  
21 requirements customers and then used as adjustments to the net energy for  
22 load forecast.

1 **Q. What contracts are included in the wholesale requirements sales**  
2 **forecast?**

3 A. The largest of these contracts provides full requirements service to the Lee  
4 County Electric Cooperative (“LCEC”), a not-for-profit electric distribution  
5 cooperative serving a five-county area in Southwest Florida. FPL served  
6 LCEC as a partial requirements customer in 2010 through 2013. Since 2014,  
7 FPL has served LCEC as a full-requirements customer under a multi-decade  
8 contract. FPL has also made a 200-MW requirements sale to Seminole  
9 Electric Cooperative since June 2014. In addition, effective May 2011, FPL  
10 began serving the Florida Keys Electric Cooperative (“FKEC”) as a full-  
11 requirements customer. The wholesale sales forecast also includes a number  
12 of smaller contracts including service to Blountstown, Wauchula, New  
13 Smyrna Beach, Winter Park, Quincy, and Homestead. FPL only includes  
14 executed and approved wholesale contracts in its sales forecast.

15 **Q. How is the forecast of wholesale requirements sales developed?**

16 A. LCEC and FKEC, the largest contracts served by FPL, each provide their own  
17 forecast of projected wholesale requirements. The forecasted wholesale  
18 requirements sales for other contracts reflect customer-specific inputs and  
19 historical usage. Expected changes in service including the initiation and/or  
20 termination of a contract are also incorporated into the forecast, along with  
21 any known changes in the terms of service that would affect the projected  
22 amount of requirements sales.

23

1 **Q. What is the forecast for wholesale requirements sales?**

2 A. The net energy for load from wholesale requirements sales is projected to be  
3 6,536 GWh in 2016, a decline of about 2.9% from the 2015 level. The decline  
4 in wholesale requirements sales in 2016 is driven by decreases in projected  
5 sales provided by LCEC and FKEC. The net energy for load from wholesale  
6 requirements sales is projected to decline by another 9.0% in 2017 as a result  
7 of the terminations of the sales to Wauchula and Blountstown as well as  
8 modifications to other contracts. After 2017, the level of wholesale  
9 requirements sales is expected to increase modestly as a result of the steady  
10 increase in sales to LCEC and FKEC. Between 2017 and 2020, wholesale  
11 requirements sales are expected to increase at a compound annual rate of  
12 1.2%, reaching 6,162 GWh by 2020.

13 **Q. How does the forecast of wholesale requirements sales compare to recent**  
14 **actuals?**

15 A. Wholesale requirements sales are projected to decline at a compound annual  
16 rate of about 6.0% between 2015 and 2017, and then grow by about 1.2% a  
17 year between 2017 and 2020. By contrast, wholesale requirements sales in  
18 2014 and 2015 experienced unusually large increases. There were two  
19 contract changes that substantially increased the amount of wholesale  
20 requirements sales in 2014 and 2015. With the initiation of full requirements  
21 sales to LCEC in 2014, the level of wholesale sales increased from 2,152  
22 GWh in 2013 to 5,597 GWh in 2014, a 160% increase. Due to the inclusion of  
23 a full year of service under the new Seminole contract, the level of wholesale

1 requirements sales increased another 20% in 2015 to 6,730 GWh. While the  
2 forecast of wholesale requirements sales includes some recently executed  
3 contracts, these contracts are very small relative to the increase in sales  
4 resulting from LCEC or Seminole. Moreover, a number of contracts will be  
5 terminated or modified, resulting in a decline in wholesale requirements sales  
6 in 2016 and 2017.

7 **Q. Why is an adjustment to FPL's net energy for load forecast being made**  
8 **for plug-in electric vehicles?**

9 A. The net energy for load forecast is adjusted for plug-in electric vehicles in  
10 order to reflect additional load not otherwise captured in FPL's historical load  
11 levels. As of mid-2015, there were estimated to be over 9,000 plug-in electric  
12 vehicles in FPL's service area, adding approximately 40 GWh to FPL's net  
13 energy for load. By 2020, more than 70,000 additional plug-in vehicles are  
14 projected, resulting in an additional 333 GWh in net energy for load.

15 **Q. How is the load from plug-in electric vehicles projected?**

16 A. Projections of the U.S. market for plug-in electric vehicles were first  
17 developed based on a review of multiple forecasts from leading experts and  
18 discussions with knowledgeable professionals in the automotive industry.  
19 Florida's share of the U.S. market for plug-in electric vehicles was then  
20 estimated based on data from the Florida Department of Motor Vehicles for  
21 registered plug-in vehicles in the state. Using the same Department of Motor  
22 Vehicles data for counties served by FPL, FPL's share of plug-in vehicles was  
23 then estimated. The contribution to net energy for load from plug-in electric

1 vehicles was then derived from the vehicle forecast using an estimate of  
2 kilowatt-hours per vehicle.

3 **Q. Why is an adjustment to FPL's net energy for load forecast being made**  
4 **for FPL's economic development tariffs?**

5 A. The net energy for load forecast is adjusted for FPL's economic development  
6 tariffs in order to reflect additional load not otherwise captured in FPL's  
7 historical load levels. FPL's economic development tariffs consist of the  
8 Economic Development Rider, the Existing Facilities Economic Development  
9 Rider, and the Commercial/Industrial Service Rider. Under all three tariffs,  
10 customers are provided discounts for adding new or incremental load. To  
11 qualify for any of the tariffs, customers are required to verify that the  
12 availability of the rider was a significant factor in their location or expansion  
13 decision. Based on estimates developed by FPL's Economic Development  
14 group and in conjunction with the Customer Service and Regulatory Business  
15 Units, the Economic Development Rider, the Existing Facilities Economic  
16 Development Rider, and the Commercial/Industrial Service Rider are  
17 collectively projected to add about 279 GWh to net energy for load in 2017.  
18 This amount is expected to rise to 378 GWh in 2020.

19 **Q. Why is an adjustment to FPL's net energy for load forecast being made**  
20 **for the impact of new distributed solar generation?**

21 A. The net energy for load forecast is adjusted for new distributed solar  
22 generation in order to reflect the load impact not otherwise captured in FPL's  
23 historical load levels. The impact of new distributed solar generation is

1 estimated to reduce 2016 net energy for load by 38 GWh. The amount is  
2 expected to increase to 63 GWh in 2017 and to 218 GWh by 2020. For  
3 clarification, distributed solar generation in this context is refers to customer-  
4 owned or leased photovoltaics, such as rooftop solar.

