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October 12, 2016

VIA ELECTRONIC FILING

Ms. Carlotta Stauffer
Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850

Re: Petition for an increase in rates by Gulf Power Company, Docket No. 160186-EI

Re: Petition for approval of 2016 depreciation and dismantlement studies, approval of proposed depreciation rates and annual dismantlement accruals and Plant Smith Units 1 and 2 regulatory asset amortization by Gulf Power Company, Docket No. 160170-EI

Dear Ms. Stauffer:

Attached is the Direct Testimony and Exhibit of Gulf Power Company Witness Jun K. Park.

(Document 15 of 29)

Sincerely,

Robert L. McGee, Jr.

Robert L. McGee, Jr.
Regulatory & Pricing Manager

BEFORE THE

FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 160186-EI

Gulf Power

TESTIMONY AND EXHIBIT

OF

JUN K. PARK

GULF POWER COMPANY

Before the Florida Public Service Commission
Prepared Direct Testimony of
Jun K. Park
Docket No. 160186-EI
In Support of Rate Relief
Date of Filing: October 12, 2016

Q. Please state your name and business address.

A. My name is Jun Park. My business address is One Energy Place, Pensacola, Florida, 32520.

Q By whom are you employed?

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

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

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

Q. Please state your prior work experience and responsibilities.

A. I started my career with Southern Company in 1999. Over the course of my career, I have held various positions with forecasting and analytical responsibilities, including forecasting wholesale energy prices, coordinating the development of price forecasts for fuel commodities and emissions allowances, and developing long-term energy and peak demand forecasts. I joined Gulf Power in 2011 as a forecast analyst and have been leading Gulf's forecasting team since 2014.

Q. What is your educational background?
A. I graduated from the University of Alabama at Birmingham with a Bachelor of Science degree in Finance.

Q. What is the purpose of your testimony?
A. My testimony presents Gulf's forecast methodologies and forecast results for customers, energy sales, peak demand, and base rate revenue. The forecast is provided to Corporate Planning for use in the budgeting and planning process as discussed by Gulf Witness Mason.

Q. Are you sponsoring any exhibits?
A. Yes, I am sponsoring Exhibit JKP-1, Schedules 1 through 6. Exhibit JKP-1 was prepared under my direction and control, and the information contained therein is true and correct to the best of my knowledge and belief.

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

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

I. OVERVIEW

Overview of Economic Conditions and Historical Sales Trends

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

A. Gulf provides retail service to customers in eight counties in Northwest Florida (NW FL): Bay, Escambia, Holmes, Jackson, Okaloosa, Santa Rosa, Walton, and Washington. Our service area is generally represented by three Metropolitan Statistical Areas (MSAs): Pensacola-Ferry Pass-Brent, Crestview-Fort Walton Beach-Destin, and Panama City.

Prior to the most recent economic recession, Gulf's service area saw strong economic growth. For the pre-recession years from 2002 to 2006, economic growth was strong, with a compound annual average growth rate (CAGR) of 3.6 percent for non-manufacturing employment, 5.0 percent for real disposable personal income, and 5.5 percent for gross domestic product (GDP) for Gulf's MSAs.

Beginning in late 2006 and continuing through 2012, economic conditions in Gulf’s service area deteriorated significantly. Employment and GDP fell at an average annual rate of 1.0 percent and 1.9 percent, respectively, and income growth slowed to just 0.9 percent per year.

Since 2012, economic conditions have improved somewhat, but growth still remains below pre-recession rates. Growth rates for the years 2012 to 2015 have been generally less than half that of pre-recession levels, with annual average growth rates of only 1.9 percent per year for GDP and average annual growth rates for employment and income of just 1.5 percent.

Q. Please describe Gulf’s historical sales trends.

A. Gulf’s sales trends were generally similar to economic performance measures for the overall NW FL economy, with Gulf’s retail energy sales experiencing average annual growth of 1.8 percent during the pre-recession years from 2002 to 2006. Gulf’s retail energy sales dropped significantly through the recession, with an average annual decline of 0.9 percent. Since 2012, retail sales have remained relatively flat at an average annual growth rate of less than one half of a percent.

Q. How do these historical sales compare to the forecasts for retail energy sales in Gulf’s 2012 test year rate case (Docket No. 110138-EI)?

A. Actual retail energy sales during 2012 were significantly below forecasts because the economic growth during that time was slower than projected.

Weather-normalized retail energy sales have continued to remain relatively flat and have not reached the levels projected for the 2012 test year in Gulf's 2012 test year rate case.

Q. Why have retail sales remained relatively flat since 2012?

A. Declining use per customer was the overwhelming driver for the relatively flat retail sales since 2012. As shown in Schedule 2 of my exhibit, residential use per customer has declined an average of 0.7 percent per year since 2012, compared to an average annual residential customer growth of 1.0 percent for the same period. Schedule 3 of my exhibit shows similar trends for the commercial class, where commercial use per customer declined an average of 1.1 percent since 2012, compared to an average commercial customer growth of 1.1 percent.

Q. What factors contributed to the declines in use per customer?

A. The economic slowdown experienced during the recent recession and the subsequent sluggish recovery significantly impacted Gulf's use per customer. Additional declines in use per customer were driven by improvements to overall equipment efficiencies due to changes in minimum codes and standards for new equipment such as HVAC units and lighting.

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

A. The forecast for the 2014 test year used in Gulf's last base rate proceeding (Docket No. 130140-EI) was accurate, as Gulf minimally over-forecast retail energy sales by 0.8 percent.

Economic Outlook and Sales Growth Expectations

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

A. The economic projections used by Gulf are from Moody's Analytics, a well-respected economic forecasting firm that has supplied Gulf with economic forecasts for over 20 years. Gulf used the October 2015 vintage of Moody's economic projections, which were the most current data available at the time the forecast was developed. In that outlook, Moody's projects that the economy in Gulf's service area will grow in 2016 and experience improved growth in 2017.

Q. Please summarize Gulf's sales growth expectations in its forecast.

A. Retail sales are expected to grow at a CAGR of 0.2 percent over the next two years.

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

A. Yes. There is always an element of risk in forecasting due to a variety of factors such as declining use per customer and economic uncertainty. For example, Gulf's most recent forecast of retail base rate revenues for 2017 is 1.0 percent lower than the forecast for this base rate proceeding, which equates to $5.7 million less in projected base rate revenues for the 2017 test year. Despite the continuing trend of flat or declining use per customer along with the challenging economic conditions experienced over the most recent years, Gulf's forecast methodology is fundamentally sound and is the most accurate tool available for forecasting the Company's future energy sales.

<u>Overview of Forecast Methodology</u>

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

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

Q. Has the previously described forecast methodology for customers, energy, peak demand, and base revenue been used by Gulf in its regular course of business?
A. Yes. Gulf produces a forecast annually using this same methodology. The annual forecast is routinely utilized for business planning and operations. This forecast is used by the Company for financial planning; budgeting; generation, distribution and transmission planning; and fuel procurement planning.

Q. Has the previously described forecast methodology for customers, energy, peak demand, and base revenue been used by Gulf in base rate proceedings where the Florida Public Service Commission (FPSC or the Commission) has accepted, approved, or relied upon Gulf's forecast?
A. Yes. This forecast methodology was used by Gulf in its 2012 test year rate case where it was stipulated to by the parties and approved by the Commission. This methodology was also used in Gulf's most recent base rate proceeding which was settled by the parties.

Q. Has the previously described forecast methodology for customers, energy, peak demand, and base revenue been used by Gulf in other proceedings or filings where the Commission has accepted, approved, or relied upon Gulf's forecast?
A. Yes. This methodology has also been used by the Company over the years for various purposes including: Ten Year Site Plan filings; need

determination proceedings; Renewable Standard Offer Contract filings; and annual cost recovery filings for Gulf's clauses.

