BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In Re: Petition for Determination of Need for Levy Units 1 and 2 Nuclear Power Plants.	)	Docket No: 080148-EI
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TESTIMONY OF JOHN BENJAMIN CRISP ON BEHALF OF PROGRESS ENERGY FLORIDA

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IN RE: PETITION FOR DETERMINATION OF NEED FOR LEVY UNITS 1 AND 2 NUCLEAR POWER PLANTS

FPSC DOCKET NO. _____-EI

DIRECT TESTIMONY OF JOHN BENJAMIN CRISP

I. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name and business address.

A. My name is John Benjamin (Ben) Crisp. My business address is 6565 38th Avenue N., St. Petersburg, Florida 33710.

Q. Please tell us how you are employed and describe your background.

A. I am employed by Progress Energy Florida, Inc. ("PEF" or the "Company") as the Director of System Planning and Regulatory Performance for PEF. I have over 20 years of electric utility experience in generation, transmission and fuels planning, load forecasting, generation construction, plants operations, system operations, fuels and power trading, and energy efficiency systems. I have served in various management positions for Progress Energy, including Manager of Energy Efficiency Programs and Director of Resource Planning. I have a bachelor's degree in Industrial Engineering from Georgia Tech, and have completed post graduate marketing and management programs at Georgia Tech and Duke University.

II. PURPOSE AND SUMMARY OF TESTIMONY

Q. What is the purpose of your testimony?

A. I am providing testimony to support the Company's Petition for determination of need for Levy Units 1 and 2. I will provide an overview of Levy Units 1 and 2 that the Company proposes to build. Then I will discuss PEF's Integrated Resource Planning ("IRP") process, including the impact of the Florida Renewable Energy Technologies and Energy Efficiency Act of 2006 (the "2006 Florida Energy Act") on that process. I will explain how the Company's IRP process led the Company to identify Levy Units 1 and 2 to meet the Company's generation reliability need for the time period 2016 to 2019 and beyond. I will explain that the Company determined Levy Units 1 and 2 were superior to other supply-side alternatives, including renewable generation resources, which were commercially available to the Company to meet its reliability need. I will further generally explain how existing and planned Demand Side Management ("DSM") programs fail to mitigate the need for Levy Units 1 and 2. As a result of the Company's analysis, I will explain that the Company has determined that (1) Levy Units 1 and 2 will provide adequate electricity at a reasonable cost, and (2) they are the most cost-effective alternative to meet the Company's need when the criteria of fuel diversity, fuel independence, emission compliance, and long-term stability and reliability under Section 403.519(40(b)3, Florida Statutes, are considered as the Florida Legislature directed. I will conclude by explaining that the Company has therefore decided to proceed at this time with the need determination for Levy Units 1 and 2. Detailed information concerning the Company's decision to build Levy Units 1 and 2 is contained in the Need Determination Study for Levy Units 1 and 2, provided as Exhibit No. ___ (JBC-1) to my testimony.

Q. Are you sponsoring any sections of the Company's Need Study, Exhibit No. ___ (JBC-1)?

A. Yes. In general I am the sponsor of the Need Study, and in particular I am sponsoring Section I, the "Executive Summary;" Section II, the "Introduction;" the following subsections of Section IV, "Resource Need and Identification," subsections A, B, C1., C2., C3.c., C6., C7., C8., C9.b., C9.c., C9.d., C9.e., C9.f., C9.h.; Section V, the "Conclusions," and Section VI, the "Adverse Consequences of Delay." The Need Study was prepared under my direction, and it is accurate.

Q. Are you sponsoring any exhibits to your testimony?

A. Yes. I am sponsoring the following exhibits to my testimony:

- Exhibit No. ___ (JBC-1), PEF's Need Study for Levy Units 1 and 2;
- Exhibit No. ___ (JBC-2), PEF's Resource Plan with Levy Units 1 and 2;
- Exhibit No. ___ (JBC-3), Forecasts of summer and winter demand and reserves with and without Levy Unit 1;
- Exhibit No. ___ (JBC-4), Forecasts of summer and winter demand and reserves with and without Levy Unit 2;
- Exhibit No. ____ (JBC-5), PEF's fuel forecasts for nuclear, natural gas, and oil;
- Exhibit No. ___ (JBC-6), PEF's 2018 daily system load forecast with and without Levy Units 1 and 2;
- Exhibit No. ____ (JBC-7), PEF's current system energy mix;

- Exhibit No. _____ (JBC-8), PEF's 2018 system energy mix with and without Levy Units 1 and 2; and
- Exhibit No. ____ (JBC-9), the table of the Cumulative Present Value Revenue Requirements (CPVRR") of the Resource Plan with Levy Units 1 and 2, including changes in natural gas prices and potential impacts from greenhouse gas ("GHG") regulation, compared to an all gas generation resource plan alternative.

Each of these exhibits was prepared under my direction, and each is accurate.

Q. Please summarize your testimony.

A. PEF needs Levy Units 1 and 2 in the time period 2016 to 2019 and beyond, taking into account the need for electric system reliability and integrity including fuel diversity, the need for base-load generating capacity, the need for adequate electricity at a reasonable cost, and whether renewable energy sources and technologies, as well as conservation measures, are used to the extent reasonably available, as required by the 2006 Florida Energy Act. By building Levy Units 1 and 2, the Company will be able to meet its commitment to maintain a 20 percent Reserve Margin, and it will do so by adding needed additional, base load nuclear generation resources to the Company's integrated electric system. Additional nuclear generation provides customers with adequate electricity at a reasonable cost because nuclear fuel is the lowest cost fuel resource available to the Company and operation of the nuclear units will displace higher cost fossil fuel generation. The nuclear generation units will further add fuel

diversity and fuel supply reliability to PEF's system, and they will reduce PEF's and Florida's dependence on fuel oil and natural gas.

Levy Units 1 and 2 will provide PEF's customers the most cost-effective source of power, taking into account as PEF must under the 2006 Florida Energy Act, the need to (1) improve the balance of fuel diversity, (2) reduce Florida's dependence on fuel oil and natural gas, (3) reduce air emission compliance costs, and (4) contribute to the long-term stability and reliability of the electric grid. The Levy units will be state-of-the-art nuclear reactors, operating at high efficiency and availability on the lowest cost, commercially available fuel, with environmentally clean generation. They will improve fuel diversity, reduce reliance on fuel oil and natural gas, and insulate the Company and its customers from environmental costs from current and future environmental regulations, including potential GHG regulations. They will provide reliable, base load power to the PEF system. We, accordingly, request the Florida Public Service Commission ("PSC" or the "Commission") to approve the need determination for these units.

III. OVERVIEW OF LEVY UNITS 1 AND 2

Q. Please provide an overview of Levy Units 1 and 2.

A. Levy Units 1 and 2 are currently expected to be state-of-the-art, advanced passive light water nuclear power plants, with expected summer and winter capacity ratings of 1,092 MW and 1,120 MW, respectively. The Westinghouse Advanced Passive ("AP") 1000 light water nuclear reactor design was initially selected and is being considered for Levy Units 1 and 2. The summer and winter capacity ratings for Levy Units 1 and

2 are derived from the nominal 1,100 MW capacity rating for the Westinghouse AP 1000 design. This nominal capacity rating was selected by Westinghouse as the most cost-effective, efficient capacity for this generation of nuclear power plants. The Westinghouse AP1000 light water reactor design has received Design Certification and Final Design Approval from the Nuclear Regulatory Commission ("NRC").

Levy Units 1 and 2 will be highly efficient, base load nuclear power plants. They are currently expected to have low forced outage and planned outage rates. The projected annual capacity factor is expected to average 90 percent over time, depending on the outage cycles and how the units are ultimately integrated into fleet maintenance cycles. Essentially though, these nuclear units are expected to operate nearly year-round. The average net operating heat rate for the units is expected to be 9,715 BTU/kWh. Processed, enriched uranium will be the fuel for the two units. This nuclear fuel is the most price stable and lowest cost fuel available to the Company for energy generation.

The non-binding project cost estimate for Levy Units 1 and 2 is currently estimated to be $9,303 M in overnight costs (2007 dollars), excluding transmission facilities. With escalation and an estimated $3,245 M for Allowance for Funds Used During Construction ("AFUDC"), the total non-binding cost estimate for Levy Units 1 and 2 is $14,090 M (in-service cost). The estimated incremental annual fixed operation and maintenance ("O&M") expense for Levy Unit 1 is $51.17/kW-yr (Summer Basis, 2007 dollars), and the estimated variable O&M is $1.82/MWh (Summer Basis, 2007 dollars). The preliminary, non-binding cost estimate for the two nuclear units includes all land acquisition, site development, major equipment,

construction including labor and materials, training and staffing, start-up and testing, and initial fuel core load costs.

Q. Is there a difference between the estimated cost of Levy Unit 1 and Levy Unit 2?

A. Yes. Based on the current non-binding cost estimates, substantial cost savings are expected for the second nuclear unit if the second unit is constructed within twelve (12) to eighteen (18) months of the first nuclear unit. The projected cost savings for the second nuclear unit are a result of expected engineering and construction efficiencies and economies of scale, for example, from concurrent manufacturing of key components and the continuous mobilization for on-site construction of both nuclear units. These efficiencies and economies of scale significantly lower the overall cost for Levy Units 1 and 2 with the resulting cost savings benefiting PEF and its customers.

The expected cost of the second nuclear unit, Levy Unit 2, is $3,376/ kW (Summer Basis, 2007 dollars), which is significantly less than the cost of Levy Unit 1 on a dollar per-kW (summer) cost basis at $5,144/kW (2007 dollars). Similarly, the estimated fixed O&M cost for Levy Unit 2, at $36.25/kw-yr (Summer Basis, 2007 dollars), is lower than the estimated fixed O&M cost for Levy Unit 1 by $15.54/kw-yr (Summer Basis, 2007 dollars). As a result, there are substantial cost savings for PEF and its customers if Levy Unit 2 is constructed within a year to eighteen (18) months of Levy Unit 1.