5 **Q. How are the adjustments for new distributed solar generation**  
6 **determined?**

7 A. A forecast of installed distributed solar generation capacity for the state of  
8 Florida is obtained from Greentech Media (“GTM”) Research, one of the  
9 leading sources of market research and statistics on green technology. FPL’s  
10 share of the state forecast is determined based on actual year-end 2014 FPL  
11 data for residential and commercial distributed solar generation. These shares,  
12 along with GTM Research’s state forecast, are used to develop FPL’s installed  
13 capacity of distributed solar generation. Megawatt hours of distributed solar  
14 are derived using a capacity factor, and hourly MWh values are then  
15 developed using solar profiles. Only the impact of distributed solar generation  
16 installed after mid-2015 is included as an adjustment to the net energy for load  
17 forecast.

18 **Q. Why is an adjustment to FPL’s net energy for load forecast being made**  
19 **for the impact of incremental DSM?**

20 A. An adjustment is made for the impact of incremental DSM in order to reflect  
21 reductions in load not otherwise reflected in history. The effects of DSM  
22 energy efficiency programs that occurred through mid-2015 are assumed to be  
23 embedded in actual usage data for forecasting purposes. The impact of

1 incremental DSM that FPL plans to implement in the future is treated as a  
2 line-item reduction to the forecast. The impact of incremental DSM is  
3 consistent with the goals established by the Commission in Order No. PSC-  
4 14-0696-FOF-EU and incorporates estimated actuals through year-end 2015.  
5 The amount of incremental DSM is projected to increase by approximately 46  
6 GWh in 2016 and by another 48 GWh in 2017. Between 2015 and 2020, the  
7 level of incremental DSM is expected to increase by approximately 50 GWh  
8 per year.

9 **Q. Have the types of adjustments to the net energy for load forecast just**  
10 **described been incorporated into prior forecasts?**

11 A. Yes. The 2015 Ten Year Site Plan forecast incorporated adjustments for  
12 wholesale load, plug-in electric vehicles, economic development tariffs, and  
13 distributed solar generation. In addition, the resource planning process has  
14 treated incremental DSM as a line-item reduction to the sales forecast for  
15 several years.

16 **Q. What is FPL's forecasted net energy for load?**

17 A. FPL is forecasting net energy for load of 119,625 GWh in 2016, an increase of  
18 about 1.4% over weather-normalized actual 2015. A decline in 2017 is  
19 projected with net energy for load slipping to 118,832 GWh in 2017, a drop of  
20 0.7% from 2016. Nonetheless, the underlying trend remains one of positive  
21 growth, with the level of net energy for load in 2017 up by 7,026 GWh, or  
22 6.3% over its weather-normalized 2013 level. Moreover, weather-normalized  
23 net energy for load is projected to increase at a positive 0.4% compound

1 annual growth rate between 2015 and 2017. In 2018, net energy for load is  
2 forecasted to reach 119,563 GWh, a 0.6% increase over its projected 2017  
3 level. As shown in Exhibit RM-3, weather-normalized net energy for load is  
4 projected to grow at a 0.6% compound annual growth rate between 2015 and  
5 2020.

6 **Q. How do FPL's forecasted growth rates in net energy for load compare**  
7 **with recent actuals?**

8 A. Substantial increases in the volume of wholesale requirements sales in 2014  
9 and 2015 resulted in larger increases in net energy for load than would  
10 otherwise be the case. As a result, weather-normalized net energy for load  
11 increased at a compound annual rate of 2.7% between 2013 and 2015. Absent  
12 similarly large increases in wholesale requirements sales, the weather-  
13 normalized net energy for load between 2015 and 2017 is projected to  
14 increase at a compound annual rate of 0.4%. As I discuss later in my  
15 testimony, the forecasted growth in retail delivered sales, which excludes the  
16 fluctuations associated with wholesale requirements sales, is more consistent  
17 with recent trends.

18 **Q. Why is a decrease in weather-normalized net energy for load projected**  
19 **between 2016 and 2017?**

20 A. Consistent with the year-to-year fluctuations in net energy for load  
21 experienced historically, there are a number of factors that are projected to  
22 reduce the level of net energy for load in 2017 relative to the 2016 level.  
23 Wholesale requirements sales are projected to decline between 2016 and 2017



1 for the reasons discussed earlier in my testimony. In addition, the projected  
2 impact of energy efficiency codes and standards and incremental DSM are  
3 higher in 2017 relative to 2016. At the same time, the pace of the economic  
4 expansion is forecasted to moderate in 2017. The price of electricity is also  
5 projected to increase in 2017. Finally, the absence of the extra day of sales  
6 associated with leap year is projected to reduce net energy for load in 2017  
7 relative to 2016.

8 **Q. Is FPL's methodology for forecasting net energy for load the same**  
9 **methodology utilized by the Company in its last rate case?**

10 A. Fundamentally, yes. Both forecasts rely on econometric models and inputs  
11 representing the major factors influencing electric sales, including weather,  
12 the economy, energy efficiency codes and standards, and so forth. Some  
13 refinements have been made. The most significant of these include how  
14 energy prices and the housing market are treated. In the last rate case, CPI for  
15 energy was used to capture the impact of rising energy prices on electricity  
16 consumption. Many customers need to budget for their total energy  
17 purchases, not just electricity, particularly when rising energy prices, such as  
18 those for gasoline, exceed the overall cost of living. However, with the  
19 significant monthly fluctuations in the CPI for energy experienced in 2015,  
20 the linkage between the CPI for energy and short-term electricity consumption  
21 has weakened. Accordingly, the CPI for energy is no longer used in the  
22 current net energy for load per customer model.

23

1 **Q. How has FPL's methodology for forecasting net energy for load evolved**  
2 **in terms of the housing market?**

3 A. The increase in empty homes resulting from the housing crisis helped spur the  
4 state's economic decline during the Great Recession. To capture this impact,  
5 FPL's net energy for load per customer models began to include an  
6 adjustment for empty homes, effective with the Company's 2009 Ten Year  
7 Site Plan load forecast. A statistically supported variable for empty homes  
8 was incorporated into the 2012 Ten Year Site Plan forecast, the same forecast  
9 used in the Company's last rate case. The empty-homes variable remained a  
10 statistically significant variable in FPL's net energy for load per customer  
11 models up through the 2014 Ten Year Site Plan. However, as the housing  
12 market recovered and the number of empty homes fell, the statistical  
13 significance of the empty-homes variable waned. Apparently, the decline in  
14 the number of empty homes did not have the positive impact on electricity  
15 usage suggested by the negative impact of usage that had resulted from the  
16 rise in the number of empty homes during the Great Recession. Effective with  
17 its 2015 Ten Year Site Plan forecast, FPL does not include a variable for the  
18 number of empty homes in its net energy for load per customer model.