II. GULF'S CUSTOMER FORECAST

Q. What are the 2017 results of Gulf's customer forecast?

A. Gulf projects that it will have a total of 460,850 retail customers by December 2017, an increase of 6,682 customers over projections for December 2016. This represents an anticipated annual growth rate of 1.5 percent for the test year. By comparison, historical growth rates of 0.5 percent, 1.1 percent, 1.1 percent and 1.2 percent were experienced in 2012, 2013, 2014 and 2015, respectively. Projections for year-end 2016 indicate an annual growth rate of 1.0 percent.

Q. How were Gulf's forecasts of customers and customer growth for 2016 and 2017 developed?

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

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

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

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

Q. Has this forecast methodology provided reliable forecasts of customers in the past?
A. Yes. For the past three years, Gulf minimally under-forecast residential customer count one year out by 0.1 percent and minimally over-forecast residential customer count two years out by 0.1 percent.

The commercial class is smaller and more diverse than the residential class, which makes projections more difficult. However, despite these challenges, Gulf's forecast methodology has provided reliable forecasts for commercial customers. For the past three years, Gulf minimally under-forecast commercial customer count one year out and two years out by 0.2 percent.

Q. Is this the same forecast methodology for customers and customer growth that Gulf used in its 2014 test year rate case?
A. Yes.

Q. Was the customer and customer growth forecast advanced by Gulf in the 2014 test year rate case relied upon in the settlement of that case?
A. Yes. It was one of the underlying assumptions used for establishing rates approved in the settlement.

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

A. Gulf's forecast of residential and commercial customers in the last base rate proceeding was very accurate. For residential, Gulf minimally over-forecast the customer count one year out by 0.1 percent for 2013, and minimally over-forecast the customer count two years out by 0.3 percent for 2014. For commercial, Gulf minimally under-forecast the customer count one year out by 0.2 percent for 2013, and minimally under-forecast the customer count two years out by 0.2 percent for 2014. Gulf's customer forecast methodology, which relies on the experience and knowledge of our field managers and their employees, has produced reliable, accurate results.

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

A. Over the 11 months of the forecast period for which actual data are available (October 2015 through August 2016), residential customers were minimally under-forecast by 0.2 percent. The forecast of commercial customers was essentially on budget.

III. GULF'S ENERGY SALES FORECAST

Overall Retail Energy Sales Forecast

Q. What are the results of Gulf's retail energy sales forecast for 2017?

A. Based on our forecast used in this case, retail energy sales are expected to total 11,022,525 megawatt hours (MWh) in the test year, representing an increase of 1.1 percent over projections for the twelve months ending in December 2016. This growth is being driven by projected sales to new customers.

The retail MWh sales forecast by class consists of the following:

Residential:	5,357,974 MWh, comprising 48.6 percent;
Commercial:	3,943,439 MWh, comprising 35.8 percent;
Industrial:	1,697,827 MWh, comprising 15.4 percent; and
Street Lighting:	23,285 MWh, comprising 0.2 percent.

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

A. Gulf used three multiple linear regression models to estimate residential and commercial non-lighting energy sales, one for residential and two for commercial. For forecasting purposes, the commercial class was split into two groups—small and large.

The primary economic variables used in the models are twelve month moving average electricity price, real disposable income per household for the residential model, and GDP per capita for Gulf's MSAs for the commercial models. Gulf's residential model also includes an energy efficiency variable. Historical and projected data for these variables are incorporated into the models to capture how customers behave in response to changes in these variables. Typically, when price goes up, customers use less energy, and when price goes down, customers use more energy. Typically, when income and GDP go up, customers use more energy, and when they go down, customers use less energy. Typically, when energy efficiency improves, customers use less energy.

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

As is standard industry practice, Gulf's residential and commercial energy forecasts assumed normal weather conditions for future projections. Likewise, forecast accuracy calculations compared these normal weather forecasts of energy sales to weather-normalized actual energy sales.

The forecast of sales to small industrial customers was produced in a similar manner using historical growth rates rather than a regression model.

Projections of sales to the largest industrial customers were based on field surveys. Outdoor lighting energy sales were projected by rate and class using historical growth rates and input from Gulf's lighting team. My testimony below further describes Gulf's retail energy sales forecast methodology.

Residential Energy Sales Forecast

Q. How was Gulf's forecast of 2017 residential energy sales developed?

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

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

A. The dependent variable, the quantity being estimated, in the residential energy regression equation was monthly billing cycle energy per customer per billing day. The regression included a constant term and 20 years of historical data for the following variables: billing cycle residential cooling degree hours per billing day for the months March through December, billing cycle residential heating degree hours per billing day for the months November through April, twelve month moving average of real residential electricity price, real disposable income per household, and energy efficiency. Also included in the model was a binary variable for the month of September 2004 to account for the impact of Hurricane Ivan, a binary variable for the months of August 2012 and September 2012 to account for the impact of Hurricane Isaac, an autoregressive term lagged one month to address first-order residual autocorrelation over time, a binary variable for October 1998 to address a model residual in that month, and a binary variable for the combined months of June 2008, July 2008, and August 2008 to address model residuals in those months. These variables were carefully chosen to make the model both simple and statistically robust. Variables were required to have a logical connection to residential electricity sales, substantial data history, dependable projections of future values, limited overlap with other variables (i.e. limited multicollinearity), and good statistical significance (i.e. low p-value).

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

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

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

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

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

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

Q. What statistical results did Gulf attain with the residential regression model?
A. As presented on page 2 of Schedule 4 of my exhibit, all variables used in the residential regression model were statistically significant (i.e. low p-values) and each coefficient had the expected sign. The model’s adjusted R-squared was 98.6 percent, indicating that all but 1.4 percent of the variance in the historical data was explained by the model. The model’s Durbin-Watson d-statistic was 2.02, indicating no significant autocorrelation in the residuals. Overall, these are excellent statistical results.

Q. What data sources were employed for the economic variables used in Gulf's residential regression model?
A. Historical values and forecast projections of the economic variables real disposable income, households, and GDP price deflator were purchased from Moody's Analytics. Gulf used the October 2015 vintage of Moody's economic projections, which was the most recent data available at the time the forecast was developed.

Q. Previously, when describing the variables used for the forecast, you mentioned an energy efficiency variable. What is the purpose of the energy efficiency variable?
A. The purpose of the energy efficiency variable is to estimate the impact of changes in minimum codes and standards for new equipment, such as HVAC and lighting.

Q. How was the energy efficiency variable calculated?
A. The energy efficiency variable is calculated based upon the federal minimum SEER rating for HVAC units and the average life expectancy of an HVAC unit. The variable accounts for the effect that energy efficiency code changes have on electricity sales.

Q. How was the number of cycle billing days per month determined?
A. Gulf's customers are divided among 21 bill groups. Each bill group has a different scheduled read date, which varies from month to month and is staggered from bill group to bill group. Monthly cycle billing days were

calculated as follows. For a given month, the number of billing days in a bill group was the sum of the days from the day after the prior month's scheduled read date through the current month's scheduled read date. These summed days for each of the 21 bill groups were then totaled and divided by 21 to get the month's cycle billing days.

Q. How was historical residential weather calculated?

A. Cooling and heating degree hours were calculated using the National Oceanic and Atmospheric Administration's (NOAA) Pensacola weather station's hourly temperatures. Residential cooling degree hours are the result of taking the number of degrees Fahrenheit that each hourly temperature is above a 67 degree baseline and summing over a given time period. Residential heating degree hours are the result of taking the number of degrees Fahrenheit that each hourly temperature is below a 59 degree baseline and summing over a given time period. These residential cooling and heating degree hour temperature baselines reflect the observed correlation between hourly temperatures and hourly energy purchases by Gulf's residential customers.

