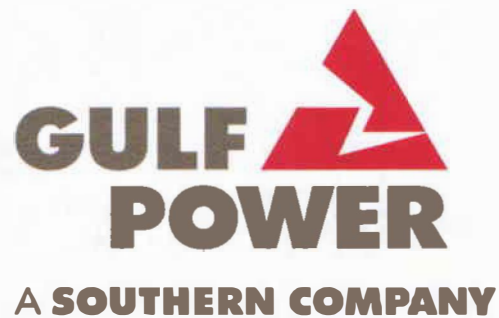


**BEFORE THE  
FLORIDA PUBLIC SERVICE COMMISSION**

**DOCKET NO. 130140-EI**



**TESTIMONY AND EXHIBIT  
OF  
RHONDA J. ALEXANDER**

1 GULF POWER COMPANY

2 Before the Florida Public Service Commission  
3 Prepared Direct Testimony of  
4 Rhonda J. Alexander  
5 Docket No. 130140-EI  
6 In Support of Rate Relief  
7 Date of Filing: July 12, 2013

8 Q. Please state your name and business address.

9 A. My name is Rhonda Alexander. My business address is One Energy Place,  
10 Pensacola Florida, 32520.

11 Q. By whom are you employed?

12 A. I am employed by Gulf Power Company (Gulf or the Company). I serve as  
13 Gulf's Supervisor of Forecasting.

14 Q. What are your responsibilities as Gulf's Supervisor of Forecasting?

15 A. As Supervisor of Forecasting, I am responsible for leading a team of  
16 analysts to produce Gulf's forecast of customers, energy sales, peak  
17 demand, and base revenue. In this role, I direct and review the forecast  
18 each year as it is developed from beginning to end, provide guidance to the  
19 forecast team at important decision points, direct forecast-related analyses  
20 and process improvements, brief executive management on forecast  
21 development progress, and oversee workflow and staffing.

22 Q. Please state your prior work experience and responsibilities.

23 A. In 1994, I began my career with Gulf as an accountant and advanced to the  
24 position of Team Leader of Corporate Accounting in which I was  
25

1 primarily responsible for the Company's monthly closing and reporting of  
2 financial data. Subsequently, I served as the Supervisor of Financial  
3 Planning for four years and managed the development of the Company's  
4 financial forecast and performed as needed financial and economic project  
5 analyses. In 2006, I became the Supervisor of Rates and Regulatory  
6 Matters where I served as the Company's financial witness in the  
7 environmental, fuel, and capacity clause dockets and was responsible for  
8 tariff administration, cost-of-service activities, calculation of cost recovery  
9 factors, and the regulatory filing function. From 2008 through 2010, I served  
10 as Gulf's Nuclear Development Manager and coordinated Gulf's efforts to  
11 investigate a potential nuclear site and to begin the processes for licensing  
12 and permitting a potential nuclear plant. I have been in my current role  
13 since 2010.

14  
15 Q. What is your educational background?

16 A. I graduated from the University of West Florida in Pensacola, Florida in  
17 1994 with a Bachelor of Arts Degree in Accounting. I am also a licensed  
18 Certified Public Accountant.

19  
20 Q. What is the purpose of your testimony?

21 A. My testimony presents Gulf's forecast methodologies and forecast results  
22 for customers, energy sales, peak demand and base rate revenue. The  
23 forecast is provided to Corporate Planning for use in the budgeting and  
24 planning process as discussed by Gulf Witness Ritenour.

25

1 Q. Are you sponsoring any exhibits?

2 A. Yes, I am sponsoring Exhibit RJA-1, Schedules 1 through 5. Exhibit RJA-1  
3 was prepared under my direction and control, and the information contained  
4 therein is true and correct to the best of my knowledge and belief.

5

6 Q. Are you sponsoring any of the Minimum Filing Requirements (MFRs) filed  
7 by Gulf?

8 A. Yes. The MFRs I sponsor or co-sponsor are listed in Schedule 1 of my  
9 exhibit. The information contained in the MFRs I sponsor or co-sponsor is  
10 true and correct to the best of my knowledge and belief.

11

12

13

## I. OVERVIEW

14

### **Overview of Economic Conditions and Historical Sales Growth**

15  
16 Q. Please describe the economic conditions for Gulf's service area.

17 A. Gulf's retail service area covers eight counties in Northwest Florida: Bay,  
18 Escambia, Holmes, Jackson, Okaloosa, Santa Rosa, Walton, and  
19 Washington. Our service area is generally represented by three  
20 Metropolitan Statistical Areas (MSAs): Pensacola-Ferry Pass-Brent,  
21 Crestview-Fort Walton Beach-Destin, and Panama City-Lynn Haven-  
22 Panama City Beach.

23

24 Like the rest of the country and state, Gulf's service area experienced the  
25 effects of the most recent nationwide recession. Often referred to as the

1 "Great Recession," this was the worst national economic and financial crisis  
2 since the Great Depression of the 1930s. The effects of the Great  
3 Recession were felt in Gulf's service area well before the nationwide  
4 downturn and have lingered beyond the official end date of the national  
5 recession. A number of economic indicators for Gulf's service area, namely  
6 income, employment, housing starts and population, were in decline at the  
7 end of 2006 or beginning of 2007 and either continued to decline or  
8 remained weak through 2012. Although many economists believed that the  
9 low point of the recession had been reached in 2010 and recovery would  
10 begin in 2011, the effects of the Great Recession continued through 2012 in  
11 Gulf's service area.

12

13 Q. How did the recent recession impact Gulf's customer growth?

14 A. Gulf's customer growth dropped dramatically after 2007. Since 2007, Gulf's  
15 retail customer base has grown at a compound annual growth rate (CAGR)  
16 of only 0.3 percent, which compares to 2.1 percent growth prior to the  
17 recession.

18

19 Q. During the recent recession, did Gulf experience a change in the amount of  
20 energy consumed by Gulf's customers?

21 A. Yes. Another result of the economic downturn in Gulf's service area was a  
22 decline in average kilowatt hour (kWh) use per residential and commercial  
23 customer. Since 2006, average residential and commercial kWh use per  
24 customer has declined on a cumulative basis almost 10 percent and 0.3  
25 percent, respectively. This compares to cumulative growth in average

1 residential and commercial kWh use per customer for the 6 years prior to  
2 the recession of 2.8 percent and 1.1 percent, respectively.

3

4 Q. Please discuss Gulf's recent historical sales experience.

5 A. Gulf has experienced a decline in retail sales in every year but one since  
6 2007. Retail sales peaked in 2006 prior to the recession and declined at a  
7 CAGR of 0.9 percent for the period 2007 to 2012.

8

9 Q. How did the energy sales forecast used in Gulf's last base rate proceeding  
10 compare to actual results?

11 A. For the 2012 test year used in Gulf's last base rate proceeding, Gulf over-  
12 forecast retail energy sales by 8.4 percent, resulting in actual retail base  
13 revenue being \$32.5 million less than forecasted. (Over-forecast means  
14 Gulf forecast more energy than our customers actually purchased during  
15 that time). For the prior year of 2011, Gulf over-forecast retail energy sales  
16 by 4.5 percent.

17

18 Q. What caused the shortfall in actual retail energy sales for 2011 and 2012  
19 compared to the forecast used in the Company's last base rate proceeding?

20 A. The effects of the Great Recession continued through 2012 in the nation  
21 and in Gulf's service area, whereas the forecast had assumed that recovery  
22 would begin in 2011. During 2010 and the first half of 2011, many  
23 economists had projected recovery during 2011 and 2012. As shown on  
24 Schedule 2 of my exhibit, Moody's Analytics and the Federal Reserve  
25 Federal Open Market Committee's (FOMC) projections of U.S. real gross

1 domestic product (GDP) growth released through the first half of 2011 for  
2 the 2011 and 2012 period were strong based on the expectation that the  
3 economy would recover from the recession. However, economic  
4 projections for this period changed significantly in the third quarter of 2011  
5 primarily due to the U.S. debt ceiling crisis and the European sovereign debt  
6 crisis, along with greater economic policy uncertainty. Actual growth in U.S.  
7 real GDP for the 2011 to 2012 period turned out to be even lower than  
8 revised projections, reflecting a stalled recovery from the recession. In  
9 short, between the time Gulf's forecast was developed and the last base  
10 rate case concluded, intervening events impacted the economy that were  
11 not anticipated or reasonably foreseeable in the forecast.

12

13 Q. What was the source of economic variables used by Gulf in its last base  
14 rate case?

15 A. Gulf's source of economic variables used in its forecast for its last base rate  
16 case was Moody's Analytics, a well-respected economic forecasting firm  
17 which has supplied data to Gulf for over 15 years. Gulf used the May 2010  
18 vintage of Moody's economic projections in the forecast for its 2012 test  
19 year, which was the most recent data available at the time the forecast was  
20 developed.

21

22 As shown on Schedule 2 of my exhibit, Moody's projections of U.S. real  
23 GDP growth for the 2011 to 2012 period, which were released during 2010  
24 and 2011, were in line with the Federal Reserve FOMC's Central Tendency  
25 projections. However, actual results were much weaker than Moody's

1 projections and projections made by other economists, including the  
2 Federal Reserve FOMC, due to continued effects of the recession.  
3 Although Gulf's service area saw some economic growth during 2011,  
4 recovery stalled during 2012.

5  
6 Q. How does Gulf's historical forecast accuracy for total energy sales compare  
7 to other utilities in Florida?

8 A. Gulf's historical forecast accuracy compares favorably to other utilities in  
9 Florida. In the Florida Public Service Commission's (FPSC or the  
10 Commission) "Review of the 2012 Ten-Year Site Plans for Florida's Electric  
11 Utilities" issued in December 2012, the Commission presents the historical  
12 forecast accuracy of total energy sales for each utility filing a Ten Year Site  
13 Plan (TYSP) for the five-year period 2007 to 2011. The FPSC report states,  
14 Analysis of Gulf's historic forecast accuracy for total retail energy  
15 sales from 2007 through 2011 shows that Gulf's average forecast  
16 error is 5.44 percent. This value indicates that the company tends to  
17 over-forecast its retail energy sales by 5.44 percent, the lowest of the  
18 TYSP utilities. Gulf's forecast error is favorable when compared to  
19 the average forecast error for all eleven of the TYSP utilities, which  
20 was 11.38 percent in 2012.

21 The Commission's report recognized that the high error rate for the TYSP  
22 utilities represents the impact of the recession on energy usage in Florida.



