



# Review of 2008 Ten-Year Site Plans

---

## for Florida's Electric Utilities

# TABLE OF CONTENTS

---

|   |     |
|---|-----|
| Table of Contents.....  | i   |
| List of Tables.....   | iii |
| List of Figures.....  | iv  |
| List of Utilities Filing a Ten-Year Site Plan.....              | v   |
| List of Acronyms.....   | vi  |
| 1. Executive Summary.....                                       | 1   |
| Building an Energy Efficient Florida.....                       | 1   |
| Demand-Side Management (DSM) and Conservation.....              | 2   |
| Renewable Generation.....                                       | 2   |
| Utility Generation Efficiency and Fuel Diversity.....           | 3   |
| 2. Introduction.....  | 5   |
| Statutory Authority.....  | 5   |
| Suitability.....  | 5   |
| Information Sources.....  | 6   |
| Resource Additions.....   | 6   |
| 3. Energy Demand.....   | 8   |
| Load and Energy Forecasts.....                                  | 8   |
| Demand-Side Management and Energy Efficiency.....               | 11  |
| Energy Conservation Cost Recovery.....                          | 14  |
| Actions to Encourage DSM and Energy Efficiency.....             | 15  |
| 4. Energy Generation.....                                       | 16  |
| Renewable Generation.....                                       | 16  |
| Renewable Generation Resource Additions.....                    | 17  |
| Legislative and Commission Actions to Encourage Renewables..... | 19  |
| Net Metering and Interconnection Rules.....                     | 19  |
| Renewable Portfolio Standard (RPS) for Florida.....             | 19  |
| Solar.....  | 20  |
| Utility Generation Efficiency and Modernization.....            | 20  |

|  |    |
|--|----|
| Traditional Energy Generation and a Balanced Fuel Supply ..... | 21 |
| Proposed Generating Units.....                                 | 23 |
| Coal .....   | 24 |
| Nuclear .....  | 25 |
| Natural Gas .....  | 26 |
| Power Plant Siting Act (PPSA).....                             | 27 |
| 5. Fuel Price, Supply, and Transportation .....                | 29 |
| Natural Gas Price Forecasts and Supply.....                    | 30 |
| Transportation .....   | 31 |
| In-State Pipeline Transportation Projects .....                | 31 |
| Out-of-State Pipeline Projects.....                            | 31 |
| Liquefied Natural Gas Pipeline Projects.....                   | 32 |
| Coal Price Forecasts and Supply.....                           | 32 |
| Transportation .....   | 33 |
| Residual and Distillate Oil Price Forecast and Supply .....    | 33 |
| Nuclear Fuel Price Forecasts and Supply .....                  | 34 |
| 6. Transmission Plans .....                                    | 35 |
| Reliability Standards.....                                     | 35 |
| FRCC Transmission Planning Process .....                       | 36 |
| 2009-2017 Long Range Transmission Study.....                   | 37 |
| Florida-Southern Interface Transfer Capability Study.....      | 37 |
| Update of 2006 Florida Central Coordinated Study .....         | 38 |
| Proposed Transmission Lines Requiring Certification.....       | 38 |
| 7. State, Regional, and Local Comments.....                    | 39 |

# LIST OF TABLES

---

|  |    |
|--|----|
| Table 1. State of Florida: Proposed Capacity Changes As Reported.....        | 7  |
| Table 2. Characteristics of Florida’s Electric Customers (2007 Actual) ..... | 8  |
| Table 3. Total Retail Energy Sales: Historical Forecast Accuracy .....       | 10 |
| Table 4. DSM and Energy Efficiency Growth Rate .....                         | 14 |
| Table 5. Existing Renewable Resources.....                                   | 16 |
| Table 6. Contribution of Firm Renewable Energy to Net Energy for Load .....  | 17 |
| Table 7. Planned Renewable Resource Additions .....                          | 18 |
| Table 8. Resident Owned Solar Interconnections .....                         | 19 |
| Table 9. Fossil Steam Facilities to Consider for Conversion.....             | 21 |
| Table 10. Nuclear Capacity Additions.....                                    | 26 |
| Table 11. Power Plants Requiring Certification.....                          | 27 |
| Table 12. Proposed Units Requiring a Determination of Need.....              | 28 |
| Table 13. Florida-Southern Interface Transfer Capability.....                | 37 |
| Table 14. Proposed Transmission Lines Requiring Certification .....          | 38 |

# LIST OF FIGURES

---

|   |    |
|---|----|
| Figure 1. State of Florida: Electric Utility Summer Capacity (MW) Mix As Reported ..... | 7  |
| Figure 2. Summer Peak Demand Forecast .....   | 9  |
| Figure 3. Energy Demand Forecast .....  | 9  |
| Figure 4. State of Florida: Energy Consumption per Residential Customer .....           | 11 |
| Figure 5. State of Florida: DSM Summer Peak Demand Savings .....                        | 12 |
| Figure 6. State of Florida: DSM Winter Peak Demand Savings .....                        | 13 |
| Figure 7. State of Florida: DSM Net Energy for Load Savings .....                       | 13 |
| Figure 8. Conservation Expenses for IOUs .....  | 14 |
| Figure 9. State of Florida: Energy Generation by Fuel Type (GWh) .....                  | 22 |
| Figure 10. State of Florida: Energy Generation by Fuel Type (Percent of Total) .....    | 22 |
| Figure 11. Average Residential Electric Bill: 1980 to Present .....                     | 23 |
| Figure 12. Summer Reserve Margin Projections .....                                      | 24 |
| Figure 13. Reporting Utilities: 2008 Weighted Average Fuel Price Forecast .....         | 29 |
| Figure 14. Natural Gas Consumption in the U.S. by Place of Origin .....                 | 30 |

## **LIST OF UTILITIES FILING A TEN-YEAR SITE PLAN**

---

|      |  |
|------|--|
| FPL  | Florida Power & Light Company                  |
| GRU  | Gainesville Regional Utilities                 |
| GULF | Gulf Power Company                             |
| PEF  | Progress Energy Florida, Inc.                  |
| TECO | Tampa Electric Company                         |
| FMPA | Florida Municipal Power Agency                 |
| JEA  | JEA (formerly Jacksonville Electric Authority) |
| LAK  | City of Lakeland                               |
| OUC  | Orlando Utilities Commission                   |
| TAL  | City of Tallahassee                            |
| SEC  | Seminole Electric Cooperative                  |

## LIST OF ACRONYMS

---

|            |   |
|------------|---|
| Bcf        | Billion Cubic Feet  |
| CC         | Combined Cycle generating unit                              |
| Commission | Florida Public Service Commission                           |
| CT         | Combustion Turbine generating unit                          |
| DEP        | Florida Department of Environmental Protection              |
| DOE        | United States Department of Energy                          |
| DSM        | Demand-Side Management                                      |
| ECCR       | Energy Conservation Cost Recovery Clause                    |
| EIA        | Energy Information Administration                           |
| ERO        | Electric Reliability Organization                           |
| FEECA      | Florida Energy Efficiency and Conservation Act              |
| FRCC       | Florida Reliability Coordinating Council                    |
| GWh        | Gigawatt-Hour   |
| IGCC       | Integrated Coal Gasification Combined Cycle generating unit |
| LFG        | Landfill Gas  |
| LNG        | Liquefied Natural Gas                                       |
| MMBtu      | Million British Thermal Units                               |
| MSW        | Municipal Solid Waste                                       |
| MW         | Megawatt  |
| NEL        | Net Energy for Load   |
| NERC       | North American Electric Reliability Corporation             |
| NUG        | Non-utility Generator                                       |
| PPSA       | Power Plant Siting Act                                      |
| RFP        | Request for Proposal  |
| RTO        | Regional Transmission Organization                          |
| TLSA       | Transmission Line Siting Act                                |

# 1. EXECUTIVE SUMMARY

---

Pursuant to Section 186.801(1), Florida Statutes (F.S.), each generating electric utility must submit to the Florida Public Service Commission (Commission) a ten-year site plan which estimates the utility's power generating needs and the general location of its proposed power plant sites over the ten-year planning horizon. By April 1, 2008, eleven utilities filed Ten-Year Site Plans with the Commission.<sup>1</sup>

The Commission is required to perform a preliminary study of each plan and classify them as either "suitable" or "unsuitable." All findings of the Commission are made available to the Florida Department of Environmental Protection (DEP) for its consideration at any subsequent electrical power plant site certification proceedings.

The Commission has reviewed the Ten-Year Site Plans filed by the eleven reporting utilities and finds that the projections of load growth appear reasonable and that the reporting utilities have identified additional generation facilities required in order to maintain an adequate supply of electricity at a reasonable cost. Therefore, the Commission finds the 2008 Ten-Year Site Plans filed by the eleven reporting utilities to be suitable for planning purposes.

While the 2008 Ten-Year Site Plans are suitable for planning purposes, they are subject to change due to several factors including changes to fuel cost and energy use projections, evolving technology, and changing energy policy. Currently, approximately 11,000 megawatts (MW) of capacity have either received a determination of need or are under construction. Based upon other utility filings and actions, approximately 5,000 MW of planned capacity may be delayed beyond 2017. Utilities have cited declining energy projections as one reason for the recent changes. The Commission will continue to monitor changes to the utilities' plans in order to ensure an adequate supply of electricity at a reasonable cost.

## **Building an Energy Efficient Florida**

Pursuant to Section 366.03, F.S., each public utility has a statutory obligation to serve every customer within its service territory. As the state's load and energy requirements continue to grow, Florida's utilities must continue to explore all measures to ensure the most efficient means for serving their customers' needs. The Commission notes the following components as critical to implementing an effective energy policy in Florida.

---

<sup>1</sup> Investor-owned utilities (IOUs) filing 2008 Ten-Year Site Plans include Florida Power & Light Company (FPL), Tampa Electric Company (TECO), Gulf Power Company (GULF), and Progress Energy Florida, Inc. (PEF). Municipal utilities filing 2008 Ten-Year Site Plans include Florida Municipal Power Agency (FMPA), Orlando Utilities Commission (OUC), City of Lakeland (LAK), City of Tallahassee (TAL), JEA (formerly Jacksonville Electric Authority), and Gainesville Regional Utilities (GRU). Seminole Electric Cooperative (SEC) also filed a 2008 Ten-Year Site Plan.



## **1. Demand-Side Management (DSM) and Conservation**

The first step toward building an energy efficient Florida begins with minimizing the load and energy requirements which the utilities must serve. Reduced load and energy requirements are essential in decreasing the burning of fossil fuels and deferring the need for additional generating capacity. Load and energy requirements are affected by many variables including population growth, demographics, and weather patterns. Customer choice, however, serves as the foundation for wise energy use in order to reduce dependence on expensive liquid fuels and reduce greenhouse gas emissions.

Utilities play an important role in educating consumers to make wise energy choices. Through DSM programs, Florida's utilities can have a direct effect on customer energy usage patterns. Florida's investor-owned utilities (IOUs) have reported more than \$250 million in conservation-related expenditures in 2007, marking the highest expenditures since 1999. Expenditures in 2008 are projected to exceed \$285 million. This trend illustrates the commitment of Florida's utilities to DSM and energy efficiency. However, per capita energy consumption is projected to increase.

Over the planning period, Florida's utilities are projecting more than 7,600 MW of summer peak load reduction from DSM and energy efficiency programs. The demand reductions projected in the 2008 Ten-Year Site Plans are based on goals which represent a minimum threshold utilities must meet before building any major power plants. Overall, demand and energy savings from utility-sponsored DSM and energy efficiency programs are expected to surpass current goals by as much as 60 percent. The utilities' current goals were set by the Commission in 2004.

In 2008, the Legislature amended Section 366.82, F.S., which expands the Commission's process for establishing DSM and energy conservation goals. More specifically, the Commission must now consider the impact of demand-side renewable energy systems as well as an expanded scope of potential conservation and efficiency measures. Additional considerations include the need for incentives and the effect of emission compliance costs. Utilities have launched a technical potential study to start the goal setting process, and a hearing date is set for August 2009. New goals will be set in December 2009 and should be reflected in the utilities' 2010 Ten-Year Site Plans.

## **2. Renewable Generation**

Renewable generation is another key component of building an energy efficient Florida. Currently, approximately 1,000 MW of renewable generation are available in Florida. Roughly 450 MW are sold to Florida's utilities as firm capacity; the remaining capacity is either sold on an as-available basis or used internally by customers. If all three forms of renewable energy – firm, non-firm, and self-service – are combined, data suggests that renewable energy accounted for 3.6 percent of the IOUs retail energy needs in 2007.

Historically, relatively high capital and operating costs as well as limited physical applications have hampered the development of renewable energy in the state. The 2008 Ten-Year Site Plans indicate approximately 500 MW of new renewable capacity are presently planned through the year 2017. Current utility-owned generation is approximately 50,000 MW, so the contribution toward fuel diversification from renewable energy remains relatively small.

Recently, the Legislature and Commission have taken several steps to encourage additional development of renewable generation while minimizing the cost of power supply to retail ratepayers. The 2008 Legislature passed several amendments to Section 366.92, F.S. Specifically, Section 366.92(2), F.S., was amended to require the Commission to draft rules to establish a renewable portfolio standard (RPS) which will require each IOU to supply a percentage of their retail electricity sales from renewable energy sources located in Florida. The statute requires specific focus to be placed on existing and potential sources of renewable energy in Florida and the economic impact of new renewable generation. The Commission has held two rule development workshops and is scheduled to hold a third workshop on December 3, 2008. On January 9, 2009, the Commission will consider a draft rule which will be submitted to the Legislature by February 1, 2009, for ratification.

Section 366.92(4), F.S. was also amended to allow full cost recovery under the environmental cost recovery clause for up to 110 MW of zero greenhouse gas emitting renewable generation. On July 15, 2008, the Commission approved FPL's petition to move forward with three solar energy projects totaling 110 MW. FPL's largest proposed project, Martin Solar, is a 75 MW solar thermal steam generating facility at the existing Martin power plant site in Martin County, Florida. Martin Solar is designed as a fuel substitution resource which will supplement the steam supply of the natural gas-fired Martin 8 combined cycle generator. The DeSoto and Space Coast Solar projects are photovoltaic arrays that will provide a combined 35 MW of non-firm renewable capacity. All three projects are scheduled to be in-service by the end of 2010. FPL estimates that the three projects will have a net cost of \$558 million above traditional energy generation costs.