Q. Where will Levy Units 1 and 2 be built?

A. The preferred site selected for Levy Units 1 and 2 consists of approximately 3,100 acres located in Levy County, Florida. This site is about ten miles north of the Company's Crystal River Energy Complex, and eight miles inland from the Gulf of Mexico, on the west coast of Florida. The two units will be located on a "Greenfield" site so site and transmission infrastructure must be constructed along with the buildings and structures necessary for the power units. The site will include low profile cooling towers, intake and discharge structures, containment buildings, auxiliary buildings, turbine buildings, diesel generators, warehouses, related site work and infrastructure including roads, transmission lines and a transmission switchyard. The Company will submit a Site Certification Application ("SCA") to the Florida Department of Environmental Protection ("DEP") for the entire site, including the site and transmission infrastructure for the units. The units, site, transmission and other, associated infrastructure, however, will occupy only approximately ten percent of the entire site and the rest will be preserved.

Q. Are the costs of site development, infrastructure, and transmission included in the cost of Levy Units 1 and 2 that you have identified?

A. All costs are included except the transmission substation and additional transmission facilities that are required at and from the Levy County site to deliver power to PEF's transmission and distribution system. Preliminary estimates have identified non-binding cost estimates for these transmission facilities in a range of approximately $2,450 M excluding AFUDC. As the transmission design and licensing efforts progress, more detailed cost estimates will be available.

Q. When does the Company plan to place the units in commercial operation?

A. The Company currently plans to place Levy Unit 1 and 2 in commercial operation in June 2016 and June 2017, respectively.

IV. THE COMPANY'S RESOURCE PLANNING PROCESS

Q. Please explain PEF's Resource Planning Process.

A. The Resource Planning process is an integrated process in which the Company seeks to optimize its supply-side options along with its demand-side options into a final, integrated optimal plan designed to deliver reliable, cost-effective power to PEF customers. Typically, we evaluate the relationship of demand and supply against the Company's reliability criteria to determine if additional capacity is needed during the planning period. With the adoption of the 2006 Florida Energy Act, additional criteria must be considered too, if nuclear generation might satisfy the Company's reliability criteria. This includes whether nuclear generation provides needed base load capacity and contributes to fuel diversity and supply reliability by reducing the Company's and Florida's dependence on fuel oil and natural gas.

Additionally, the Company must include cost-effective renewable energy sources and DSM programs in its generation resource plan optimization to determine the most cost-effective overall plan. Economics alone, however, does not establish the most cost-effective generation plan under the 2006 Florida Energy Act if nuclear generation is being considered. The Company must also account for the need to (1) improve the balance of fuel diversity, (2) reduce Florida's dependence on fuel oil and

natural gas, (3) reduce air emission compliance costs, and (4) contribute to the long-term stability and reliability of the electric grid in determining whether additional nuclear generation is the most cost-effective source of power and, thus, should be included in the Company's integrated optimal plan.

The Company's optimal plan is presented to the Commission in April of every year in the Company's annual TYSP filing and reflects the optimal plan for the Company at the end of the prior year. The Company's most recent TYSP, filed in April 2007, is included as Appendix G to the Need Determination Study, Exhibit No. ___ (JBC-1), and reflects the optimal plan for the Company at the end of December 2006.

Subsequent to the filing of the TYSP the Company updates its optimal plan to account for changes over time in the information that drives the plan. These updates typically occur two to three times a year, but may be more or less frequent depending on how rapidly the information changes that warrants updates to the plan. Since filing its April 2007 TYSP, PEF's optimal plan has changed as a result of additional information and analysis affecting, among others, PEF's load and fuel forecasts and available purchased power resources. PEF's current optimal Resource Plan with Levy Units 1 and 2 is attached as Exhibit No. ___ (JBC-2) to my testimony.

Q. What are the reliability standards the Company uses to determine the need for additional resources?

A. PEF plans its resources in a manner consistent with utility industry planning practices, and generally employs both deterministic and probabilistic reliability criteria in the

resource planning process. The Company first plans its resources to satisfy a minimum Reserve Margin criterion and, if necessary, a maximum Loss of Load Probability (LOLP) criterion. PEF has based its planning on the use of dual reliability criteria since the early 1990s, a practice that has been accepted by the FPSC. By using the Reserve Margin and LOLP planning criteria when necessary, PEF's resource portfolio is designed to have sufficient capacity available to meet customer peak demand and to provide reliable generation service under all expected load conditions.

Q. Why are reserves needed?

A. Utilities require a margin of generating capacity above the firm demands of their customers in order to provide reliable service. Periodic scheduled outages are required to perform maintenance and inspections of generating plant equipment and to refuel nuclear plants. Also, at any given time during the year, some plants will be out of service due to unanticipated equipment failures resulting in forced outages of generation units. Adequate reserves must be available to accommodate these outages and to compensate for higher than projected peak demand due to forecast uncertainty and abnormal weather. In addition, some capacity must be available for operating reserves to maintain the balance between supply and demand on a moment-to-moment basis.

Q. What is PEF's minimum planning Reserve Margin?

A. PEF's current minimum Reserve Margin threshold is twenty (20) percent. The Commission approved a joint stipulation from the investor-owned utilities in

peninsular Florida establishing a 20 percent Reserve Margin in Order No. PSC-99-2507-S-EU. PEF, Florida Power & Light Company ("FPL"), and Tampa Electric Company ("TECO") agreed to increase minimum planning Reserve Margin levels to at least 20 percent by the summer of 2004.

Q. How does the Company's Resource Planning process begin?

A. The Resource Planning process begins with the development of a forecast of system load growth for the next ten years. This forecast draws on the collection of certain input data, such as population growth, fuel prices, interest and inflation rates, and the development of economic and demographic assumptions that impact future energy sales and customer demand.

Q. Briefly describe PEF's system demand and energy forecasts.

A. By the summers of 2016 and 2017, net firm demand is projected to grow to 10,961 MW and 11,150 MW, respectively, followed by a net firm demand of 12,011 MW and 12,242 MW net firm demand in the winters of 2017 and 2018, respectively. The net energy for load is projected to grow to 59,448 GWh and 60,836 GWh in the same time periods. What we are seeing is an expected growth of over twenty (20) percent in the demand for electricity in our service area over the next ten (10) years. These demand and energy forecasts reflect the impacts of the recent changes in the housing and construction markets in Florida and the current downturn in the economy as a whole on the current and future growth in customers and customer energy use. That said, however, both customer growth and load growth is still expected over the next decade

and beyond. The projection in our detailed analyses of long-term customer and load growth is not unique or unexpected given current market conditions; following both the downturns in the economy in the early 90's and after 9/11 our analyses showed and we in fact experienced continued growth in the demand for electricity. Our current analyses similarly show that the current economic downturn is cyclical and that over the long-term continued, albeit lower, customer growth and load growth is expected and we must be prepared to meet it. The demand and energy forecasts, and the methodology used to develop them, are discussed in detail in Section III of the Need Determination Study.

Q. What experience suggests that customer and load growth will continue?

A. Florida is currently the fourth most populous state, with a population of more than 17 million people. Florida will continue to add to the state's population; it is adding over 1,000 new residents a day. PEF has experienced this growth too, with more than 600,000 homes and businesses added to its service areas in the past twenty years. In fact, PEF's customer base has grown by 157 percent since 1975, from 622,000 customers to about 1.7 million today. While PEF expects this growth to slow down, Florida is still expanding, and 30,000 to 40,000 new homes and businesses have been added to PEF's service area each year, which is the equivalent size of a medium-sized city. Florida is still expected to be an attractive place for people to establish homes and businesses.

These homes and businesses are using more electricity too. Florida's per-capita electricity use currently ranks third in the country. PEF has experienced this

increase in electricity usage too, since 1975 per capita electricity use in PEF's service area has grown more than 53 percent. Even with more energy efficient appliances, equipment, and technology, energy use is still expected to grow.

Among the reasons for this growth, are the size of homes, the prevalence of air conditioning, and more electronic equipment and appliances in homes and businesses. The average new home in Florida is 54 percent larger today than it was in 1970 and 12 percent larger than it was even in 1990. Florida's subtropical environment drives air conditioning use, which is now nearly universal in Florida, when only two-thirds of homes in the south had air conditioning in 1980. The expanding number of electronic appliances and equipment in homes and businesses include computers, electronic games, and plasma-screen TVs, among other devices. The prevalence of plasma screen TVs is noteworthy because they consume more electricity than a refrigerator, which historically has been the third largest source of electrical use in a typical home. All of these factors reflect lifestyle choices by Florida residents that signify continuing growth in electricity use in their homes and businesses.

Q. Does the Company take steps to encourage energy conservation and reduce energy demand?

A. Yes, it does. PEF has long undertaken such steps through its demand-side management ("DSM") programs, which are reflected in the Company's DSM Plan.

Q. How are demand-side management programs quantified and incorporated into the Company's planning process?

A. The Commission holds regular DSM Goals and DSM Plan proceedings (most recently Docket No. 060647-EG for PEF), to assess the projected cost, performance, viability, and cost-effectiveness of DSM programs to meet utility specific DSM goals. As a result, PEF conducted a thorough analysis of a wide range of dispatchable and non-dispatchable DSM program options, and the Company identified a set of DSM programs that were cost-effective and that met Commission-established goals. PEF proposed seven residential programs, seven commercial and industrial programs, a qualifying facilities program, and a research and development program, for a total of sixteen (16) DSM programs. Of these 16 DSM programs, two were new and all the proposed programs included thirty-nine (39) new measures. The PSC approved PEF's DSM plan in Consummating Order No. PSC-07-0017-CO-EG making Order No. PSC-06-1018-TRF-EG effective and final.

PEF's current approved DSM Plan is comprised of sixteen (16) programs with over one hundred (100) individual measures and it includes new conservation goals over the ten-year period. Over the ten year period, the proposed conservation goals are generally higher than the existing set of goals were, reflecting even more savings from demand-side resources. All other things being equal, the new goals cause a decrease in PEF's firm winter and summer peak demand. PEF expects to reduce the need for an additional 527 winter MW ("WMW") of peak demand load from direct load control and 418 WMW from energy efficiency, for a total load reduction of 945 WMW from the additional programs. Together with the expected load reduction from PEF's existing DSM programs, the expanded DSM plan will provide an expected reduction in load of over 2,400 MW. Despite this decrease in peak demand, however,

Levy Units 1 and 2 are still needed in the 2016 to 2019 timeframe to satisfy PEF's Reserve Margin and meet the Company's reliability need. The Company's historical DSM programs, current and planned DSM programs, and the limits of those programs are explained in more detail in the testimony of John Masiello.