19 **Q. Is FPL's net energy for load forecast based on an econometric model with**  
20 **excellent diagnostic statistics?**

21 A. Yes. The energy use per customer model used to forecast FPL's net energy  
22 for load has a strong goodness of fit, as demonstrated by the model's adjusted  
23 R-squared of 99.4%. This means 99.4% of the variability in energy use per

1 customer is explained by the model. In addition, the coefficients for all of the  
2 variables have the expected sign (+/-) and are statistically significant. This  
3 indicates that the variables influencing net energy for load have been properly  
4 identified, and their predicted impact is statistically sound. Finally, the model  
5 has a Durbin-Watson statistic of 1.957, which indicates the absence of  
6 significant autocorrelation. The absence of significant autocorrelation is a  
7 desirable quality in a well-constructed model. Overall, the model has  
8 excellent diagnostic statistics.

9 **Q. Is FPL's net energy for load forecast reasonable?**

10 A. Yes. FPL's net energy for load forecast is based on assumptions developed by  
11 industry experts and relies on methodologies that have proven to be accurate  
12 based on actual weather-normalized net energy for load. FPL's net energy for  
13 load forecast is based on an econometric model with a strong goodness of fit  
14 and a high degree of statistical significance. FPL is confident the relationship  
15 that exists between the level of net energy for load and the economy, weather,  
16 customers, energy efficiency codes and standards, and other variables have  
17 been properly assessed and numerically quantified. FPL's net energy for load  
18 forecast should be approved.

19

20

21

1 **V. DELIVERED AND BILLED SALES**

2

3 **Q. How do delivered sales differ from billed sales?**

4 A. Because meters are read throughout the month, billed sales in any given  
5 month reflect a mix of usage from the current and prior month. Delivered  
6 sales, on the other hand, are based on customer usage in the current month.  
7 Delivered sales are derived from net energy for load less losses. Delivered  
8 sales are a component of billed sales, but billed sales also reflect the changes  
9 in unbilled sales (i.e., sales delivered in one month, but not billed until the  
10 following month).

11 **Q. How is FPL's forecast of delivered sales developed?**

12 A. Historical patterns in monthly losses are first examined. Based on recent  
13 actuals, monthly loss factors are then projected. The forecast of delivered  
14 sales was then developed by applying these projected monthly loss factors to  
15 the forecast of net energy for load.

16 **Q. How is FPL's forecast of billed sales developed?**

17 A. Billed sales are based on delivered sales plus the unbilled sales for the prior  
18 month minus the unbilled sales for the current month. Unbilled sales are  
19 estimated based on the historical pattern between unbilled sales and net  
20 energy for load by month.

21 **Q. What is FPL's forecast of retail delivered sales?**

22 A. Retail delivered sales are expected to reach 107,429 GWh in 2016, an increase  
23 of 1.6% from the level of weather-normalized retail delivered sales in 2015.

1 In 2017, retail delivered sales are projected to be 107,261 GWh, a minimal  
2 0.2% decline from the 2016 level. The minimal decline in 2017 relative to  
3 2016 reflects a number of factors including moderating economic growth,  
4 higher electricity prices, a higher level of incremental DSM, the continued  
5 impact from energy efficiency codes and standards, and the absence of the  
6 additional day of consumption associated with leap year. The projected 2015  
7 to 2017 growth provides a better indication of the underlying trend in retail  
8 delivered sales. Weather-normalized retail delivered sales are projected to  
9 grow at a compound annual rate of 0.7% between 2015 and 2017. Retail  
10 delivered sales are forecasted to grow by another 0.6% between 2017 and  
11 2018, reaching 107,888 GWh. Between 2015 and 2020, a 0.7% a compound  
12 annual growth rate is projected.

13 **Q. How does the forecasted growth in retail delivered sales compare with**  
14 **recent trends?**

15 A. The 0.7% compound annual rate of increase in weather-normalized retail  
16 delivered sales between 2015 and 2017 is similar to the 0.8% growth in  
17 weather-normalized retail delivered sales between 2011 and 2015. The 0.7%  
18 compound annual rate of growth in weather-normalized retail delivered sales  
19 between 2015 and 2020 is also comparable to the growth in weather-  
20 normalized retail delivered sales between 2011 and 2015.

21

22

1 **Q. What is the forecast for weather-normalized retail delivered sales per**  
2 **customer?**

3 A. Between 2015 and 2017, weather-normalized retail delivered sales per  
4 customer is projected to decline at a compound annual rate of 0.7%. The  
5 longer-term trend is similar. Between 2015 and 2020, weather-normalized  
6 retail delivered sales per customer is projected to decline at a compound  
7 annual rate of 0.7%.

8 **Q. Is the decline in weather-normalized retail delivered sales per customer a**  
9 **short-term anomaly?**

10 A. Not at all. As Exhibit RM-2 shows, the general trend in recent years has been  
11 one of declining weather-normalized retail delivered sales per customer.  
12 Declining weather-normalized retail delivered sales per customer have been  
13 experienced for nine out of eleven years since 2005. Moreover, a positive  
14 year-over-year increase in weather-normalized retail sales per customer has  
15 not been experienced since 2012.

16

## 17 **VI. CUSTOMERS AND SALES BY REVENUE CLASS**

18

19 **Q. How does FPL forecast customers by revenue class?**

20 A. Preliminary forecasts of customers for each revenue class are developed using  
21 econometric models and customer-specific information. Econometric models  
22 are developed to forecast customers in the residential, commercial, industrial,  
23 and street & highway lighting revenue classes. Customer forecasts for the

1           wholesale, railroads & railways, and other revenue classes are based on class-  
2           specific information. The sum of the preliminary forecasts of customers by  
3           revenue class is then compared with FPL's total customer forecast, described  
4           earlier in my testimony. The preliminary forecasts of residential and  
5           commercial customers are then adjusted for the difference between the sum of  
6           the revenue classes and FPL's total customer forecast. This adjustment is  
7           made to the residential and commercial customer forecast because these  
8           customers account for the vast majority of FPL's customers. By making this  
9           adjustment, consistency between the total customer forecast and customer by  
10          revenue class forecast is assured.