Monthly billing cycle residential weather was calculated as follows. For each bill group, the total residential cooling degree hours were summed over the period from the day after the prior month's scheduled read date through the current month's scheduled read date. These summed residential cooling degree hours for each of the 21 bill groups were then totaled and divided by 21 to get the monthly billing cycle residential cooling degree hours. This process was repeated to calculate the monthly billing cycle residential heating degree hours.

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

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

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

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

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

A. Gulf utilized its most recent DSM plan, which was approved by the Commission in Order No. PSC-15-0330-PAA-EG on August 19, 2015, to adjust forecasted sales and annual system peak demand for projected conservation impacts. These assumptions for conservation impacts are reasonable and in accordance with the past methodology included in the forecast used in Gulf's last rate case.

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

A. The forecast reflects all expected impacts of the DSM plan – some of those impacts were embedded in the regression model output and some of those impacts were included through an exogenous adjustment to the regression model output. Gulf utilized data from ITRON (the vendor used by parties in the DSM goals docket to develop technical and achievable potential levels of DSM for Gulf and other utilities) as well as Gulf's experience in the energy efficiency market and knowledge of existing programs to determine, by program, the amount of energy savings embedded in the historical regression data. The remaining impacts, those not embedded in the historical data, formed the exogenous DSM adjustment. The exogenous DSM adjustment to residential class energy in the test year was 9 million kWh, which reduced total retail energy sales by 0.2 percent.

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

A. Gulf used a purchased study from the Electric Power Research Institute to estimate the impact of electric vehicles on retail sales. The study estimated an exogenous impact of 3.6 million kWh in the test year. All charging was assumed to occur off-peak in the residential class.

Q. Did the proposed changes to the residential pricing structure and new conservation programs result in additional adjustments to the residential energy forecast?

A. No. The changes to the residential pricing structure proposed by Gulf Witness McGee are projected to result in a slight increase in residential energy sales in the test year but those increases in sales are more than offset by the energy savings from the new and modified residential DSM programs proposed by Gulf Witness Floyd. As a result, no additional adjustments to the residential energy forecast were necessary.

Commercial Energy Sales Forecast

Q. How was Gulf's forecast of 2017 commercial energy sales developed?

A. The short-term non-lighting commercial energy sales forecast was developed using two multiple linear regression models. One modeled "small commercial" customer energy usage (rate schedules GS and Flat-GS), and the other modeled energy usage of the remainder of the commercial class (all other rate schedules), the latter being referred to as "large commercial." Both models were similar in specification.

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

A. In each commercial regression model, the dependent variable (the quantity being estimated) was monthly billing cycle energy per customer per billing day. The small commercial model included a constant term and 20 years of historical data for the following variables: billing cycle cooling degree hours per billing day for the months of April through November, billing cycle heating degree hours per billing day for the months of December through April, twelve month moving average of real commercial electricity price, and GDP per capita for Gulf's MSAs. Also included in the small commercial model was a binary variable for the month of September 2004 to account for the impact of Hurricane Ivan, a binary variable for the month of August 1997 to address a large residual in that month, a binary to account for residuals beginning in May 2012, and one autoregressive term lagged one month to address first-order residual autocorrelation over time.

The large commercial model included a constant term and 20 years of historical data for the following variables: billing cycle cooling degree hours per billing day for the months of March through November, billing cycle heating degree hours per billing day for the months of December through March, a binary variable to capture the seasonal variation for the month of January, twelve month moving average of real commercial electricity price, and GDP per capita for Gulf's MSAs. Also included in the large commercial model was a binary variable for the month of September 2004 to account for the impact of Hurricane Ivan, a binary to account for residuals beginning in

May 2012, and one autoregressive term lagged one month to address first-order residual autocorrelation over time.

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

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

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

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

A. As presented on page 2 of Schedule 5 of my exhibit, all variables used in the small commercial regression model were statistically significant (i.e. low p-values) and each coefficient had the expected sign. The model's adjusted R-squared was 95.0 percent, indicating that all but 5.0 percent of the variance in the historical data was explained by the model. The model's Durbin-Watson d-statistic was 2.25, indicating no significant autocorrelation in the residuals. Overall, these are excellent statistical results.

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

A. As presented on page 2 of Schedule 6 of my exhibit, all variables used in the large commercial regression model were statistically significant (i.e., low p-values) and each coefficient had the expected sign. The model's adjusted R-squared was 97.4 percent, indicating that all but 2.6 percent of the variance in the historical data was explained by the model. The model's Durbin-Watson d-statistic was 2.13, indicating no significant autocorrelation in the residuals. Overall, these are excellent statistical results.

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

A. Historical values and forecast projections of the economic variables GDP, population, and GDP price deflator were purchased from Moody's Analytics.

Gulf used the October 2015 vintage of Moody's economic projections, which was the most recent data available at the time the forecast was developed.

Q. How was historical commercial weather calculated?

A. Cooling and heating degree hours were calculated using the NOAA Pensacola weather station's hourly temperatures. Commercial cooling degree hours are the result of taking the number of degrees Fahrenheit that each hourly temperature is above a 63 degree baseline and summing over a given time period. Commercial heating degree hours are the result of taking the number of degrees Fahrenheit that each hourly temperature is below a 54 degree baseline and summing over a given time period. These commercial cooling and heating degree hour temperature baselines reflect the observed correlation between hourly temperatures and hourly energy purchases by Gulf's commercial customers. Observed commercial customer temperature breakpoints are lower than residential customer temperature breakpoints because commercial buildings typically contain more heat producing equipment and people than residential buildings. Thus, commercial Heating Ventilating and Air Conditioning (HVAC) equipment typically begins heating later (below a lower temperature) and begins cooling sooner (above a lower temperature) than residential HVAC equipment.

Monthly billing cycle commercial weather was calculated as follows. For each bill group, the total commercial cooling degree hours were summed over the period from the day after the prior month's scheduled read date through the current month's scheduled read date. These summed commercial cooling degree hours for each of the 21 bill groups were then totaled and divided by 21 to get the monthly billing cycle commercial cooling degree hours. This process was repeated to calculate the monthly billing cycle commercial heating degree hours.

Q. How was forecast commercial weather calculated?

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

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

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

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

A. The forecast reflects all expected impacts of the DSM plan – some of those impacts were embedded in the regression model output and some of those impacts were included through an exogenous adjustment to the regression model output. Gulf utilized data from ITRON as well as Gulf's experience in the energy efficiency market and knowledge of existing programs to determine, by program, the amount of energy savings embedded in the historical regression data. The remaining impacts, those not embedded in the historical data, formed the exogenous DSM adjustment. The exogenous DSM adjustment to commercial class energy in the test year was 3 million kWh, which reduced total retail energy sales by 0.1 percent.

Industrial Energy Sales Forecast

Q. How was Gulf's 2017 forecast of industrial energy sales developed?

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

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

The forecast of short-term sales to the remaining smaller industrial customers, which represent 1.6 percent of total retail energy sales, was developed by rate schedule and month using historical averages. The resulting estimates of energy purchases per customer per billing day were multiplied by the expected number of customers and billing days by month to expand to the rate level totals. These projections were then added to the results for the major industrial customers, the industrial class outdoor lighting energy projections, and the industrial class unbilled energy estimates to sum to the industrial class calendar month totals.