Q. Have PEF's demand-side management programs been successful in reducing demand?

A. Yes. PEF's DSM programs have met or exceeded the Commission-established DSM goals and PEF anticipates achieving all of the future year goals under the current plan. Since enactment of the Florida Energy Efficiency and Conservation Act ("FEECA"), PEF's DSM Plans have allowed the Company to meet or exceed the Commission's DSM goals for PEF every year. As a result, since 1981 when FEECA went into effect, PEF has been a leader in DSM and implementing energy efficiency programs and, in fact, PEF has one of the most robust DSM and energy efficiency programs in the country. PEF is ranked third in the nation for load management peak demand reduction with a reduction of 17 percent of peak demand, and PEF is ranked fourth in the nation for energy efficiency megawatt-hour ("MWh") saved for utilities with 1.5 million customers or more, based on 2006 data from the Department of Energy. Customers have saved 10 billion kilowatt hours and over 1,500 MW, which is equivalent to avoiding three 500 MW power plants. Further, PEF's DSM programs have avoided significant emissions that would otherwise have been released into the air to produce power, including over 7,500,000 tons of carbon dioxide (CO_2), which is equivalent to removing 1,900,000 cars from Florida roads each year. Other significant

emissions, such as sulfur dioxide (SO_2), nitrogen oxide (NOx), and mercury, have also been avoided as a result of PEF's DSM programs.

PEF will continue to pursue the research and development of cost-effective additional or modified DSM programs to reduce and control the growth rate of energy consumption, increase the conservation of resources, and increase the efficiency of the electric system. Such programs, however, cannot offset the need for additional generation units to meet the demands of PEF's customers for electrical power.

Q. Does the Company supply all the electric power its customers demand from its own generation resources?

A. No. PEF purchases or plans to purchase firm capacity and energy under purchased power contracts from other electrical power generators, including cogeneration and renewable fuel resource facilities, when it is more cost-effective to do so. PEF's resource plan takes into account its future supply from these resources as well as the future supply from its own existing and committed generating units that will be in service during the period at issue.

Q. How are new supply-side alternatives identified?

A. If a need for additional capacity during the planning period is identified, PEF examines alternative generation expansion scenarios. Supply-side resources are screened to determine those that are the most cost-effective. The Company begins with a wide range of options, identified from various industry sources and PEF's experience, and pre-screens those that do not warrant more detailed cost-effectiveness

analysis. The screening criteria include costs, fuel sources and availability, technological and commercial maturity, and overall resource feasibility within the Company's system.

Generation alternatives that pass the initial screening are considered viable capacity alternatives and are included in the next step of the planning process. That step involves an economic evaluation of generation alternatives in a computer model called Strategist. The primary output of Strategist is a CPVRR comparison of the viable resource combinations that will satisfy PEF's reliability requirements. The most cost-effective supply-side resource (or combinations), are typically evaluated based on cost performance over both the study period (30 years) and the planning period (10 years). Generally, the generation plan with the lowest CPVRR over the study period is chosen as the optimal generation plan.

In selecting Levy Units 1 and 2 as the supply-side alternatives to meet the Company's capacity need beginning in the 2016 to 2019 timeframe, PEF examined, evaluated, and ultimately rejected other conventional, advanced, and renewable generation resources as potential capacity addition alternatives in this time period. These potential supply-side alternatives are described more fully in PEF's Need Study at Exhibit No. ___ (JBC-1) to my testimony.

The Company narrowed its options to four viable generation options, natural gas-fired combined cycle generation, pulverized coal or atmospheric fluidized bed combustion ("AFBC") coal generation, coal gasification generation, and advanced light water nuclear generation. The potential coal, coal gasification, and nuclear supply-side generation units were initially evaluated against an all natural gas

generation reference case. Natural gas generation was used as the default supply-side generation alternative for several reasons. First, relative to the other generation alternatives, natural gas-fired generation has lower capital costs. Also, the combined-cycle generation technology is well-developed and the Company has extensive experience with it. Finally, natural gas-fired generation offered lower sulfur dioxide (SO_2), nitrogen oxide (NOx), mercury, and GHG emissions than the coal and coal gasification generation alternatives studied.

The nuclear generation technology proved more cost-effective than pulverized coal and coal gasification against the all natural gas generation case in preliminary evaluations. Additionally, because of the (1) significant, potential future environmental costs associated with pulverized coal and coal gasification resulting from GHG and possible carbon capture requirements or carbon abatement costs, and (2) recent regulatory and utility decisions to forego pulverized coal and coal gasification generation options in Florida, the nuclear generation option appeared to be the more viable generation alternative to evaluate further against an all natural gas generation scenario. As a result, advanced light water nuclear generation technology was selected for further economic evaluation against an all natural gas generation reference case.

V. LEVY UNITS 1 AND 2 AS PART OF THE OPTIMAL PLAN

Q. Please explain how Levy Units 1 and 2 were identified in the Company's Resource Planning efforts.

A. Through the Resource Planning process I described, we develop the TYSPs and updates to the TYSP. The April 2007 TYSP first identified a reliability need in 2016 that was met by a nuclear power plant, which became Levy Unit 1, as part of the Company's optimal plan. At that time, and through continued review and analysis of the optimal plan, a subsequent reliability need was identified following the expected commercial operation of Levy Unit 1 that was satisfied by an additional nuclear power plant, Levy Unit 2, as part of the Company's optimal plan. This determination was made after conducting a more detailed economic screening of the advanced light water nuclear generation alternatives represented by Levy Units 1 and 2 against an all natural gas generation reference case using the Strategist optimization program. The Strategist model was used to assess the Company's seasonal Reserve Margins when selected generation resources were added to meet the prescribed minimum Reserve Margin requirements. The ultimate decision to add the Levy Units 1 and 2 advanced light water nuclear power generation was driven by the Company's reliability need for both nuclear units, the favorable economics for the second nuclear unit addition within a year to eighteen months of the first unit, and the fuel diversity, technological benefits, and environmental benefits from construction and operation of two nuclear units.

The Company's current optimal plan also calls for additional supply side generation resources to meet the Company's reliability needs by maintaining the Company's 20 percent Reserve Margin commitment prior to the expected commercial operation of Levy Unit 1 in 2016. These include the Bartow repowering project in 2009, the additional uprates at PEF's existing nuclear unit, Crystal River Unit 3

("CR3") in 2009 and 2011, an unsited combined cycle ("CC") unit in 2013, and purchased power (primarily from peaking power and renewable generation resources). These additions are identified in the Company's optimal Resource Plan attached as Exhibit No. ___ (JBC-2) to my testimony. This plan is a slight variation of the expansion plan published in the Company's 2007 Ten-Year Site Plan filed with the PSC on April 1, 2007. The current optimal expansion plan reflects additional information and analysis since the Ten-Year Site Plan was prepared, as I have generally described. The additional generation resources, together with Levy Units 1 and 2 in the current optimal expansion plan, however, are consistent with and the result of the Company's Resource Planning process.

Q. If other generation resources precede Levy Units 1 and 2 in the Company's optimal plan, why is the Company filing a petition for determination of need for Levy Units 1 and 2?

A. To preserve the ability to meet the Company's reliability need in the 2016 to 2019 timeframe with nuclear generation, PEF must file its petition for determination of need at this time. The development of nuclear power plants as a generation resource requires substantial time for the location, acquisition, and development of an appropriate site, engineering and design of the necessary infrastructure and nuclear plant components, procurement of necessary equipment and materials, regulatory licensing and permits for the plants and associated generation and transmission facilities, in addition to the significant time needed for actual construction of the nuclear unit.

Long lead times are necessary to place orders to "get in the queue" for major components of the nuclear generation plant and related supporting structures. PEF must place orders for many of those components at this time to allow for sufficient time for ordering, design, engineering, and construction to ensure that the first unit will achieve commercial operation in 2016.

Additionally, substantial time is required for the necessary regulatory review for a nuclear power plant at the federal level (the NRC) and state level (PSC, DEP, and local authorities). In fact, the Company has already identified the site, commenced work to obtain the necessary approvals to develop the property, initially selected for further evaluation a design of the nuclear generation plants, and taken many other steps, all to ensure that the Company can complete Levy Units 1 and 2 in time for commercial operation in the summer of 2016 and the summer of 2017, respectively.

The process to obtain regulatory approval, design, engineer, and construct a nuclear power plant is estimated to take at least ten (10) years. The same process for a combined cycle generation unit, on the other hand, takes about three to four years. Commercial operation of a combustion turbine ("CT") peaking unit can occur one to one-half years after the process of developing a CT unit begins. As a result, PEF must commence the process to obtain approval of the need for Levy Units 1 and 2 now, even though other generation units will be built under the Company's optimal Resource Plan before the nuclear generation units.

Q. Why does PEF need additional new generation in the summers of 2016 and 2017?

A. PEF maintains its Reserve Margin for both its summer and winter peak demands to ensure reliable electric service to its customers. Historically, PEF has been a winter peaking utility, meaning the Company's winter peak season has typically triggered the need for additional resources. This occurs because there typically are one or two abnormally cold days or other periods of time in the winter relative to the typical Florida winter when customer demand for energy exceeds any peak demand on any summer day, even though there typically are many more days of high demand in the summer months. Over time, however, PEF has observed the peak move to the summer period of time, which is what most people would expect anyway, since Florida is a subtropical environment. This is what is occurring in the summer of 2016. PEF needs additional generating capacity by the summer of 2016 to maintain system reliability and integrity, and to meet PEF's commitment to maintain a 20 percent Reserve Margin. Levy Units 1 and 2 will enable PEF to meet this reliability need, and the reliability needs thereafter, and they will allow PEF to continue to provide and increase adequate electrical generation from nuclear fuel for customers at a reasonable cost relative to fossil fuel generation costs.

Q. What impact will the addition of Levy Units 1 and 2 have upon PEF's Reserve Margin and its ability to provide reliable service to customers?

A. By the summer of 2016, PEF's projected Reserve Margin will be 15.4 percent without the addition of any new supply-side generation, signifying the need for additional generation resources to meet the Company's minimum 20 percent Reserve Margin requirement. If Levy Unit 1 is added in the summer of 2016 the Reserve Margin will

be 25.3 percent. PEF clearly has a reliability need for Levy Unit 1 in the summer of 2016. This is visually demonstrated in the table in Exhibit No. ___ (JBC-3) to my testimony, which provides the Company's Summer Demand and Reserves with and without Levy Unit 1.