11   **Q.   How does FPL forecast billed sales by revenue class?**

12   A.   Preliminary forecasts of billed sales for each revenue class are developed  
13          using econometric models and customer-specific information. Separate  
14          econometric models are developed for the residential, commercial, and  
15          industrial revenue classes. Sales forecasts for the wholesale, street & highway  
16          lighting, railroads & railways, and other revenue classes are based on class-  
17          specific information. The sum of the preliminary forecasts of billed sales by  
18          revenue class is then compared with FPL's total billed-sales forecast derived  
19          from the net energy for load forecast described earlier in my testimony. The  
20          preliminary residential and commercial sales forecasts are then  
21          proportionately adjusted for the difference between the sum of the revenue  
22          classes and the overall billed sales derived from the total net energy for load  
23          forecast. This adjustment is made to the residential and commercial forecast

1           because residential and commercial customers account for over 96% of FPL's  
2           retail sales. This adjustment assures consistency within the forecast.

3   **Q.   Instead of adjusting residential and commercial sales, would it be**  
4           **appropriate to adjust total FPL sales to match the sum of the individual**  
5           **revenue class forecasts?**

6   A.   No. The econometric model supporting the net energy for load forecast is  
7           superior to the models supporting the individual revenue class forecasts in a  
8           number of respects. The net energy for load per customer model encompasses  
9           a richer array of variables relative to the individual revenue class models. For  
10          example, the net energy for load per customer model includes a variable for  
11          the impact of energy efficiency codes and standards. In addition, the net  
12          energy for load forecast includes adjustments for the impact of plug-in electric  
13          vehicles and distributed solar generation. Therefore, the impacts from energy  
14          efficiency codes and standards, plug-in electric vehicles, and distributed solar  
15          generation would not be included in the revenue class forecasts absent the  
16          adjustment to total billed sales resulting from FPL's net energy for load  
17          forecast. The net energy for load per customer model also has the advantage  
18          of reflecting monthly weather conditions without the potential distortions  
19          created by the billing cycle. Accordingly, the net energy for load per  
20          customer model has better statistical diagnostics relative to the revenue class  
21          models. For example, the residential sales per customer model and small  
22          commercial sales per customer model have adjusted R-squared values of  
23          93.7% and 94.8%, respectively. While each of these values represents a very



1 good statistical fit, the net energy for load per customer model is substantially  
2 better with an adjusted R-squared value of 99.4%.

3 **Q. Has FPL previously used this method of assuring consistency by**  
4 **adjusting residential and commercial sales so that the sum of the**  
5 **individual revenue classes matches total billed sales?**

6 A. Yes. Adjusting residential and commercial sales so that the sum of the  
7 individual revenue classes matches total billed sales has been used for a  
8 number of years, including FPL's last three rate cases. This method of  
9 assuring consistency has been reviewed and accepted by the Commission in  
10 multiple proceedings, including the proceeding concluded by Order No. PSC-  
11 10-0153-FOF-EI.

12 **Q. Are the assumptions incorporated into the individual sales and customer**  
13 **forecasts by revenue class consistent with those used in the total customer**  
14 **and total billed sales forecast?**

15 A. Yes. The specific assumptions regarding the weather, population growth, and  
16 the economy used in the individual sales and customer forecasts by revenue  
17 class are consistent with those used in the total customer and total billed sales  
18 forecast. As previously discussed, these assumptions are provided by leading  
19 industry experts.

20 **Q. Are the forecasted shares of weather-normalized sales by revenue class**  
21 **consistent with recent history?**

22 A. Yes. In 2015 residential sales accounted for approximately 53% of billed  
23 weather-normalized retail sales. For the forecasted 2016 to 2017 period,

1 residential sales are likewise projected to account for approximately 53% of  
2 weather-normalized billed retail sales. The pattern in terms of commercial  
3 sales is similar. In 2015, commercial sales accounted for about 43% of  
4 weather-normalized billed retail sales. For the forecasted 2016 to 2017  
5 period, commercial sales are projected to account for about 43% of weather-  
6 normalized billed retail sales. Consistent with historical patterns, other  
7 revenue classes (i.e., industrial, street & highway lighting, railroads &  
8 railways, and other) are expected to account for 4% or less of weather-  
9 normalized billed retail sales.

10 **Q. Are weather-normalized sales the appropriate measure to use in**  
11 **determining trends in sales by revenue class?**

12 A. Yes. Deviations from normal weather conditions can create significant  
13 variations in sales. Moreover, the impact of weather varies significantly by  
14 revenue class. Residential sales, for instance, tend to be more sensitive to  
15 weather conditions, particularly cold weather, relative to other revenue  
16 classes. As a result, billed sales by revenue class that have not been weather-  
17 normalized are subject to weather fluctuations that can distort underlying  
18 trends.

19 **Q. Is additional detail available on how the customer and sales forecasts by**  
20 **revenue class are developed?**

21 A. Yes. MFR F-5 provides additional detail on the forecasting models  
22 supporting the customer and sales forecasts by revenue class.

23

1 **Q. What is FPL's forecast of billed jurisdictional sales?**

2 A. Billed jurisdictional sales or billed retail sales are defined as total billed sales  
3 less wholesale billed sales. FPL is forecasting billed jurisdictional sales of  
4 107,374 GWh in 2016 and 107,246 GWh in 2017.

5 **Q. Is FPL's forecast of billed jurisdictional sales reasonable?**

6 A. Yes. The forecast is consistent with the forecasts of net energy for load and  
7 billed sales previously discussed. The forecast is based on sound statistical  
8 methods and inputs provided by industry experts. The forecast also  
9 incorporates recent trends in losses and billed and unbilled sales. FPL's  
10 forecast of billed jurisdictional sales should be approved.

11

12 **VII. MONTHLY PEAK FORECAST**

13

14 **Q. How does FPL forecast monthly peaks?**

15 A. Econometric models are developed to forecast the annual summer and winter  
16 peaks. The annual summer peak is assumed to occur in August because that  
17 month has historically accounted for the highest percentage of annual summer  
18 peak days. The annual winter peak is assumed to occur in January because  
19 that month has historically accounted for the highest percentage of annual  
20 winter peak days. The monthly peaks for other months are forecasted based  
21 on the historical relationship between the peaks in those months and the  
22 annual summer peak. The annual summer peak is used as the basis for  
23 projecting the monthly peaks in February through July and September through

1 December because the majority of the monthly peaks in those months are  
2 driven by warm weather.

3 **Q. How does FPL forecast the annual summer peak?**

4 A. FPL uses an econometric model to forecast summer peak per customer. This  
5 econometric model includes variables for the weather, energy prices, the  
6 economy, and energy efficiency codes and standards. The impact of the  
7 economy is captured through a real disposable income per household variable  
8 based on projections provide by IHS Global Insight. Energy prices are based  
9 on CPI for energy, also provided by IHS Global Insight. The impact of  
10 energy efficiency codes and standards is based on inputs provided by ITRON.  
11 The summer peak per customer model also incorporates two weather series:  
12 the maximum temperature on the day of the summer peak and the sum of the  
13 cooling degree hours two days prior to the peak day. A preliminary forecast  
14 of the annual summer peak is obtained by multiplying the forecasted summer  
15 peak per customer from this model by the total number of customers.