The Commission has taken steps to promote renewable generation on the customer's side of the meter as well. On April 7, 2008, Commission amendments to Rule 25-6.065, Florida Administrative Code, relating to interconnection and net metering of small customer-owned renewable generation, became effective.<sup>2</sup> Such changes will promote the development of small customer-owned renewable generation by streamlining the interconnection process and allowing for monthly credits for excess on-site renewable generation on the retail customer's bill. Currently, IOUs report approximately 400 residential interconnections with a total capacity of approximately 1.075 MW.

### **3. Utility Generation Efficiency and Fuel Diversity**

Current projections indicate that the state's total energy demand will surpass projected conservation, DSM, and renewable energy programs offered by Florida's utilities. Therefore, the addition of traditional generation capacity is necessary to satisfy reliability requirements.

When considering the addition of supply-side generation, Florida's electric utilities must consider many environmental, economic, and reliability issues. The modernization of existing units plays a key role in addressing each of these issues. Such projects may require the temporary removal of existing units, thus impacting reliability until the completion of the modernization. In 2008, the Commission granted FPL a need determination to transform more than 1,400 MW of relatively inefficient oil-fired steam generation into approximately 2,400 MW of newer and more efficient gas-fired combined cycle generation. PEF's 2008 Ten-Year Site Plan shows designs to replace 129 MW of oil-fired steam generation with 1,125 MW of gas-fired combined cycle generation at its Suwannee

---

<sup>2</sup> See Order No. PSC-08-0161-FOF-EI, issued March 19, 2008, Docket No. 070674-EI, In re: Interconnection and Net Metering of Customer-Owned Renewable Generation.

Station. PEF is currently conducting a request for proposal (RFP) process for the new combined cycle unit which is scheduled to be in service in 2013. Utilities should continue to explore potential conversion projects and report the feasibility of each conversion in next year's Ten-Year Site Plans.

Fuel diversity is a strategic concern when the construction of new supply-side generation is necessary. Maintaining a balanced mix of fuel sources enhances the reliability of supply and allows utilities to mitigate the effects of volatile price fluctuations. The use of natural gas as a fuel has grown over the last 20 years and currently accounts for 38.8 percent of the state's energy needs. In previous Ten-Year Site Plans, Florida's utilities responded to fuel diversity concerns through the inclusion of multiple coal-fired power plants. Fuel cost uncertainties, high capital costs, and uncertainties regarding potential expenses related to future carbon emission regulations were all cited as concerns as more than 3,500 MW of planned coal-fired generation additions were canceled. Despite initial opposition, Seminole Electric Cooperative received final certification of Seminole Unit 3, a 750 MW coal-fired power plant, on June 13, 2008. Seminole Unit 3 has an in-service date of May 2014, and represents the only planned coal-fired generation capacity addition in Florida. The development and deployment of advanced coal technology that is both cost-effective and environmentally responsible plays a critical role in balancing the state's fuel mix.

Because nuclear generation is one generating technology that provides base-load capacity yet produces no greenhouse gas emissions, it has become a cornerstone of an energy efficient Florida. In 2007 and 2008, the Commission approved the need for approximately 5,000 MW of nuclear capacity, including more than 4,300 MW of new nuclear construction, based primarily on projected fuel cost savings. The four proposed power plants will mark the first construction of new nuclear generation in Florida in more than 20 years. The 2008 Ten-Year Site Plan for PEF contains the first two units, Levy 1 & 2, which are scheduled to be completed in 2016 and 2017, respectively. FPL's planned Turkey Point Units 6 & 7 are not scheduled to be in-service until 2018 and 2020, which are beyond the 2008 Ten-Year Site Plan planning horizon.

Even with the identified new base-load coal and nuclear units, Florida's dependence on natural gas is projected to increase from 38.8 percent in 2008 to 54.4 percent by 2017. As the state continues to construct new natural gas-fired generation, natural gas storage and supply becomes increasingly significant in ensuring the reliability of the state's electrical system. Multiple supply options and sufficient storage are critical to maintain the integrity of Florida's electric system during supply disruptions due to severe storms and hurricanes. Florida's utilities have begun increasing the amount of natural gas storage that is available to the state. Utilities should continue to evaluate diversity within a fuel type, such as liquefied natural gas (LNG) and gas storage, as options to traditional sources and delivery methods for natural gas.

## 2. INTRODUCTION

---

A Ten-Year Site Plan gives state, regional, and local agencies advance notice of proposed power plants and transmission facilities. The Commission receives comments from the aforementioned agencies regarding various issues of concern. These comments are summarized in Chapter 7. Because a utility's Ten-Year Site Plan is a planning document containing tentative data, it may not contain sufficient information to allow regional planning councils, water management districts, and other review agencies to evaluate site-specific issues within their jurisdictions. Each utility must provide detailed data, based on in-depth environmental assessments, during certification proceedings under the Power Plant Siting Act (PPSA), Sections 403.501-403.518, Florida Statutes (F.S.) or the Transmission Line Siting Act (TLSA), Sections 403.52-406.5365, F.S..

### Statutory Authority

Section 186.801, F.S., requires that all major generating electric utilities in Florida submit a Ten-Year Site Plan to the Florida Public Service Commission (Commission) for annual review. To fulfill the requirements of Section 186.801, F.S., the Commission has adopted Rules 25-22.070 through 25-22.072, Florida Administrative Code (F.A.C.). Each utility's Ten-Year Site Plan contains projections of the utility's electric power needs, fuel requirements, and the general location of proposed power plant sites and major transmission facilities. Utilities whose existing generating capacity is below 250 megawatts (MW) are exempt from this requirement unless the utility plans to build a new unit larger than 75 MW within the 10-year planning period.

Also in accordance with the Section 186.801, F.S., the Commission performs a preliminary study of each Ten-Year Site Plan and is required to determine whether it is **suitable** or **unsuitable**. The results of the Commission's study are contained in this report, Review of 2008 Ten-Year Site Plans, which is forwarded to the Department of Environmental Protection (DEP) for use in subsequent power plant siting proceedings.

Section 377.703(2)(e), F.S., requires the Commission to analyze and provide natural gas and electricity forecasts to the Florida Energy and Climate Commission. The Ten-Year Site Plan Review also fulfills this statutory requirement.

### Suitability

The Commission has reviewed the Ten-Year Site Plans filed by the eleven reporting utilities and finds that the projections of load growth appear reasonable and that the reporting utilities have identified additional generation facilities required in order to maintain an adequate supply of electricity at a reasonable cost. Therefore, the Commission finds the 2008 Ten-Year Site Plans filed by the eleven reporting utilities to be suitable for planning purposes.

Since the Ten-Year Site Plan is not a binding plan of action on electric utilities, the Commission's classification of a Ten-Year Site Plan as suitable or unsuitable has no formal effect on the utility. Such a classification does not constitute a finding or determination in docketed matters before the Commission. The Commission may address any concerns raised by a utility's Ten-Year Site Plan at a public hearing.

## Information Sources

In April 2008, eleven utilities<sup>3</sup> filed their Ten-Year Site Plans, and on August 12, 2008, the Commission held a public workshop to facilitate discussion of the plans. In addition to the individual utility filings, the Commission also relies on cost and performance data obtained through supplemental data requests made to the reporting utilities, as well as other sources. The Florida Reliability Coordinating Council (FRCC) annually publishes several documents that assess the adequacy and reliability of Peninsular Florida's<sup>4</sup> generating units and transmission system. The Commission used the following FRCC documents to supplement this review:

- The 2008 *Regional Load and Resource Plan* contains aggregate data on demand and energy, capacity and reserves, and proposed new generating unit and transmission line additions for Peninsular Florida as well as statewide. The FRCC submitted this study in July 2008.
- The 2008 *Reliability Assessment* is an aggregate study of generating unit availability, forced outage rates, load forecast methodologies, and gas pipeline availability. The FRCC submitted this study in August 2008.
- The *Long Range Transmission Reliability Study* is an assessment of the adequacy of Peninsular Florida's bulk power and transmission system. The study includes both short-term (2009-2012) detailed analysis and long-term (2013-2017) evaluation of developing trends that would require transmission additions or other corrective action. The FRCC submitted an executive summary of this study in August 2008.

## Resource Additions

Table 1 on the following page reflects the aggregate capacity additions contained in the reporting utilities' 2008 Ten-Year Site Plans. At the time of filing, the state's electric utilities planned to add a net capacity of 14,565 MW over the next 10 years. As in past years, the majority of new capacity planned in the 2008 Ten-Year Site Plans is expected to come from gas-fired combined cycle units.

Figure 1 on the following page illustrates the present and future aggregate capacity mix. The capacity values in Figure 1 incorporate all proposed additions, changes, and retirements from Table 1. Negative values in the table reflect the retirement of fossil steam units, the expiration of firm capacity interchange contracts from out of state, and the expiration of firm capacity contracts with independent power producers and qualifying facilities within the state. If new contracts are signed in the future to replace those that expire, these resources will once again be included in the state's capacity mix. The subsequent effects of these additions as well as recent changes are discussed throughout this report.

---

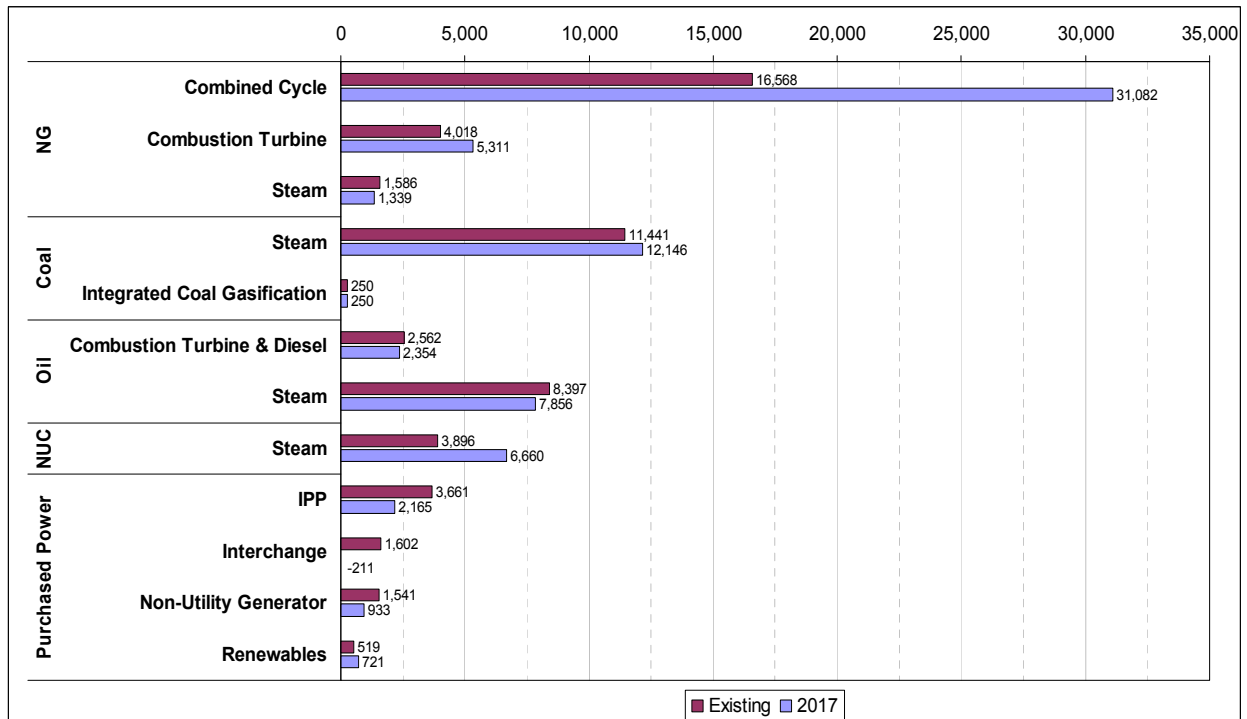
<sup>3</sup> Investor-owned utilities (IOUs) filing 2008 Ten-Year Site Plans include Florida Power & Light Company (FPL), Tampa Electric Company (TECO), Gulf Power Company (GULF), and Progress Energy Florida, Inc. (PEF). Municipal utilities filing 2008 Ten-Year Site Plans include Florida Municipal Power Agency (FMPA), Orlando Utilities Commission (OUC), City of Lakeland (LAK), City of Tallahassee (TAL), JEA (formerly Jacksonville Electric Authority), and Gainesville Regional Utilities (GRU). Seminole Electric Cooperative (SEC) also filed a 2008 Ten-Year Site Plan.

<sup>4</sup> Peninsular Florida refers to the FRCC region which includes all utilities with the exception of Gulf Power Company.

**Table 1. State of Florida: Proposed Capacity Changes As Reported**

| Unit Type                        | Summer Capacity Changes (MW) |                              |
|----------------------------------|------------------------------|------------------------------|
|                                  | 2007 Forecast<br>(2007-2016) | 2008 Forecast<br>(2008-2017) |
| <b>Natural Gas (NG)</b>          |                              |                              |
| Combined Cycle                   | 11,775                       | 14,514                       |
| Combustion Turbine               | 1,573                        | 1,293                        |
| Steam                            | -246                         | -247                         |
| <b>Coal</b>                      |                              |                              |
| Steam                            | 3,628                        | 705                          |
| Integrated Coal Gasification     | 854                          | 0                            |
| <b>Oil</b>                       |                              |                              |
| Combustion Turbine & Diesel      | -10                          | -208                         |
| Steam                            | -432                         | -541                         |
| <b>Nuclear (NUC)</b>             |                              |                              |
| Steam                            | 1,305                        | 2,764                        |
| <b>Firm Purchases</b>            |                              |                              |
| Independent Power Producer (IPP) | -2,324                       | -1,496                       |
| Interchange                      | -101                         | -1,813                       |
| Non-Utility Generator (NUG)      | -614                         | -608                         |
| Renewables                       | -103                         | 202                          |
| <b>NET CAPACITY ADDITIONS</b>    | <b>15,305</b>                | <b>14,565</b>                |

**Figure 1. State of Florida: Electric Utility Summer Capacity (MW) Mix As Reported**



### 3. ENERGY DEMAND

---

A utility's load and energy forecasts serve as the starting point for determining the timing and size of new capacity additions needed to reliably serve load. The first step toward building an energy efficient Florida begins with minimizing the load and energy requirements which the utilities must meet. Reduced load and energy requirements are essential in reducing the burning of fossil fuels and deferring the need for additional generating capacity. Historical data forms the foundation for utility load and energy forecasts. These data take into account energy usage patterns, trends in population growth, demographics, weather data for the utility's service territory, appliance-specific saturation, and energy consumption characteristics.