The addition of Levy Unit 2 in the summer of 2017 does result in Reserve Margins above the minimum 20 percent Reserve Margin criterion that summer and for a few subsequent years. Both Levy Units 1 and 2 are still needed, however, to allow PEF to satisfy its commitment to maintain a minimum 20 percent Reserve Margin in the period 2016 to 2019 and beyond.

Q. Why is there a reliability need for both Levy Units 1 and 2 in the 2016 to 2019 time period?

A. There are a number of reasons why there is a reliability need for both nuclear units in this time period. To begin with, if Levy Unit 1 is added in the summer of 2016, but Levy Unit 2 is not added the next summer as planned, PEF's Reserve Margin falls below the 20 percent Reserve Margin criterion at 19.1 percent by the summer of 2019, just two years later, and the Reserve Margin further falls to just 17.2 percent in the summer of 2020, only three years after Levy Unit 2 is planned for commercial operation. This is visually demonstrated in the table in Exhibit No. ___ (JBC-4) to my testimony, which shows the Summer Demand and Reserves with Levy Unit 1 but without Levy Unit 2. Faced with a need for additional resources within this short window of time, moving forward with Levy Unit 2 in the summer of 2017 is certainly reasonable. In fact, given the length of time necessary to plan, site, obtain regulatory

approval for, and design and build a nuclear unit, proceeding with both Levy Units 1 and 2 at this time for commercial operation in the summers of 2016 and 2017 is necessary to reasonably meet customer reliability needs in the time period from 2016 to 2019 and beyond with nuclear power generation.

Second, there is a reliability need for both nuclear units because the Company's Reserve Margin includes projected capacity resources from future renewable fuel facilities under recently executed purchase power agreements. These facilities have not been built and they rely on unproven technologies or fuel sources, such as waste-wood biomass and biomass crops, which have not yet been shown to support consistent, reliable capacity and energy production. The types of factors that can adversely affect the development of these unique renewable fuel facilities are described further in the testimony of Robert Niekum, but they include available financing and financing at a favorable rate, available land and land that is available at an economic price, and weather impacts on biomass fuel production, among others. As a result, these renewable generation facilities might not be built, their construction might be delayed, or they may fail to achieve reliable commercial operation at all or at the expected capacity when that capacity is needed. If that occurs over 250 MW is at risk of not being available when needed, and the Company's need for additional capacity resources will increase and its Reserve Margins will be lower than currently projected.

Third, the additional capacity from the second nuclear unit will provide PEF greater assurance that the minimum 20 percent Reserve Margin criterion will be met in the event that peak loads are higher than currently anticipated. Levy Unit 1 will be

operational over eight years from now and Levy Unit 2 will be operational over nine years from this date under the current plan. Over such an extended period of time load growth may exceed projections. It has happened before in PEF's experience, even over shorter time periods than eight or nine years. With Levy Unit 2 PEF will have the capability it needs under changing circumstances over time affecting load growth and Reserve Margins to meet customer energy needs.

Fourth, the addition of Levy Unit 2 provides PEF the flexibility to reduce or replace the use of potentially less economic resources. Nuclear fuel historically is more stable in price and cheaper than fossil fuels. This relationship between nuclear and fossil fuels is expected to continue, as explained in the testimony of Sasha Weintraub and John Siphers. With an eight to nine year period required to bring the nuclear units on line, PEF and its customers face growing uncertainty surrounding the cost of using carbon-based fossil fuels. Having an additional nuclear unit in commercial operation in 2017 and beyond provides PEF with greater flexibility in meeting customer demands for electrical power with nuclear generation as an alternative to fossil fuel generation. For all of these reasons, we believe there is a reliability need for both Levy Unit 1 and 2 in the summer of 2016 and 2017, respectively, when they are currently planned for commercial operation.

Q. Is it unusual to experience increases in the Reserve Margin above the 20 percent commitment with the addition of generation resources to PEF's system?

A. No. PEF rarely maintains an exact 20 percent Reserve Margin at all times. Rather, some additional capacity above the 20 percent Reserve Margin is typical when PEF

has determined that an additional generation resource is necessary to maintain its 20 percent Reserve Margin commitment. It is, therefore, not unusual for a utility to grow into the capacity of a large generating unit. Economics generally demand that a utility build a larger generation unit than immediately required to meet a capacity need to provide customers the best value for their capital investment.

Indeed, once PEF has identified a capacity need, PEF will select the most cost effective resource by taking into account all factors and circumstances to meet that reliability need. One of those factors is the most economic size of the generation unit to meet the Company's reliability need. Economies of scale generally reduce the cost of a new generation unit on a $/kW basis the larger the unit is. PEF will look at the $/kW cost to meet the Company's reliability need, and as a result, the most economic size unit to meet that need may not be a generation unit that is equivalent to meeting the 20 percent Reserve Margin commitment. Instead, PEF and its customers will be better off at times to build larger generation units to meet the Company's reliability need even though the result is that the 20 percent Reserve Margin is exceeded when the unit comes on line or even for a period of time thereafter.

Q. Why is there a need for nuclear generation units, instead of natural gas combined cycle units for example, to meet PEF's reliability needs in the 2016 to 2019 time frame and beyond?

A. Given the information available today, nuclear generation resources appear to be the best resources to meet PEF's reliability need in 2016 to 2019 and beyond, based on the Company's analysis of the economic and socio-economic benefits nuclear generation

provides. This analysis is required by the Florida Legislature under the amended need determination provision. Under this analysis, these nuclear generation units provide fuel diversity and supply reliability benefits, fuel independence benefits, and environmental emission benefits. When these factors are considered, Levy Units 1 and 2 show significant advantages over the Company's other options to meet its need in 2016 to 2019 and beyond. In addition, these nuclear units will likely provide PEF and its customers economic benefits from (1) cost savings from constructing both Levy Unit 1 and 2 within a year to eighteen months of each other and (2) the addition of new, advanced nuclear technology with its fuel savings benefits to PEF's generation portfolio.

Q. What are the cost savings for PEF and its customers from the construction of both Levy Units 1 and 2 in the planned time frame?

A. With the current selection of the Westinghouse AP1000 reactor design, PEF has the opportunity to take advantage of cost savings resulting from economies of scale and engineering and construction efficiencies from building successive nuclear units at the same site, which effectively lower the projected cost of Levy Unit 2. These engineering and construction efficiencies or economies of scale may include concurrent engineering and manufacturing of large, key components of the nuclear reactor and related support structures. If long lead time equipment for both units can be procured concurrently, these economies of scale in engineering and manufacturing can be achieved. The back-to-back construction of Levy Units 1 and 2 also allows for the continuous mobilization of engineers and construction personnel for on-site

engineering and construction of both nuclear units. PEF will therefore avoid de-mobilization and re-mobilization costs if the second nuclear unit is built consecutively with the first unit. PEF will also achieve cost savings from the continuous use of an experienced, efficient work force on both units. These are a few examples of the engineering and construction efficiencies and economies of scale achieved if Levy Unit 2 is constructed within a year to eighteen months of Levy Unit 1. Further explanation of these benefits is provided by Mr. Daniel Roderick in his testimony.

The economies of scale in procurement, engineering, manufacture, and construction can be achieved if the second unit is constructed within twelve (12) to eighteen (18) months of the first unit. If commercial operation of Levy Unit 2 is delayed significantly beyond the summer of 2017, the projected cost savings benefits from the successive construction and commercial operation of Levy Units 1 and 2 may be lost.

The resulting economic effect is a lower dollar per-kW cost for Levy Unit 2 than Levy Unit 1. Levy Unit 2 is expected to cost $3,376/kW (Summer Basis, 2007 dollars), which is substantially lower than the cost of Levy Unit 1 on a per-kW cost (Summer Basis) at $5,144/kW (2007 dollars). Similarly, the fixed O&M cost for Levy Unit 2 is $36.25/kW-yr (Summer Basis, 2007 dollars), which is $15.54/kW-yr (2007 dollars) lower than the fixed O&M cost for Levy Unit 1. These cost savings from the construction of Levy Unit 2 within a year to eighteen months of Levy Unit 1 represent substantial economic benefits to PEF and its customers.

Q. What are the benefits of adding the nuclear generation technology of Levy Units 1 and 2 to PEF's generation system?

A. When they achieve commercial operation, Levy Units 1 and 2 will add additional base load capacity and energy to PEF's generation portfolio with state-of-the-art nuclear generation technology. PEF's existing base load nuclear generation unit, Crystal River Unit 3 ("CR3"), is a second generation nuclear power plant. CR3 has served customers well and will continue to serve customers well for years to come, but CR3 was built thirty years ago, and it represents aging nuclear generation technology. PEF's other existing base load generation plants, its Crystal River coal plants, were either built before CR3 or over two decades ago, and therefore they also represent aging coal-fuel, base load generation technology. Generally speaking too, as generation units age, they require more maintenance and thus more outages and higher maintenance costs than newer generation units.

Advancements in generation technology provide opportunities for greater efficiency in operation and lower maintenance cost. This is certainly true for the Westinghouse AP 1000 design which uses passive safety system designs and engineering simplicity that simply was not available in prior nuclear power plant designs. This means relatively lower construction and operation costs for Levy Units 1 and 2 than the construction and operation of a nuclear power plant using designs available in nuclear plants that are currently operating. The more efficient design for the Westinghouse AP 1000 nuclear reactors, for example, will also mean greater reliability in operation than what is expected from base load nuclear power plants operating today.

Additional advanced base load generation technology is important to PEF because the vintage of PEF's current base load generation runs from over twenty to over forty years old today. By the time Levy Units 1 and 2 are planned to come on-line in 2016 and 2017, the vintage of PEF's existing base load generation units will be nearly forty to over fifty years old. Levy Units 1 and 2 offer PEF and its customers the opportunity to add new base load generation with the most advanced, efficient nuclear generation technology available today. The addition of Levy Units 1 and 2 will change the vintage of PEF's base load generation for the better, providing PEF and its customers with more reliable, efficient, and less costly base load generation to maintain and operate.

Q. You mentioned that there will be fuel savings benefits too, can you explain how Levy Units 1 and 2 will provide fuel savings benefits to PEF's customers?