16 **Q. Are any adjustments made to the annual summer peak forecast?**

17 A. Yes. The annual summer peak forecast is adjusted for wholesale requirements  
18 load, distributed solar generation, new load resulting from plug-in electric  
19 vehicles, and incremental load resulting from the FPL's economic  
20 development tariffs.

21

22

1 **Q. Is the annual summer peak forecast consistent with the net energy for**  
2 **load forecast previously discussed?**

3 A. Yes. The annual summer peak forecast relies on inputs from the same leading  
4 industry experts utilized in the net energy for load forecast. Economic  
5 projections are provided by IHS Global Insight. The impact from energy  
6 efficiency codes and standards is based on estimates developed by ITRON,  
7 while projections from GTM Research are used to determine the impact from  
8 new distributed solar generation. The annual summer peak forecast also uses  
9 the same customer forecast incorporated into the net energy for load forecast.  
10 In addition, the annual summer peak forecast incorporates adjustments for  
11 factors also used as line item adjustments in the net energy for load forecast  
12 (i.e., wholesale requirements load, distributed solar generation, new load from  
13 plug-in electric vehicles, and incremental load resulting from FPL's economic  
14 development tariffs).

15 **Q. Is FPL's summer peak demand forecast based on an econometric model**  
16 **with a strong goodness of fit and a high degree of statistical significance?**

17 A. Yes. FPL's summer peak model has a strong goodness of fit as demonstrated  
18 by the model's adjusted R-squared of 98.3%. This means 98.3% of the  
19 variability in the summer peak per customer is explained by the model. In  
20 addition, the coefficients for all of the variables have the expected sign (+/-)  
21 and are statistically significant. This indicates the variables influencing the  
22 summer peak demand have been properly identified and their predicted impact  
23 is statistically sound. Finally, the model has a Durbin-Watson statistic of

1 1.980, indicating the absence of significant autocorrelation. The absence of  
2 significant autocorrelation is a desirable quality in a well-constructed model.  
3 Overall, the summer peak model has excellent diagnostic statistics.

4 **Q. How does FPL forecast the annual winter peak?**

5 A. Like the system summer peak model, the winter peak model is also an  
6 econometric model. The winter peak model is a per-customer model that  
7 includes two weather-related variables: the minimum temperature on the peak  
8 day and the square of heating degree hours from the prior day until 9:00 a.m.  
9 of the peak day. In addition, the model also includes a term for peaks  
10 occurring during the weekends as these tend to be lower than weekday peaks.  
11 The winter peak per customer model also includes an economic variable based  
12 on housing starts per capita. The projected winter peak load per customer  
13 value is multiplied by the total number of customers to derive a preliminary  
14 estimate of the forecasted winter peak.

15 **Q. Is the annual winter peak forecast consistent with the annual summer  
16 peak forecast and net energy for load forecast?**

17 A. Yes. The annual winter peak forecast relies on inputs from the same leading  
18 industry experts utilized in the annual summer peak forecast and net energy  
19 for load forecast. The annual winter peak forecast also uses the same  
20 customer forecast incorporated into the annual summer peak and net energy  
21 for load forecasts. In addition, the annual winter peak forecast incorporates  
22 adjustments for factors also used as line item adjustments in the annual  
23 summer peak and net energy for load forecast. The winter peak forecast is

1 adjusted for wholesale requirements loads, new load resulting from plug-in  
2 electric vehicles, incremental load resulting from FPL's economic  
3 development tariffs, and the impact from new distributed solar generation. In  
4 the case of the winter peak, the impact from new distributed solar is expected  
5 to be minimal due to the timing of the peak.

6 **Q. How are energy efficiency codes and standards treated in the winter peak**  
7 **forecast?**

8 A. ITRON developed estimates of the impact that energy efficiency codes and  
9 standards are likely to have on the winter peak, similar to the estimates  
10 developed for the summer peak. The historical levels of the winter peak are  
11 first increased to remove the historical impact of energy efficiency codes and  
12 standards. The winter peak per customer model is based on these adjusted  
13 historical levels. The future impact from energy efficiency codes and  
14 standards is then treated as a line item adjustment reducing the level of the  
15 winter peak forecast.

16 **Q. Is FPL's winter peak demand forecast based on an econometric model**  
17 **with a strong goodness of fit and a high degree of statistical significance?**

18 A. Yes. FPL's winter peak model has an adjusted R-squared of 95.6%, meaning  
19 that 95.6% of the variability in the winter peak per customer is explained by  
20 the model. This suggests a strong goodness of fit, particularly given that the  
21 winter peak tends to be highly volatile from year to year. In addition, the  
22 coefficients for all of the variables have the expected sign (+/-) and are  
23 statistically significant. This indicates that the variables influencing the

1 winter peak demand have been properly identified and their predicted impact  
2 is statistically sound. Finally, the model has a Durbin-Watson statistic of 2.02  
3 indicating the absence of significant autocorrelation. The absence of  
4 significant autocorrelation is a desirable quality in a well-constructed model.  
5 Overall, the winter peak model has excellent diagnostic statistics.

6 **Q. Are the assumptions incorporated into the annual summer and winter**  
7 **peak forecasts consistent with those used in the total customer and total**  
8 **billed sales forecast?**

9 A. Yes. The specific assumptions regarding the weather, population growth, and  
10 the economy used in the annual summer and winter peak forecasts are  
11 consistent with those used in the total customer and total billed sales forecasts.  
12 As previously discussed, these assumptions are provided by leading industry  
13 experts.

14 **Q. What are FPL's forecasted annual summer and winter peaks?**

15 A. The annual winter peak is projected to reach 20,252 MW in 2016, 21,140 MW  
16 in 2017, and 21,358 MW by 2018. The annual summer peak is projected to  
17 reach 24,170 MW in 2016, 24,336 MW in 2017, and 24,606 MW by 2018.