1           **Economic Outlook and Sales Growth Expectations**

2    Q.    Please describe the economic outlook for Gulf's service area used to  
3           develop this forecast.

4    A.    Moody's projects that the economy in our service area will begin recovery in  
5           2013 and will return to or exceed 2006 pre-recession levels by the end of  
6           2015. This outlook is presented in Moody's November 2012 economic  
7           projections, which was the most recent data available to Gulf at the time the  
8           forecast used in this rate case was developed.

9

10   Q.    Please discuss Gulf's sales growth expectations.

11   A.    Retail sales are expected to grow at a CAGR of 1.4 percent over the next  
12           two years. This forecasted growth in retail sales compares to a CAGR of  
13           0.3 percent for the last 2 years and -0.9 percent over the last 6 years.

14

15   Q.    Is there a risk that Gulf's actual sales over the next two years might differ  
16           from Gulf's forecast for the same period?

17   A.    Yes. There is always an element of risk in forecasting. Economic  
18           uncertainty contributes greatly to risk in forecasting energy sales. In fact,  
19           given the prolonged recessionary effects and the continued uncertainty  
20           surrounding economic recovery nationally and regionally, the risk  
21           associated with economic uncertainty is higher now than has historically  
22           been the case. But despite the challenging economic conditions  
23           experienced over the past several years, Gulf is confident that our forecast  
24           methodology is fundamentally sound and is the most accurate tool available  
25           for forecasting the Company's future energy sales.

1           **Overview of Forecast Methodology**

2    Q.    Please provide an overview of Gulf's forecast methodology.

3    A.    Each year, Gulf produces a new forecast. Gulf starts with a projection of  
4           the number of customers it expects to add in each customer class. Next,  
5           Gulf estimates how much energy these customers will use under normal  
6           weather conditions. For customers on demand rates, Gulf then estimates  
7           monthly billing demands. Finally, the base charge, energy charge, and  
8           demand charge from the appropriate rate schedules are applied to the  
9           number of customers, monthly energy and monthly billing demands to  
10          estimate base rate revenue. Gulf also forecasts total Company peak  
11          demand using total energy projections and historical relationships between  
12          energy and demand. This same methodology has been used by Gulf to  
13          develop the forecast for almost 20 years. Minor refinements in the  
14          methodology have been made over those years, but the fundamental  
15          methods have remained unchanged and continue to produce reliable  
16          forecasts. Refinements in the forecast methodology made since Gulf's last  
17          base rate case are described in my testimony below.

18

19   Q    Has the previously described forecast methodology for customers, energy,  
20          peak demand and base revenue been used by Gulf in its regular course of  
21          business?

22   A.    Yes. Gulf produces a forecast annually using this same methodology. The  
23          annual forecast is routinely utilized for business planning and operations.  
24          This forecast is used by the Company for financial planning; budgeting;

25

1 generation, distribution and transmission planning; and fuel procurement  
2 planning.

3

4 Q. Has the previously described forecast methodology for customers, energy,  
5 peak demand and base revenue been used by Gulf in other proceedings or  
6 filings where the Commission has accepted, approved or relied upon Gulf's  
7 forecast?

8 A. Yes. This forecast methodology was used by Gulf in its last base rate  
9 proceeding and was stipulated to by the parties and approved by the  
10 Commission. This methodology has also been used by the Company over  
11 the years for various purposes including: Ten Year Site Plan filings; need  
12 determination proceedings; Renewable Standard Offer Contract filings; and  
13 annual cost recovery filings for Gulf's clauses.

14

15

16

## II. GULF'S CUSTOMER FORECAST

17

18 Q. What are the 2014 results of Gulf's customer forecast?

19 A. Gulf projects that it will have a total of 445,187 retail customers by  
20 December 2014, an increase of 5,577 customers over projections for  
21 December 2013. This represents an anticipated annual growth rate of  
22 1.3 percent for the test year. By comparison, historical growth rates of 0.1  
23 percent, 0.6 percent, 0.4 percent and 0.5 percent were experienced in 2009,  
24 2010, 2011 and 2012, respectively. Current projections for year-end 2013  
25 indicate an annual growth rate of 1.2 percent.

1 Q. How were Gulf's forecasts of customers and customer growth for 2013 and  
2 2014 developed?

3 A. The short-term forecasts of residential, commercial and industrial non-  
4 lighting customers were based primarily on input from Gulf's field Marketing  
5 Managers with the assistance of their field employees. These field  
6 managers and their employees have frequent and consistent interaction  
7 with our customers as part of their daily job tasks. The three managers'  
8 combined direct experience with Gulf's customers and markets exceeds  
9 three quarters of a century. The projections prepared by these managers  
10 reflect recent historical trends in net customer gains as well as anticipated  
11 effects of changes in the local economy, the real estate market, planned  
12 construction projects, and factors affecting population such as military  
13 personnel movements and changes in local industrial production.

14  
15 Forecasters supplied field managers with historical customer gains by rate  
16 schedule and summary economic outlooks for the appropriate MSA. After  
17 collecting initial input from field managers, forecasters reviewed the one-  
18 year-out customer projections by rate schedule, checking for consistency  
19 with historical trends, consistency with economic outlooks, and consistency  
20 across MSAs. Forecasters then supplied field managers with draft second-  
21 year-out customer projections based on number of households from  
22 Moody's, which the field managers reviewed and modified as necessary. In  
23 this iterative process, forecasters and field managers reviewed the  
24 projections until all were satisfied that the projections reflected an unbiased,  
25 most-likely estimate.

1           The strength of the short-term customer projection methodology, which Gulf  
2           has employed for more than 30 years, is that information is gathered at the  
3           district level and built up to total company. Because Gulf is a relatively  
4           small company, it can manage such a localized process without needing to  
5           rely primarily on macro-economic projections to estimate residential and  
6           commercial customer growth in the short term.

7

8           Gulf projected the number of outdoor lighting customers by rate and class  
9           based on historical growth rates and input from Gulf's lighting team to gain  
10          insight into future trends.

11

12    Q.    Is this the same forecast methodology for customers and customer growth  
13          that Gulf used and the Commission accepted in Gulf's last base rate  
14          proceeding?

15    A.    Yes.

16

17    Q.    Has this forecast methodology provided reliable forecasts of customers in  
18          the past?

19    A.    Yes. Over the four-year period ending 2006, prior to the recession, Gulf  
20          minimally over-forecast the residential customer count one year out and two  
21          years out by 0.5 percent and 0.4 percent, respectively. (Over-forecast  
22          means Gulf forecast more customers than we actually gained over that time  
23          period). During the six-year period since 2006, Gulf slightly over-forecast  
24          the residential customer count one year out and two years out by 0.6  
25          percent and 1.6 percent, respectively.

1           The commercial class is smaller and more diverse than the residential  
2           class, which makes projections more difficult. During the four-year period  
3           ending 2006, prior to the recession, Gulf slightly over-forecast the  
4           commercial customer count one year out and two years out by 0.9 percent  
5           and 1.0 percent, respectively. During the six-year period since 2006, Gulf  
6           over-forecast the commercial customer count one year out and two years  
7           out by 1.3 percent and 3.6 percent, respectively.

8

9    **Q.**    How did the forecast of residential and commercial customers used in Gulf's  
10           last base rate proceeding compare to actual results?

11   **A.**    Gulf's forecast of residential and commercial customers in the last base rate  
12           proceeding was very accurate. For residential, Gulf minimally under-  
13           forecast the customer count one year out by 0.1 percent for 2011, and  
14           minimally over-forecast the customer count two years out by 0.3 percent for  
15           2012. For commercial, Gulf minimally over-forecast the customer count one  
16           year out by 0.8 percent for 2011, and slightly over-forecast the customer  
17           count two years out by 1.5 percent for 2012.

18

19           Gulf's customer forecast methodology, which relies on the experience and  
20           knowledge of our field managers and their employees, has produced  
21           reliable, accurate results, even during the recent recession.

22

23   **Q.**    How accurate have the residential and commercial customer forecasts  
24           which have been proposed for use in this proceeding been?

25   **A.**    Over the seven months of the forecast period for which we have actual data

1 to compare to the forecast (November 2012 through May 2013), residential  
2 customers were minimally over-forecast by 0.1 percent. Our forecast of  
3 commercial customers was on target.  
4  
5

### 6 III. GULF'S ENERGY SALES FORECAST

7

#### 8 Overall Retail Energy Sales Forecast

9 Q. What are the 2014 results of Gulf's retail energy sales forecast?

10 A. Retail energy sales are expected to total 11,154,278 megawatt hours in the  
11 test year, representing an increase of 0.6 percent over projections for the  
12 twelve months ending in December 2013. This growth is being driven by  
13 projected sales to new customers and the anticipated economic recovery  
14 from the recession, which is expected to begin in 2013.  
15

16 The retail megawatt hour (MWh) sales forecast by class consists of the  
17 following:

18 Residential: 5,285,608 MWh, comprising 47.4 percent;

19 Commercial: 4,109,438 MWh, comprising 36.8 percent;

20 Industrial: 1,733,618 MWh, comprising 15.5 percent; and

21 Street Lighting: 25,614 MWh, comprising 0.3 percent.  
22

23 Q. Please provide a brief overview of the methodology Gulf used to develop its  
24 retail energy sales forecast.

25 A. Gulf used three multiple linear regression models to estimate residential and

1 commercial non-lighting energy sales, one for residential and two for  
2 commercial. For forecasting purposes, the commercial class was split into  
3 two groups (small and large).

4  
5 The primary independent variables used in the models are twelve month  
6 moving average electricity price, real disposable income per household for  
7 the residential model, and non-manufacturing employment for the  
8 commercial models. Historical and projected data for these independent  
9 variables are incorporated into the models to capture how customers  
10 behave in response to changes in these variables. Typically when price  
11 goes up, customers use less energy, and when price goes down, customers  
12 use more energy. Typically when income and employment go up,  
13 customers use more energy, and when they go down, customers use less  
14 energy.

15  
16 Each regression model estimated energy use per customer per day on a  
17 billing cycle basis. Multiplying use per customer per day by the appropriate  
18 number of billing cycle days in a month and the number of customers  
19 produced total energy. The impacts of demand-side management (DSM)  
20 efforts and electric vehicle (EV) charging were then incorporated. The  
21 resulting energy projection was then adjusted for unbilled sales to yield  
22 calendar month projections.

23  
24 As is standard industry practice, Gulf's residential and commercial energy  
25 forecasts assumed normal weather conditions for future projections.