Florida's electrical demand and energy requirements are somewhat unique due to the fact that the customer base is heavily weighted toward residential customers. As shown in Table 2 below, residential customers make up nearly 89 percent of Florida's electric customers, and they purchase more than 50 percent of the state's electric energy. Therefore, residential customers have the greatest influence over the state's load and energy forecasts.

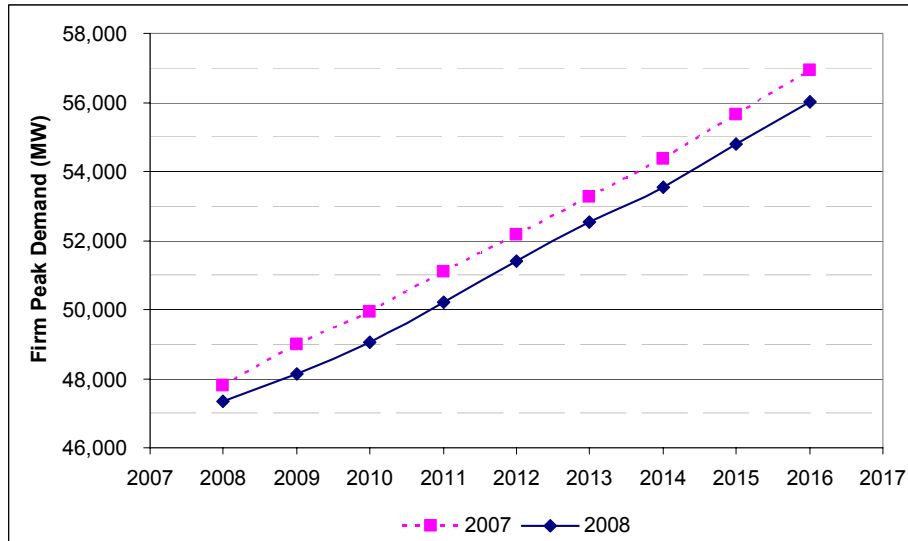
**Table 2. Characteristics of Florida's Electric Customers (2007 Actual)**

| Customer Class | Number of Customers | % of Customers | Energy Sales (GWh) | % of Sales   |
|----------------|---------------------|----------------|--------------------|--------------|
| Residential    | 8,318,132           | 88.6           | 116,132            | 52.3         |
| Commercial     | 1,029,331           | 11.0           | 82,758             | 37.3         |
| Industrial     | 35,733              | 0.4            | 23,107             | 10.4         |
| <b>Total</b>   | <b>9,383,196</b>    | <b>100.0</b>   | <b>221,997</b>     | <b>100.0</b> |

#### Load and Energy Forecasts

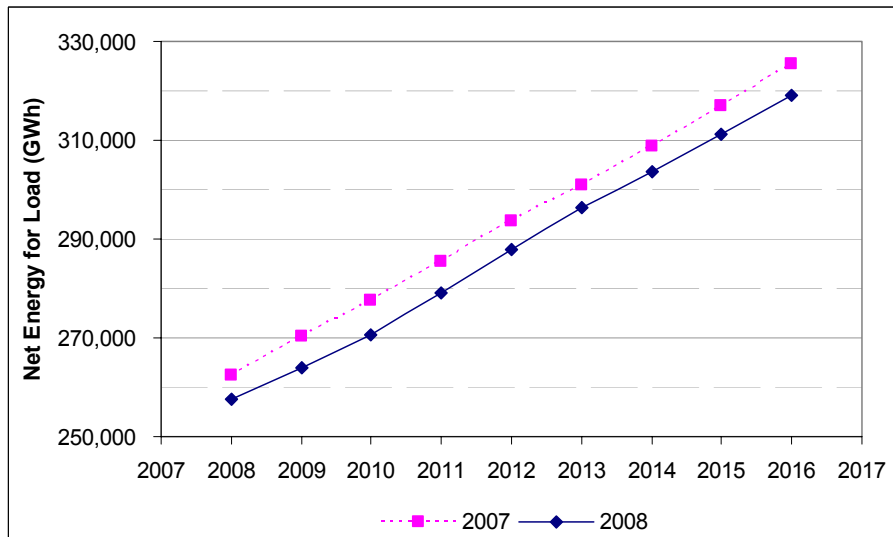
Utility projections indicate that both the summer and the winter peak demand will increase approximately 10,000 MW over the planning period. The utilities' current summer peak demand forecast, however, is an average of nearly 800 MW lower than last year's forecast for the same years (2008-2016). Similarly, winter peak demand forecasts are an average of more than 1,100 MW lower than last year's forecasts. Such a trend can be attributed primarily to a decrease in the economy and a slowing state population growth. Figure 2 on the following page illustrates the decrease in load projection and the total peak demand projections over the planning period. The effects of the decreased peak demand forecasts with respect to utility generation are discussed in Chapter 4.

**Figure 2. Summer Peak Demand Forecast**



As seen in Figure 3 below, the reduction in summer and winter peak demand projections translates to a reduction in the utilities' energy forecasts. Thus, a similar trend can be seen as current annual net energy for load projections are an average of nearly 6,000 GWh less than last year's projections. Overall, Florida's utilities project energy consumption to increase nearly 70,000 GWh over the planning period.

**Figure 3. Energy Demand Forecast**



The Commission has reviewed the historical forecast accuracy of total retail energy sales for the five-year period from 2003-2007. The Commission's analysis, summarized in Table 3 on the following page, compared actual energy sales for each year to energy sale forecasts made three, four,



and five years prior. For example, actual 2007 energy sales were compared to 2007 forecasts made in 2001, 2002, and 2003. These differences, expressed as a percentage error rate, were used to calculate two measures of a utility’s historical forecast accuracy: average forecast error and average absolute forecast error. Average forecast error indicates a utility’s tendency to over-forecast (positive values) or under-forecast (negative values). Average absolute forecast error accumulates the magnitude of past forecast errors, ignoring positive and negative signs.

Overall, utilities’ forecast accuracy has slightly declined in recent years. Also notable is the tendency of utilities to under-forecast. This tendency was reversed in 2007 as several factors resulted in lower than projected energy requirements. As discussed previously the utilities’ 2008 forecasts have substantially changed from previous forecasts.

**Table 3. Total Retail Energy Sales: Historical Forecast Accuracy**

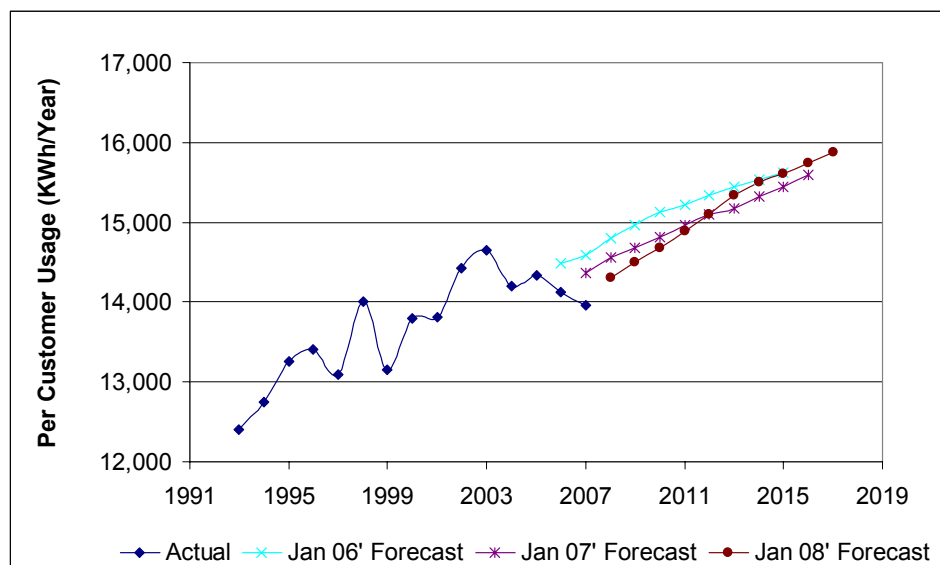
|  | Forecast Error (%) |                  |
|--|--------------------|------------------|
|  | Average            | Average Absolute |
| Weighted Avg. (1999-2003) - 2004 TYSP        | -1.66              | 2.58             |
| Weighted Avg. (2000-2004) - 2005 TYSP        | -1.31              | 2.60             |
| Weighted Avg. (2001-2005) - 2006 TYSP        | -0.97              | 2.56             |
| Weighted Avg. (2002-2006) - 2007 TYSP        | -0.64              | 2.92             |
| <b>Weighted Avg. (2003-2007) - 2008 TYSP</b> | <b>0.48</b>        | <b>3.12</b>      |

## Demand-Side Management and Energy Efficiency

As previously discussed, load and energy projections are affected by many variables. Consumer choice and lifestyle, however, serve as the foundation to controlling load and energy demand. Florida's utilities play an important role in educating consumers to make wise energy decisions.

As illustrated in Figure 4 below, statewide per capita residential energy consumption usage has increased over the past 15 years but decreased over the past 5 years. Given current population growth projections, residential customers would need to reduce their per capita energy consumption by more than 15 percent over the planning period in order to maintain or reduce their total energy consumption.

Figure 4. State of Florida: Energy Consumption per Residential Customer



Key to the reduction of energy usage is customer participation in utility sponsored demand-side management (DSM) and energy conservation programs. Since 1980, utilities have offered DSM programs to customers based on the requirements of the Florida Energy Efficiency and Conservation Act (FEECA). The FEECA emphasizes reducing the growth rates of weather-sensitive peak demand, reducing and controlling the growth rates of electricity consumption, and reducing the consumption of scarce resources such as petroleum fuels. To accomplish these objectives, the FEECA requires the Commission to establish conservation and DSM goals and requires all IOUs and any municipal or cooperative utility with annual energy sales of at least 2,000 GWh as of July 1, 1993, to implement DSM programs to meet the established goals. Demand and energy goals for the seven FEECA utilities (FPL, FPUC,<sup>5</sup> GULF, JEA, OUC, PEF, and TECO) were last set in July 2004. The goals set

<sup>5</sup> Florida Public Utilities Corporation (FPUC) is a non-generating, investor-owned utility subject to FEECA's requirements. FPUC does not file a Ten-Year Site Plan with the PSC.

by the Commission represent a minimum threshold utilities must meet before building any major power plants.

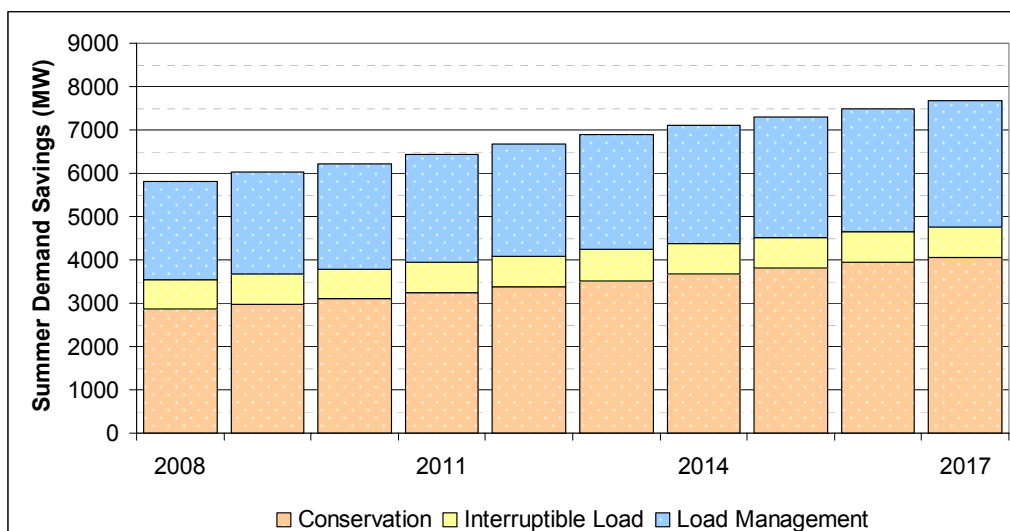
The seven Florida utilities which are subject to FEECA currently offer more than 100 DSM and conservation programs to residential, commercial, and industrial customers in an effort to meet the objectives set forth by the FEECA. Energy audit programs provide a first step for utilities and customers to assess conservation opportunities for Florida’s electric customers and serve as the foundation for all other DSM and conservation programs. Each utility subject to FEECA is required to offer energy audits to residential customers, pursuant to Section 366.82(5), F.S., and most utilities also provide energy audits for commercial/industrial customers.

Load management and interruptible load programs also play a significant role in any utility energy conservation plan. Load management programs pay the participant for allowing the utility to control when certain electric appliances are available for use. Interruptible load programs allow a utility to interrupt specific services to a commercial or industrial customer. Load management and interruptible service are measures that allow reductions in system peak demand when needed.

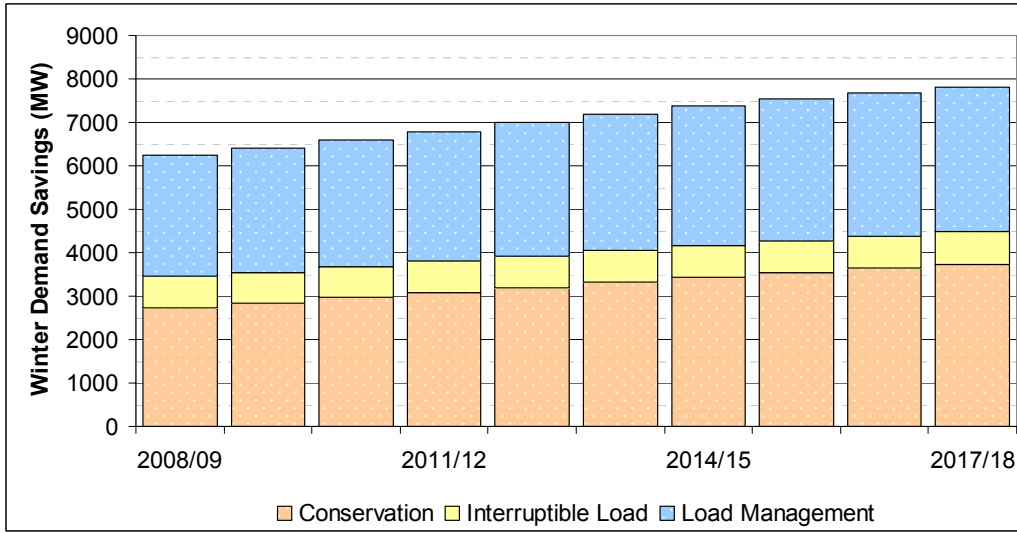
Load and energy savings from non-dispatchable DSM (conservation), such as ceiling insulation, are included in a utility’s demand and energy forecast. Such programs enable utilities and customers to realize sustained energy savings over time. Savings from dispatchable DSM, such as load management and interruptible service, are added separately. All DSM and conservation savings reduce the utilities’ projected peak demand.