18 **Q. Are FPL's forecasted annual winter and summer peaks reasonable?**

19 A. Yes. FPL's forecasted annual summer and winter peaks are based on  
20 assumptions developed by industry experts and rely on the forecasting  
21 methods previously reviewed and accepted by the Commission. The models  
22 employed by FPL have a strong goodness of fit and a high degree of statistical  
23 significance. FPL is confident the relationships that exist among the levels of



1 peak demand, the weather, customers, energy efficiency codes and standards,  
2 and other variables have been properly assessed and numerically quantified.  
3 FPL's forecasted annual winter and summer peaks should be approved.

4

5

## VIII. INFLATION FORECAST

6

7 **Q. What measures of inflation does FPL utilize in its budgeting process?**

8 A. FPL utilizes a forecast of the CPI for all goods and services (or overall CPI) as  
9 part of the budgeting process. The same CPI forecast is also used in  
10 computing the Commission's O&M Benchmark.

11 **Q. What has been the cumulative impact of inflation over the last decade as  
12 measured by changes in the overall CPI?**

13 A. Between January 2006 and January 2016, the overall CPI experienced a  
14 cumulative increase of 19.5%. This indicates the level of prices on goods and  
15 services on average rose by 19.5% during this period.

16 **Q. Has the cumulative impact of inflation over the last decade varied by  
17 sector?**

18 A. Yes. Exhibit RM-4 shows that while the overall CPI increased by 19.5%  
19 between January 2006 and January 2016, there was substantial variability by  
20 sector. For example, the CPI for food increased by 28.2% between January  
21 2006 and January 2016. The CPI for medical care increased by 37.9%  
22 between January 2006 and January 2016, while the CPI for  
23 homeowners/renters insurance increased by 27.6% during the same period.

1 By way of comparison, as noted in FPL witness Cohen's testimony, FPL's  
2 typical 1,000-kWh residential customer bill declined by 14% between January  
3 2006 and January 2016.

4 **Q. What has been the trend in the overall CPI in recent years?**

5 A. For the most part, the overall CPI in recent years has increased at a fairly  
6 moderate pace. Between 2010 and 2014 the overall CPI increased at a  
7 compound annual rate of 2.1% a year. Moreover, the annual increases in the  
8 overall CPI during this time were fairly steady, fluctuating between 3.1% and  
9 1.5% a year.

10 **Q. Did the pattern of moderate annual increases in the overall CPI continue**  
11 **in 2015?**

12 A. No. The overall CPI in 2015 was virtually flat, with only a 0.1% increase from  
13 its 2014 level. This abrupt change in what had been a fairly steady rate of  
14 increase was driven by sharp declines in energy prices in 2015.

15 **Q. How did energy prices impact the overall CPI in 2015?**

16 A. The CPI for energy in 2015 was down nearly 17% from the prior year. This  
17 represents the largest decline in the CPI for energy since 2009. This  
18 substantial decline in energy prices helped limit any potential increase in the  
19 overall CPI in 2015.

20

21

1 **Q. Does the fact that the overall CPI in 2015 was virtually unchanged from**  
2 **the prior year suggest the absence of any inflationary pressures going**  
3 **forward?**

4 A. No. Data on the core CPI, which excludes the volatile energy and food  
5 sectors, indicate that inflationary pressures remain moderately positive.  
6 Because it excludes the volatile energy and food sectors, the core CPI is  
7 sometimes used as a measure of the underlying rate of inflation. The core CPI  
8 increased moderately in 2015 with a 1.8% gain compared to its 2014 level.  
9 The increase in the core CPI in 2015 is comparable to the increases  
10 experienced from 2011 to 2014. Moreover, the core CPI in January 2016 was  
11 up 2.2% from the prior year. Thus, the core CPI data continue to confirm a  
12 pattern of moderately positive inflationary pressures.

13 **Q. What is the basis for FPL's forecast for the overall CPI?**

14 A. FPL relies on industry expert IHS Global Insight as the source for its CPI  
15 forecast. In addition, FPL reviews the forecasts developed by other sources  
16 and considers historical trends in order to assess the reasonableness of IHS  
17 Global Insight's forecast.

18 **Q. Does IHS Global Insight anticipate a continuation of the large declines in**  
19 **energy prices experienced in 2015?**

20 A. No. IHS Global Insight is projecting that the CPI for energy will stabilize in  
21 2016 and that the longer-term trend between 2015 and 2020 is one of positive  
22 increase. This suggests that while energy prices will remain low relative to

1 their historical highs, an eventual increase in energy prices can be expected  
2 following their sharp declines in 2015.

3 **Q. What is FPL's forecast of the overall CPI for 2016 and 2017?**

4 A. Based on projections provided by IHS Global Insight, FPL is forecasting an  
5 increase in the overall CPI of 2.0% and 2.5% in 2016 and 2017, respectively.

6 The forecasted increases in overall CPI are consistent with the consensus view  
7 that a moderately positive rate of inflation can be expected for the next few  
8 years. Contributing to this consensus view is the expectation that energy  
9 prices should eventually stabilize following their sharp declines in 2015.

10 **Q. What is FPL's longer term forecast of the overall CPI?**

11 A. Consistent with a forecast of relatively moderate inflation, FPL is projecting  
12 an average annual increase in the overall CPI of 2.5% between 2015 and  
13 2020. More specifically, FPL is forecasting a 2.6% increase in the overall  
14 CPI in 2018, followed by a 2.5% increase in 2019 and a 2.7% increase in  
15 2020.

16 **Q. What cumulative increase in the overall CPI is FPL forecasting?**

17 A. By 2017, FPL is projecting a cumulative 6.3% increase in the overall CPI  
18 relative to its 2013 level. By 2020, the cumulative increase in the overall CPI  
19 from 2013 is expected to rise to 14.9%.

20 **Q. How does FPL's forecast of the overall CPI compare with the historical  
21 rate of inflation?**

22 A. FPL's forecast of the overall CPI is comparable to the long-term average rate  
23 of inflation. The overall CPI is forecasted to increase at a compound annual

1 rate of 2.5% between 2015 and 2020, the same rate experienced on average  
2 since the 1990s and up modestly from the 2.1% compound annual rate  
3 averaged between 2010 and 2014.

4 **Q. How does FPL's forecast of the overall CPI compare with inflation  
5 projections developed by other experts?**

6 A. FPL's forecast of the overall CPI is consistent with the inflation projections  
7 developed by other experts, including the Philadelphia Federal Reserve Banks  
8 Survey of Professional Forecasters and the National Association for Business  
9 Economics.

10 **Q. Is FPL's forecast of the overall CPI reasonable?**

11 A. Yes. FPL's forecast of the overall CPI is based on forecasts developed by  
12 IHS Global Insight, a leading economic forecasting firm. FPL's CPI forecast  
13 is also consistent with projections developed by other professional forecasters.  
14 The projected increases in FPL's CPI forecast are reasonable given long-term  
15 historical trends, expectations regarding energy prices, and the underlying rate  
16 of inflation recently experienced.