1 Likewise, forecast accuracy calculations compared these normal weather  
2 forecasts of energy sales to weather-normalized actual energy sales.

3

4 The forecast of sales to small industrial customers was produced in a  
5 similar manner using historical growth rates rather than a regression model.  
6 Projections of sales to the largest industrial customers were based on field  
7 surveys. Outdoor lighting energy sales were projected by rate and class  
8 using historical growth rates and input from Gulf's lighting team. My  
9 testimony below further describes Gulf's retail energy sales forecast  
10 methodology.

11

12 **Residential Energy Sales Forecast**

13 Q. How was Gulf's forecast of 2014 residential energy sales developed?

14 A. The short-term, non-lighting residential energy sales forecast was  
15 developed using a multiple linear regression model.

16

17 Q. What variables were employed by Gulf in the regression model used to  
18 develop the residential energy sales forecast?

19 A. The dependent variable, the quantity being estimated, in the residential  
20 energy regression equation was monthly billing cycle energy per customer  
21 per billing day. The regression included a constant term and 20 years of  
22 historical data for the following variables: billing cycle residential cooling  
23 degree hours per billing day for the months March through December;  
24 billing cycle residential heating degree hours per billing day for the months  
25 November through April; twelve month moving average of real residential

1 electricity price (decline and increase indices); and real disposable income  
2 per household. Also included in the model was an indicator variable for the  
3 month of September 2004 to account for the impact of Hurricane Ivan, one  
4 indicator variable for the months of August 2012 and September 2012 to  
5 account for the impact of Hurricane Isaac, an autoregressive term lagged  
6 one month to address first-order residual autocorrelation over time and one  
7 indicator variable for the combined months of June 2008, July 2008, and  
8 August 2008 to address residuals in those months. These variables were  
9 carefully chosen to make the model both simple and statistically robust.  
10 Variables were required to have a logical connection to residential electricity  
11 sales, substantial data history, dependable projections of future values,  
12 limited overlap with other variables (i.e. limited multicollinearity), and good  
13 statistical significance (i.e. low p-value).

14  
15 Page 1 of Schedule 3 of my exhibit is a graph comparing the residential  
16 regression model's predicted values with actual historical data. It shows  
17 how well the model's output "fits" history. Page 2 of Schedule 3 of my  
18 exhibit is a list of statistics associated with the residential regression model.

19  
20 Q. Please describe the primary statistical tests Gulf used to evaluate each  
21 regression model for reasonableness.

22 A. Time series multiple linear regression models and their components are  
23 typically evaluated for reasonableness using the following statistics: p-value,  
24 adjusted R-squared, and the Durbin-Watson d-statistic. Standard statistical  
25 software packages routinely provide these statistics as part of their output.

1 A p-value is computed for each independent variable in a regression model  
2 indicating the level of statistical significance of that variable. The p-value  
3 can range from 0 to 100 percent. A low p-value indicates a desired result,  
4 meaning that the variable is statistically significant.

5  
6 An adjusted R-squared value, also called a “goodness of fit” test, is  
7 calculated for each regression model. A model is considered a “good fit” if  
8 its adjusted R-squared is high. R-squared values range from 0 to 100  
9 percent. A regression model that fits the historical data perfectly would  
10 have an R-squared value of 100 percent.

11  
12 The Durbin-Watson d-statistic is calculated for each regression model. The  
13 calculation results in a number ranging in value between zero and four. A  
14 d-statistic value near two indicates a desired result and implies no  
15 autocorrelation in the regression model residuals, i.e. residuals in one time  
16 period are not related to residuals in the previous time period.

17

18 Q. What statistical results did Gulf attain with the residential regression model?

19 A. As presented on page 2 of Schedule 3 of my exhibit, all variables used in  
20 the residential regression model were statistically significant (p-values were  
21 low) and each coefficient had the expected sign. The model’s adjusted R-  
22 squared was 98.5 percent, indicating that all but 1.5 percent of the variance  
23 in the historical data was explained by the model. The model’s Durbin-  
24 Watson d-statistic was 2.09, indicating no significant autocorrelation in the  
25 residuals. Overall, these are excellent statistical results.

1 Q. What data sources were employed for the economic variables used in Gulf's  
2 residential regression model?

3 A. Historical values and forecast projections of the economic variables "real  
4 disposable income per household" and "GDP price deflator" were  
5 purchased from Moody's Analytics. Gulf used the November 2012 vintage  
6 of Moody's economic projections, which was the most recent data available  
7 at the time the forecast was developed.

8

9 Q. How was the number of cycle billing days per month determined?

10 A. Gulf's customers are divided among 21 bill groups. Each bill group has a  
11 different scheduled read date, which varies from month to month and is  
12 staggered from bill group to bill group. Monthly cycle billing days were  
13 calculated as follows. For a given month, the number of billing days in a bill  
14 group was the sum of the days from the day after the prior month's  
15 scheduled read date through the current month's scheduled read date.  
16 These summed days for each of the 21 bill groups were then totaled and  
17 divided by 21 to get the month's cycle billing days.

18

19 Q. How was historical residential weather calculated?

20 A. Cooling and heating degree hours were calculated using the National  
21 Oceanic and Atmospheric Administration's (NOAA) Pensacola weather  
22 station's hourly temperatures. Residential cooling degree hours are the  
23 result of taking the number of degrees Fahrenheit that each hourly  
24 temperature is above a 67 degree baseline, and summing over a given time  
25 period. Residential heating degree hours are the result of taking the

1 number of degrees Fahrenheit that each hourly temperature is below a 59  
2 degree baseline, and summing over a given time period. These residential  
3 cooling and heating degree hour temperature baselines reflect the observed  
4 correlation between hourly temperatures and hourly energy purchases by  
5 Gulf's residential customers. Gulf did an analysis during 2012 to refine the  
6 baseline temperatures used to calculate degree hours to be more reflective  
7 of actual energy sales response to temperatures experienced over the most  
8 recent 20 years.

9  
10 Monthly billing cycle residential weather was calculated as follows. For  
11 each bill group, the total residential cooling (heating) degree hours were  
12 summed over the period from the day after the prior month's scheduled read  
13 date through the current month's scheduled read date. These summed  
14 residential cooling (heating) degree hours for each of the 21 bill groups  
15 were then totaled and divided by 21 to get the monthly billing cycle  
16 residential cooling (heating) degree hours.

17  
18 Q. Given the strong dependence of residential energy use on weather, what  
19 weather forecast was used in the residential energy projection?

20 A. As is standard practice in the industry, Gulf used "normal" weather in its  
21 energy forecasts, where "normal" is defined as a long-term average of  
22 historical weather. Monthly normal weather for the residential class was  
23 developed using historical monthly cycle residential cooling (heating)  
24 degree hours per billing day averaged by month over the past 20 years.

25

1 Q. How was the residential regression model output used to develop the  
2 residential energy forecast?

3 A. The residential regression model output, monthly billing cycle energy per  
4 customer per billing day, was multiplied by the projected number of non-  
5 lighting residential customers and projected cycle billing days by month.  
6 The residential class outdoor lighting energy projection was then added to  
7 produce the total residential class energy projection. The total residential  
8 class energy projection was then adjusted to reflect the anticipated impacts  
9 of Gulf's DSM plan and the introduction of electric vehicles to the market. A  
10 projection of unbilled energy was then added to the resulting billed energy  
11 projection to develop a calendar month projection of total residential class  
12 energy. Residential energy sales by rate were developed using average  
13 historical use per customer by rate.

14  
15 Q. What DSM plan assumptions were included in Gulf's forecast?

16 A. Gulf utilized its most recent DSM plan, which was approved by the  
17 Commission in Order No. PSC-11-0114-PAA-EG on February 11, 2011, to  
18 adjust forecasted sales and annual system peak demand for projected  
19 conservation impacts. These assumptions for conservation impacts are  
20 reasonable and in line with actual achievement as results for 2012 show  
21 energy savings by Gulf's customers exceeded the plan.

22  
23 Q. Please address the anticipated impacts of Gulf's DSM plan on the  
24 residential energy forecast.

25 A. The anticipated impacts of Gulf's DSM plan on the residential class were

1 projected to be 110 million kWh in the test year. The forecast reflects all  
2 expected impacts of the DSM plan – some of those impacts were  
3 embedded in the regression model output and some of those impacts were  
4 included through an exogenous adjustment to the regression model output.  
5 Gulf utilized data from ITRON (the vendor used by parties in the DSM goals  
6 docket to develop technical and achievable potential levels of DSM for Gulf  
7 and other utilities) as well as Gulf’s experience in the energy efficiency  
8 market and knowledge of existing programs to determine, by program, the  
9 amount of energy savings embedded in the historical regression data. The  
10 remaining impacts, those not embedded in the historical data, formed the  
11 exogenous DSM adjustment. The exogenous DSM adjustment to  
12 residential class energy in the test year was 94 million kWh, which reduced  
13 total retail energy sales by 0.8 percent.

14

15 Q. How did Gulf project the impact of electric vehicles in its residential energy  
16 forecast?

17 A. Gulf assumed an electric and plug-in-hybrid electric vehicle penetration of 2  
18 percent of new vehicle sales in the test year, resulting in an exogenous  
19 adjustment for charging electric vehicles of 6 million kWh in the test year.  
20 The penetration rate assumption was based on a purchased study  
21 published by Pike Research in the 1st quarter of 2011 entitled “Electric  
22 Vehicle Geographic Forecasts.” All charging was assumed to occur off-  
23 peak in the residential class. As customer behavior patterns emerge in the  
24 electric vehicle charging market, Gulf will refine this estimate based on load  
25 research and customer surveys. Gulf has implemented a pilot program

1 through its approved DSM plan that will encourage customers who  
2 purchase electric vehicles to charge them during off-peak hours.

3  
4 **Commercial Energy Sales Forecast**

5 Q. How was Gulf's forecast of 2014 commercial energy sales developed?

6 A. The short-term, non-lighting commercial energy sales forecast was  
7 developed using two multiple linear regression models. One modeled  
8 "small commercial" customer energy purchases (less than 25 kilowatts), and  
9 the other modeled energy purchases of the remainder of the commercial  
10 class, the latter being referred to as "large commercial." Both models were  
11 similar in specification.

12  
13 Q. What variables were employed by Gulf in the two regression models used to  
14 develop the commercial energy sales forecast?