Street Lighting Energy Sales Forecast

Q. How was Gulf's 2017 forecast of street lighting energy sales developed?

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

Total Retail Energy Sales Forecast and Forecast Methodology

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

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

Q. Is this the same forecast methodology for energy sales that was used in Gulf's last base rate proceeding?

A. Yes. The overall methodology that Gulf currently uses to forecast energy sales is substantially the same as that employed in the last base rate proceeding, which was stipulated to by the parties and approved by the Commission. Gulf made two minor changes to its residential model specification during 2015. Both changes were made to the residential regression model to improve the forecast of residential energy sales. The first change to the residential model specification was to add the energy efficiency variable. The continued improvement of efficiency in electric equipment will continue to reduce sales and needed to be reflected in the model. As a result of adding the energy efficiency variable, the split price indices were replaced with a single price variable representing the twelve month moving average of real residential electricity price. It was necessary to remove the split prices because the price increase index and the energy efficiency variable exhibited a high degree of multicollinearity.

The second change to the residential model specification was to add a binary variable for the month of October 1998 to address a model residual in that month. The addition of this variable improved the overall model statistics.

Gulf made three minor changes to the small commercial model specification in 2015 to improve the forecast of small commercial sales. The first change was to replace the economic variable of non-manufacturing employment with GDP per capita for Gulf's MSAs. GDP per capita exhibited a better relationship with commercial energy sales and improved the overall model statistics.

The second change to the small commercial model specification was to add a binary that begins in May of 2012. The binary addresses changes in commercial customer usage that had resulted in actual energy sales coming in under forecast.

The third change to the small commercial model specification was to add heating degree hours for the month of April. Each year, the models are evaluated for potential improvements. Previously, the April heating degree hour variable was not statistically significant. In the model, however, the variable now has a lower p-value, which indicates the variable is statistically significant and warrants inclusion into the small commercial model.

Gulf made three minor changes to the large commercial model specification in 2015 to improve the forecast of large commercial sales. The first change to the large commercial model specification was to replace the economic variable of non-manufacturing employment with GDP per capita for Gulf's MSAs. GDP per capita exhibited a better relationship with commercial energy sales and improved the overall model statistics.

The second change to the large commercial model specification was to add a binary that begins in May of 2012. The binary addresses changes in commercial customer usage that had resulted in actual energy sales coming in under forecast.

The third change to the large commercial model specification was to remove two binaries: the first was for Hurricanes Dennis and Katrina and the second was for Hurricane Isaac. In the model, these variables were no longer statistically significant.

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

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

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

A. Yes. Gulf's retail energy sales forecasts during the recent recession were higher than actual results because of the lingering effects of the recession, the slower than projected recovery, and unprecedented declines in use per customer. But refinements to model specifications and somewhat lower economic outlook risks have resulted in improvements to Gulf's retail energy sales forecast accuracy. For the past three years, Gulf over-forecast retail sales one year and two years out by 0.9 percent and 3.6 percent, respectively. For the most recent historical year, Gulf minimally under-forecast retail sales one year out by 0.1 percent and minimally over-forecast retail sales two years out by 0.8 percent.

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

A. Over the 11 months of the forecast period for which actual data are available (October 2015 through August 2016), total retail energy sales were slightly under-forecast by 0.8 percent.

Territorial Wholesale Energy Sales Forecast

Q. How was Gulf's forecast of 2017 territorial wholesale energy sales developed?

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

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

A. Monthly wholesale energy purchases per day were estimated based on historical energy sales, residential weather (heating and cooling degree hours), GDP for the applicable MSA, a binary variable corresponding to the wholesale price level, binary variables to account for unusual residuals, and an autoregressive term lagged one month to address first-order residual autocorrelation over time.

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

A. All variables used in the wholesale regression model were statistically significant (i.e., low p-values) and each coefficient had the expected sign. The model's adjusted R-squared value was 95.7 percent, indicating that all but 4.3 percent of the variance in the historical data was explained by the model. The model's Durbin-Watson d-statistic was 2.06, indicating no significant autocorrelation in the residuals. Overall, these are excellent statistical results.

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

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

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

A. The 2017 wholesale energy projection was used by Gulf Witness O'Sheasy in the cost of service study to develop allocators that help determine the jurisdictional split between the wholesale and retail jurisdictions.

IV. GULF'S PEAK DEMAND FORECAST

Q. What is Gulf's forecasted peak demand for 2017?

A. Gulf's territorial system peak demand is projected to be 2,491 MW in the test year, representing an increase of 41 MW or 1.7 percent over projections for the twelve months ended December 2016. This peak is expected to occur in the summer month of July 2017.

Q. How was this forecast of peak demand developed?

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

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

A. The forecast reflects all expected impacts of the DSM plan – some of those impacts were embedded in historical peak demand levels and some of those impacts were included through an adjustment. As with DSM adjustments to energy, data from ITRON, as well as Gulf's experience in the energy efficiency market and knowledge of existing programs, were used to determine, by program, the amount of demand savings embedded in the historical data. The remaining impacts, i.e., those not embedded in the historical data, formed the DSM adjustment. The DSM adjustment to system peak demand in the test year was 5 MW, which reduced system peak demand by 0.2 percent.

V. GULF'S FORECAST OF RETAIL BASE RATE REVENUE

Q. What are the 2017 results of Gulf's retail base rate revenue forecast?

A. Retail base rate revenue is forecasted to total $555,880,000 in the test year. Using rates approved in Gulf's last base rate case in FPSC Order No. PSC-13-0670-S-EI, the base rate revenue forecast by class consists of the following:

Residential:	$338,952,000
Commercial:	$170,550,000
Industrial:	$ 42,455,000
Street Lighting:	$ 3,923,000

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

A. Rate schedules approved in Gulf's last base rate case were applied to monthly projections of customers, energy sales, and aggregate billing demands, as applicable by rate, for each customer classification. Outdoor lighting base revenue was estimated by class and rate using the most recent actual base revenue per kWh and guidance from Gulf's lighting team.

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

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

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

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

- Monthly number of customers was derived from the customer forecast.
- Monthly energy was derived from the energy forecast.
    - Monthly time of use (TOU) energy was based on monthly energy from the forecast allocated to tier based on monthly historical averages by tier.

- Monthly aggregate max demands for commercial and small industrial customers by rate were derived from monthly historical average max demand to energy ratios multiplied by forecast year monthly energy.
- Monthly aggregate on-peak demands for commercial and small industrial customers by rate were derived from monthly historical average on-peak demand to energy ratios multiplied by forecast year monthly energy.
- Monthly max demands, monthly on-peak demands and monthly reactive demands for the 47 largest industrial customers and the eight largest commercial customers were derived from historical ratios applied to projected annual max demands which are collected through the large customer survey.
    - Monthly max demands for each of these customers were calculated as the product of the forecast year's annual peak demand times the ratio of a historical year's monthly max demand to annual max demand.
    - Monthly on-peak demands for each of these customers were calculated as the product of the forecast year's monthly max demand times the ratio of a historical year's monthly on-peak demand to monthly max demand.
    - Monthly reactive demands for each of these customers were calculated as the product of the forecast year's monthly max demand times the ratio of a historical year's monthly reactive demand to monthly max demand.

- The historical year in the billing demand calculations was October 2014 through September 2015, the most recent 12 months of billing data available at the time the billing determinants forecast was developed.

Q. Is this the same forecast methodology for retail base revenue that was used in Gulf's last base rate proceeding?

A. Yes.

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

A. Over the 11 months of the forecast period for which actual data are available (October 2015 through August 2016), total retail base rate revenue was minimally under-forecast by 0.4 percent.