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

18 A. Yes.

**Florida Power and Light Company**

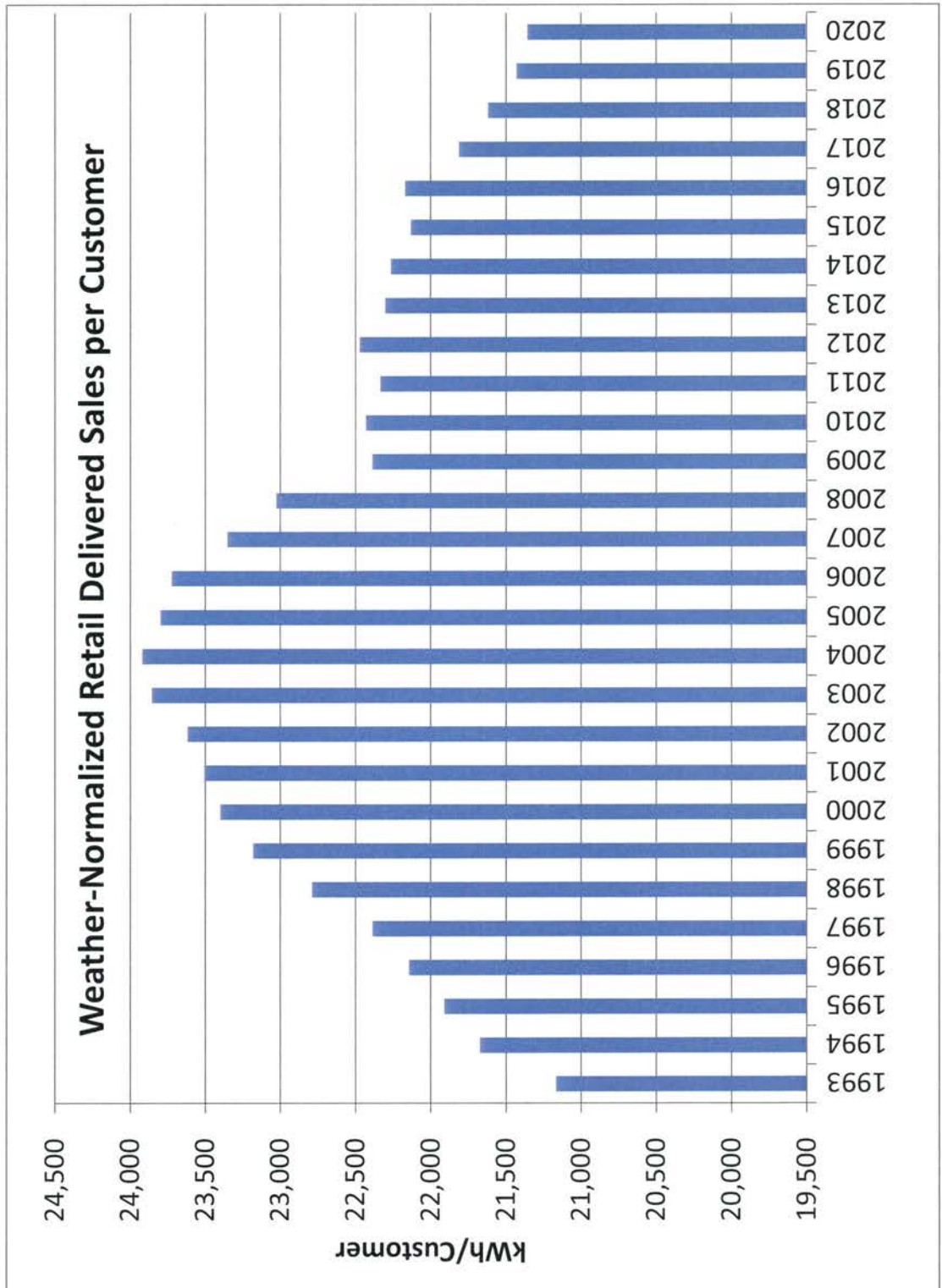
**MFRs AND SCHEDULES SPONSORED AND CO-SPONSORED BY ROSEMARY MORLEY**

<b>SOLE SPONSOR:</b>		
C-40	Historic Prior Test Subsequent Year Adjustment	O & M COMPOUND MULTIPLIER CALCULATION
E-18	Historic Prior Test Subsequent Year Adjustment	MONTHLY PEAKS
F-06	Test Subsequent Year Adjustment	FORECASTING MODELS - SENSITIVITY OF OUTPUT TO CHANGES IN INPUT DATA
F-07	Test Subsequent Year Adjustment	FORECASTING MODELS - HISTORICAL DATA
<b>CO-SPONSOR:</b>		
C-12	Historic Test Subsequent Year Adjustment	ADMINISTRATIVE EXPENSES
C-14	Historic Test Subsequent Year Adjustment	ADVERTISING EXPENSES
C-33	Historic Prior Test Subsequent Year Adjustment	PERFORMANCE INDICES
C-34	Historic Subsequent Year Adjustment	STATISTICAL INFORMATION
C-35	Historic Prior Test Subsequent Year Adjustment	PAYROLL AND FRINGE BENEFIT INCREASES COMPARED TO CPI
C-36	Historic Prior Test Subsequent Year Adjustment	NON-FUEL OPERATION AND MAINTENANCE EXPENSE COMPARED TO CPI
C-37	Test Subsequent Year Adjustment	O&M BENCHMARK COMPARISON BY FUNCTION
E-09	Test Subsequent Year Adjustment	COST OF SERVICE - LOAD DATA

**Florida Power and Light Company**

**MFRs AND SCHEDULES SPONSORED AND CO-SPONSORED BY ROSEMARY MORLEY**

E-11	Test Subsequent Year Adjustment	DEVELOPMENT OF COINCIDENT AND NON COINCIDENT DEMANDS FOR COST STUDY
E-12	Test Subsequent Year Adjustment	ADJUSTMENT TO TEST YEAR REVENUE
E-15	Test Subsequent Year Adjustment	PROJECTED BILLING DETERMINANTS - DERIVATION
E-16	Prior Test Subsequent Year Adjustment	CUSTOMERS BY VOLTAGE LEVEL
E-19a	Test Subsequent Year Adjustment	DEMAND AND ENERGY LOSSES
E-19b	Test Subsequent Year Adjustment	ENERGY LOSSES
E-19c	Test Subsequent Year Adjustment	DEMAND LOSSES
F-05	Test Subsequent Year Adjustment	FORECASTING MODELS
F-08	Test Subsequent Year Adjustment	ASSUMPTIONS