15 A. In each commercial regression model the dependent variable, the quantity  
16 being estimated, was monthly billing cycle energy per customer per billing  
17 day. The small commercial model included a constant term and 20 years of  
18 historical data for the following variables: billing cycle cooling degree hours  
19 per billing day for the months of April through November; billing cycle  
20 heating degree hours per billing day for the months of December through  
21 March; twelve month moving average of real commercial electricity price;  
22 and non-manufacturing employment. Also included in the small commercial  
23 model was an indicator variable for the month of September 2004 to  
24 account for the impact of Hurricane Ivan; an indicator variable for the month  
25 of August 1997 to address a large residual in that month; and one



1            autoregressive term lagged one month to address first-order residual  
2            autocorrelation over time.

3

4            The large commercial model included a constant term and 20 years of  
5            historical data for the following variables: billing cycle cooling degree hours  
6            per billing day for the months of March through November; billing cycle  
7            heating degree hours per billing day for the months of December through  
8            March; an indicator variable to capture the seasonal variation for the month  
9            of January; twelve month moving average of real commercial electricity  
10           price; and non-manufacturing employment. Also included in the large  
11           commercial model was an indicator variable for the month of September  
12           2004 to account for the impact of Hurricane Ivan; an indicator variable for  
13           the months of July 2005, August 2005 and September 2005 to account for  
14           the impacts of Hurricanes Dennis and Katrina; an indicator variable for the  
15           months of August 2012 and September 2012 to account for the impacts of  
16           Hurricane Isaac; and one autoregressive term lagged one month to address  
17           first-order residual autocorrelation over time.

18

19           These variables were carefully chosen to make the commercial model both  
20           simple and statistically robust. Variables were required to have a logical  
21           connection to commercial electricity sales, substantial data history,  
22           dependable projections of future values, limited overlap with other variables  
23           (i.e. limited multicollinearity), and good statistical significance (i.e. low p-  
24           value).

25

1 Page 1 of Schedule 4 of my exhibit is a graph comparing the small  
2 commercial regression model's predicted values with actual historical  
3 data. It shows how well the model's output "fits" history. Page 2 of  
4 Schedule 4 of my exhibit is a list of statistics associated with the small  
5 commercial regression model.

6  
7 Page 1 of Schedule 5 of my exhibit is a graph comparing the large  
8 commercial regression model's predicted values with actual historical  
9 data. It shows how well the model's output "fits" history. Page 2 of  
10 Schedule 5 of my exhibit is a list of statistics associated with the large  
11 commercial regression model.

12  
13 Q. Why do the indicator variables for hurricanes differ in the three regression  
14 models?

15 A. Hurricane indicator variables are used to account for the significant, non-  
16 recurring impact of hurricanes on historical energy sales. An indicator  
17 variable for Hurricane Ivan is included in all three regression models due to  
18 the scale and magnitude of the damage and its impact on sales. An  
19 indicator variable for Hurricanes Dennis and Katrina is included in the large  
20 commercial model because those hurricanes significantly affected the  
21 tourism industry, and a majority of Gulf's tourism and recreation kWh sales  
22 are to large commercial businesses. Hurricanes Dennis and Katrina caused  
23 significantly fewer outages in Gulf's service area than Hurricane Ivan, so  
24 they had a smaller impact on residential and small commercial customers.  
25 However, they had a larger impact on tourism than Ivan primarily because

1 they made landfall earlier in the tourist season (July and August versus  
2 September). Dennis and Katrina also caused gasoline prices to rise to a  
3 new high, which further impacted tourism in 2005. Therefore, a Dennis-  
4 Katrina indicator variable appropriately fit the large commercial regression  
5 model but was not needed in the residential or small commercial regression  
6 model. An indicator variable for Hurricane Isaac is included in the  
7 residential and large commercial models because the heavy rainfall with  
8 localized flooding and preemptive closures of schools and businesses  
9 primarily affected the residential and large commercial customers.

10  
11 Q. What statistical results did Gulf attain with the small commercial regression  
12 model?

13 A. As presented on page 2 of Schedule 4 of my exhibit, all variables used in  
14 the small commercial regression model were statistically significant (p-  
15 values were low) and each coefficient had the expected sign. The model's  
16 adjusted R-squared was 94.9 percent, indicating that all but 5.1 percent of  
17 the variance in the historical data was explained by the model. The model's  
18 Durbin-Watson d-statistic was 2.27, indicating no significant autocorrelation  
19 in the residuals. Overall, these are excellent statistical results.

20  
21 Q. What statistical results did Gulf attain with the large commercial regression  
22 model?

23 A. As presented on page 2 of Schedule 5 of my exhibit, all variables used in  
24 the large commercial regression model were statistically significant  
25 (p-values were low) and each coefficient had the expected sign. The

1 model's adjusted R-squared was 97.4 percent, indicating that all but 2.6  
2 percent of the variance in the historical data was explained by the model.  
3 The model's Durbin-Watson d-statistic was 2.03, indicating no significant  
4 autocorrelation in the residuals. Overall, these are excellent statistical  
5 results.

6  
7 Q. What data sources were employed for the economic variables used in Gulf's  
8 commercial regression models?

9 A. Historical values and forecast projections of the economic variables "non-  
10 manufacturing employment" and "GDP price deflator" were purchased from  
11 Moody's Analytics. Gulf used the November 2012 vintage of Moody's  
12 economic projections, which was the most recent data available at the time  
13 the forecast was developed.

14  
15 Q. How was historical commercial weather calculated?

16 A. Cooling and heating degree hours were calculated using the NOAA  
17 Pensacola weather station's hourly temperatures. Commercial cooling  
18 degree hours are the result of taking the number of degrees Fahrenheit that  
19 each hourly temperature is above a 63 degree baseline, and summing over  
20 a given time period. Commercial heating degree hours are the result of  
21 taking the number of degrees Fahrenheit that each hourly temperature is  
22 below a 54 degree baseline, and summing over a given time period. These  
23 commercial cooling and heating degree hour temperature baselines reflect  
24 the observed correlation between hourly temperatures and hourly energy  
25 purchases by Gulf's commercial customers. Gulf did an analysis during

1 2012 to refine the baseline temperatures used to calculate degree hours to  
2 be more reflective of actual energy sales response to temperatures  
3 experienced over the most recent 20 years. Observed commercial  
4 customer temperature breakpoints are lower than residential customer  
5 temperature breakpoints because commercial buildings typically contain  
6 more heat producing equipment and people than residential buildings.  
7 Thus, commercial Heating Ventilating and Air Conditioning (HVAC)  
8 equipment typically begins heating later (below a lower temperature) and  
9 begins cooling sooner (above a lower temperature) than residential HVAC  
10 equipment.

11  
12 Monthly billing cycle commercial weather was calculated as follows. For  
13 each bill group, the total commercial cooling (heating) degree hours were  
14 summed over the period from the day after the prior month's scheduled read  
15 date through the current month's scheduled read date. These summed  
16 commercial cooling (heating) degree hours for each of the 21 bill groups  
17 were then totaled and divided by 21 to get the monthly billing cycle  
18 commercial cooling (heating) degree hours.

19  
20 Q. How was forecast commercial weather calculated?

21 A. As is standard practice in the industry, Gulf used "normal" weather in its  
22 energy forecasts, where "normal" is defined as a long-term average of  
23 historical weather. Monthly normal weather for the commercial class was  
24 developed using historical monthly cycle commercial cooling (heating)  
25 degree hours per billing day averaged by month over the past 20 years.

1 Q. How were the outputs of the two commercial regression models used to  
2 develop the commercial energy forecast?

3 A. The small commercial regression model output was multiplied by the  
4 projected number of non-lighting small commercial customers and projected  
5 cycle billing days by month. The large commercial regression model output  
6 was multiplied by the projected number of non-lighting large commercial  
7 customers and projected cycle billing days by month. These small  
8 commercial and large commercial results were then summed. The  
9 commercial class outdoor lighting energy projection was then added to  
10 produce the total commercial class energy projection. The total commercial  
11 class energy projection was then adjusted to reflect the anticipated impacts  
12 of Gulf's DSM plan. A projection of unbilled energy was then added to the  
13 resulting billed energy projection to develop a calendar month projection of  
14 total commercial class energy. Commercial energy sales by rate were  
15 developed using average historical use per customer by rate.

16  
17 Q. Please address the anticipated impacts of Gulf's DSM plan on the  
18 commercial energy forecast.

19 A. The anticipated impacts of Gulf's DSM plan on the commercial class were  
20 projected to be 25 million kWh in the test year. The forecast reflects all  
21 expected impacts of the DSM plan – some of those impacts were  
22 embedded in the regression model output and some of those impacts were  
23 included through an exogenous adjustment to the regression model output.  
24 Gulf utilized data from ITRON as well as Gulf's experience in the energy  
25 efficiency market and knowledge of existing programs to determine, by

1 program, the amount of energy savings embedded in the historical  
2 regression data. The remaining impacts, those not embedded in the  
3 historical data, formed the exogenous DSM adjustment. The exogenous  
4 DSM adjustment to commercial class energy in the test year was 12 million  
5 kWh, which reduced total retail energy sales by 0.1 percent.

6  
7 **Industrial Energy Sales Forecast**

8 Q. How was Gulf's 2014 forecast of industrial energy sales developed?

9 A. The short-term industrial energy sales forecast was developed using a  
10 combination of on-site surveys of major industrial customers and historical  
11 average consumption per customer per billing day.

12  
13 Fifty-two of Gulf's largest industrial customers, representing over 90 percent  
14 of the industrial class sales, were interviewed by Gulf's industrial account  
15 representatives to identify expected load changes due to equipment  
16 additions and replacements or changes in operating schedules and  
17 characteristics. The short-term forecast of monthly sales to these major  
18 industrial customers was a synthesis of this survey information and  
19 historical monthly to annual energy ratios.

20  
21 The forecast of short-term sales to the remaining smaller industrial  
22 customers, which represent 1.3 percent of total retail energy sales, was  
23 developed by rate schedule and month using historical averages. The  
24 resulting estimates of energy purchases per customer per billing day were  
25 multiplied by the expected number of customers and billing days by month

1 to expand to the rate level totals. These projections were then added to the  
2 results for the major industrial customers, the industrial class outdoor  
3 lighting energy projections and the industrial class unbilled energy estimates  
4 to sum to the industrial class calendar month totals.

5  
6 **Street Lighting Energy Sales Forecast**

7 Q. How was Gulf's 2014 forecast of street lighting energy sales developed?

8 A. Similar to the outdoor lighting projections for the residential, commercial and  
9 industrial classes, Gulf's forecast of street lighting energy sales was  
10 developed using a projected growth rate, based on input from Gulf's lighting  
11 team, applied to the one rate (OS-I/II) applicable to the street lighting  
12 classification.