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

A. Yes. This forecast of customers, energy, and peak demand was the foundation for and was included in Gulf's 2016-2025 Ten Year Site Plan, which was filed with the Commission on April 1, 2016. This forecast of energy and demand was also the basis for calculations used in Gulf's Renewable Standard Offer Contract which was filed with the Commission on April 1, 2016, in Docket No. 160072-EQ and approved by the Commission on June 29, 2016, in Order No. PSC-16-0251-PAA-EQ. This forecast of customers and energy was included in Gulf's Forecasted

Earnings Surveillance Report which was submitted to the Commission staff on March 9, 2016.

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

A. Yes. It is based upon an established and proven methodology. It employed reliable data from well-respected sources. The methodology and forecast are routinely used by Gulf in its regular course of business and were not developed just for this rate case. The methodology and the resulting forecast have been relied upon by Gulf and the Commission in a number of proceedings.

VI. SUMMARY

Q. Please summarize your testimony.

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

Q. Does this conclude your testimony?
A. Yes.

AFFIDAVIT

STATE OF FLORIDA)
)
COUNTY OF ESCAMBIA)

Docket No. 160186-EI

Before me, the undersigned authority, personally appeared Jun K. Park, who being first duly sworn, deposes, and says that he is the Supervisor of Forecasting for Gulf Power Company, a Florida corporation, and that the foregoing is true and correct to the best of his knowledge, information, and belief. He is personally known to me.

s/____________________
Jun K. Park
Supervisor of Forecasting

Sworn to and subscribed before me this 5th day of October, 2016.

____
Notary Public, State of Florida at Large

Commission No. FF950425

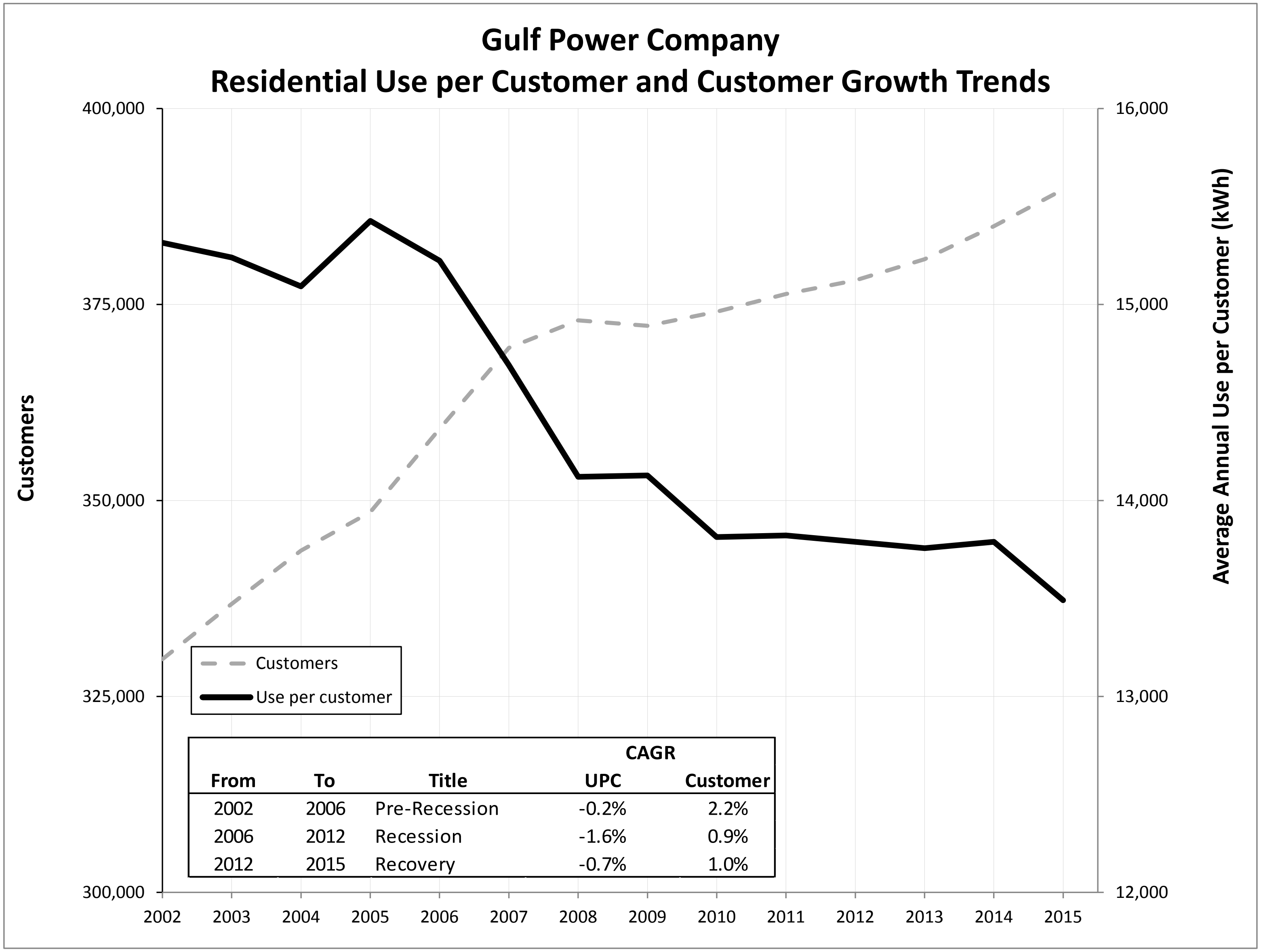
My Commission Expires 2/6/20

MONICA SIMPSON
MY COMMISSION # FF950425
EXPIRES February 06, 2020
(407) 398-0153 FloridaNotaryService.com

Exhibit

Responsibility for Minimum Filing Requirements

Schedule	Title
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



			CAGR	
From	To	Title	UPC	Customer
2002	2006	Pre-Recession	-0.2%	2.2%
2006	2012	Recession	-1.6%	0.9%
2012	2015	Recovery	-0.7%	1.0%