A. Yes. Nuclear generation uses the lowest cost fuel source available to the Company for supply-side generation. Compared to fossil fuels (natural gas and oil), the enriched uranium that is processed for use in nuclear production is substantially less expensive on a $/MWh basis. Nuclear fuel is historically more stable in price than fossil fuels too. The relative differential between nuclear fuel and natural gas and oil is demonstrated in PEF's fuel forecasts for these fuels in Exhibit No. ___ (JBC-5) and explained in the testimony of Mr. Sasha Weintraub. As a result, when PEF adds Levy Units 1 and 2 to its system to meet its reliability need in 2016 to 2019, PEF will be adding energy generation output at a lower $/MWh cost relative to natural gas and oil generation.

This lower cost energy will displace higher cost energy on PEF's system. As base load generation units, Levy Units 1 and 2 will run essentially all the time, except when they are off-line for re-fueling and maintenance or forced outages. The expected capacity factor in fact is over 90 percent for each nuclear generation unit. During off-peak hours, or even during peak hours when not all generation resources will be used to provide energy to meet demand, Levy Units 1 and 2 will be operating and producing energy to meet demand. This is visually demonstrated by Exhibit No. ___ (JBC-6), which shows PEF's 2018 daily system load forecast with Levy Units 1 and 2. As a result, Levy Units 1 and 2 will displace higher cost fossil fuel generation or purchased power that would otherwise have been used to meet energy demand.

The fuel component of customer bills will be lower because of this displacement of higher cost fossil fuel energy generation by nuclear energy generation. In fact, when comparing the projected system fuel costs for the reference case with Levy Units 1 and 2 versus the all natural gas reference case alone, the fuel savings are $930 million in 2018, the first year of full operation of both nuclear units. Fuel savings are projected annually for the Levy Units over the expected sixty-year operational lives of both units.

Q. You testified that Levy Units 1 and 2 will provide PEF and its customers fuel diversity and supply reliability benefits. What do you mean?

A. By fuel diversity I am referring to the ability of the Company to reduce the impacts of price escalations in a certain fuel resource by having available on the system additional generation or purchased power resources that use other fuels to produce

energy. PEF has a mix of fuel resources available for power generation to meet net energy load on the system. These fuel resources include oil, natural gas, coal, renewable fuels, and nuclear. PEF's current fuel mix to meet energy load is shown in Exhibit No. ___ (JBC-7) to my testimony.

Fossil fuels, in particular natural gas and oil, historically are much more volatile than nuclear fuel. More recently, in the past few years, natural gas has been particularly volatile. Rapid escalations can occur in natural gas and oil used for energy generation that can correspondingly cause a rapid escalation in the fuel costs that customers pay for energy. In Florida, the volatility in natural gas prices is further influenced by the fact that Florida is a peninsula and natural gas transportation into the State is constrained. When the natural gas commodity price increases, these natural and physical transportation constraints cause a further escalation in the natural gas price to Florida electric utilities. Relative to natural gas and oil, however, nuclear fuel is more stable in price.

Adding additional nuclear fuel generation to meet net energy for load therefore increases PEF's fuel diversity. Without Levy Units 1 and 2, natural gas and oil will comprise 61 percent of PEF's energy mix to meet net energy load on its system by 2018 and nuclear will account for only 12 percent of the energy generation to meet load. Indeed, without Levy Units 1 and 2, by 2018 fossil fuels will account for 85 percent of the energy generated on PEF's system. With Levy Units 1 and 2, however, nuclear generation will contribute 38 percent of the total system energy to meet load in 2018. This is demonstrated by Exhibit No. ___ (JBC-8), which shows the fuel resources to meet net energy load on PEF's system in 2018 with and without Levy

Units 1 and 2. As a result of the addition of Levy Units 1and 2 to PEF's system, PEF's reliance on natural gas (and other fossil fuel) generation to meet load will be reduced, providing greater fuel diversity to PEF and its customers.

Adding additional nuclear generation to PEF's generation system will also improve the Company's fuel supply reliability. Fuel supply reliability refers to the ability of the utility to depend on receiving fuel when it is needed to meet customer demand for energy. Florida is not only a peninsula; Florida has no natural fossil fuel resources of its own. PEF must therefore rely on the supply of fossil fuels for energy generation from sources outside the State, including sources from foreign countries. This fuel supply is subject to disruptions, especially during extreme weather events or natural disasters. The hurricane seasons of 2004 and 2005 demonstrated the vulnerability of this supply for PEF and other Florida utilities when natural gas and coal supplies were temporarily precluded or disrupted by weather conditions and resulting damage caused by the storms. These supply disruptions naturally had an impact on fuel prices, causing the price of natural gas, for example, to increase dramatically.

Nuclear fuel does not face the same supply disruptions as fossil fuels. Nuclear fuel is added to the units during refueling outages, typically once every eighteen (18) to twenty-four (24) months, and therefore an adequate fuel supply is available for an extended period of time. Further, the fuel supply for a nuclear unit is not subject to the same supply disruptions due to adverse weather conditions. As a result, the addition of additional nuclear generation, like Levy Units 1 and 2, reduces PEF's dependence on fuels that have a less reliable supply capability. The reliability of PEF's fuel

supply will therefore increase with the addition of Levy Units 1 and 2 to PEF's system.

Q. What are the environmental benefits from adding Levy Units 1 and 2 to PEF's system?

A. Nuclear generation is a clean source of electric capacity and energy. The generation of electric energy from nuclear fuel produces no SO_2, NOx, GHG, or other emissions that have an adverse impact on the environment. Fossil fuel and renewable fuel generation have some or all of these emissions.

Currently, environmental requirements like the Environmental Protection Agency ("EPA") and DEP Clean Air Interstate Rule ("CAIR") impose significant emission requirements, and therefore substantial costs, on fossil fuel generation. The proposed Levy Units 1 and 2 will not be subject to the EPA and DEP CAIR rules and other current and future regulations of fossil fuel and renewable fuel emissions. Levy Units 1 and 2, therefore, will not be subject to the substantial costs that must be incurred to comply with such environmental regulations. They will also provide cleaner air for Florida compared to other commercially feasible, fossil fuel generation alternatives. Additionally, Levy Units 1 and 2 will assist the Company in complying with existing environmental regulations by providing an alternative clean source of generation. This is discussed more fully in the testimony of Michael Kennedy.

Levy Units 1 and 2 will also assist the Company in preparing to meet more stringent environmental regulations in the future. Because of global warming concerns, the potential regulation of GHG currently is a matter of much political,

legislative, regulatory, and scientific discussion and debate. Some form of regulation of GHG seems inevitable. Because nuclear generation produces no GHG emissions Levy Units 1 and 2 are reasonable generation alternatives to meet customer energy needs in the event of GHG regulations.

VIII. MOST COST-EFFECTIVE ALTERNATIVE

Q. Are Levy Units 1 and 2 the Company's most cost-effective alternative for meeting its reliability need in the period 2016 to 2019?

A. Yes, they are, when the legislative criteria in Section 403.519(4)(b)3, Florida Statutes, are fully considered and applied in the evaluation of credible generation alternatives. As I have described, the Company conducted a deliberate, detailed evaluation of various other supply-side alternatives as part of its Resource Planning process before identifying Levy Units 1 and 2 as the generating alternatives to meet the Company's reliability need in the period 2016 to 2019 and beyond. That evaluation applied the Florida Legislature's directive in Section 403.519(4)(b)3 that the utility must consider whether the nuclear power plant will "provide the most cost-effective source of power, taking into account the need to improve the balance of fuel diversity, reduce Florida's dependence on fuel oil and natural gas, reduce air emission compliance costs, and contribute to the long-term stability and reliability of the electric grid." As a result of that evaluation, the Company determined that Levy Units 1 and 2 are the most cost-effective generation alternative available to meet the Company's need in the period 2016 to 2019 because they will improve the Company's fuel diversity, substantially reduce the Company's and Florida's reliance on fossil fuels, help insulate the

Company and its customers from costs resulting from existing and potential environmental regulations including GHG regulations, and improve the long-term grid reliability with new vintage base load generation with advanced technology.

Q. Are fuel diversity and fuel independence important factors in determining whether Levy Units 1 and 2 are the most cost-effective source of power?

A. Yes, they are. There is a cost to customers to choose one generation alternative over another, beyond the direct capital and fuel costs of the alternatives, as a result of altering the fuel mix to meet customer energy demand. Not only do different fuels have different commodity prices but they also have different means of supply, different end-use markets, different geographic commodity sources, and a host of other factors that affect their relative prices. These differences cause some fuel sources --- such as natural gas and oil --- to be more volatile in price than others (like nuclear fuel). As a result, increased reliance on certain fuels like natural gas and oil to generate energy to meet demand means increased price volatility.

Price volatility is important to customers because the fuel cost is passed through directly to the customer. Customers therefore experience changes in fuel prices immediately on their bills. Customers generally prefer stable energy prices. They want their bills to be predictable. As a result, PEF attempts to maintain fuel diversity among its generation resources to minimize to the extent possible sudden and erratic shifts in fuel prices.

Recent experience has shown, however, an increase in the price volatility of natural gas and oil fuel prices. In the last few years these fuels have been subject to

more and wider ranging price changes than was the case in the 1990's. This price volatility is expected to continue during short-term periods in the future, even as the price of these fossil fuels levels off over time in PEF's long-term forecasts. Adding additional nuclear generation to the fuel mix on PEF's system will temper the effects of these volatile changes in fossil fuel prices for the benefit of PEF's customers.

The significance of the impact nuclear generation will have on future volatility in fossil fuel prices is readily apparent when one compares the Company's existing system energy mix, see Exhibit No. ___ (JBC-7), with its expected system energy mix in 2018 without Levy Units 1 and 2, see Exhibit No. ___ (JBC-8). Without Levy Units 1 and 2, the Company will rely on fossil fuels for 85 percent of its energy in 2018, which is equivalent to its reliance on fossil fuels today (at 83 percent), and therefore, nothing will change customer exposure to fossil fuel price volatility for the next ten years or a decade after that, because it will likely take another ten years to develop additional nuclear generation. If Levy Units 1 and 2 are added to PEF's generation system, however, nuclear fuels will account for almost 40 percent of all energy generation in 2018, see the chart in Exhibit No. ___ (JBC-8), which shows PEF's system energy mix in 2018 with Levy Units 1 and 2.