13  
14 **Total Retail Energy Sales Forecast and Forecast Methodology**

15 Q. How was the total retail energy sales forecast developed?

16 A. Gulf's total retail energy sales forecast was the result of summing  
17 residential, commercial, industrial and street lighting energy sales together.

18  
19 Q. Is this the same forecast methodology for energy sales that Gulf used and  
20 the Commission accepted in Gulf's last base rate proceeding?

21 A. Yes. The overall methodology that Gulf currently uses to forecast energy  
22 sales is substantially the same as that employed in the last base rate  
23 proceeding, which was stipulated to by the parties and approved by the  
24 Commission. Gulf made two minor changes to its residential forecast  
25 methodology during 2012. Both changes were made to the residential



1 regression model to improve the forecast of residential energy sales.

2  
3 The first change was to remove from the model the variable for residential  
4 vacancy rate. If included in the model, this variable has a p-value of over 20  
5 percent. A low p-value indicates a desired result, meaning that the variable  
6 is statistically significant. Therefore, a p-value of over 20 percent indicates  
7 that the variable is not statistically significant, i.e. not meaningful to the  
8 model.

9  
10 The second change was to split the residential electricity price variable into  
11 two variables: a price decline index and a price increase index. The  
12 elasticities were significantly different for the two price variables showing  
13 that historically residential customer response to price has been  
14 asymmetrical. In other words, based on Gulf's historical data, when price  
15 has increased, residential customers have reduced their energy usage by a  
16 larger amount than their increase in energy usage when price has  
17 decreased by the same amount. Therefore, this change was incorporated  
18 into the residential regression model to capture the difference in price  
19 response in the forecast. With this change, the statistical results of the  
20 model were excellent, as shown on page 2 of Schedule 3 of my exhibit.

21  
22 Q. Why were two price variables used in the residential regression model, but  
23 not in the small and large commercial regression models?

24 A. In the small commercial model, a test was performed using price decline  
25 and increase variables similar to those used in the residential model.

1           However, in the small commercial model, the price decline index had a high  
2           p-value indicating it was not statistically significant. A similar test was  
3           performed for the large commercial model, which showed that the  
4           elasticities for the price decline index and price increase index were not  
5           significantly different. This means that historically large commercial  
6           customers have not responded significantly differently to price increases  
7           versus price decreases. Therefore, only one price variable was used in the  
8           large commercial model to keep the model simple, since two price variables  
9           were not necessary.

10

11    **Q.**    Did you make any adjustments to the forecast besides those already  
12           described for DSM, EV charging, and unbilled energy?

13    **A.**    No. Because the regression equations fit the historical data well, there was  
14           no need to adjust the regression outputs.

15

16    **Q.**    Has this forecast methodology provided reliable forecasts of retail energy  
17           sales in the past?

18    **A.**    Yes. Over the four-year period ending 2006, prior to the recession, Gulf  
19           under-forecast retail energy sales one year out and two years out by 3.1  
20           percent and 3.5 percent, respectively. (Under-forecast means Gulf forecast  
21           less energy than our customers actually purchased over that time period).  
22           During the six-year period since 2006, Gulf over-forecast retail energy sales  
23           one year out and two years out by 2.9 percent and 5.7 percent, respectively.  
24           (Over-forecast means Gulf forecast more energy than our customers  
25           actually purchased over that time period).

1 Gulf's retail energy sales forecasts during the recent recession have been  
2 higher than actual results because the economy took a downturn and did  
3 not perform as expected. Some of these forecasts were developed before  
4 the recession began and before the effects of the recession were even  
5 known. More recently, forecasts assumed a turnaround in the economy and  
6 a recovery from the recession; however, the recovery stalled and effects of  
7 the recession continued in Gulf's service area through the end of 2012.

8

9 Q. How accurate has the retail energy sales forecast which has been proposed  
10 for use in this proceeding been?

11 A. Over the seven months of the forecast period for which we have actual data  
12 to compare to the forecast (November 2012 through May 2013), total retail  
13 energy sales were slightly over-forecast by 1.0 percent.

14

15 **Territorial Wholesale Energy Sales Forecast**

16 Q. How was Gulf's forecast of 2014 territorial wholesale energy sales  
17 developed?

18 A. The forecast of territorial wholesale energy sales was developed using a  
19 multiple linear regression model.

20

21 Q. What variables were employed by Gulf in the regression models used to  
22 develop the wholesale energy sales forecast?

23 A. Monthly wholesale energy purchases per day were estimated based on  
24 historical energy sales, residential weather (heating and cooling degree  
25 hours), real disposable income per household, an indicator variable

1 corresponding to the wholesale price level, and an autoregressive term  
2 lagged one month to address first-order residual autocorrelation over time.

3

4 **Q. What statistical results did Gulf attain with the wholesale regression model?**

5 **A. All variables used in the wholesale regression model were statistically  
6 significant (p-values were low) and each coefficient had the expected sign.  
7 The model's adjusted R-squared value was 95.5 percent, indicating that all  
8 but 4.5 percent of the variance in the historical data was explained by the  
9 model. The model's Durbin-Watson d-statistic was 2.03, indicating no  
10 significant autocorrelation in the residuals. Overall, these are excellent  
11 statistical results.**

12

13 **Q. How was the wholesale model output used to develop the total wholesale  
14 energy forecast?**

15 **A. The model output, monthly energy purchases per day, was multiplied by the  
16 projected number of days per month to expand to the total wholesale  
17 energy forecast.**

18

19 **Q. What is the importance of the wholesale energy projection in this  
20 proceeding?**

21 **A. Gulf's 2014 wholesale energy projection was used by Gulf Witness  
22 O'Sheasy in the cost-of-service study to develop allocators that help  
23 determine the jurisdictional split between the wholesale and retail  
24 jurisdictions.**

25

1 **IV. GULF'S PEAK DEMAND FORECAST**

2

3 Q. What is Gulf's forecasted peak demand for 2014?

4 A. Gulf's territorial system peak demand is projected to be 2,522 megawatts  
5 (MW) in the test year, representing an increase of 8 MW or 0.3 percent over  
6 projections for the twelve months ended December 2013. This peak is  
7 expected to occur in the summer month of July 2014.

8

9 Q. How was this forecast of peak demand developed?

10 A. The forecast of annual system peak demands was developed using  
11 historical load shapes and projections of net energy for load. Net energy for  
12 load is the total supply of energy from the generator available to serve  
13 territorial customers' load requirements including an estimate for losses.  
14 Projected net energy for load was based on the forecasted energy sales  
15 described previously in my testimony. Forecasted energy sales were  
16 spread using historical hourly load shapes to determine the single highest  
17 hour of demand for each month. Gulf's annual system peak demand  
18 typically occurs in the month of July. The resulting monthly system peak  
19 demand projections were then adjusted to reflect the anticipated impacts of  
20 conservation programs from Gulf's DSM plan.

21

22 Q. Please address the anticipated impacts of Gulf's DSM plan on the  
23 Company's annual system peak demand forecast.

24 A. The anticipated impact of Gulf's DSM plan on the Company's annual  
25 system peak demand was projected to be 45 MW in the test year. The

1 forecast reflects all expected impacts of the DSM plan – some of those  
2 impacts were embedded in historical peak demand levels and some of  
3 those impacts were included through an adjustment. As with DSM  
4 adjustments to energy, data from ITRON as well as Gulf’s experience in the  
5 energy efficiency market and knowledge of existing programs were used to  
6 determine, by program, the amount of demand savings embedded in the  
7 historical data. The remaining impacts, those not embedded in the  
8 historical data, formed the DSM adjustment. The DSM adjustment to  
9 system peak demand in the test year was 33 MW, which reduced system  
10 peak demand by 1.3 percent.

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**V. GULF’S FORECAST OF RETAIL BASE RATE REVENUE**

- 15 Q. What are the 2014 results of Gulf’s retail base rate revenue forecast?
- 16 A. Retail base rate revenue is forecasted to total \$498,489,000 in the test year.  
17 Using rates approved in Gulf’s last base rate case in FPSC Order No. PSC-  
18 12-0179-FOF-EI, the base rate revenue forecast by class consists of the  
19 following:

Residential:	\$299,814,000
Commercial:	\$157,413,000
Industrial:	\$ 38,141,000
Street Lighting:	\$ 3,121,000

1 Q. Please address how the base rate revenue forecast was developed.

2 A. Rate schedules approved in Gulf's last base rate case were applied to  
3 monthly projections of customers, energy sales and aggregate billing  
4 demands, as applicable by rate, for each customer classification. Outdoor  
5 lighting base revenue was estimated by class and rate using the most  
6 recent actual base revenue per kWh, adjusted for the FPSC-approved  
7 increase for lighting rates in January 2013, applied to the appropriate  
8 outdoor lighting energy forecast.

9

10 Q. What billing components were used to develop the base revenue forecast?

11 A. The residential monthly billing components consisted of the base charge  
12 and the energy charge. The commercial and industrial billing components  
13 consisted of the base charge, the energy charge and, where applicable, the  
14 demand charge. The non-residential energy-only time-of-use rate (GSTOU)  
15 energy charge included an on-peak, intermediate and off-peak tier by  
16 season. The commercial and industrial demand charge consisted of the  
17 max demand charge and, where applicable, the on-peak demand charge  
18 and the reactive demand charge. Primary and transmission voltage level  
19 discounts were applied to energy and demand charges as appropriate.

20

21 Q. How were forecast monthly billing determinants developed for each of these  
22 billing components?

23 A. Forecast year billing determinants were developed for each rate schedule  
24 and, where applicable, each voltage discount level as follows:

25

- 1           • Monthly number of customers was derived from the customer forecast.
- 2           • Monthly energy was derived from the energy forecast.
- 3                 ○ Monthly time of use (TOU) energy was based on monthly energy
- 4                 from the forecast allocated to tier based on monthly historical
- 5                 averages by tier.
- 6           • Monthly aggregate max demands for commercial and small industrial
- 7           customers by rate were derived from monthly historical average max
- 8           demand to energy ratios multiplied by forecast year monthly energy.
- 9           • Monthly aggregate on-peak demands for commercial and small
- 10          industrial customers by rate were derived from monthly historical
- 11          average on-peak demand to energy ratios multiplied by forecast year
- 12          monthly energy.
- 13          • Monthly max demands, monthly on-peak demands and monthly reactive
- 14          demands for the 52 largest industrial customers and the 18 largest
- 15          commercial customers were derived from historical ratios applied to
- 16          projected annual max demands which are collected through the large
- 17          customer survey.
- 18                 ○ Monthly max demands for each of these customers were
- 19                 calculated as the product of the forecast year's annual peak
- 20                 demand times the ratio of a historical year's monthly max demand
- 21                 to annual max demand.
- 22                 ○ Monthly on-peak demands for each of these customers were
- 23                 calculated as the product of the forecast year's monthly max
- 24                 demand times the ratio of a historical year's monthly on-peak
- 25                 demand to monthly max demand.