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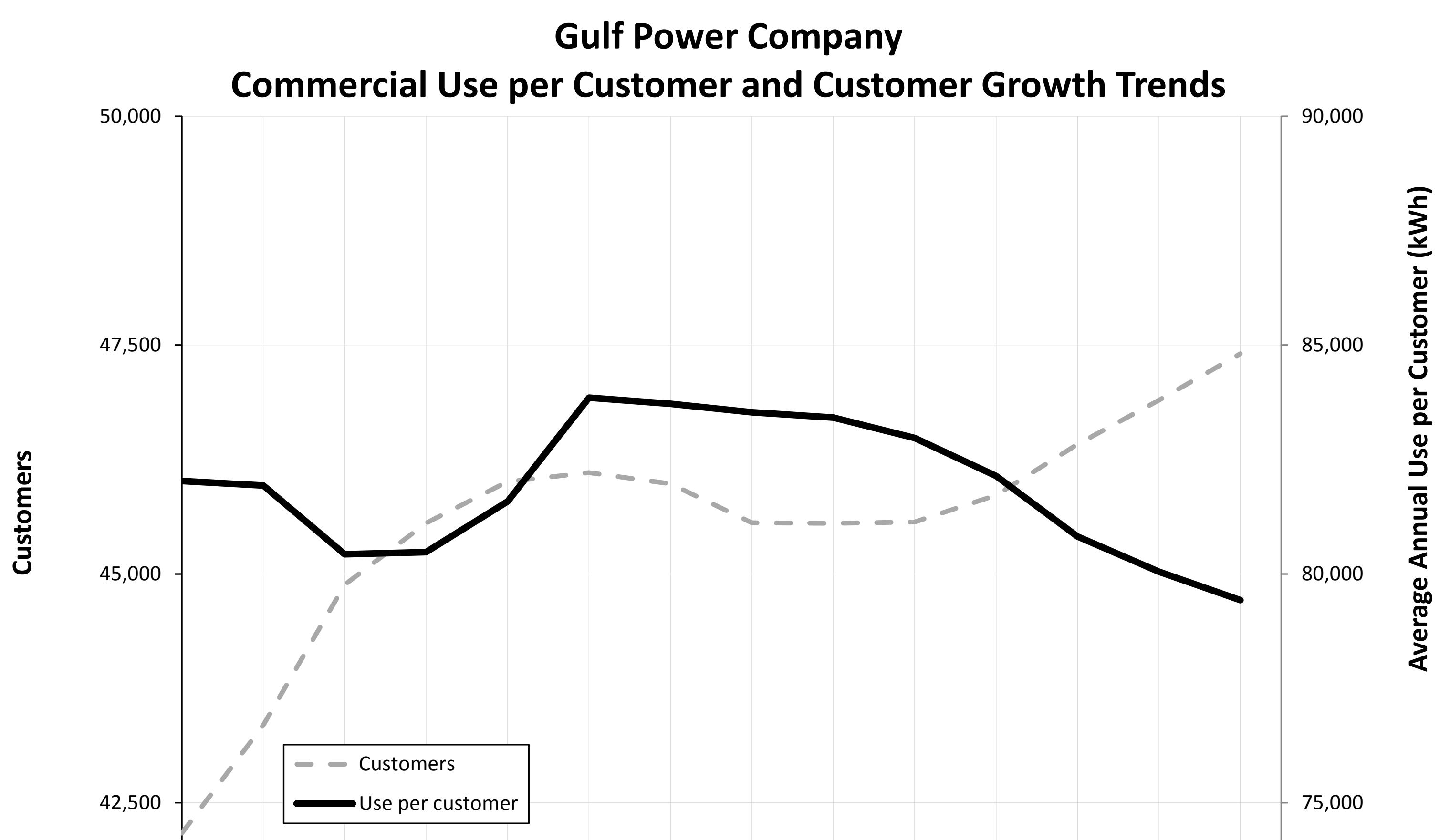
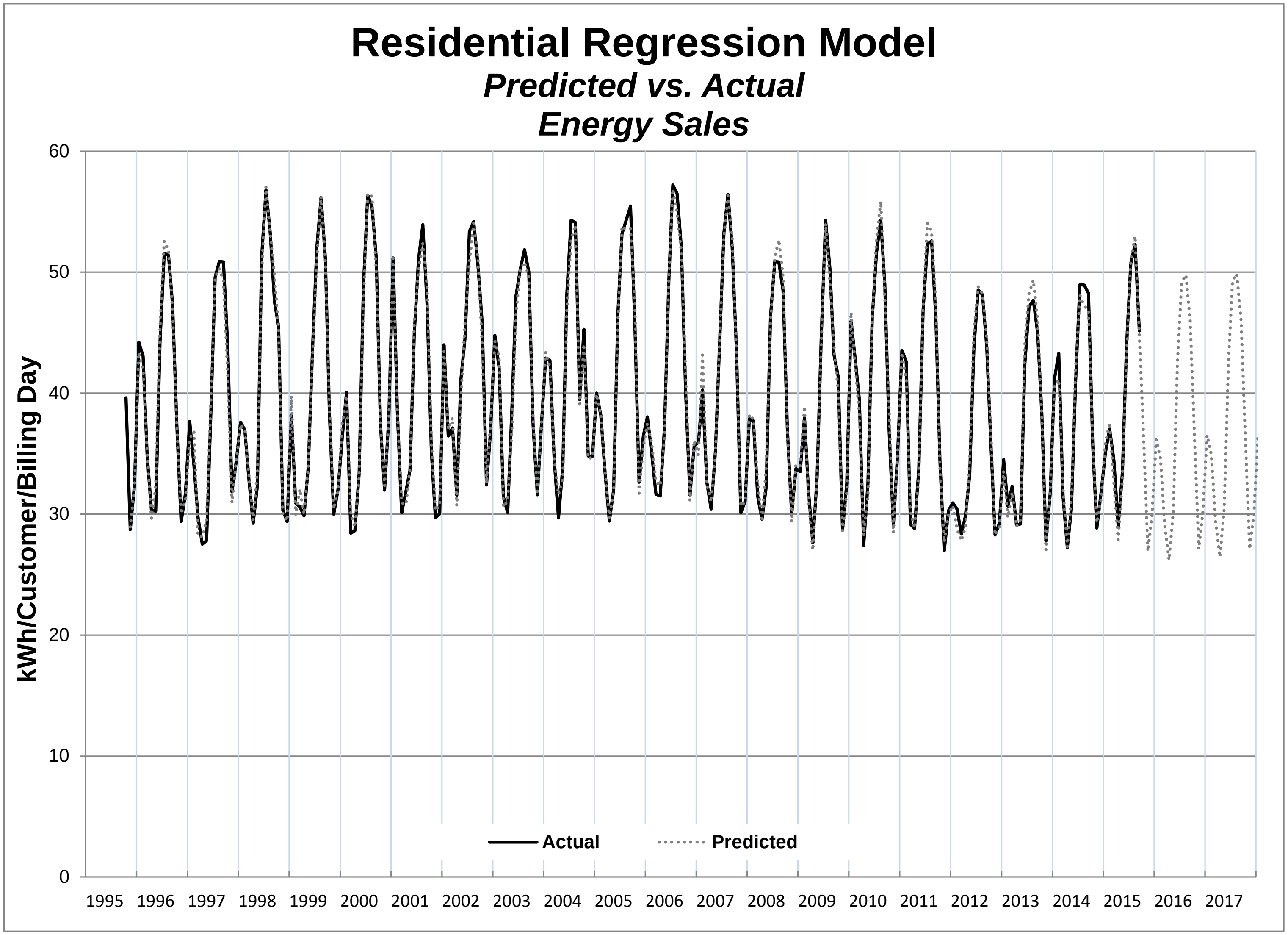


			CAGR	
From	**To**	**Title**	**UPC**	**Customer**
2002	2006	Pre-Recession	-0.1%	2.2%
2006	2012	Recession	0.1%	-0.1%
2012	2015	Recovery	-1.1%	1.1%



Residential Regression Model
Predicted vs. Actual
Energy Sales
kWh/Customer/Billing Day
60
50
40
30
20
10
0
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
Actual
Predicted

Residential Regression Model Summary

Software:	MetrixND Version 4.4
Dependent Variable:	Monthly Billing Cycle Residential kWh per Customer per Billing Day
Estimation Dates:	October 1995-September 2015