DSM programs are projected to reduce summer peak demand by just over 5,800 MW in 2008 to more than 7,600 MW by 2017, while winter peak demand reductions are projected to exceed 7,800 MW by 2017. Projections indicate a summer and winter peak demand reduction of approximately 12 percent from DSM for each year between 2008 and 2017. Figure 5 below and Figure 6 on the following page illustrate the projected total amounts of summer peak demand and winter peak demand savings from utility-sponsored DSM programs over the ten-year planning horizon.

**Figure 5. State of Florida: DSM Summer Peak Demand Savings**

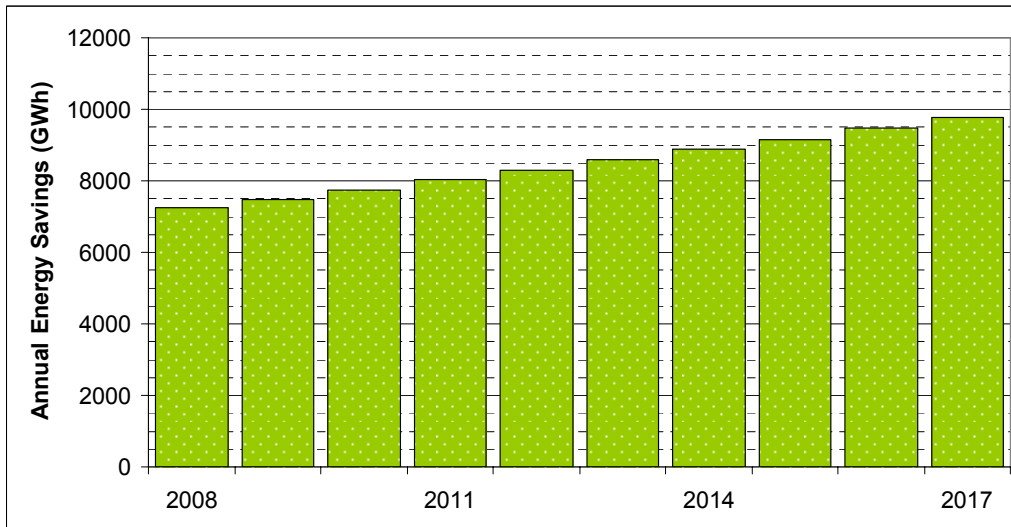


**Figure 6. State of Florida: DSM Winter Peak Demand Savings**



Summer and winter peak demand savings, in addition to non-peak demand savings, translate to net energy savings of nearly 10,000 GWh in 2017, which is an increase of more than 2,500 GWh over the planning period. Such energy savings allow utilities to avoid burning fossil fuels. Figure 7 below illustrates the projected total amounts of annual energy savings from utility-sponsored DSM programs over the ten-year planning horizon.

**Figure 7. State of Florida: DSM Net Energy for Load Savings**



Overall, demand and energy savings from utility-sponsored conservation programs are expected to surpass current goals by as much as 60 percent. Although total demand is slated to outgrow DSM and energy efficiency efforts, as summarized in Table 4 below, current projections indicate that savings from DSM and energy efficiency efforts will increase at a rate greater than total demand. Furthermore, the projected average annual growth rate of DSM program savings has increased annually since goals were set in 2004, reflecting the effectiveness and success of current programs.

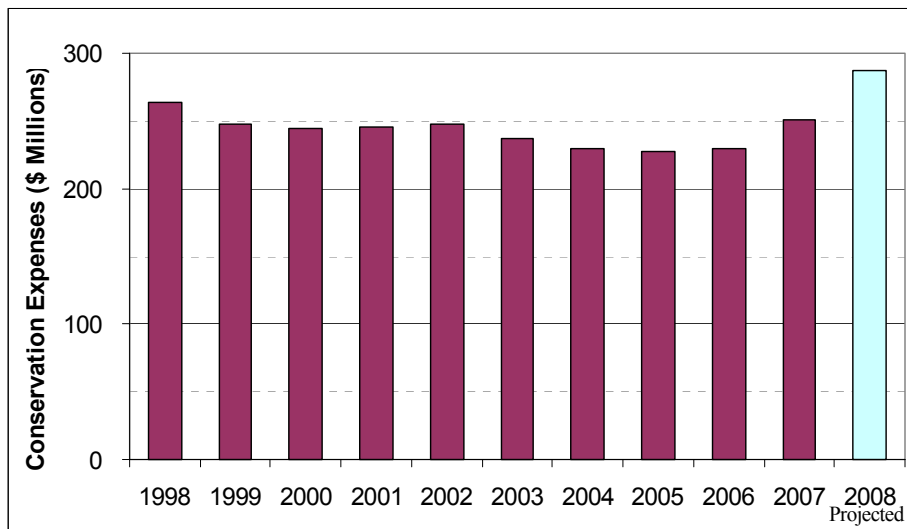
**Table 4. DSM and Energy Efficiency Growth Rate**

|        | DSM and Energy efficiency | Total Demand |
|--------|---------------------------|--------------|
| Summer | 3.14%                     | 2.24%        |
| Winter | 2.51%                     | 2.12%        |

## Energy Conservation Cost Recovery

IOUs have the opportunity to recover prudently incurred expenditures associated with Commission-approved DSM programs through the Energy Conservation Cost Recovery Clause (ECCR). Since 1981, Florida’s IOUs have collected more than \$4.5 billion through the ECCR clause, with more than \$2.4 billion of that amount recovered in the last 10 years. As illustrated in Figure 8, annual ECCR expenditures for 2004 through 2006 stabilized at just under \$230 million per year for two primary reasons: certain DSM programs have reached saturation in participation levels, and DSM program cost-effectiveness declined due to the relatively lower cost of new generating units. However, expenditures in 2007 exceeded \$250 million, and 2008 expenditures are projected to exceed \$285 million. This trend may be evidence of the implementation of new programs approved by the Commission in 2006 and 2007.

**Figure 8. Conservation Expenses for IOUs**



## **Actions to Encourage DSM and Energy Efficiency**

In 2008, the Legislature amended Section 366.82, F.S., which directs the Commission's process for establishing DSM and energy efficiency goals. More specifically, the Commission must now consider the impact of demand-side renewable energy systems as well as an expanded scope of potential conservation and efficiency measures. Additional considerations include the need for incentives and the effect of emission compliance costs. These changes should further promote utility implementation of new DSM programs. The utilities have launched a technical potential study to start the goal-setting process.

Utilities are scheduled to file their proposed goals around May 2009, and a hearing is currently scheduled for August 19-21, 2009. The Commission will re-establish demand and energy conservation goals for Florida's largest utilities to become effective January 1, 2010. The impact of the new goals should be reflected in the utilities' 2010 Ten-Year Site Plans.

## 4. ENERGY GENERATION

---

Current projections indicate that the state's total energy needs will surpass existing DSM and energy efficiency programs offered by Florida's utilities. Therefore, the addition of supply-side generation is necessary to satisfy reliability requirements. Florida's electric utilities must consider several strategic and economic factors prior to selecting a supply-side resource. In recent years, the Legislature and the Commission have stressed the importance of utilities reducing the state's dependence on natural gas, which generated nearly 40 percent of the state's energy in 2007, and maintaining a balanced fuel supply. A balanced fuel supply adds value in terms of supply reliability and price stability.

Florida's utilities must additionally address growing environmental concerns. Discussions regarding emission requirements for substances such as carbon dioxide are underway at both the state and national level. Potential incremental environmental costs, therefore, must also be considered as utilities explore supply side resources. Such costs are particularly critical when considering fossil fuel-fired generation.

### Renewable Generation

Despite providing a small percentage of the utilities' total energy supply, renewable generation serves as a key component to Florida's energy future with regard to reducing reliance on fossil fuels and improving environmental conditions. In Florida, renewable energy is primarily fueled by municipal solid waste, biomass, and waste heat energy sources.

Hydroelectric generation also provides renewable energy generation in Florida. Hydroelectric units at two sites, one utility-owned and one operated by the Federal government, supply 54 MW of renewable capacity. Because of Florida's geography, however, new hydroelectric power generation is not expected. Currently, renewable energy facilities provide more than 1,000 MW of firm and non-firm capacity. Table 5 below summarizes Florida's existing renewable resources.

**Table 5. Existing Renewable Resources**

| Fuel Type             | Capacity (MW) |
|-----------------------|---------------|
| Biomass               | 270           |
| Hydro                 | 54            |
| Landfill Gas          | 16            |
| Municipal Solid Waste | 428           |
| Solar                 | 0             |
| Wind                  | 0             |
| Waste Heat            | 329           |
| <b>Total</b>          | <b>1,097</b>  |

A portion of Florida’s renewable energy generation comes from renewable generators which sell to electric utilities under firm contracts. Capacity purchased under a firm contract from these renewable energy sources can defer the need for utilities to construct power plants. Florida’s utilities currently purchase more than 450 MW of firm renewable generation. Table 6 below lists the reporting utilities that rely upon renewable energy sources for greater than one percent of their total net energy for load.

**Table 6. Contribution of Firm Renewable Energy to Net Energy for Load<sup>6</sup>**

| Utility                       | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|-------------------------------|------|------|------|------|------|------|
| Progress Energy Florida, Inc. | 3.4% | 3.3% | 3.1% | 2.8% | 3.0% | 2.5% |
| Seminole Electric Cooperative | 2.4% | 2.2% | 2.4% | 2.7% | 2.6% | 2.6% |
| Tampa Electric Company        | 1.9% | 1.8% | 1.7% | 2.2% | 2.4% | 2.6% |
| Orlando Utilities Commission  | 1.7% | 1.6% | 1.6% | 1.6% | 1.5% | 1.4% |
| Florida Power & Light Company | 1.5% | 1.5% | 1.5% | 1.4% | 1.5% | 1.3% |

Renewable energy facilities also produce over 530 MW of non-firm capacity for sale to utilities on an as-available basis. Energy purchased on an as-available basis is considered non-firm capacity, so Florida’s utilities do not count on this generation for reliability purposes. However, the energy produced by these utilities can give a utility the ability to avoid burning fossil fuels from existing generators.

A third form of renewable energy is known as self-service generation. Many renewable generators supply their internal electricity needs and sell excess energy, if any, to a utility. If all three forms of renewable energy – firm, non-firm, and self-service – are combined, data suggests that renewable energy accounted for 3.6 percent of the IOU’s retail energy needs in 2007.

## Renewable Generation Resource Additions

Florida’s utilities plan to add approximately 500 MW of renewable generation over the ten-year planning period. The majority of the state’s generation additions are currently proposed to come from landfill gas and biomass.

In 2008, the Commission approved three negotiated contracts which will result in 175 MW of firm capacity and associated energy produced by renewable facilities. The proposed facilities will use MSW, gasified biomass, and cultivated biomass as primary fuels. Some biomass projects rely on the cultivation of crops to produce fuel and carry significant land requirements which may constrain siting and, ultimately, project completion. For example, a recently approved negotiated contract for the purchase of 40 MW of firm capacity and associated energy produced by a biomass facility requires an area greater than 25,000 acres to be used for the production of sweet sorghum as a biomass fuel crop.

In addition to power purchased from non-utility generators, FPL is in the process of developing the St. Lucie Wind Project which may consist of up to 6 wind turbine generators capable

<sup>6</sup> GULF, FMPA, GRU, JEA, and LAK reported a contribution of less than one percent.



of generating up to approximately 13.8 MW of wind generation. FPL's goal is to start construction on the St. Lucie Wind Project in 2008 with completion in 2009. FPL's Ten-Year Site Plan also indicates that other wind development efforts are currently underway on Florida's coastline.

FPL is also planning to add 3 new solar facilities which will produce 110 MW of solar generation. These projects are further discussed in the following section. In addition to FPL's solar projects, OUC is planning the addition of a 1 MW solar facility. Table 7 below summarizes the planned renewable resources through the planning horizon.

**Table 7. Planned Renewable Resource Additions**

| <b>Fuel Type</b>             | <b>Capacity (MW)</b> |
|------------------------------|----------------------|
| <b>Biomass</b>               | 326                  |
| <b>Hydro</b>                 | 0                    |
| <b>Landfill Gas</b>          | 11                   |
| <b>Municipal Solid Waste</b> | 20                   |
| <b>Solar</b>                 | 111                  |
| <b>Wind</b>                  | 14                   |
| <b>Waste Heat</b>            | 0                    |
| <b>Total</b>                 | <b>482</b>           |

## Legislative and Commission Actions to Encourage Renewables

Historically, relatively high capital and operating costs, as well as limited applications, have hampered the development of renewable energy in the state. The Legislature and Commission, however, have taken several steps in recent years to encourage the development of renewable generation. Additionally, heightened national and global awareness regarding energy resources and climate change have further intensified efforts to implement renewable energy.

### ***Net Metering and Interconnection Rules***

On April 7, 2008, Commission amendments to Rule 25-6.065, F.A.C., relating to interconnection and net metering of customer-owned renewable generation became effective.<sup>7</sup> The purpose of the rule is to promote the development of customer-owned demand-side renewable generation up to two MW in size by expediting the interconnection of such generation and by minimizing costs that customers might experience when attempting to interconnect to a utility system. In addition, the rule permits customers to offset electric consumption through net metering, further mitigating costs associated with self-generation. In response to a data request, Florida's four IOUs reported more than 400 residential solar photovoltaic (PV) and solar thermal interconnections. The IOUs' responses are summarized in Table 8 below.