- 1           o Monthly reactive demands for each of these customers were  
2           calculated as the product of the forecast year's monthly max  
3           demand times the ratio of a historical year's monthly reactive  
4           demand to monthly max demand.
- 5           • The historical year in the billing demand calculations was May 2011  
6           through April 2012, the most recent 12 months of billing data available at  
7           the time the billing determinants forecast was developed.

8

9   Q.    Is this the same forecast methodology for retail base revenue that Gulf used  
10       and the Commission accepted in Gulf's last base rate proceeding?

11   A.    Yes.

12

13   Q.    Has this forecast methodology provided reliable forecasts of retail base  
14       revenue in the past?

15   A.    Yes. Over the four-year period ending 2006, prior to the recession, Gulf  
16       under-forecast retail base revenue one year out and two years out by 2.3  
17       percent and 3.0 percent, respectively. (Under-forecast means Gulf forecast  
18       less retail base revenue than we actually received over that time period).  
19       During the six-year period since 2006, Gulf over-forecast retail base  
20       revenue one year out and two years out by 2.3 percent and 4.1 percent,  
21       respectively. (Over-forecast means Gulf forecast more retail base revenue  
22       than we actually received over that time period). Consistent with the retail  
23       energy sales forecasts, Gulf's retail base revenue forecasts were also  
24       higher than actual results during the recent recession due primarily to the  
25       economic downturn and the delayed recovery from the recession.

1 Q. How accurate has the retail base revenue forecast which has been  
2 proposed for use in this proceeding been?

3 A. Over the seven months of the forecast period for which we have actual data  
4 to compare to the forecast (November 2012 through May 2013), total retail  
5 base rate revenue was minimally under-forecast by 0.7 percent.

6

7 Q. Has the particular forecast proposed in this proceeding been used by Gulf in  
8 other recent proceedings or filings before the Commission?

9 A. Yes. This forecast of customers, energy, and peak demand was the  
10 foundation for and was included in Gulf's 2013-2022 Ten Year Site Plan  
11 which was filed with the Commission on April 1, 2013. This forecast of  
12 energy and demand was also the basis for calculations used in Gulf's  
13 Renewable Standard Offer Contract which was filed with the Commission  
14 on April 1, 2013 and approved by the Commission on June 25, 2013 in  
15 Docket No. 130070-EQ. This forecast of customers and energy was  
16 included in Gulf's Forecasted Earnings Surveillance Report which was  
17 submitted to the Commission staff on March 14, 2013.

18

19 Q. Is the forecast prepared by and relied upon by Gulf in this proceeding  
20 appropriate for the Commission to use in setting Gulf's base rates?

21 A. Yes. It is based upon an established and proven methodology. It employed  
22 reliable data from well-respected sources. The methodology and forecast  
23 are routinely used by Gulf in its regular course of business and were not  
24 developed just for this rate case. The methodology and the resulting

25

1 forecast have been relied upon by Gulf and the Commission in a number of  
2 proceedings.

3

4

5

## VI. SUMMARY

6

7 Q. Please summarize your testimony.

8 A. Gulf's forecast methodologies are rigorous, statistically significant and  
9 logically connected to the marketplace. Gulf's forecast methodologies are  
10 well established. They have been consistently used for many years in  
11 substantially the same form and have been reviewed and approved by the  
12 Commission in other proceedings. Gulf's methodologies appropriately  
13 incorporate adjustments for Gulf's approved DSM plan as well as emerging  
14 electric vehicle charging loads. Gulf's forecast methodologies consistently  
15 produce accurate results which are routinely used by many departments  
16 throughout the Company in the regular course of business. The specific  
17 forecast proposed in this proceeding, which has been relied on by the  
18 Commission in other filings, is appropriate for use in this base rate  
19 proceeding.

20

21 Q. Does this conclude your testimony?

22 A. Yes.

23

24

25

AFFIDAVIT

STATE OF FLORIDA     )  
  )  
COUNTY OF ESCAMBIA )

Docket No. 130140-EI

Before me the undersigned authority, personally appeared Rhonda J. Alexander, who being first duly sworn, deposes, and says that she is the Supervisor of Forecasting for Gulf Power Company, a Florida corporation, that the foregoing is true and correct to the best of her knowledge, information, and belief. She is personally known to me.

*Rhonda J. Alexander*

Rhonda J. Alexander  
Supervisor of Forecasting

Sworn to and subscribed before me this 8<sup>th</sup> day of July, 2013.

*Melissa A. Darnes*  
Notary Public, State of Florida at Large

Commission No. EE 150873

My Commission Expires December 17, 2015

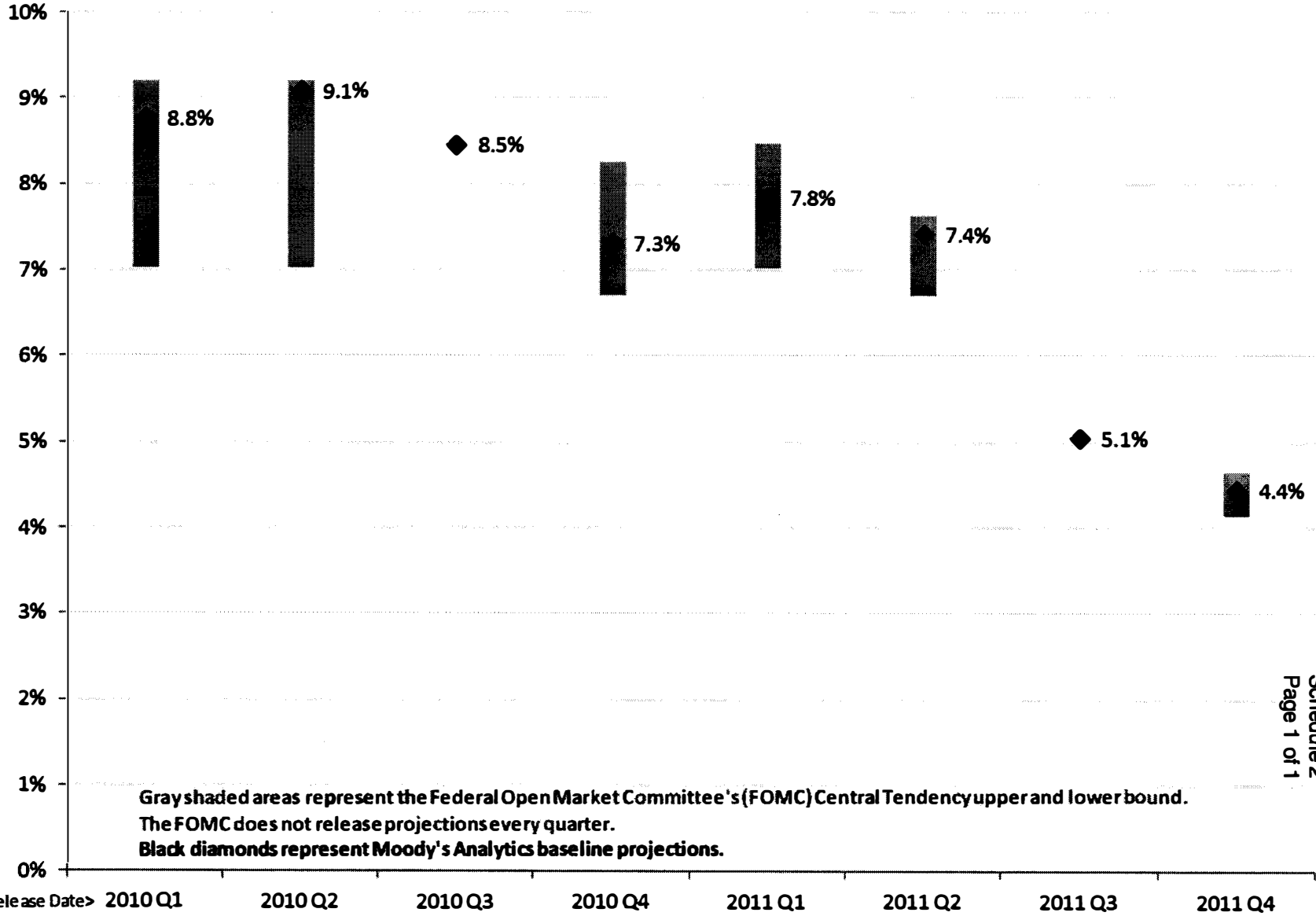


MELISSA A. DARNES  
MY COMMISSION # EE 150873  
EXPIRES: December 17, 2015  
Bonded Thru Budget Notary Services

**Responsibility for Minimum Filing Requirements**

<b><u>Schedule</u></b>	<b><u>Title</u></b>
C-34	Statistical Information
E-15	Projected Billing Determinants – Derivation
E-18	Monthly Peaks
F-5	Forecasting Models
F-6	Forecasting Models – Sensitivity of Output to Changes in Input Data
F-7	Forecasting Models – Historical Data
F-8	Assumptions