The addition of nuclear generation is significant too when one considers that foreign suppliers will account for a growing percentage of the Company's future oil and natural gas supplies. These oil and natural gas supplies are predominantly located in the Middle East and Eurasia. These sources along with Africa, for example, will account for the growing use of liquidified natural gas ("LNG") to meet domestic natural gas demand in the future. The oil and gas supplies in these areas are, however,

largely owned or controlled by the state and, therefore, supplies and thus prices are subject not only to market forces but also foreign governmental objectives and political instability. These factors increase the uncertainty and volatility surrounding future oil and gas prices. Adding additional nuclear generation to PEF's system in 2016 and 2017 increases the Company's future fuel independence by reducing its reliance on foreign fossil fuel sources.

Q. You mentioned fuel supply reliability too, how does that affect the Company's determination of what is the most cost-effective alternative?

A. As I have explained, Florida is a peninsula with no natural fossil fuel resources. All fossil fuels used for energy generation must come from geographic regions outside Florida. Pipelines (land and water) bring natural gas to PEF and rail, barge, and/or trucks bring coal and oil to PEF on a regular basis. Natural gas and oil production and refinery resources are located near, on, or in the Gulf of Mexico. Florida and the Gulf of Mexico are subject to extreme weather conditions, including hurricanes. During and following such extreme weather conditions, natural gas, oil, and coal supplies can be limited or stopped altogether as natural gas production and oil refineries are shut down or damaged and/or pipelines are shut down. These events have an adverse effect on the price of fossil fuels, causing increased prices.

This phenomenon was recently experienced during and following the 2004 and 2005 hurricane seasons. At times, fossil fuel supplies were restricted or stopped completely and PEF (and other Florida utilities) experienced increased fossil fuel prices as a result. Indeed, the 2006 Florida Energy Plan commented on the severe fuel

supply disruptions caused by the adverse weather during these hurricane seasons because production platforms in the Gulf of Mexico were shutting down, refining systems were going offline for months, and pipelines were rendered inoperable. Additional nuclear generation offsets the economic impacts of adverse weather conditions (or any other supply disruptions) because nuclear fuel is not subject to the same type of supply disruptions.

Q. Are the potential economic impacts from increased fuel diversity and supply reliability well recognized?

A. Yes. Both Congress, in passing EPACT, and the Florida Legislature, in passing the 2006 Florida Renewable Energy Technologies and Energy Efficiency Act, recognized that increased fuel diversity and fuel supply reliability had a positive economic impact by reducing dependence on foreign fossil fuels and minimizing volatile fuel costs. Similarly, executive orders at the federal and state level have recognized the importance of fuel diversity and supply reliability to the federal and state economies. As a result of this legislative and executive attention to fuel diversity and supply reliability issues the Commission and Florida electric utilities were directed to explicitly consider fuel diversity and reliability in determining the need for a proposed electrical power plant and to consider fuel diversity and reliability in determining the cost-effectiveness of nuclear generation as a generation alternative to meet that need.

Q. You also said that additional nuclear generation insulates the Company and its customers from environmental costs; can you explain what you mean?

A. Yes. As I have also explained, nuclear generation causes none of the environmental emissions that are a concern with fossil fuel generation, such as SO_2, NOx, and mercury emissions, that are subject to existing environmental regulations. As a result, there is no cost impact to PEF or its customers from an emissions standpoint to consider nuclear energy generation.

Additionally, and perhaps more significantly, nuclear energy generation does not involve the burning of carbon-based fuels. All fossil fuels, on the other hand, when burned to produce energy release carbon into the air in the form of carbon dioxide ("CO_2"). Carbon dioxide is a GHG, and GHG contribute to global warming. In fact, carbon dioxide is probably the most significant GHG. As a result, presently there are a number of proposals for the regulation of GHG, in particular, carbon dioxide. Proposals to regulate GHG, if implemented, have an impact on a utility's assessment of the most cost effective alternative generation resource to meet future reliability needs. Indeed, the proposals to regulate GHG make nuclear generation a more cost effective alternative generation resource to fossil fuel generation resources.

Q. Can you explain how the Company incorporated all of these factors in its resource planning analysis and determined that Levy Units 1 and 2 are the most cost-effective generation alternative to meet future customer needs?

A. Yes. As I have generally explained above, the Company evaluated the CPVRR of the advanced light water nuclear generation units, Levy 1 and 2, against an all natural gas generation reference scenario. The Company included the economic benefits from the reduced price estimate for Levy Unit 2, resulting from the economies of scale and

engineering and construction efficiencies from constructing both units within a year to eighteen months of each other, in its CPVRR evaluation of Levy Units 1 and 2.

The Company used the Strategist computer model to compare Levy Units 1 and 2 to the all natural gas generation reference case. The Strategist computer model is a resource optimization program from New Energy Associates. The primary output of Strategist is a CPVRR comparison of potential resource plan combinations on PEF's entire system that will satisfy PEF's reliability requirements.

Supply-side resources are typically evaluated in the Strategist model over a ten-year planning period and a thirty year study period. With the evaluation of new nuclear generation beginning in 2016, however, the use of a typical thirty-year study period accounts for the costs and benefits of only the first twenty years of commercial operation of the nuclear generation units, because there are ten years in the model before commercial operation of the nuclear units is planned. The economic benefits from the commercial operation of Levy Units 1 and 2, however, will continue over the sixty-(60)-year expected life of the units. That life includes a forty (40) year, initial license period plus the accepted convention based on experience that the license for such units can be extended an additional twenty (20) years. In our evaluation of future nuclear generation, then, we decided to extend the model study period to sixty years to capture the long term costs and benefits of nuclear generation. This CPVRR evaluation, we believe, more accurately accounts for the economic costs and benefits of nuclear generation given the commercial life of those units.

PEF worked with New Energy Associates to extend the model beyond its typical thirty-year study period to a sixty-year study period. This modeling work

allowed the CPVRR analyses to more accurately account for the economic costs and benefits for the majority of the commercially operational life of Levy Units 1 and 2. The sixty-year modeling period in the Strategist computer model that the Company used provides the best practicable method of capturing the economic costs and benefits of the commercial operation of Levy Units 1 and 2. This analysis is conservative too, since it still does not reflect the entire expected commercial operation period of Levy Units 1 and 2.

The results of this CPVRR analysis are shown in the table in Exhibit No. ___ (JBC-9) to my testimony. This table represents the CPVRR economic evaluations of the Resource Plan with Levy Units 1 and 2 compared to an all-natural gas generation reference resource plan. In Exhibit No. ___ (JBC-9), as you can see, we also included in the CPVRR modeling analysis our mid-level, low, and high natural gas and oil forecasts and our reasonable forecasts of potential GHG air emission compliance costs. As a result of these CPVRR analyses in the Strategist model there were fifteen (15) different CPVRR scenarios.

The resource expansion plan with the nuclear generation alternative in 2016 and 2017 is more beneficial for customers on a CPVRR basis in ten (10) of the fifteen (15) CPVRR scenarios. In those 10 out of 15 CPVRR scenarios where the nuclear generation resource plan was more cost-effective than an all natural gas reference plan, the range of benefits to customers for a resource plan including Levy Units 1 and 2 is from a low of $85 M to a high of about $12,000 M.

The generation resource plan including Levy Units 1 and 2 is in fact more cost-effective than an all natural gas generation resource plan under every high fuel cost

scenario. Because the CPVRR evaluation did not capture the last ten years of commercial operation of Levy Units 1 and 2, and there no doubt likely would be additional benefits from nuclear generation in that period, the Company believes that the nuclear generation resource plan will likely be more cost-effective under the mid-fuel gas and oil case in all scenarios except the unlikely event of no GHG emission regulation too. Only in the unlikely events, in the Company's view, of low gas and oil fuel costs and no GHG regulation, or a combination of low fuel with lower- to mid-cost GHG regulation, is the all natural gas resource plan more cost-effective.

As a result of its evaluation, the Company concluded that, in its judgment after taking into account all of the factors that the Florida Legislature requires the Company to consider in assessing the cost-effectiveness of nuclear generation to meet a future need, the resource plan including Levy Units 1 and 2 was the most cost-effective generation alternative.

Q. What happens if the costs to develop and place Levy Units 1 and 2 in commercial operation change over the next decade; did the Company consider that possibility in its evaluation?

A. Yes, it did. Potentially higher costs, of course, are an inherent risk with nuclear generation development, especially when you consider the unique nature of this project, which will require the construction of the first nuclear power plants on a Greenfield site in more than thirty years in this country. The long-lead time necessary to site and obtain regulatory approvals for new nuclear reactors, in addition to the time to design and construct them, precludes the Company from receiving anything more

than cost estimates and non-binding ones at that at this time, even though the Company is working with the best information available today.

Costs are likely to change as cost estimates are refined and costs are incurred over the next decade as the Company proceeds toward commercial operation of these units. The circumstances affecting these costs include the potential risk of permitting and licensing delays at the state and federal level, litigation delays at the state and federal level, labor and equipment availability, vendor ability to meet schedules, material and labor cost escalations, the possible imposition of new regulatory requirements, inflation or increases in the cost of capital, and the ability to acquire necessary rights-of-way in a timely manner for associated transmission facilities, among others. Faced with the risk that any one or more of these circumstances may occur over the next ten years, the Company agrees that the actual cost to place Levy Units 1 and 2 in commercial operation may be higher than the current, non-binding cost estimates.

So, the Company did in fact conduct scenario evaluations with higher cost sensitivities. As one would expect, the higher the capital costs, the less economic the nuclear plants become. Even so, however, when we compare the risk of higher capital costs with the risks of higher fuel costs and higher GHG emission costs, Levy Units 1 and 2 still have significant economic advantages in most scenarios over natural gas. Indeed, under all high fuel cost scenarios, the Levy nuclear plants remain economic notwithstanding the increased capital cost sensitivities.

Q. Are there economic benefits to customers from the construction and operation of Levy Units 1 and 2?

A. Yes. Levy Units 1 and 2 will provide PEF and its customers reliable capacity and energy generation from the lowest cost fuel source commercially available to the Company. As I have explained, nuclear fuel historically is the most stable and lowest cost fuel for electrical energy generation. The Company's fuel forecasts, contained in Exhibit No. ___ (JBC-5), demonstrate that nuclear fuel will continue to be the lowest cost fuel available for commercially feasible supply-side generation in the future.