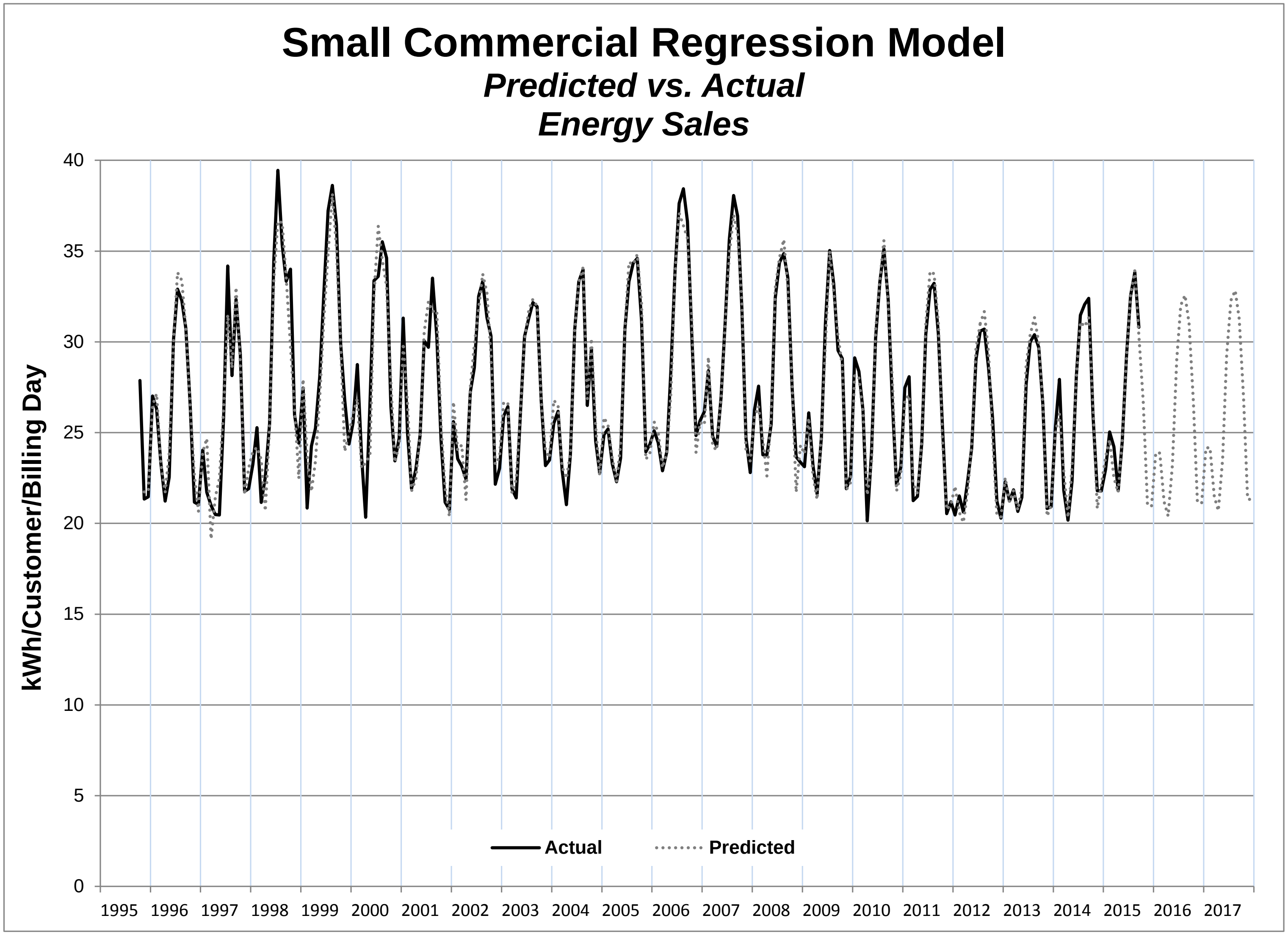
Residential Regression Statistics

Iterations	12
Adjusted Observations	239
Deg. of Freedom for Error	214
R-Squared	0.988
Adjusted R-Squared	0.986
Durbin-Watson Statistic	2.024
Standard Error of Regression	1.00
Mean Absolute Percentage Error (MAPE)	1.94%
Skewness	-0.107
Kurtosis	3.019

Residential Regression Model Coefficients

Variable	Coefficient	Standard Error	p-Value	Elasticity	Mean
Constant	25.958	1.758	0.00%	N/A	N/A
Real Disposable Personal Income per Household	0.218	0.029	0.00%	0.432	78.42
12-Month Average of Real Residential Price	-1.002	0.186	0.00%	-0.253	9.98
Energy Efficiency Variable	-0.933	0.365	1.13%	-0.241	10.19
Billing Cycle Residential CDH per Billing Day - March	0.053	0.015	0.08%	0.002	1.59
Billing Cycle Residential CDH per Billing Day - April	0.060	0.007	0.00%	0.007	4.63
Billing Cycle Residential CDH per Billing Day - May	0.071	0.003	0.00%	0.021	11.65
Billing Cycle Residential CDH per Billing Day - June	0.080	0.002	0.00%	0.047	23.08
Billing Cycle Residential CDH per Billing Day - July	0.082	0.001	0.00%	0.061	29.20
Billing Cycle Residential CDH per Billing Day - August	0.083	0.001	0.00%	0.062	29.55
Billing Cycle Residential CDH per Billing Day - September	0.079	0.002	0.00%	0.053	26.63
Billing Cycle Residential CDH per Billing Day - October	0.078	0.002	0.00%	0.034	17.05
Billing Cycle Residential CDH per Billing Day - November	0.059	0.006	0.00%	0.009	6.24
Billing Cycle Residential CDH per Billing Day - December	0.060	0.015	0.01%	0.003	1.76
Billing Cycle Residential HDH per Billing Day - January	0.077	0.002	0.00%	0.034	17.37
Billing Cycle Residential HDH per Billing Day - February	0.076	0.002	0.00%	0.030	15.77
Billing Cycle Residential HDH per Billing Day - March	0.070	0.003	0.00%	0.016	9.26
Billing Cycle Residential HDH per Billing Day - April	0.070	0.009	0.00%	0.006	3.15
Billing Cycle Residential HDH per Billing Day - November	0.048	0.008	0.00%	0.005	3.91
Billing Cycle Residential HDH per Billing Day - December	0.063	0.003	0.00%	0.018	11.08
Binary Variable for Hurricane Ivan September 2004	-10.330	0.915	0.00%	-0.001	0.00
Binary Variable for June-August 2008	-2.979	0.785	0.02%	-0.001	0.01
Binary Variable for Hurricane Isaac August-September 2012	-2.016	0.840	1.72%	-0.000	0.01
Binary Variable for October 1998	4.682	0.936	0.00%	0.000	0.00
First Order Auto-Regressive Term, AR(1)	0.504	0.060	0.00%	N/A	N/A

HDH = Heating Degree Hours
CDH = Cooling Degree Hours



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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:	October 1995-September 2015