# Forecast 2011 & 2012 Cumulative Annual Growth in U.S. Real GDP

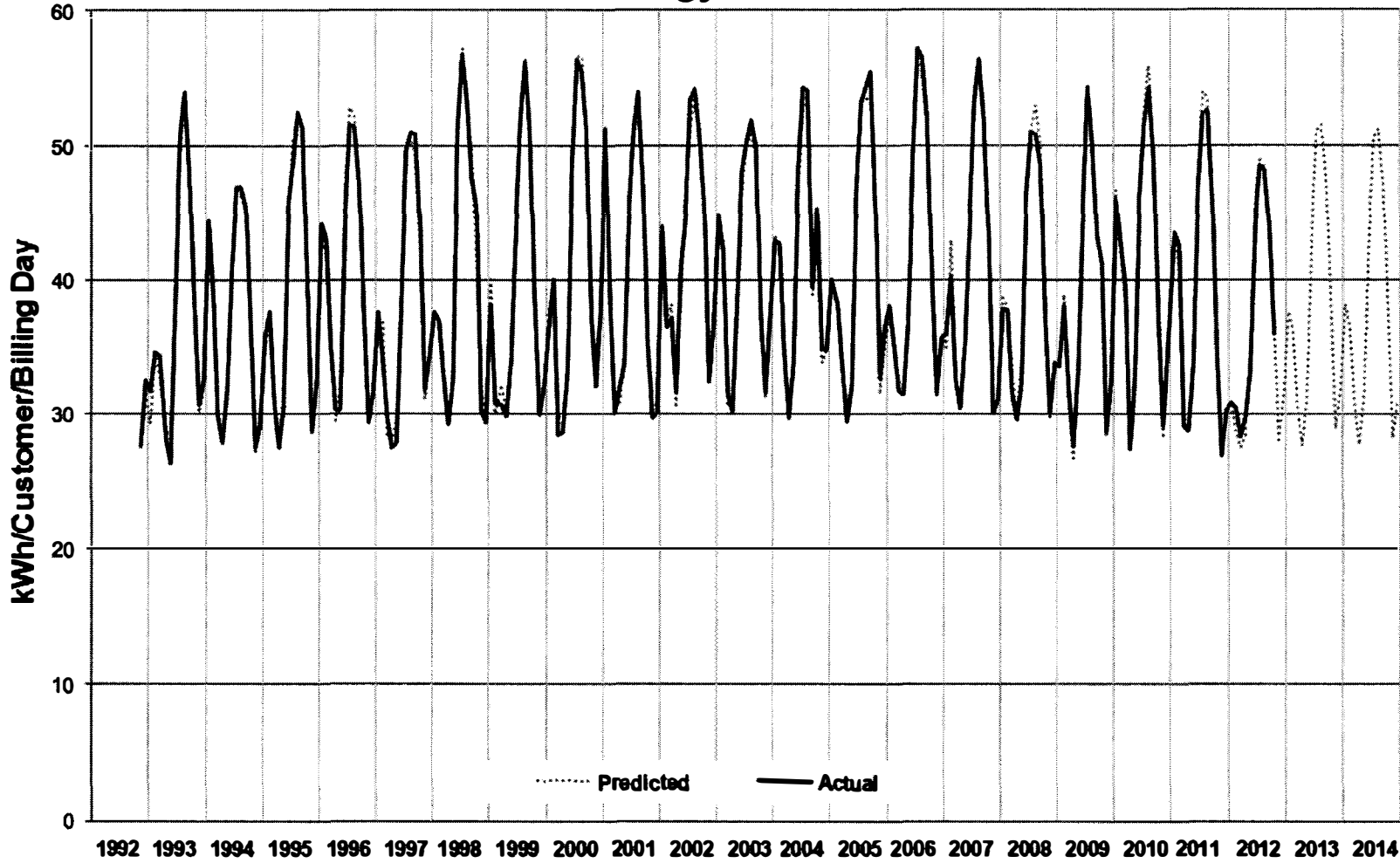


Gray shaded areas represent the Federal Open Market Committee's (FOMC) Central Tendency upper and lower bound.  
 The FOMC does not release projections every quarter.  
 Black diamonds represent Moody's Analytics baseline projections.

Florida Public Service Commission  
 Docket No. 130140-EI  
 GULF POWER COMPANY  
 Witness: Rhonda J. Alexander  
 Exhibit No. \_\_\_\_\_ (FJA-1)  
 Schedule 2  
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# Residential Regression Model

## Predicted vs. Actual Energy Sales



Florida Public Service Commission  
Docket No. 130140-EI  
GULF POWER COMPANY  
Witness: Rhonda J. Alexander  
Exhibit No. \_\_\_\_\_ (RJA-1)  
Schedule 3  
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## Residential Regression Model Summary

Software: MetrixND Version 4.4  
Dependent Variable: Monthly Billing Cycle Residential kWh per Customer per Billing Day  
Estimation Dates: November 1992-October 2012

## Residential Regression Statistics

Iterations	12
Adjusted Observations	239
Deg. of Freedom for Error	215
R-Squared	0.986
Adjusted R-Squared	0.985
Durbin-Watson Statistic	2.090
Standard Error of Regression	1.07
Mean Absolute Percentage Error (MAPE)	2.07%
Skewness	0.178
Kurtosis	3.762

## Residential Regression Model Coefficients

Variable	Coefficient	Standard Error	p-Value	Mean	Elasticity
Constant	27.548	5.384	0.00%	NA	NA
Real Disposable Personal Income per Household	0.263	0.054	0.00%	67.397	0.449
12-Month Average of Real Residential Price - Decline Index	-0.700	0.403	8.36%	6.984	-0.124
12-Month Average of Real Residential Price - Increase Index	-1.532	0.153	0.00%	10.993	-0.426
Billing Cycle Residential CDH per Billing Day - March	0.047	0.017	0.55%	1.592	0.002
Billing Cycle Residential CDH per Billing Day - April	0.058	0.008	0.00%	4.504	0.007
Billing Cycle Residential CDH per Billing Day - May	0.070	0.004	0.00%	11.567	0.020
Billing Cycle Residential CDH per Billing Day - June	0.080	0.002	0.00%	22.892	0.046
Billing Cycle Residential CDH per Billing Day - July	0.082	0.001	0.00%	29.050	0.061
Billing Cycle Residential CDH per Billing Day - August	0.084	0.001	0.00%	29.500	0.062
Billing Cycle Residential CDH per Billing Day - September	0.079	0.002	0.00%	26.842	0.054
Billing Cycle Residential CDH per Billing Day - October	0.080	0.002	0.00%	17.042	0.034
Billing Cycle Residential CDH per Billing Day - November	0.055	0.007	0.00%	6.350	0.009
Billing Cycle Residential CDH per Billing Day - December	0.060	0.016	0.02%	1.796	0.003
Billing Cycle Residential HDH per Billing Day - January	0.078	0.002	0.00%	17.117	0.034
Billing Cycle Residential HDH per Billing Day - February	0.077	0.002	0.00%	15.667	0.030
Billing Cycle Residential HDH per Billing Day - March	0.071	0.004	0.00%	8.954	0.016
Billing Cycle Residential HDH per Billing Day - April	0.070	0.010	0.00%	3.254	0.006
Billing Cycle Residential HDH per Billing Day - November	0.057	0.010	0.00%	3.721	0.005
Billing Cycle Residential HDH per Billing Day - December	0.064	0.003	0.00%	10.963	0.018
Binary Variable for Hurricane Ivan September 2004	-9.998	1.004	0.00%	0.004	-0.001
Binary Variable for June-August 2008	-3.787	0.836	0.00%	0.013	-0.001
Binary Variable for Hurricane Isaac August-September 2012	-2.234	0.906	1.45%	0.008	-0.000
First Order Auto-Regressive Term, AR(1)	0.435	0.062	0.00%	NA	NA

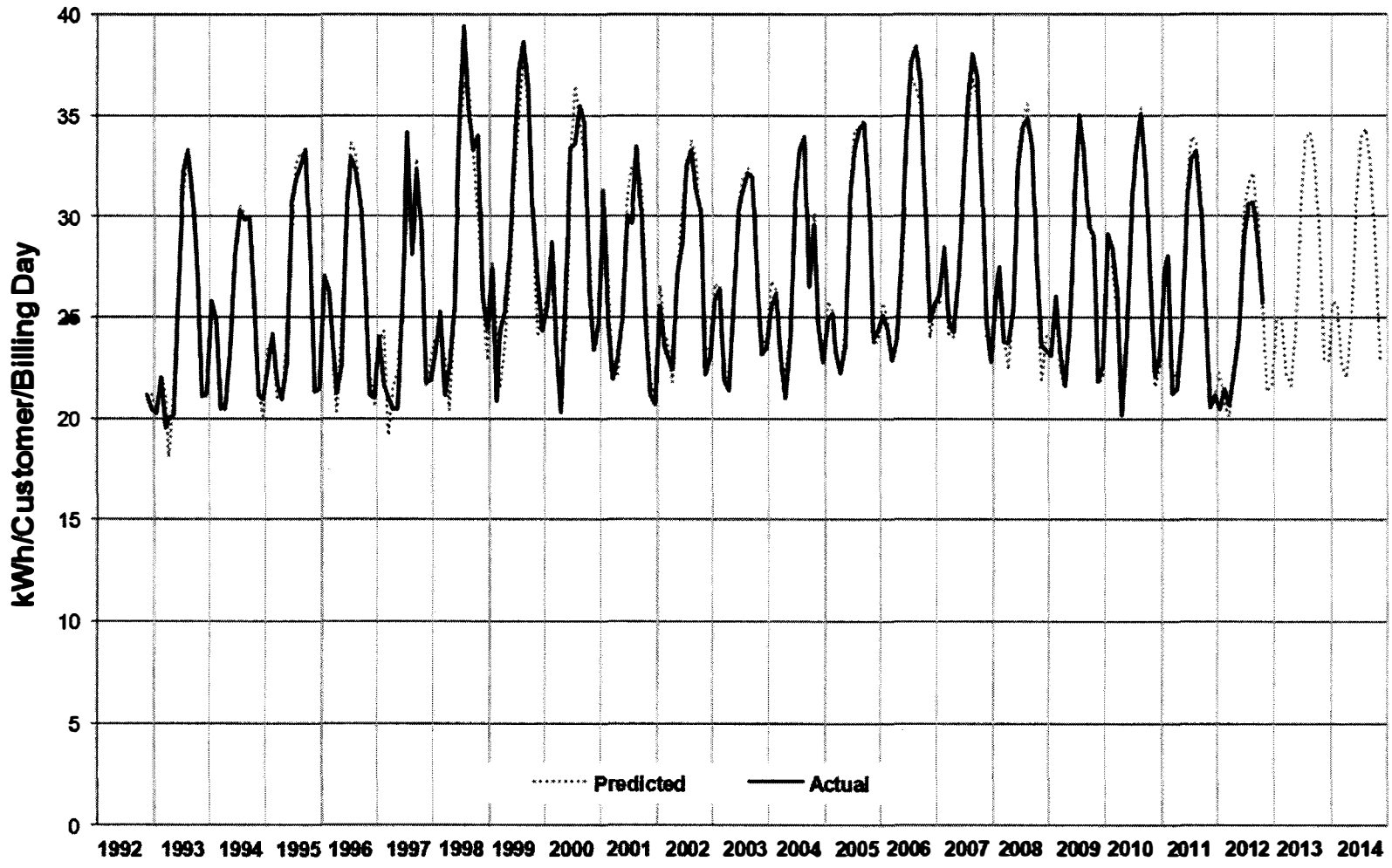
HDH = Heating Degree Hours  
CDH = Cooling Degree Hours