Mr. Weintraub further explains that these fuel forecasts represent the technical expertise of two, independent, third-party sources and the Company's own expertise and experience. The combination produces the most reasonable forecast taking into account both third-party market information and information internal to the Company. PEF forecasts that nuclear fuel assemblies will be the lowest cost fuel source for the Company, even with recent increases in the commodity cost for uranium. The uranium supply is projected to increase to meet demand created by additional nuclear generation. Mr. John Siphers explains this is exactly what occurred the last time the uranium commodity cost increased because additional, future nuclear reactors were announced. The uranium supply increased to meet demand, and the cost leveled off and reached an equilibrium that was well below fossil fuel costs at the time. The same result is expected today, the supply of uranium will increase to meet projected demand from current announcements of potential, future nuclear reactors, and the uranium price will stabilize at a level that is still well below projected costs for natural gas and oil.

By adding generation with the lowest cost fuel to meet customer demand, then, customers receive an economic benefit. Other supply-side generation alternatives, in particular natural gas plants, have lower capital costs but they expose customers to higher and more volatile fuel costs for the life of the units. The economic benefits of the lower cost nuclear fuel source for customers are immediate and continuing --- nuclear generation from Levy Units 1 and 2 will take their place at the head of the dispatch order and customers will see a reduction in the fuel costs on their bills. During peak hours Levy Units 1 and 2 will provide energy to meet customer demand at a lower fuel cost than any other generation source and during off peak hours this nuclear generation will displace higher cost fossil fuel generation.

Q. Are there other potential economic benefits for customers if Levy Units 1 and 2 are approved and achieve commercial operation as planned?

A. Yes. Under the Energy Policy Act of 2005 ("EPACT"), federal production tax credits were provided as an incentive for utilities to invest in nuclear power generation. These production tax credits are only available for the first few nuclear power reactors that are put into commercial operation. The production tax credit is $0.018/kWH for the first eight years of the nuclear facility's operation, if the facility meets certain eligibility requirements and deadlines and is in service by January 1, 2021. PEF has conservatively estimated the value of the production tax credits for customers at $88 million to $167 million if Levy Units 1 and 2 are brought on line by 2016 and 2017. PEF was conservative, however, in its detailed CPVRR evaluation of the Levy nuclear units against an all natural gas reference case and did not include the production tax

credit benefits in that evaluation. The production tax credit benefits, therefore, represent an additive potential benefit for PEF's customers.

Additionally, EPACT provides utilities that develop and commence operation of new nuclear reactors Department of Energy ("DOE") loan guarantees and DOE stand-by support, which is a type of risk insurance. It is unclear at this time, however, whether the DOE loan guarantees and stand-by support will be available to the Levy project. PEF continues to review whether such programs will be available.

Q. Will Levy Units 1 and 2 contribute to the long-term stability and reliability of the Florida electric grid?

A. Yes, they will. Levy Units 1 and 2 will provide needed base load capacity to PEF's system, thus, adding base load capacity on the electric grid as a whole. They will essentially operate year-round, at a very high capacity factor, producing energy using state-of-the-art, advanced nuclear power generation technology. The technological advancements in the Westinghouse AP 1000 design will provide greater operational efficiency and reduced maintenance with lower maintenance costs compared to existing nuclear technology in operation today. The Westinghouse AP 1000 uses passive safety system designs and engineering simplicity to reduce the sheer number of material and working parts that can be found in and that must be maintained in currently operating nuclear reactors. As a result, Levy Units 1 and 2 will provide more efficient, reliable base load generation to the electric grid.

Additionally, Levy Units 1 and 2 will be placed on a system with aging base load generation. The vintage of PEF's current base load generation runs from over

twenty to over forty years old. By the time Levy Units 1 and 2 achieve commercial operation in 2016 and 2017, respectively, the vintage of PEF's existing base load generation units will be even older, ranging from over thirty to over fifty years old. PEF's existing nuclear unit, CR3 for example, is currently over 30 years old and it will be over 40 years old by the time Levy Units 1 and 2 come on line. The addition of Levy Units 1 and 2 will certainly change the vintage of PEF's base load generation for the better, in this additional way providing PEF and the State with more reliable, efficient base load generation.

VIII. ENHANCEMENT OF STATE ELECTRICAL POWER PRODUCTION

Q. Florida Statute Section 403.519(4)(a)2 requires the Company to explain how Levy Units 1 and 2 will enhance electric power production within the state by improving the balance of power plant fuel diversity and reducing Florida's dependence on fuel oil and natural gas. Can you address this requirement?

A. Yes. In recent years, PEF and other Florida electric utilities have relied almost entirely on natural gas generation to meet customer reliability needs. During the 90's and early 2000's this generation resource selection was warranted by advancements in technology, low relative natural gas fuel costs, and the need for more flexible generation units to fill in between base load and peaking load units. As a result, natural gas generation has increased, and will continue to increase, as a component of PEF's fuel and energy generation mix and the fuel and energy generation mix of other electric utilities in the state.

The addition of Levy Units 1 and 2 in the future counters this trend and provides greater fuel diversity for PEF. As I have explained, and as demonstrated in Exhibit No. ___ (JBC-8), without Levy Units 1 and 2, nuclear generation will account for only 12 percent of the energy generation needed to meet load in 2018. With Levy Units 1 and 2, however, nuclear generation will contribute 38 percent of PEF's total system energy to meet load in 2018. This increase in nuclear generation as a percentage of PEF's energy production in 2018 will therefore improve the balance of power plant fuel diversity for PEF. If PEF improves its fuel diversity, there will be a corresponding beneficial impact on the balance of power plant diversity in the state.

Likewise, the increase in nuclear generation by the addition of Levy Units 1 and 2 to PEF's system reduces reliance on additional fossil fuel generation. As a result, PEF will use less fossil fuel for energy generation with Levy Units 1 and 2 than PEF would have used without those units on its system. If PEF uses less natural gas and oil in the future with the addition of Levy Units 1 and 2, PEF is contributing to efforts to reduce Florida's dependence on fuel oil and natural gas for energy generation.

IX. CONSEQUENCES OF DELAY

Q. What will be the impact of delay in a need determination for Levy Units 1 and 2?

A. If the need determination for Levy Units 1 and 2 is delayed, the implementation of this project will be delayed, the project may be terminated, and PEF's future development of nuclear generation may need to be reconsidered.

PEF must proceed with the need determination at this time to remain on schedule. As I have explained, nuclear generation units require considerably more time to site, obtain various regulatory approvals, design, engineer, and construct than other generation alternatives. PEF must obtain a need determination at this time to begin the procurement process for long lead items and commence the engineering work necessary to ensure that the nuclear units will be completed in time to meet the Company's reliability need in the summer of 2016 and the summer of 2017, respectively. If there is a delay, PEF will not be able to satisfy its minimum 20 percent Reserve Margin planning criterion by the summers of 2016 and 2017 with nuclear generation. If other options are considered to meet the Company's reliability need in the same time frame the Company may have to reconsider the development of additional nuclear generation facilities to meet future customer needs.

If that occurs, PEF and its customers would lose the benefits of reliable and cost-effective nuclear generation that I have described in my testimony. For example, without the commercial operation of Levy Units 1 and 2 in the 2016 to 2019 period, PEF's customers will likely be subject to higher and more volatile fuel costs as higher cost fossil generation units or purchased power are used to meet their reliability needs. They also will likely lose the potential production tax credits and other financial benefits that EPACT provides for the first wave of new nuclear generation facilities. Additionally, PEF and its customers would face greater exposure to potential GHG regulation at a potentially greater cost to PEF and its customers.

Finally, as I have indicated, any delay in the need determination for Levy Units 1 and 2 will have an impact on the Company's evaluation of nuclear generation as a

potential future generation resource. Nuclear generation is a substantial commitment of Company time, effort, and resources. A denial or delay in approval of these units inevitably means higher costs if the Company proceeds with them at a later date, but more than that, a denial or delay in approval raises doubts regarding the further investment of the Company's time, efforts, and resources in developing nuclear generation that could be expended elsewhere. If there was a denial of the need, or a delay in the determination of need for Levy Units 1 and 2 however long it may be, the Company would be forced to re-evaluate its commitment to nuclear generation to meet the Company's future reliability needs.

X. CONSERVATION AND RENEWABLE MEASURES

Q. Did PEF attempt to mitigate its need for Levy Units 1 and 2 by pursuing conservation or renewable resources reasonably available to the Company?

A. Yes, we did. As I discussed previously, the Company has identified and implemented a set of cost-effective DSM programs that have successfully met and exceeded Commission-established DSM goals. The Company's most recent, approved DSM programs go beyond the previously approved goals and attempt to obtain even more MW savings from energy efficiency and other demand-side measures. These programs and measures are explained in greater detail in the testimony of Mr. Masiello. The Company expects, however, to reduce an additional 945 WMW of peak demand load from its enhanced DSM programs and measures for a total load reduction of over 2,400 MW from its DSM Program.

Additionally, the Company has invested substantial time and commitment to the development of renewable resources to meet customer capacity and energy needs. PEF continues to make purchases from renewable energy facilities, including Municipal Solid Waste Facilities, Waste Wood, Tires, Landfill Gases, and even photovoltaics, as well as purchases from cogeneration facilities. PEF has also entered into contracts for capacity and energy from biomass energy crops, and what will be the largest waste-wood biomass plant in the nation. The Company has even issued a request for renewables ("RFR") to expand its renewable portfolio even further. These renewable energy resource facility contracts, those in place and those that can reasonably be expected in the future, are explained in further detail in the testimony of Robert Niekum.

PEF is committed to continuing to develop viable DSM programs and renewable energy resources as part of its balanced solution to meeting customer growth and demand in the future and to reduce the Company's reliance on fossil fuels. Even with this continuing commitment to DSM and renewable resources, however, Levy Units 1 and 2 will still be needed in the 2016 to 2019 timeframe to meet the Company's reliability needs.

XI. CONCLUSION

Q. Please summarize the benefits of Levy Units 1 and 2.

A. Levy Units 1 and 2 will maintain electric system reliability and integrity in the time period 2016 to 2019 and beyond by meeting the Company's 20 percent Reserve Margin commitment with additional base load nuclear generation resources.

Customers will receive adequate electricity at a reasonable cost because nuclear fuel is the lowest cost fuel resource available to the Company and the nuclear units will displace higher cost fossil fuel generation. Nuclear generation adds fuel diversity and fuel supply reliability to PEF's system and it helps insulate the Company and its customers from environmental costs such as potential GHG regulations. Levy Units 1 and 2 will be state-of-the-art nuclear generation units, operating at high efficiency and availability on the lowest cost commercially available fuel, with environmentally clean generation. We are pleased to be able to add Levy Units 1 and 2 to the Company's generation fleet and we request that the Commission approve the need determination for these units.