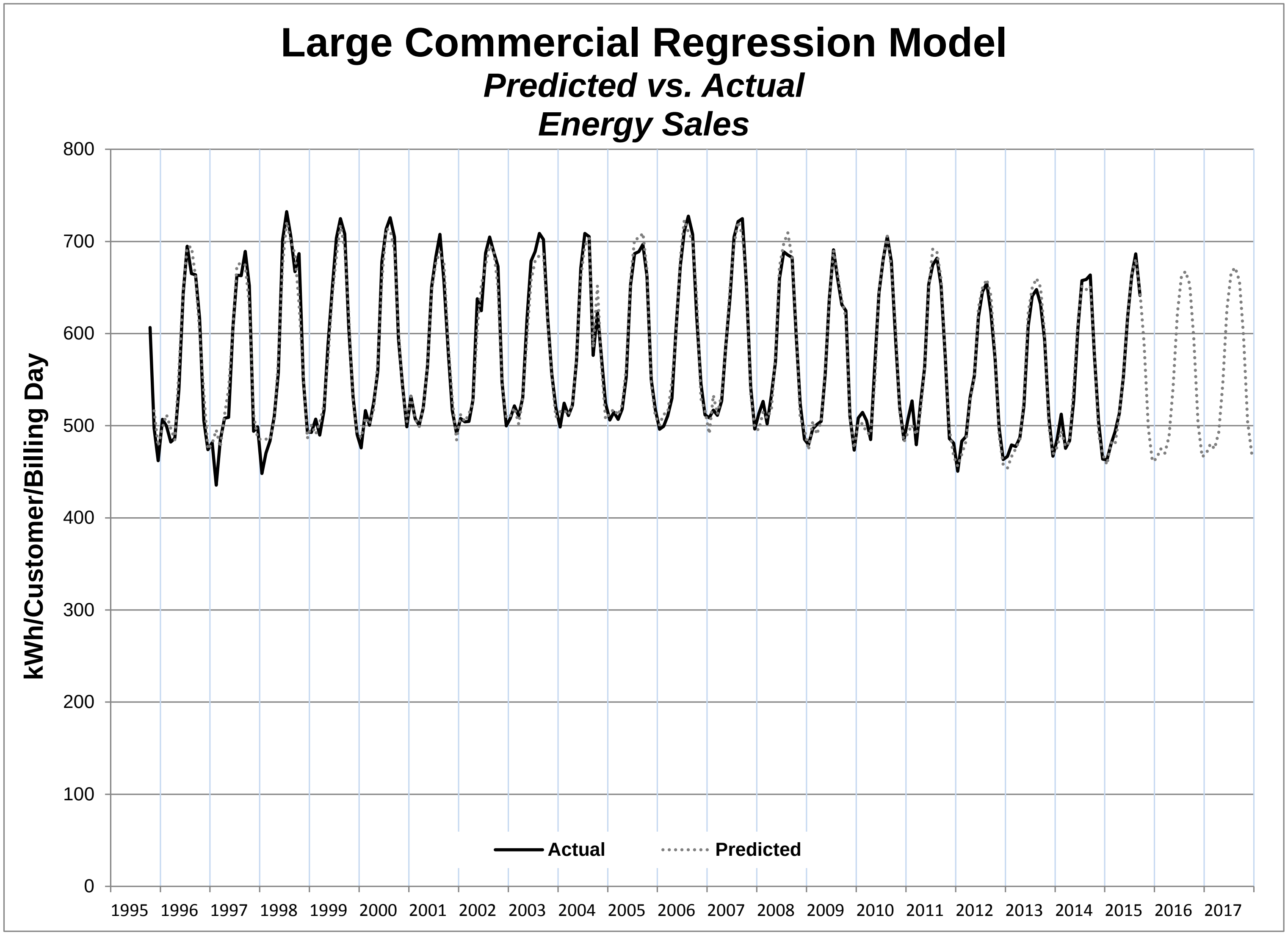
Small Commercial Regression Statistics

Iterations	9
Adjusted Observations	239
Deg. of Freedom for Error	219
R-Squared	0.954
Adjusted R-Squared	0.950
Durbin-Watson Statistic	2.254
Standard Error of Regression	1.07
Mean Absolute Percentage Error (MAPE)	2.84%
Skewness	0.381
Kurtosis	4.769

Small Commercial Regression Model Coefficients

Variable	Coefficient	Standard Error	p-Value	Elasticity	Mean
Constant	14.202	2.853	0.00%	N/A	N/A
Real Gross Metro Product per Capita	0.237	0.074	0.15%	0.332	37.97
12-Month Average of Real Commercial Price	-0.399	0.144	0.61%	-0.122	8.29
Billing Cycle Small Commercial CDH per Billing Day - April	0.025	0.006	0.00%	0.004	4.63
Billing Cycle Small Commercial CDH per Billing Day - May	0.037	0.003	0.00%	0.016	11.65
Billing Cycle Small Commercial CDH per Billing Day - June	0.039	0.002	0.00%	0.034	23.08
Billing Cycle Small Commercial CDH per Billing Day - July	0.040	0.001	0.00%	0.043	29.20
Billing Cycle Small Commercial CDH per Billing Day - August	0.041	0.001	0.00%	0.045	29.55
Billing Cycle Small Commercial CDH per Billing Day - September	0.040	0.001	0.00%	0.039	26.63
Billing Cycle Small Commercial CDH per Billing Day - October	0.042	0.002	0.00%	0.026	17.05
Billing Cycle Small Commercial CDH per Billing Day - November	0.039	0.005	0.00%	0.009	6.24
Billing Cycle Small Commercial HDH per Billing Day - January	0.028	0.002	0.00%	0.018	17.37
Billing Cycle Small Commercial HDH per Billing Day - February	0.031	0.002	0.00%	0.018	15.77
Billing Cycle Small Commercial HDH per Billing Day - March	0.028	0.003	0.00%	0.010	9.26
Billing Cycle Small Commercial HDH per Billing Day - April	0.026	0.009	0.41%	0.003	3.15
Billing Cycle Small Commercial HDH per Billing Day - December	0.021	0.003	0.00%	0.009	11.08
Binary Variable for August 1997	-5.472	0.931	0.00%	-0.001	0.00
Binary Variable for Hurricane Ivan September 2004	-5.444	0.929	0.00%	-0.001	0.00
Binary Variable for Commercial Residuals	-1.053	0.525	4.63%	-0.007	0.17
First Order Auto-Regressive Term, AR(1)	0.627	0.053	0.00%	N/A	N/A

HDH = Heating Degree Hours
CDH = Cooling Degree Hours



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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:	October 1995-September 2015

Large Commercial Regression Statistics

Iterations	9
Adjusted Observations	239
Deg. of Freedom for Error	219
R-Squared	0.976
Adjusted R-Squared	0.974
Durbin-Watson Statistic	2.131
Standard Error of Regression	13.33
Mean Absolute Percentage Error (MAPE)	1.70%
Skewness	-0.230
Kurtosis	5.602

Large Commercial Regression Model Coefficients

Variable	Coefficient	Standard Error	p-Value	Elasticity	Mean
Constant	411.433	19.448	0.00%	N/A	N/A
Real Gross Metro Product per Capita	3.273	0.496	0.00%	0.216	37.97
12-Month Average of Real Commercial Price	-7.149	0.985	0.00%	-0.103	8.29
Billing Cycle Large Commercial CDH per Billing Day - March	0.217	0.097	2.58%	0.001	3.83
Billing Cycle Large Commercial CDH per Billing Day - April	0.371	0.048	0.00%	0.006	8.94
Billing Cycle Large Commercial CDH per Billing Day - May	0.427	0.025	0.00%	0.013	18.09
Billing Cycle Large Commercial CDH per Billing Day - June	0.465	0.015	0.00%	0.025	30.90
Billing Cycle Large Commercial CDH per Billing Day - July	0.476	0.012	0.00%	0.031	37.21
Billing Cycle Large Commercial CDH per Billing Day - August	0.483	0.012	0.00%	0.032	37.55
Billing Cycle Large Commercial CDH per Billing Day - September	0.485	0.013	0.00%	0.029	34.58
Billing Cycle Large Commercial CDH per Billing Day - October	0.496	0.019	0.00%	0.021	24.01
Billing Cycle Large Commercial CDH per Billing Day - November	0.402	0.041	0.00%	0.007	10.43
Billing Cycle Large Commercial HDH per Billing Day - January	0.312	0.058	0.00%	0.006	11.36
Billing Cycle Large Commercial HDH per Billing Day - February	0.232	0.042	0.00%	0.004	9.83
Billing Cycle Large Commercial HDH per Billing Day - March	0.189	0.065	0.41%	0.002	5.23
Billing Cycle Large Commercial HDH per Billing Day - December	0.182	0.063	0.42%	0.002	6.42
Binary Variable for Hurricane Ivan September 2004	-97.953	13.039	0.00%	-0.001	0.00
Monthly Binary Variable for January	-25.592	9.011	0.49%	-0.004	0.08
Binary Variable for Commercial Residuals	-13.872	3.755	0.03%	-0.004	0.17
First Order Auto-Regressive Term, AR(1)	0.308	0.064	0.00%	N/A	N/A

HDH = Heating Degree Hours
CDH = Cooling Degree Hours