# Small Commercial Regression Model

## Predicted vs. Actual

### Energy Sales



Florida Public Service Commission  
Docket No. 130140-EI  
GULF POWER COMPANY  
Witness: Rhonda J. Alexander  
Exhibit No. \_\_\_\_\_ (RJA-1)  
Schedule 4  
Page 1 of 2

## Small Commercial Regression Model Summary

Software: MetrixND Version 4.4  
Dependent Variable: Monthly Billing Cycle Small Commercial kWh per Customer per Billing Day  
Estimation Dates: November 1992-October 2012

## Small Commercial Regression Statistics

Iterations	8
Adjusted Observations	239
Deg. of Freedom for Error	221
R-Squared	0.953
Adjusted R-Squared	0.949
Durbin-Watson Statistic	2.271
Standard Error of Regression	1.09
Mean Absolute Percentage Error (MAPE)	2.94%
Skewness	0.336
Kurtosis	4.476

## Small Commercial Regression Model Coefficients

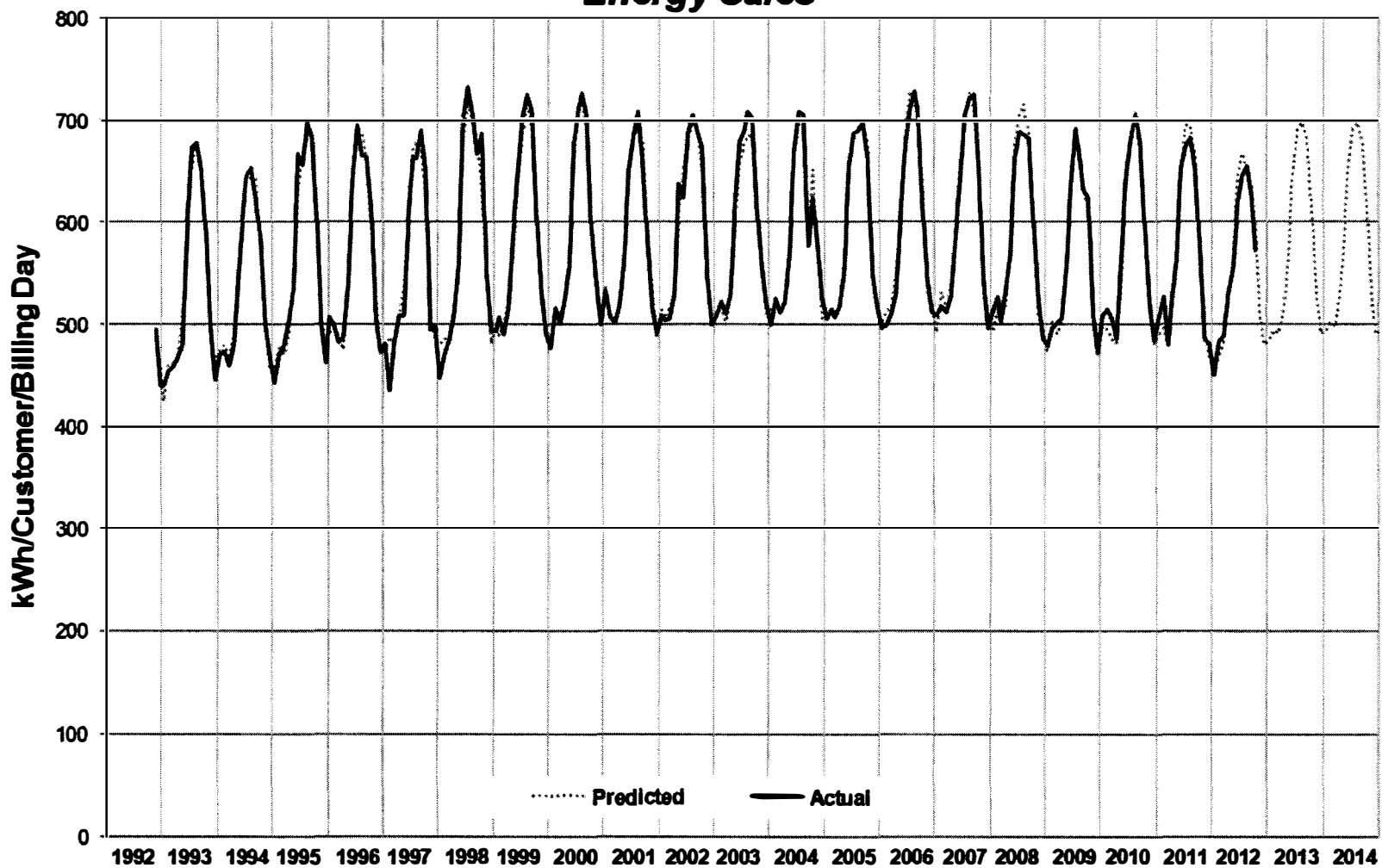
Variable	Coefficient	Standard Error	p-Value	Mean	Elasticity
Constant	14.286	2.102	0.00%	N/A	N/A
Non-Manufacturing Employment	0.040	0.008	0.00%	281.479	0.413
12-Month Average of Real Commercial Price	-0.711	0.159	0.00%	7.392	-0.195
Billing Cycle Small Commercial CDH per Billing Day - April	0.030	0.006	0.00%	4.504	0.005
Billing Cycle Small Commercial CDH per Billing Day - May	0.032	0.003	0.00%	11.567	0.014
Billing Cycle Small Commercial CDH per Billing Day - June	0.038	0.001	0.00%	22.892	0.032
Billing Cycle Small Commercial CDH per Billing Day - July	0.038	0.001	0.00%	29.050	0.041
Billing Cycle Small Commercial CDH per Billing Day - August	0.039	0.001	0.00%	29.500	0.043
Billing Cycle Small Commercial CDH per Billing Day - September	0.038	0.001	0.00%	26.842	0.038
Billing Cycle Small Commercial CDH per Billing Day - October	0.040	0.002	0.00%	17.042	0.025
Billing Cycle Small Commercial CDH per Billing Day - November	0.033	0.005	0.00%	6.350	0.008
Billing Cycle Small Commercial HDH per Billing Day - January	0.026	0.002	0.00%	17.117	0.017
Billing Cycle Small Commercial HDH per Billing Day - February	0.028	0.002	0.00%	15.667	0.016
Billing Cycle Small Commercial HDH per Billing Day - March	0.021	0.003	0.00%	8.954	0.007
Billing Cycle Small Commercial HDH per Billing Day - December	0.018	0.003	0.00%	10.963	0.008
Binary Variable for Hurricane Ivan September 2004	-5.477	0.953	0.00%	0.004	-0.001
Binary Variable for August 1997	-5.400	0.956	0.00%	0.004	-0.001
First Order Auto-Regressive Term, AR(1)	0.607	0.054	0.00%	N/A	N/A

HDH = Heating Degree Hours  
CDH = Cooling Degree Hours

# Large Commercial Regression Model

## Predicted vs. Actual

### Energy Sales



Florida Public Service Commission  
Docket No. 130140-EI  
GULF POWER COMPANY  
Witness: Rhonda J. Alexander  
Exhibit No. \_\_\_\_ (RJA-1)  
Schedule 5  
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## Large Commercial Regression Model Summary

Software: MetrixND Version 4.4  
Dependent Variable: Monthly Billing Cycle Large Commercial kWh per Customer per Billing Day  
Estimation Dates: November 1992-October 2012

## Large Commercial Regression Statistics

Iterations	12
Adjusted Observations	239
Deg. of Freedom for Error	218
R-Squared	0.976
Adjusted R-Squared	0.974
Durbin-Watson Statistic	2.025
Standard Error of Regression	13.67
Mean Absolute Percentage Error (MAPE)	1.75%
Skewness	0.057
Kurtosis	4.509

## Large Commercial Regression Model Coefficients

Variable	Coefficient	Standard Error	p-Value	Mean	Elasticity
Constant	381.984	12.661	0.00%	N/A	N/A
Non-Manufacturing Employment	0.620	0.045	0.00%	281.479	0.304
12-Month Average of Real Commercial Price	-11.603	0.952	0.00%	7.392	-0.150
Billing Cycle Large Commercial CDH per Billing Day - March	0.219	0.100	3.01%	3.825	0.001
Billing Cycle Large Commercial CDH per Billing Day - April	0.395	0.051	0.00%	8.696	0.006
Billing Cycle Large Commercial CDH per Billing Day - May	0.435	0.026	0.00%	17.967	0.014
Billing Cycle Large Commercial CDH per Billing Day - June	0.481	0.015	0.00%	30.667	0.026
Billing Cycle Large Commercial CDH per Billing Day - July	0.487	0.013	0.00%	37.046	0.031
Billing Cycle Large Commercial CDH per Billing Day - August	0.498	0.013	0.00%	37.496	0.033
Billing Cycle Large Commercial CDH per Billing Day - September	0.496	0.014	0.00%	34.792	0.030
Billing Cycle Large Commercial CDH per Billing Day - October	0.505	0.020	0.00%	23.996	0.021
Billing Cycle Large Commercial CDH per Billing Day - November	0.418	0.043	0.00%	10.638	0.008
Billing Cycle Large Commercial HDH per Billing Day - January	0.320	0.056	0.00%	11.142	0.006
Billing Cycle Large Commercial HDH per Billing Day - February	0.241	0.045	0.00%	9.754	0.004
Billing Cycle Large Commercial HDH per Billing Day - March	0.215	0.071	0.27%	4.975	0.002
Billing Cycle Large Commercial HDH per Billing Day - December	0.211	0.067	0.17%	6.313	0.002
Binary Variable for Hurricane Ivan September 2004	-101.991	13.827	0.00%	0.004	-0.001
Binary Variable for Hurricanes Dennis and Katrina July-September 2005	-19.883	9.087	2.97%	0.013	-0.000
Binary Variable for Hurricane Isaac August-September 2012	-28.325	10.774	0.92%	0.008	-0.000
Monthly Binary Variable for January	-24.570	9.041	0.71%	0.083	-0.004
First Order Auto-Regressive Term, AR(1)	0.157	0.068	2.27%	N/A	N/A

HDH = Heating Degree Hours

CDH = Cooling Degree Hours