**Table 8. Resident-Owned Solar Interconnections**

| Utility      | Connections | Non-Firm Capacity (MW) |
|--------------|-------------|------------------------|
| FPL          | 105         | 0.354                  |
| PEF          | 297         | 0.672                  |
| TECO         | 8           | 0.023                  |
| GULF         | 6           | 0.027                  |
| <b>Total</b> | <b>416</b>  | <b>1.075</b>           |

### ***Renewable Portfolio Standard (RPS) for Florida***

Recently, the Legislature and Commission have taken several steps to encourage additional development of renewable generation while minimizing the cost of power supply to retail ratepayers. The 2008 Legislature passed several amendments to Section 366.92, F.S. Specifically, Section 366.92(2), F.S., was amended to require the Commission to draft rules to establish a renewable portfolio standard (RPS) which will require each IOU to supply a percentage of their retail electricity sales from renewable energy sources located in Florida. The statute requires specific focus to be placed on existing and potential sources of renewable energy in Florida and the economic impact of new renewable generation. The Commission has held two rule development workshops and is scheduled to hold a third workshop on December 3, 2008. On January 9, 2009, the Commission will consider a draft rule which will be submitted to the Legislature by February 1, 2009, for ratification.

---

<sup>7</sup> See Order No. PSC-08-0161-FOF-EI, issued March 19, 2008, Docket No. 070674-EI, In re: Interconnection and Net Metering of Customer-Owned Renewable Generation.

## **Solar**

In order to demonstrate the feasibility and viability of clean energy systems, the Florida Legislature passed amendments to Section 366.92, F.S. The amendment allows full cost recovery under the environmental cost recovery clause for renewable energy projects that are zero greenhouse gas emitting at the point of generation up to a total of 110 MW. On July 15, 2008, the Commission approved FPL's petition for the approval of eligibility for cost recovery of 3 solar energy projects totaling 110 MW.

FPL's largest proposed project, Martin Solar, will be a 75 MW solar thermal steam generating facility at the existing Martin Power Plant Site in Martin County, Florida. Martin Solar is designed to serve as a "fuel substitution" resource; thus, the facility is not designed to provide firm capacity. Martin Solar involves the installation of solar thermal technology integrated into the existing steam cycle for the currently operating Martin Power Plant Unit 8, a natural gas-fired combined cycle plant. The supplemental steam to be supplied by Martin Solar for the Unit 8 heat recovery steam generators will be generated from the concentration of solar radiation via parabolic trough solar collectors. Once constructed, Martin Solar will be the largest solar thermal facility in the world and the largest solar plant of any kind outside of California.

Additionally, FPL is proposing the construction of two solar PV projects. DeSoto Solar and Space Coast Solar will generate 25 MW and 10 MW, respectively. DeSoto Solar will use a tracking array of solar PV panels, while Space Coast Solar will use fixed array solar PV panels. Both projects will convert energy from sunlight directly into electricity. FPL will consider both DeSoto Solar and Space Coast Solar as non-firm resources until sufficient operating experience is obtained to determine what contribution these facilities can reliably provide at FPL's system's peak hours.

## **Utility Generation Efficiency and Modernization**

Current projections indicate that the state's total energy demand will surpass existing DSM and energy efficiency programs offered by Florida's utilities and planned renewable generation. Therefore, the remaining generation needs must be met by traditional utility generation.

The modernization of existing units also plays a key role in addressing several of Florida's energy generation issues and concerns. The conversion of less efficient fossil steam generation to combined cycle generation increases capacity while reducing per unit emissions.

In 2008, the Commission granted FPL a need determination to convert four existing dual-fired steam generating units into two natural gas-fired combined cycle power plants with in-service dates in 2013 and 2014, respectively. The approved conversions, located at FPL's Cape Canaveral and Riviera sites, will transform more than 1,400 MW of relatively inefficient steam powered generation into approximately 2,400 MW of newer and more efficient combined cycle generation. FPL has estimated that the conversions will result in more than \$450 million of net present value cost savings and will avoid approximately 8 million tons of CO<sub>2</sub>, illustrating the value and importance of such projects.

FPL, in response to a staff data request, identified other facilities that are potentially capable of conversion. Table 9 below summarizes FPL’s response.

**Table 9. Fossil Steam Facilities to Consider for Conversion**

| Plant Name                         | Capacity (MW) | Respective In-Service Year |
|------------------------------------|---------------|----------------------------|
| Cutler Units 5 & 6                 | 205           | 1954 & 1955                |
| Manatee Units 1 & 2                | 1,638         | 1976 & 1977                |
| Martin Units 1 & 2                 | 1,678         | 1980 & 1981                |
| Port Everglades Units 1, 2, 3, & 4 | 1,219         | 1971                       |
| Sanford Unit 3                     | 138           | 1959                       |
| Turkey Point Units 1 & 2           | 788           | 1967 & 1968                |
| <b>Total Capacity</b>              | <b>6,672</b>  |                            |

PEF is in the process of completing the Bartow Repowering Project which is scheduled to be completed in June 2009. The project consists of replacing 444 MW of oil-fired steam generation with a new 1,159 MW natural gas-fired combined cycle unit. PEF is in the process of considering a similar project at its Suwannee Station which will replace 129 MW of oil-fired steam generation with a new 1,159 MW natural gas-fired combined cycle unit. PEF is currently conducting a request for proposal process for the Suwannee new combined cycle unit which is scheduled to be in-service in 2013.

When considering the addition of supply-side generation, Florida’s electric utilities must consider many environmental, economic, and reliability issues. The modernization of existing units plays a key role in addressing each of these issues. Such projects may require the temporary removal of existing units, thus impacting reliability until the completion of the modernization. Utilities should continue to explore potential conversion projects and report the feasibility of each conversion in next year’s Ten Year-Site Plans.

## **Traditional Energy Generation and a Balanced Fuel Supply**

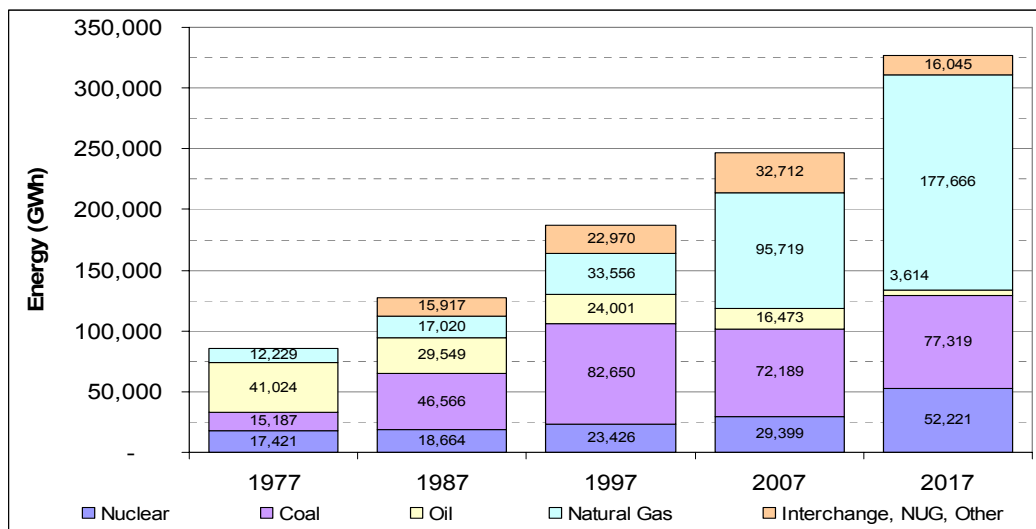
Prior to the late 1970s, Florida’s utilities used oil as the primary fuel source for generating electricity. Following the dramatic increase in oil prices in the 1970s, Florida’s utilities made a concerted effort to add generating units that used solid fuels. One early response was the purchase of economical “coal-by-wire” from the Southern Company, which had a temporary surplus of coal-fired generation resources already constructed. The Commission supported the utilities’ efforts to maintain fuel diversity with regulatory programs such as the Oil Backout Cost Recovery Factor, which gave utilities an incentive to recover costs of converting from oil-based generation, and the Energy Broker, a computerized system which matched buyers and sellers of economy energy to minimize the real time fuel costs of the participating utilities.

Prior to Congressional repeal of the Power Plant and Industrial Fuel Use Act in 1987, natural gas demand had declined substantially because of restrictions on its usage as a boiler utility fuel. These restrictions contributed to a significant oversupply of gas, resulting in falling prices. Shortly after the repeal, a new era of highly efficient, flexible, environmentally preferred combustion turbine

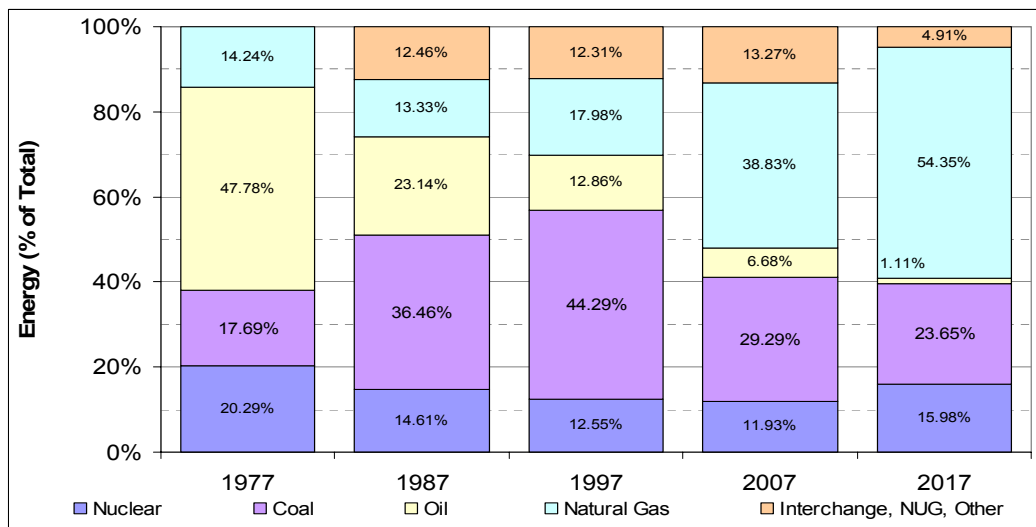
(CT) and combined cycle (CC) units entered the market. The addition of these technologies by Florida's utilities fostered an increase in the use of natural gas to produce electricity.

Due to the state's continued increase in the demand for electricity and the relatively low natural gas prices during the 1990s, Florida's utilities continued to add gas-fired generating units to satisfy economic and reliability needs. Figure 9 below illustrates Florida's energy generation by fuel type and the growth of overall energy demands which utilities were required to serve. As shown in Figure 10, natural gas generation has increased from nearly 18 percent of the state's electricity requirements in 1997 to 38.8 percent in 2007. Current projections indicate that natural gas generation will supply 54 percent of the state's energy generation by 2017.

**Figure 9. State of Florida: Energy Generation by Fuel Type (GWh)**

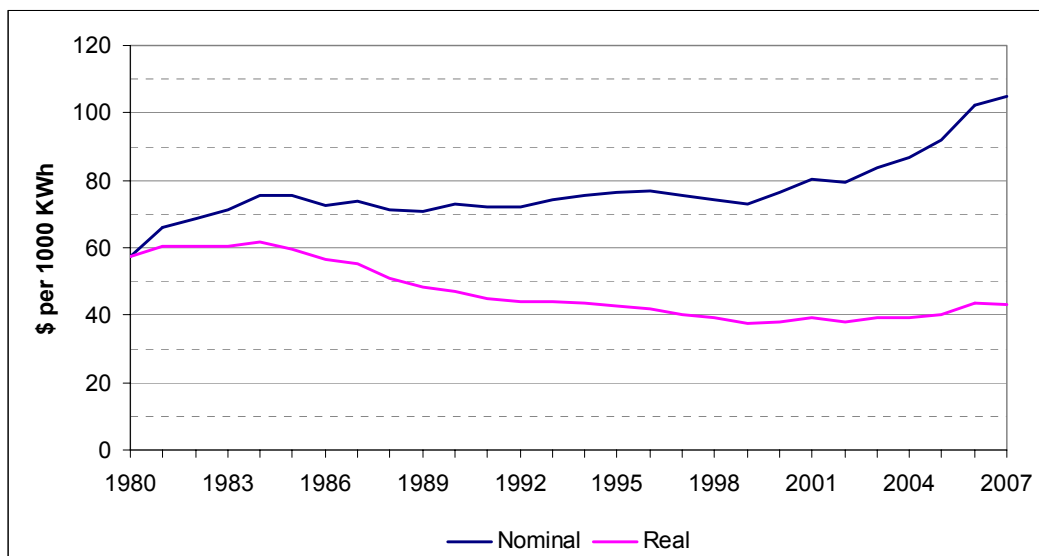


**Figure 10. State of Florida: Energy Generation by Fuel Type (Percent of Total)**



As shown in Figure 11 below, between 1980 and 2000, moderate fuel prices, as well as a balanced planning approach used by Florida’s utilities, resulted in relatively stable average electricity prices for Florida’s ratepayers with real prices actually declining. Starting in 2001, natural gas prices began to increase nationwide. The actual cost of natural gas for FPL more than doubled between 2002 and 2007, rising from approximately \$4.06 per MMBtu in 2002 to \$9.70 per MMBtu in 2007. The increase in natural gas prices, coupled with Florida’s growing dependence on natural gas generation, reversed the trend of stable electricity prices causing an increase in the average electric bill in recent years, a trend illustrated in Figure 11 below.

**Figure 11. Average Residential Electric Bill: 1980 to Present**



Moreover, in 2005, hurricanes and tropical storms in the Gulf of Mexico caused short-term spikes due to gas supply disruptions. The effects of higher, volatile gas prices have been dramatic on customer bills. Such events illustrate the importance of a balanced fuel supply since fuel diversity can serve as a risk mitigation strategy by providing a dampening effect on fuel price volatility caused by daily market conditions.

Over the last 20 years, Florida’s utilities have turned to natural gas to satisfy the state’s growing energy demand. The recent volatility of natural gas prices, however, has shown that the overdependence on a single fuel can lead to an unacceptable risk of supply disruptions and rate increases. Unfortunately, fuel diversity cannot be achieved overnight.