**Summary of FPL's Historical and Forecasted Sales**

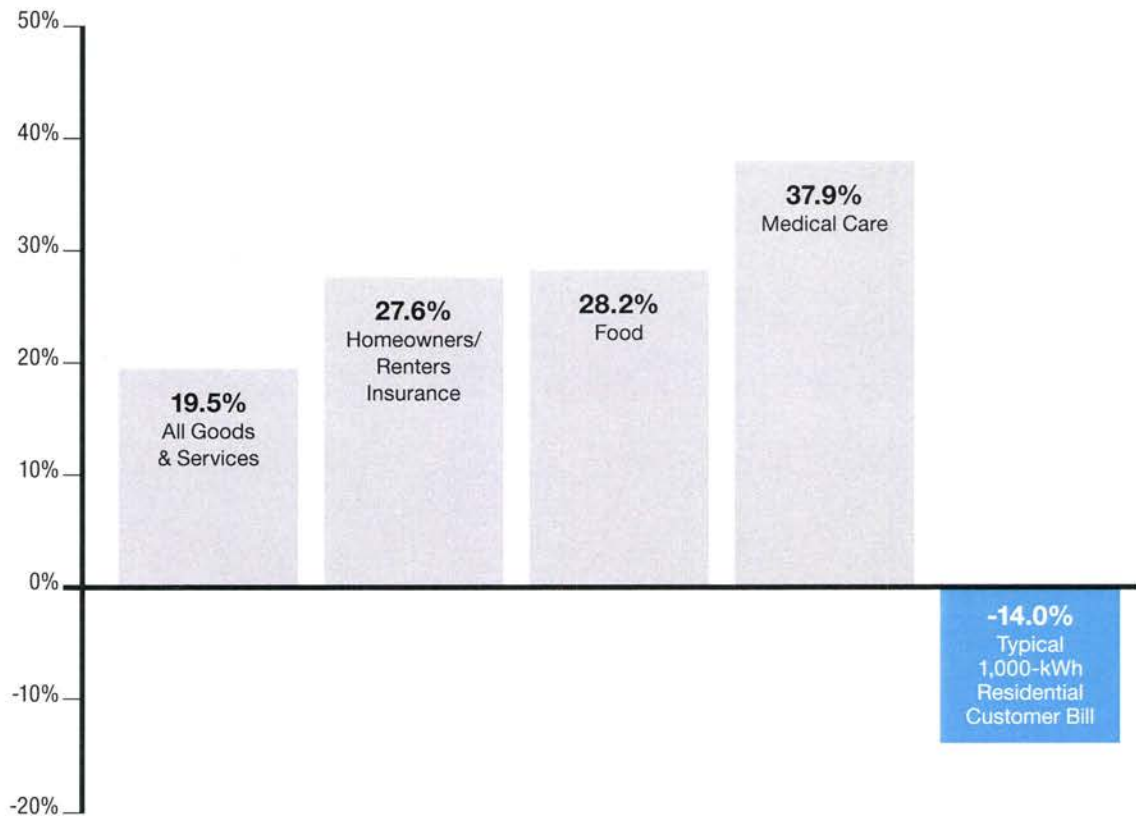
		MWh									
		Retail Billed Sales									
		Net Energy for	Retail Delivered				Street &	Railroads &			
	Customers	Load	Sales	Residential	Commercial	Industrial	Highway	Railways	Other	Total	
WN ACTUALS	2006	4,409,563	114,462,762	104,614,536	55,305,822	44,712,366	4,037,248	421,744	93,763	49,319	104,620,262
WN ACTUALS	2007	4,496,589	114,225,713	105,013,791	55,531,823	45,785,417	3,774,578	436,892	91,442	52,813	105,672,964
WN ACTUALS	2008	4,509,730	112,298,237	103,860,476	54,294,505	45,563,409	3,587,960	422,854	81,095	37,394	103,987,217
WN ACTUALS	2009	4,499,067	109,055,355	100,734,123	52,780,660	44,592,023	3,243,139	421,698	79,928	33,846	101,151,293
WN ACTUALS	2010	4,520,328	110,704,589	101,400,074	52,479,109	44,202,186	3,127,756	430,802	81,325	27,620	100,348,799
WN ACTUALS	2011	4,547,051	109,467,257	101,569,361	52,959,866	44,547,490	3,084,417	437,470	81,936	27,129	101,138,307
WN ACTUALS	2012	4,576,449	111,635,607	102,853,385	54,492,331	45,280,555	3,024,260	441,330	80,598	25,362	103,344,437
WN ACTUALS	2013	4,626,934	111,806,187	103,198,402	54,472,918	45,318,352	2,956,005	441,529	87,847	27,630	103,304,281
WN ACTUALS	2014	4,708,829	116,402,559	104,849,040	55,792,253	45,658,798	2,941,269	445,947	91,405	24,052	104,953,724
WN ACTUALS	2015	4,775,382	117,907,706	105,704,055	56,955,541	46,449,670	3,039,120	448,137	91,781	23,380	107,007,630
FORECAST	2016	4,845,390	119,624,760	107,428,768	57,230,468	46,377,965	3,173,057	477,951	91,274	23,297	107,374,013
FORECAST	2017	4,917,036	118,831,903	107,261,283	57,025,197	46,363,406	3,255,349	488,393	91,208	22,924	107,246,477
FORECAST	2018	4,989,889	119,562,964	107,887,888	57,392,486	46,533,891	3,319,445	498,758	91,241	23,056	107,858,876
FORECAST	2019	5,062,605	120,277,084	108,496,611	57,761,470	46,718,870	3,368,402	509,044	91,225	22,936	108,471,946
FORECAST	2020	5,134,692	121,585,153	109,670,195	58,471,043	47,119,132	3,406,861	519,254	91,233	22,942	109,630,464
CAGR 2006-2015		0.9%	0.3%	0.1%	0.3%	0.4%	-3.1%	0.7%	-0.2%	-8.0%	0.3%
CAGR 2015-2020		1.5%	0.6%	0.7%	0.5%	0.3%	2.3%	3.0%	-0.1%	-0.4%	0.5%

Weather-normalized (WN)



## Change in Typical Bill vs. Other Consumer Costs

Percent Change January 2006 to January 2016



Over the last ten years, the average cost for goods and services has increased by nearly 20%, while FPL's typical residential customer bill has decreased by 14%.