## Proposed Generating Units

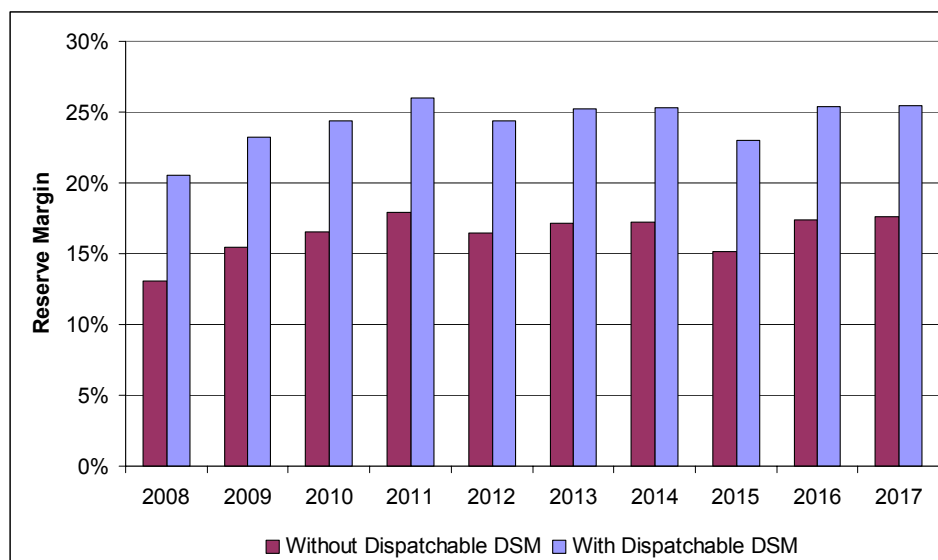
In addition to meeting projected load, the FRCC has a resource adequacy standard requiring a 15 percent reserve margin, above peak demand, which the utilities must meet. Since the summer of 2004, the three IOUs in the FRCC region (FPL, PEF, and TECO) have employed a 20 percent reserve margin criteria. Figure 12 shows the summer peninsular reserve margin, which includes DSM, energy efficiency, renewable generation, and traditional utility generation. Since the reserve margin exceeds

15 percent every year within the planning period, this figure indicates that the utilities have planned sufficient generation to meet reliability standards. As previously discussed, utilities may defer several planned capacity additions. Figure 12 below does not reflect these potential changes.

Although the 20 percent reserve margin employed by FPL, PEF, and TECO provides increased reliability to the state’s system, it is paramount that, in an era of rising rates, utilities should study all options available to mitigate price increases, including possible modification of current planning criterion.

Also illustrated in Figure 12 below is the contribution of dispatchable DSM (load management and interruptible load) to the region’s reserve margin. Although the FRCC currently has no standards which limit what percentage of the reserve margin can come from DSM, utilities have found that when interruptible load is called on frequently, customers are more likely to leave the program. The sudden loss of DSM participants can lead to a less reliable system, so utilities must balance DSM and generation.

**Figure 12. Summer Peninsular Reserve Margin Projections**



## **Coal**

Florida’s utilities proposed several coal-fired power plants in recent ten-year site plans in an effort to balance the state’s fuel supply. Fuel cost uncertainties, high capital costs, and uncertainties regarding potential expenses related to future carbon emission regulations were all cited as concerns as more than 3,500 MW of coal-fired generation additions were canceled. Despite initial opposition, Seminole Electric Cooperative received final certification of Seminole Unit 3, a 750 MW coal-fired power plant, on June 13, 2008. Seminole Unit 3 has an in-service date of May 2014, and represents the only planned coal-fired generation capacity addition in Florida.

The development and deployment of advanced coal technology that is both cost-effective and environmentally responsible plays a critical role in balancing the state's fuel mix.

## ***Nuclear***

Nuclear generation is a generating technology that produces no greenhouse gas emissions. Significant strides have been made nationally to bring nuclear generation back to the forefront, including new standardized plant designs pre-approved by the Nuclear Regulatory Commission (NRC) and streamlined safety and operating licensing to expedite construction. Nevertheless, it is expected that the licensing, certification, and construction of a new nuclear power plant in Florida will take approximately ten years. Coupled with extremely high capital costs, due in part to worldwide industrialization and demand for construction materials and labor, the commitment to the construction of new nuclear power plants entails its own set of financial risks. In an effort to mitigate the economic risks associated with nuclear power plants, the Florida Legislature enacted Section 366.93, F.S., in June 2006. The Florida Legislature directed the Commission to establish new rules to provide for early cost recovery mechanisms for costs related to the siting, design, licensing, and construction of nuclear power plants in Florida. Rule 25-6.0423, F.A.C., enacted April 8, 2007, fulfills the legislative mandate for nuclear power plant cost recovery.

Increased nuclear capacity will significantly contribute to both greater system fuel diversity and lower greenhouse gas emissions. Additionally, nuclear generation does not face the same supply disruptions as fossil fuel generation because nuclear fuel is added to the units during refueling outages which typically take place once every 18 to 24 months.

Both FPL and PEF have included additional nuclear capacity from expansion (uprates) of their existing nuclear power plants in their 2008 Ten-Year Site Plans. Combined, the uprates of the PEF and FPL units will add approximately 600 MW of additional nuclear capacity.

In 2008, the Commission also granted PEF and FPL a determination of need for new nuclear generation. PEF's Levy Units 1 & 2 will mark the first construction of new nuclear generation in Florida in more than 20 years. Levy Units 1 & 2 will provide approximately 1,100 MW of capacity each and will have in-service dates during 2016 and 2017, respectively. The units will be constructed on a greenfield site located eight miles from PEF's existing Crystal River site.

FPL's Turkey Point Units 6 & 7 will also provide approximately 1,100 MW of capacity each. The two new nuclear units have in-service dates set for 2018 and 2020 and will be constructed at the FPL's existing Turkey Point power plant site. Because of their in-service dates, Turkey Point Units 6 & 7 do not appear in FPL's 2008 Ten-Year Site Plan.



The addition of nuclear capacity will help to provide further diversity to Florida’s generation mix. Table 10 below summarizes the new nuclear projects which have been granted a determination of need by the Commission.

**Table 10. Nuclear Capacity Additions**

| Utility      | Name                              | Summer Capacity (MW) | In-Service              |
|--------------|-----------------------------------|----------------------|-------------------------|
| PEF          | Crystal River Unit 3 <sup>8</sup> | 37 & 129             | 12/2009 & 12/2011       |
| FPL          | St. Lucie 1 & 2 <sup>9</sup>      | 103 each             | Fall 2011 & Spring 2012 |
| FPL          | Turkey Pt. 3 & 4 <sup>9</sup>     | 104 each             | Spring 2012 & Fall 2012 |
| PEF          | Levy Units 1 & 2 <sup>10</sup>    | 1,092 each           | 6/2016 & 6/2017         |
| FPL          | Turkey Pt. 6 & 7 <sup>11</sup>    | 1,100 each           | 2018 & 2020             |
| <b>Total</b> |                                   | <b>4,964</b>         |                         |

Nuclear power plant construction is capital-intensive and has a long lead time, and uncertainty remains with regard to future capital costs and fuel prices. The Commission, however, will review the continued feasibility of both Levy Units 1 & 2 and Turkey Point 6 & 7 during its annual nuclear cost recovery proceedings. Such proceedings provide the Commission with a forum to ensure that construction of the nuclear units continues to be in the best interest of ratepayers.

### **Natural Gas**

Because of the long permitting and construction periods involved with nuclear generating plants, coupled with the cancellation of more than 3,500 MW of coal-fired generation, additional natural gas-fired generation has been planned in the interim. The 2008 Ten-Year Site Plans include the net addition of approximately 15,500 MW of natural gas generation. The 2007 Ten-Year Site Plans included roughly 13,100 MW. The increase of proposed natural gas generation is attributable to the cancellation of several coal plants.

In 2008, the Commission approved the determination of need for two new natural gas-fired power plants. FMPA was granted a determination of need for a 300 MW natural gas-fired combined cycle generator at the company’s existing Cane Island site which has an in-service date of June 2011.

The Commission also granted FPL a determination of need for West County Energy Center 3 (WCEC 3), a 1,219 MW combined cycle unit with a 2011 in-service date. The addition of WCEC 3

<sup>8</sup> Order No. PSC-07-0119-FOF-EI, issued February 8, 2007, Docket No. 060642-EI, In re: Petition for determination of need for expansion of Crystal River 3 nuclear power plant, for exemption from Bid Rule 25-22.082, Florida Administrative Code, and for cost recovery through fuel clause, by Progress Energy Florida, Inc.

<sup>9</sup> Order No. PSC-08-0021-FOF-EI, issued January 7, 2008, Docket No. 070602-EI, In re: Petition for determination of need for expansion of Turkey Point and St. Lucie nuclear power plants, for exemption from Bid Rule 25-22.082, F.A.C., and for cost recovery through the Commission's Nuclear Power Plant Cost Recovery Rule, Rule 25-6.0423, F.A.C.

<sup>10</sup> Order No. PSC-08-0518-FOF-EI, issued August 12, 2008, Docket No. 080148-EI, In re: Petition for determination of need for Levy Units 1 and 2 nuclear power plants, by Progress Energy Florida, Inc.

<sup>11</sup> Order No. PSC-08-0237-FOF-EI, issued April 11, 2008, Docket No. 070650-EI, In re: Petition to determine need for Turkey Point Nuclear Units 6 and 7 electrical power plant, by Florida Power & Light Company.

in 2011 will allow FPL to perform two conversions which were also approved. The conversions at FPL's Cape Canaveral and Riviera Sites, discussed earlier, will result in a net addition of approximately 1,000 MW with in-service dates during 2013 and 2014, respectively.

## Power Plant Siting Act (PPSA)

The Commission has granted a determination of need for several generating units in recent years. Many of these facilities have received certification under the PPSA by Florida's Governor and Cabinet. Any proposed steam-fired generating unit of at least 75 MW requires certification under Florida's PPSA. Table 11 below lists all proposed generating units in the 2008 Ten-Year Site Plans that have at a minimum applied for a determination of need from the Commission.

**Table 11. Power Plants Requiring Certification**

| Utility               | Generating Unit Name             | Fuel Type | Summer Capacity (MW) | Dates                      |                      |            |
|-----------------------|----------------------------------|-----------|----------------------|----------------------------|----------------------|------------|
|                       |                                  |           |                      | Need Approved (Commission) | PPSA Certified (DEP) | In-Service |
| FPL                   | West County Energy Center Unit 1 | NG        | 1,219                | Jun-06                     | Dec-06               | Jun-09     |
| FPL                   | West County Energy Center Unit 2 | NG        | 1,219                | Jun-06                     | Dec-06               | Jun-10     |
| OUC                   | Stanton Unit B                   | NG        | 287                  | Jun-06                     | Dec-06               | Jun-10     |
| FMPA                  | Cane Island 4                    | NG        | 318                  | Aug-08                     |                      | Jun-11     |
| FPL                   | West County Energy Center Unit 3 | NG        | 1,219                | Sept-08                    |                      | Jun-11     |
| JEA                   | Greenland Energy Center          | NG        | 236                  |                            |                      | Jun-13     |
| FPL                   | Cape Canaveral Conversion        | NG        | 1,219                | Sept-08                    |                      | Jun-13     |
| FPL                   | Riviera Conversion               | NG        | 1,207                | Sept-08                    |                      | Jun-14     |
| SEC                   | Seminole Unit 3                  | BIT       | 750                  | Jul-06                     | Jun-08               | May-14     |
| PEF                   | Levy Unit 1                      | NUC       | 1,100                | May-08                     |                      | Jun-16     |
| PEF                   | Levy Unit 2                      | NUC       | 1,100                | May-08                     |                      | Jun-17     |
| FPL                   | Turkey Point 6 <sup>12</sup>     | NUC       | 1,100                | March-08                   |                      | 2018       |
| FPL                   | Turkey Point 7 <sup>12</sup>     | NUC       | 1,100                | March-08                   |                      | 2020       |
| <b>Total Capacity</b> |                                  |           | <b>11,974</b>        |                            |                      |            |

<sup>12</sup> Because of their in-service dates, Turkey Point Units 6 & 7 do not appear in FPL's 2008 Ten-Year Site Plan.

Based upon other utility filings and actions subsequent to the filing of the 2008 Ten-Year Site Plans, approximately 5,000 MW of planned capacity may be delayed beyond 2017. TECO has withdrawn its RFP for a 555 MW combined cycle generator planned for 2013. Similarly, GULF has withdrawn its RFP for a 840 MW combined cycle generator planned for 2013. FPL's repowering of existing units has led to the deferral of a 1,219 MW combined cycle unit which was planned for 2014. Recent information filed in FPL testimony indicated that both 1,219 MW combined cycle units planned for 2016 are no longer part of FPL's plans. Utilities have cited declining peak demand and energy projections as one reason for the recent changes. Table 12 below summarizes the utilities' proposed capacity additions as listed in the 2008 Ten-Year Site Plans which will require a determination of need. Units which may be deferred are shown in ***BOLD ITALIC CAPS***.

**Table 12. Proposed Units Requiring a Determination of Need**

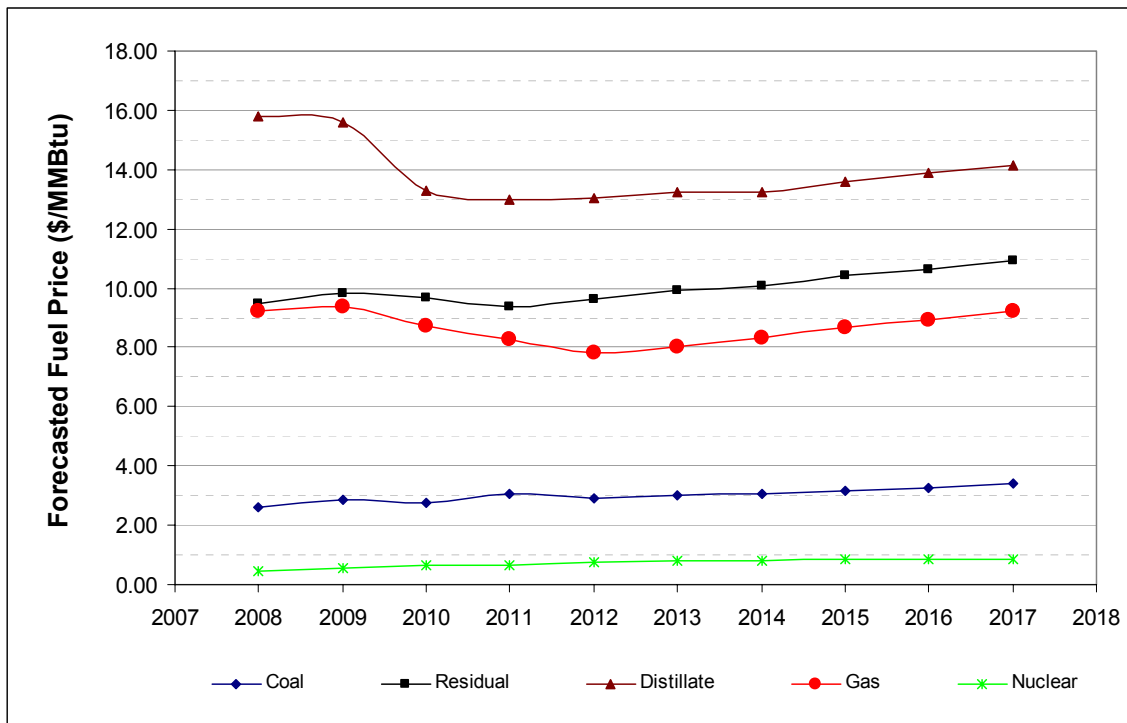
| Utility  | Generating Unit Name         | Fuel Type        | Summer Capacity (MW) | In-Service Date      |
|--|------------------------------|------------------|----------------------|----------------------|
| PEF  | Suwannee                     | NG               | 1,159                | Jun-13               |
| TECO   | <b><i>POLK UNIT 6</i></b>    | <b><i>NG</i></b> | <b><i>555</i></b>    | <b><i>JAN-13</i></b> |
| TECO   | Future                       | NG               | 555                  | Jan-17               |
| FPL  | <b><i>UNSITED CC</i></b>     | <b><i>NG</i></b> | <b><i>1,219</i></b>  | <b><i>JUN-14</i></b> |
| FPL  | <b><i>UNSITED CC</i></b>     | <b><i>NG</i></b> | <b><i>1,219</i></b>  | <b><i>JUN-16</i></b> |
| FPL  | <b><i>UNSITED CC</i></b>     | <b><i>NG</i></b> | <b><i>1,219</i></b>  | <b><i>JUN-16</i></b> |
| GULF   | <b><i>UNLOCATED UNIT</i></b> | <b><i>NG</i></b> | <b><i>840</i></b>    | <b><i>JUN-13</i></b> |
| <b>Total Capacity Per 2008 Ten-Year Site Plans</b>             |                              |                  | <b>6,766</b>         |                      |
| <b><i>TOTAL CAPACITY WHICH MAY BE DEFERRED BEYOND 2017</i></b> |                              |                  | <b><i>5,052</i></b>  |                      |

## 5. FUEL PRICE, SUPPLY, AND TRANSPORTATION

Utilities must decide which type of plant to build several years in advance: approximately four years for combined cycle, seven years for coal, and ten or more years for nuclear. As a result, the risk associated with selecting a generation technology is highly dependent on the accuracy of the long-term fuel price forecast. A utility's fuel price forecast is the foundation for determining the type of new capacity additions needed to reliably serve load.

Figure 13 below illustrates the weighted average forecasted fuel price for the eleven reporting utilities. The forecasted price for each fuel type is weighted by energy generation, meaning that utilities that generate large amounts of electricity for a particular fuel type will have more of an influence on the average. Prices for solid fuels such as nuclear and coal are forecasted to remain stable compared to oil and natural gas prices.

Figure 13. Reporting Utilities: 2008 Weighted Average Fuel Price Forecast



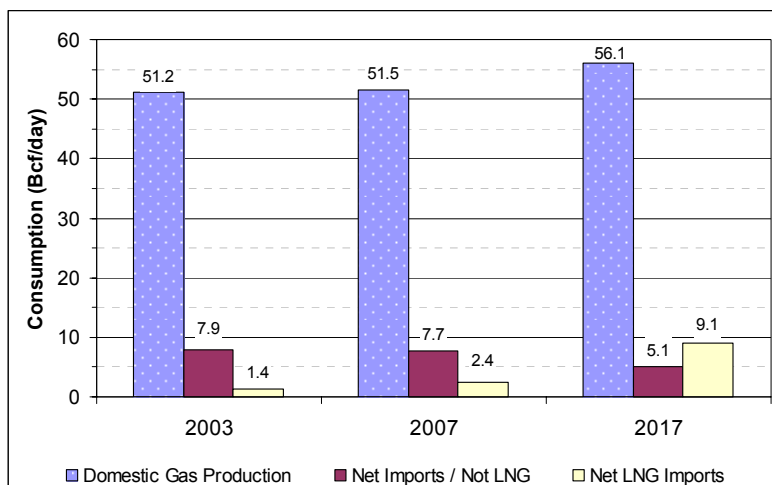
## Natural Gas Price Forecasts and Supply

The utilities provided forecasts of natural gas prices in nominal dollars on a delivered basis. The utilities generally forecast gas prices ranging from \$7 to \$10 per MMBtu through 2009. Starting around 2010, the utilities forecast gas prices to decline to \$6 to \$9 per MMBtu as imports from Canada and imported Liquefied Natural Gas (LNG) become available. High crude oil prices provide some support for gas prices due in part to fuel switching. The utilities expect continued volatility in natural gas prices. Hurricanes and tropical storms in the Gulf of Mexico typically cause short-term spikes in the price of natural gas.

As mentioned, the price forecasts are based significantly on the expectation of sizable increases in imports of LNG. A delay of this expectation will place upward pressure on natural gas prices. Furthermore, the expectation of increases in LNG supply is based on new re-gasification and terminal facilities coming on line through 2010. These projects are on schedule, and tanker capacity for importing LNG appears to be adequate. The primary source areas for LNG imports will be Qatar and Trinidad.

Figure 14 below illustrates forecasts of increasing domestically supplied natural gas coupled with increases in imports of LNG. Gas supplies from Canada and Mexico are projected to remain relatively stable. The reporting utilities are generally forecasting new gas supply from Canada's Mackenzie Delta region in 2009 and from LNG imports in 2010 to 2011. Domestic supply increases may be a result of new domestic sources and advances in drilling technology. Longer term, domestic supply could be enhanced by the development of resources in the Alaska North Slope area.

**Figure 14. Natural Gas Consumption in the U.S. by Place of Origin**



Sources: The Petroleum Industry Research Associates Energy Group (PIRA) and internal analysis by FPL.

Demand for natural gas over the planning period will be driven by the requirements of gas-fired electric generators. Demand growth in other industry sectors and the residential sector is expected to be modest.

## ***Transportation***

In Florida, increased dependency on natural gas could affect the reliability of electric utility generation supply, primarily from the possibility of natural gas supply or transportation disruption. The North American Electric Reliability Corporation (NERC) established a Gas/Electricity Interdependency Task Force to determine reliability impacts and to recommend mitigating measures should reliability risks arise. The NERC task force completed a study in May 2004, concluding in part that gas pipeline reliability can substantially impact electric generation and that electric system reliability can have an impact on gas pipeline operations. The FRCC continues to review the recommendations made by the NERC task force to determine where to focus future analyses. The FRCC has recommended that Peninsular Florida has adequate pipeline capacity for reliability purposes for both current and future natural gas demand. However, with this statement, the FRCC assumes that generating units having the capability to burn oil will do so at time of peak demand. Therefore, economics may be the driving factor for any future gas pipeline expansions.

Florida currently relies primarily on two gas pipeline companies, Florida Gas Transmission (FGT) and Gulfstream Natural Gas (Gulfstream), to supply natural gas to electric utilities, large industrial customers, and local distribution companies. FGT operates approximately 5,000 miles of pipeline nationwide, including 3,300 miles in Florida. FGT's system has undergone 6 expansions since its inception in 1959, increasing pipeline capacity from its original 0.278 Bcf/day to its current 2.2 Bcf/day. Gulfstream has a system pipeline capacity of 1.1 Bcf/day. The first phase of Gulfstream's system, which entered service in 2002, crosses the Gulf of Mexico between Pascagoula, Mississippi, and Manatee County, Florida, with more than 430 miles of 36-inch diameter pipe. The Phase II expansion, a 110-mile extension to FPL's Martin plant site in Martin County, entered service in February 2005.

### ***In-State Pipeline Transportation Projects***

**FGT:** FGT's Phase VII Expansion Project involves construction of 33 miles of 36-inch diameter pipeline looping and installation of 9,800 horsepower of compression. The expansion provides approximately 0.16 Bcf/day of additional capacity to transport natural gas from a connection with Southern Natural Gas Company's Cypress Pipeline. The expansion began service in May 2007.

**Gulfstream:** Gulfstream's Phase III expansion has provided service to FPL's West County Energy Center and began service in the summer of 2008. The Phase IV expansion will provide pipeline capacity for PEF's Bartow site in Pinellas County and is projected to begin service in the first quarter of 2009.

**Cypress Pipeline:** Phase I of this project is a 24-inch pipeline that connects the Elba Island LNG facility near Savannah, Georgia, to FGT's system near Jacksonville. This pipeline began service in May 2007 and provides gas to PEF's Hines units. This pipeline plans additional phases involving looping and additional compression.

### ***Out-of-State Pipeline Projects***

**Southeast Supply Header:** Duke Energy and CenterPoint Energy will construct a 270-mile, 36-inch diameter pipeline from the Perryville hub in Louisiana to interconnect with the Gulfstream Pipeline at Pascagoula, Mississippi. It will intersect with major pipelines and storage facilities. FPL has

contracted for 50 percent of the capacity, and PEF has contracted for 20 percent. For both utilities, the Commission has approved the recovery of prudent transportation costs associated with this pipeline through the fuel cost recovery clause. This pipeline began service in September 2008.

**Gulf South Pipeline Company:** Gulf South has proposed three expansion projects. Like the above-mentioned projects, these expansions intend to bring unconventional gas, from areas such as the Barnett Shale and Bossier Sands in east Texas, to connections with FGT and Gulfstream. Two of these projects have begun service with capacity available to Florida. The third project will begin service in the first quarter of 2009.

### ***Liquefied Natural Gas Pipeline Projects***

In addition to the Cypress Pipeline, two LNG projects are proposed to serve Florida. The Calypso project is sponsored by Suez Energy North America. This project will involve a submerged buoy system off the Southeast Florida coast that will serve as an offshore delivery point for LNG. This port would be located approximately 10 miles offshore from Port Everglades in Broward County. The expected capacity is approximately 1.9 Bcf/day.

**Höegh LNG – Port Dolphin:** This proposed offshore terminal and submerged buoy system would be 28 miles offshore and would be connected to Port Manatee near Tampa Bay by a 42-mile pipeline. The project is scheduled to start commercial operations by 2011 with a peak send-out capacity of 1.2 Bcf/day.

### **Coal Price Forecasts and Supply**

The reporting utilities' forecasted coal prices in nominal dollars on a delivered basis, resulting in differences in the forecasted prices depending on the location of the particular utility's coal plant and the mode of transportation. The forecasts use existing long-term contract prices and estimates of the spot market prices.

The reporting utilities generally see stable coal prices over the planning horizon. Some upward trend in prices is expected as demand increases due to new coal generation units coming online across the U.S. Exports and increased mining costs also provide upward price pressure. However, an ample supply of domestic coal exists, and the use of imported coal is expected to increase. Several Florida utilities import coal from Colombia and Venezuela. Current coal prices are high compared to prices in the past five years. The high prices should provide mine operators an incentive to increase production. Increased supply from the Powder River Basin and Illinois Basin, as well as imports, should moderate coal prices over the planning horizon.

Several reporting utilities burn a mix of coal and petroleum coke (petcoke), which is a by-product of petroleum refining. An increase in coal units would also increase the demand for petcoke. However, the petcoke refinery capacity will increase in the Gulf Coast area and the Caribbean Basin, which will increase supply. The forecasts suggest that petcoke prices will be stable.

## **Transportation**

Also contributing to today's relatively high delivered prices is rail transportation congestion. As railroads expand tracks to relieve the problem, transportation costs will increase since the railroads will include returns on expansions in their rates. Some reporting utilities depend entirely on rail for coal transport. Others use waterborne and rail transportation, both of which can reduce costs. Over the planning horizon, Energy Information Administration (EIA) sees periodic bottlenecks for railroads transporting western coal to the eastern United States.

Potentially, a combination of ocean transport with short-haul rail transport can reduce delivered MMBtu costs. For utilities with plants at interior sites, the ability to get short-haul rail transport contracts is an important factor for reducing the costs of delivered coal over the planning period.

## **Residual and Distillate Oil Price Forecast and Supply**

For the planning period, the Organization of Petroleum Exporting Countries (OPEC) are expected to gain market share over non-OPEC countries. By 2012, 7 countries will account for 50 percent of world crude oil production. Based on announced exploration and production projects, the supply of oil will increase through 2012.

Oil prices depend on global economic growth, other competing energy developments, and geopolitics. Economic growth in India, China, and the Pacific Rim countries has increased demand. Platts, an energy information service, states there will always be a geopolitical risk premium in oil prices. Current sources of geopolitical risk for oil prices are Venezuela, Nigeria, Russia, the former Soviet states, and the Middle East. New supplies through 2012 may moderate price increases, but as OPEC gains market share, oil prices are expected to increase at a higher rate. Spare production capacity for OPEC countries – specifically, Saudi Arabia and the United Arab Emirates – has decreased, which reduces the ability of these countries to increase supply and reduce prices.

Several Florida electric utilities make significant use of residual fuel oil (heavy oil) for generation. The companies provided price forecasts showing nominal delivered prices for residual fuel oil, typically in three categories based on sulfur content. As noted for petroleum coke, refinery capacity will increase in the Gulf Coast area and the Caribbean Basin. This expansion will increase the supply of residual fuel oil. For the planning period, the utilities are forecasting stable residual oil prices.

Florida electric utilities also use distillate oil (No. 2 fuel oil) as a back-up fuel for natural gas plants that are fuel switchable and as a starter fuel for coal plants. Due to its relatively high price, utilities do not use distillate oil to generate a significant amount of electricity. As with residual oil prices, the utilities are forecasting stable distillate oil prices.



## **Nuclear Fuel Price Forecasts and Supply**

The long-term outlook for the nuclear fuel supply chain is currently influenced by the following factors:

- Aging milling, conversion, and enrichment facilities
- Lack of excess capacity
- Lack of supply diversification at processing facilities
- Potential regulatory changes and increased security requirements
- Number and timing of the start-up of new nuclear plants
- Number and timing of the start-up of new mines and milling facilities
- Performance of processing plants

Traditionally, nuclear fuel prices have been very stable; however, based on the above factors, prices are becoming more volatile. Both owners of Florida nuclear units, PEF and FPL, are forecasting a moderate upward trend in nuclear fuel prices for the 2008 to 2017 planning period. An additional feature of industry pricing is that customers depend increasingly on long-term contracts, with terms out to five years, for uranium conversion, enrichment, and fabrication.

## 6. TRANSMISSION PLANS

---

As generation capacities increase, the transmission system must grow accordingly to maintain the capability of delivering the energy to the end user. The Commission has been given broad authority under certain sections of Chapter 366, F.S., known as the Grid Bill, to require reliability within Florida's coordinated electric grid and to ensure the planning, development, and maintenance of adequate generation, transmission, and distribution facilities within the state.

### Reliability Standards

Nationwide, electric utilities plan their bulk power systems (100 kV and above) to comply with the NERC and regional reliability standards. The NERC's mission is to ensure that the bulk electric system in North America is reliable, adequate, and secure. Since its formation in 1968, the NERC operated successfully as a self-regulatory organization, and the electric industry voluntarily complied with the NERC's reliability standards. Changes in the electric industry, however, have rendered the voluntary compliance system inadequate. In response to these industry changes, Congress required the Federal Energy Regulatory Commission (FERC) to develop a new mandatory system of reliability standards and compliance. The Energy Policy Act of 2005 authorized the creation of an electric reliability organization (ERO) with the statutory authority to enforce compliance with reliability standards among all market participants. The NERC received certification as the ERO from the FERC in July 2006.

NERC works with all stakeholder segments of the electric industry, including electricity users, to develop standards for the reliable planning and operation of the bulk power systems. Fundamentally, a power system should always operate in such a way that no credible contingency could trigger cascading outages or another form of instability. Reliability standards are generally applied as follows:

- Under a single-contingency criterion, a utility's transmission system experiences no equipment overloads, voltage violations, or instability following a contingency outage of the single most crucial element, whether that piece of equipment is a generator, a transmission line, or a transformer. The single-contingency criterion is generally the minimum reliability standard at which electric utilities plan their bulk power systems.
- Under a multiple-contingency criterion, a utility's transmission system must withstand the simultaneous failure of two or more elements with a controlled loss of load and no cascading outages which affect neighboring utilities. The transmission system must subsequently be able to adjust so that all elements operate within their emergency ratings for the duration of the outage.

In response to congressional actions to require mandatory reliability standards, which were supported by the Commission, the Florida Reliability Coordinating Council (FRCC) has implemented a compliance program that will monitor and enforce compliance with the NERC and the FRCC reliability standards. The program relies on self-assessment, periodic reporting, and on-site audits for compliance. In administering the compliance program, the FRCC works closely with all owners, operators, and users of the state's bulk electric system. The Commission staff attends FRCC meetings

and maintains an open dialog with the FRCC on reliability matters affecting the state. The Commission will continue to work closely with the FRCC, NERC, and FERC to guarantee the adequacy and reliability of Florida's electric grid.

## **FRCC Transmission Planning Process**

One of the benefits attributed to the formation of a regional transmission organization (RTO) is centralized, coordinated transmission planning. In April 2006, the Commission closed a lengthy investigation into the prudence of forming an RTO, known as GridFlorida, because the RTO did not appear to be cost-effective. The Commission directed Peninsular Florida's utilities to coordinate their transmission planning activities through the FRCC in an effort to capture some benefits of an RTO. The FRCC's transmission planning process is expected to yield a more complete transmission expansion plan from a peninsular perspective. The process will make sure that the reliability standards and criteria established by the NERC and the FRCC are met and will use the specific design, operating, and planning criteria employed by Peninsular Florida transmission owners. The Commission staff continues to participate in the FRCC's meetings on transmission planning. The Commission will continue to monitor coordinated planning efforts by Florida's utilities and, if necessary, will exercise its Grid Bill authority to ensure the adequacy and reliability of Florida's transmission system.

The FRCC performs a long range, ten-year study, as well as a study of the interface between Florida and the Southern Company (Southern). Sensitivity studies test the robustness of Peninsular Florida's transmission system under various conditions and are performed within both studies. Examples of the sensitivities studied are as follows:

- Transmission and/or generation facilities unavailable due to scheduled and/or forced outages
- Weather extremes for summer and winter periods
- Different load levels (e.g., 100-, 80-, 60-, and 40 percent) and/or seasons of the year
- Various generation dispatches that will test or stress the transmission system
- Reactive supply and demand assessment (generator reactive limits and power factor)
- Specific areas of combination/cluster of generation and load serving capability among various transmission owners/providers in the FRCC that continually experience or are expected to experience significant congestion
- Other scenarios or system conditions, such as stability analysis

Consistent with the FRCC transmission planning process, these sensitivity studies will not necessarily call for the construction of transmission facilities identified in the studies, but will furnish insight into how robust the planned transmission system is expected to be.

## 2009-2017 Long Range Transmission Study

The long range transmission study is a steady-state assessment of the adequacy of the FRCC's bulk and 69 kV transmission system for 2009-2017. The NERC Transmission Planning Standards are used to gauge the adequacy of the transmission system. These transmission planning standards state that the transmission system must remain stable within the applicable thermal and voltage rating limits without cascading outages, under normal system conditions, as well as during single and multiple contingency events. The FRCC's Long Range Transmission Reliability Study covers both near-term and long-term portions of the planning horizon. The near-term part examines years two through five (2009-2012) and analyzes in detail specific remedies identified for all thermal and/or voltage screening criteria exceptions. The long-term section examines years six through ten (2013-2017) to determine if any trends are developing that would require attention.

The Long Range Transmission Reliability Study for transmission facilities, 69kV and greater, within the FRCC Region concluded that potential thermal and voltage screening criteria violations can be resolved by operator intervention meeting the NERC Transmission Planning Standards. The resolutions were thoroughly reviewed by the transmission owners and found to be adequate in order to maintain acceptable system performance under all conditions and events. The FRCC found no major projects requiring long lead times.

## Florida-Southern Interface Transfer Capability Study

Currently, Peninsular Florida imports 1,702 MW of firm capacity into the FRCC region from the Southern Control Area within the SERC region (Southern). The remaining transferrable capacity, nearly 2,000 MW, is available through non-firm energy sales. Firm capacity exports to Southern do not occur at this time, nor are they forecasted to occur during the planning horizon. The FRCC and Southern annually perform an interregional transmission study to confirm the maximum import and export capability between the two regions and to make sure that the transmission plans of both regions jointly meet the NERC reliability standards. Based on studies performed by the FRCC and Southern, there do not appear to be any reliability constraints at the Florida-Southern interface at this time concerning the current use of interface capacity. The 2007 study confirmed the total transfer capabilities between the FRCC and Southern, which are contained in Table 13 below.

**Table 13. Florida-Southern Interface Transfer Capability**

| Transfer                     | Transfer Capability (MW) |        |
|------------------------------|--------------------------|--------|
|                              | Summer                   | Winter |
| Southern to Florida (import) | 3600                     | 3700   |
| Florida to Southern (export) | 1000                     | 2100   |

## Update of 2006 Florida Central Coordinated Study

The Florida Central Coordinated Study, completed in 2006, identified several major 230 kV projects that need to be constructed and in-service as soon as possible. Work on these projects has begun and many of these projects will be in-service by June 2011, including the Lake Agnes-Gifford 230 kV transmission line, which has recently been approved. The 2009-2017 Long Range Transmission Study performed by the FRCC showed significant improvements throughout Central Florida due to the implementation of the planned and committed projects in this area.

### Proposed Transmission Lines Requiring Certification

Many of the transmission lines proposed by the FRCC as needing to be built require Transmission Line Siting Act (TLSA) certification. To require certification under Florida's TLSA, a proposed transmission line must meet the following criteria: a rating of at least 230 kV, crossing a county line, and a length of at least 15 miles. Proposed lines in an existing corridor are exempt from TLSA requirements. The Commission determines the reliability need for and the proposed starting and ending points for lines requiring TLSA certification. The Commission must issue a final order granting or denying a determination of need within 90 days of the filing of a petition. The proposed corridor route is determined by the DEP during the certification process. The Governor and Cabinet sitting as the Siting Board ultimately must approve or deny the overall certification of the proposed line.

The Commission has granted a determination of need for four transmission lines in recent years. Two of these facilities have also received certification under the TLSA by Florida's Governor and Cabinet. Table 14 below lists all proposed transmission lines in the Ten-Year Site Plans that meet the criteria for TLSA certification.

**Table 14. Proposed Transmission Lines Requiring Certification**

| Line Owner | Transmission Line  | Line Length (Miles) | Nominal Voltage (kV) | Dates         |                | In-Service |
|------------|--------------------|---------------------|----------------------|---------------|----------------|------------|
|            |                    |                     |                      | Need Approved | TLSA Certified |            |
| FPL        | St. Johns-Pringle  | 26.0                | 230                  | 5 / 2005      | 4 / 2006       | 12 / 2008  |
| PEF/TECO   | Lake Agnes-Gifford | 32.3                | 230                  | 9 / 2007      |                | 6 / 2011   |
| FPL        | Manatee-Bob White  | 30.0                | 230                  | 8 / 2006      |                | 12 / 2011  |
| TECO       | Willow Oak-Davis   | 29.4                | 230                  | 6 / 2007      | 8 / 2008       | 6 / 2012   |

## 7. STATE, REGIONAL, AND LOCAL COMMENTS

---

### Florida Municipal Power Agency

Department of Environmental Protection. FMPA's Ten-Year Site Plan is adequate for planning purposes.

Florida Fish and Wildlife Conservation Commission. No comment on FMPA's Ten-Year Site Plan.

South Florida Regional Planning Council. FMPA should continue efforts to diversify fuel sources and emphasize renewable clean fuels and clean fuel technology. Future planning measures should be consistent with Strategic Regional Policy Plan goals and objectives including energy-efficient power generation and transportation systems.

Treasure Coast Regional Planning Council. FMPA's Ten-Year Site Plan is inconsistent with the Strategic Regional Policy Plan regarding reduced reliance on fossil fuels.

South Florida Water Management District. No adverse comments regarding the proposed sites discussed in FMPA's Ten-Year Site Plan.

### Florida Power & Light Company

Department of Environmental Protection. FPL's Ten-Year Site Plan is adequate for planning purposes.

Florida Fish and Wildlife Conservation Commission. No comment on FPL's Ten-Year Site Plan.

South Florida Regional Planning Council. FPL should continue efforts to diversify fuel sources and emphasize renewable clean fuels and clean fuel technology. Future planning measures should be consistent with Strategic Regional Policy Plan goals and objectives including energy-efficient power generation and transportation systems.

Treasure Coast Regional Planning Council. FPL's Ten-Year Site Plan is inconsistent with the Strategic Regional Policy Plan regarding reduced reliance on fossil fuels.

South Florida Water Management District. No adverse comments regarding the proposed sites discussed in FPL's Ten-Year Site Plan.

Brevard County Board of County Commissioners. The FPL plan for generator additions does not contain sufficient air emissions and cooling water evaluation for the Brevard County Board of County Commissioners to determine project consistency with the Brevard County Comprehensive Plan.

Tampa Bay Regional Planning Council. FPL's Ten-Year Site Plan is consistent with the Council's Strategic Regional Policy Plan.

Southwest Florida Regional Planning Council. FPL's plan appears to be consistent with regional goals, strategies, and actions.

Northeast Florida Regional Council. No comments on the FP&L Ten-Year Site Plan as it relates specifically to the northeast region.

## **Gainesville Regional Utilities**

Department of Environmental Protection. GRU's Ten-Year Site Plan is adequate for planning purposes.

North Central Florida Regional Planning Council. No comment on GRU's Ten-Year Site Plan.

Alachua County Department of Growth Management. There are concerns with the potential natural resource impacts of the planned biomass-fueled power generation facility at GRU's existing Deerhaven Site.

Florida Fish and Wildlife Conservation Commission. No comment on GRU's Ten-Year Site Plan.

## **Gulf Power Company**

Department of Environmental Protection. GULF's Ten-Year Site Plan is adequate for planning purposes.

Florida Fish and Wildlife Conservation Commission. No comment on GULF's Ten-Year Site Plan.

Apalachee Regional Planning Council. GULF's potential plans for capacity addition to the Sholz Plant Site may have a negative impact on adjacent natural resources thus a thorough environmental assessment is necessary.

The County of Escambia. GULF's possible additional generating unit would be within the existing boundaries of the Plant Crist site, and the plan seems suitable for its documentation of, and reasons for, that possibility.

## **JEA**

Department of Environmental Protection. JEA's Ten-Year Site Plan is adequate for planning purposes.

Florida Fish and Wildlife Conservation Commission. No comment on SEC's Ten-Year Site Plan.

## **City of Lakeland**

Department of Environmental Protection. LAK's Ten-Year Site Plan is adequate for planning purposes.

Florida Fish and Wildlife Conservation Commission. No comment on LAK's Ten-Year Site Plan.

## **Orlando Utilities Commission**

Department of Environmental Protection. OUC's Ten-Year Site Plan is adequate for planning purposes.

Florida Fish and Wildlife Conservation Commission. No comment on OUC's Ten-Year Site Plan.

## **Progress Energy Florida**

Department of Environmental Protection. PEF's Ten-Year Site Plan is adequate for planning purposes.

Florida Fish and Wildlife Conservation Commission. No comment on SEC's Ten-Year Site Plan.

Tampa Bay Regional Planning Council. PEF's Ten-Year Site Plan is consistent with the Council's Strategic Regional Policy Plan.

North Central Florida Regional Planning Council. No comment on PEF's Ten-Year Site Plan.

Levy County Planning Department. Preliminary review of PEF's Levy Nuclear Project Site Certification Application reveals potential conflicts with natural resources at the plant site and along the transmission corridor located within southern Levy County.

## **Seminole Electric Cooperative**

Department of Environmental Protection. SEC's Ten-Year Site Plan is adequate for planning purposes.

North Central Florida Regional Planning Council. No comment on SEC's Ten-Year Site Plan.

Florida Fish and Wildlife Conservation Commission. No comment on SEC's Ten-Year Site Plan.



## **City of Tallahassee**

Department of Environmental Protection. TAL's Ten-Year Site Plan is adequate for planning purposes.

Florida Fish and Wildlife Conservation Commission. No comment on TAL's Ten-Year Site Plan.

## **Tampa Electric Company**

Department of Environmental Protection. TECO's Ten-Year Site Plan is adequate for planning purposes.

Tampa Bay Regional Planning Council. TECO's Ten-Year Site Plan is consistent with the Council's Strategic Regional Policy Plan.