Q. Does this conclude your testimony?

A. Yes.

PROGRESS ENERGY FLORIDA

GENERATION EXPANSION PLAN

PLANNED AND PROSPECTIVE GENERATING FACILITY ADDITIONS AND CHANGES

AS OF JANUARY 1, 2008 THROUGH DECEMBER 31, 2017

						CONST.	COM'L IN-	EXPECTED	GEN. MAX.	NET CAPABILITY	
	UNIT	LOCATION	UNIT	FUEL		START	SERVICE	RETIREMENT	NAMEPLATE	SUMMER	WINTER
PLANT NAME	NO.	(COUNTY)	TYPE	PRI.	ALT.	MO. / YR	MO. / YR	MO. / YR	KW	MW	MW
TIGER BAY	1	POLK	CC				5/2008			10	10
CRYSTAL RIVER	5	CITRUS	ST				5/2009			(30)	(30)
CRYSTAL RIVER	5	CITRUS	ST				5/2009			14	14
BARTOW	1-3	PINELLAS	ST					6/2009		(444)	(464)
BARTOW	4	PINELLAS	CC	NG	DFO	01/2007	6/2009			1,159	1,279
CRYSTAL RIVER	3	CITRUS	NP				12/2009			40	40
CRYSTAL RIVER	4	CITRUS	ST				4/2010			(30)	(30)
ANCLOTE	2	PASCO	ST				5/2010			10	10
CRYSTAL RIVER	4	CITRUS	ST				5/2010			14	14
ANCLOTE	1	PASCO	ST				5/2011			10	10
CRYSTAL RIVER	3	CITRUS	NP				12/2011			140	140
CRYSTAL RIVER	1	CITRUS	ST				3/2012			7	7
SUWANNEE RIVER	1-3	SUWANNEE	ST					6/2013		(129)	(146)
COMBINED CYCLE	1	PENDING	CC	NG	DFO	12/2010	6/2013			1,159	1,279
RIO PINAR	P1	ORGANGE	CT					6/2016		(12)	(16)
TURNER	P1-P2	VOLUSIA	CT					6/2016		(22)	(32)
AVON PARK	P1-P2	HIGHLANDS	CT					6/2016		(49)	(70)
HIGGINS	P1-P4	PINELLAS	CT					6/2016		(113)	(133)
LEVY	1	LEVY	NP	NUC	--	01/2010	6/2016			1,092	1,120
LEVY	2	LEVY	NP	NUC	--	01/2011	6/2017			1,092	1,120

Forecast of Summer Demand and Reserves With and Without Levy Unit 1

Progress Energy Florida - Summer Reserves

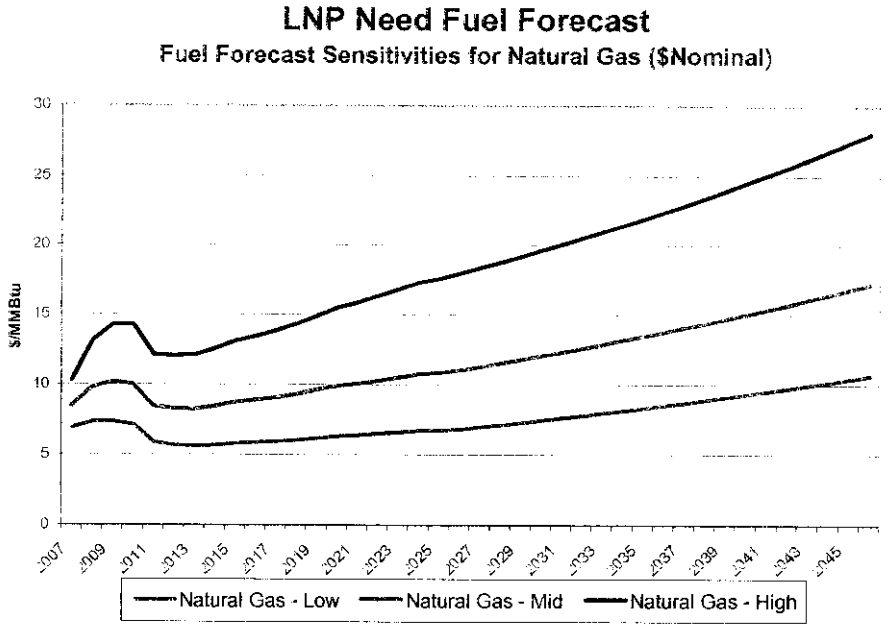
	2008 Resource Plan Assessment, No New Nuclear Generation						
	2015	2016	2017	2018	2019	2020	2021
Total Supply Resources	13,252	12,644	12,644	12,644	12,644	12,644	12,644
System Firm Load	10,776	10,961	11,150	11,335	11,530	11,722	11,904
Reserve Margin	23.0%	15.4%	13.4%	11.5%	9.7%	7.9%	6.2%
MW Above/Below 20%	321	(509)	(736)	(958)	(1,192)	(1,423)	(1,641)
	2008 Resource Plan Assessment, Addition of Levy County 1						
Total Supply Resources	13,252	13,736	13,736	13,736	13,736	13,736	13,736
System Firm Load	10,776	10,961	11,150	11,335	11,530	11,722	11,904
Reserve Margin	23.0%	25.3%	23.2%	21.2%	19.1%	17.2%	15.4%
MW Above/Below 20%	321	583	356	134	(100)	(331)	(549)

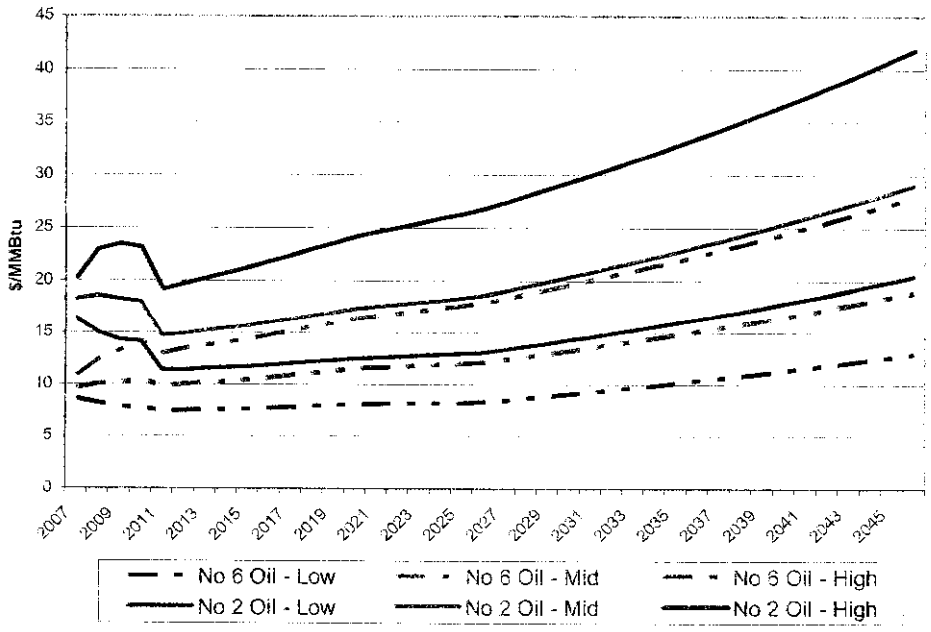
Forecast of Summer Demand and Reserves With Levy Unit 1 But Without Levy Unit 2

Progress Energy Florida - Summer Reserves

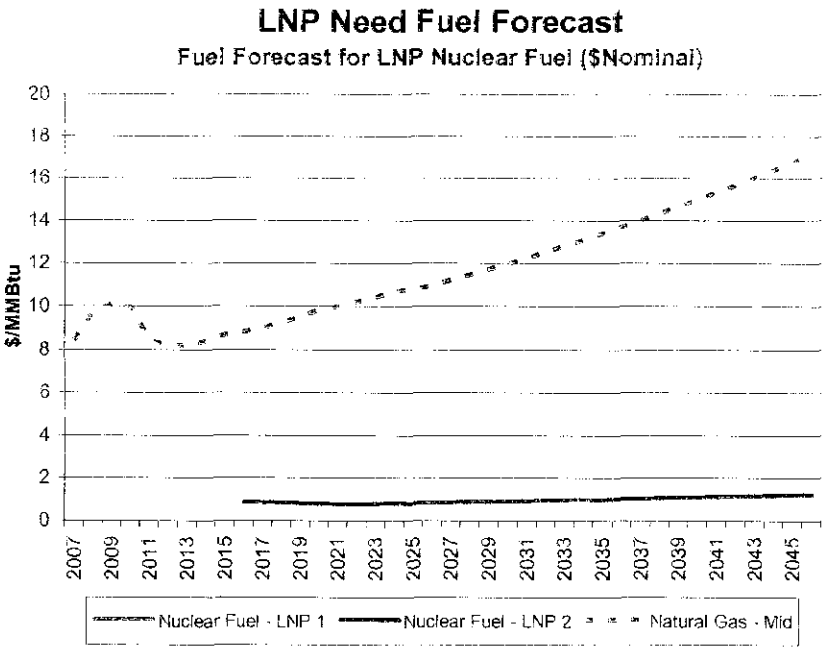
	2008 Resource Plan Assessment, Addition of Levy County 1						
	2015	2016	2017	2018	2019	2020	2021
Total Supply Resources	13,252	13,736	13,736	13,736	13,736	13,736	13,736
System Firm Load	10,776	10,961	11,150	11,335	11,530	11,722	11,904
Reserve Margin	23.0%	25.3%	23.2%	21.2%	19.1%	17.2%	15.4%
MW Above/Below 20%	321	583	356	134	(100)	(331)	(549)
	2008 Resource Plan Assessment, Addition of Levy County 1&2						
Total Supply Resources	13,252	13,736	14,828	14,828	14,828	14,828	14,828
System Firm Load	10,776	10,961	11,150	11,335	11,530	11,722	11,904
Reserve Margin	23.0%	25.3%	33.0%	30.8%	28.6%	26.5%	24.6%
MW Above/Below 20%	321	583	1,448	1,226	992	761	543

Mid-Level, High, and Low Gas and Oil Fuel Price Forecasts

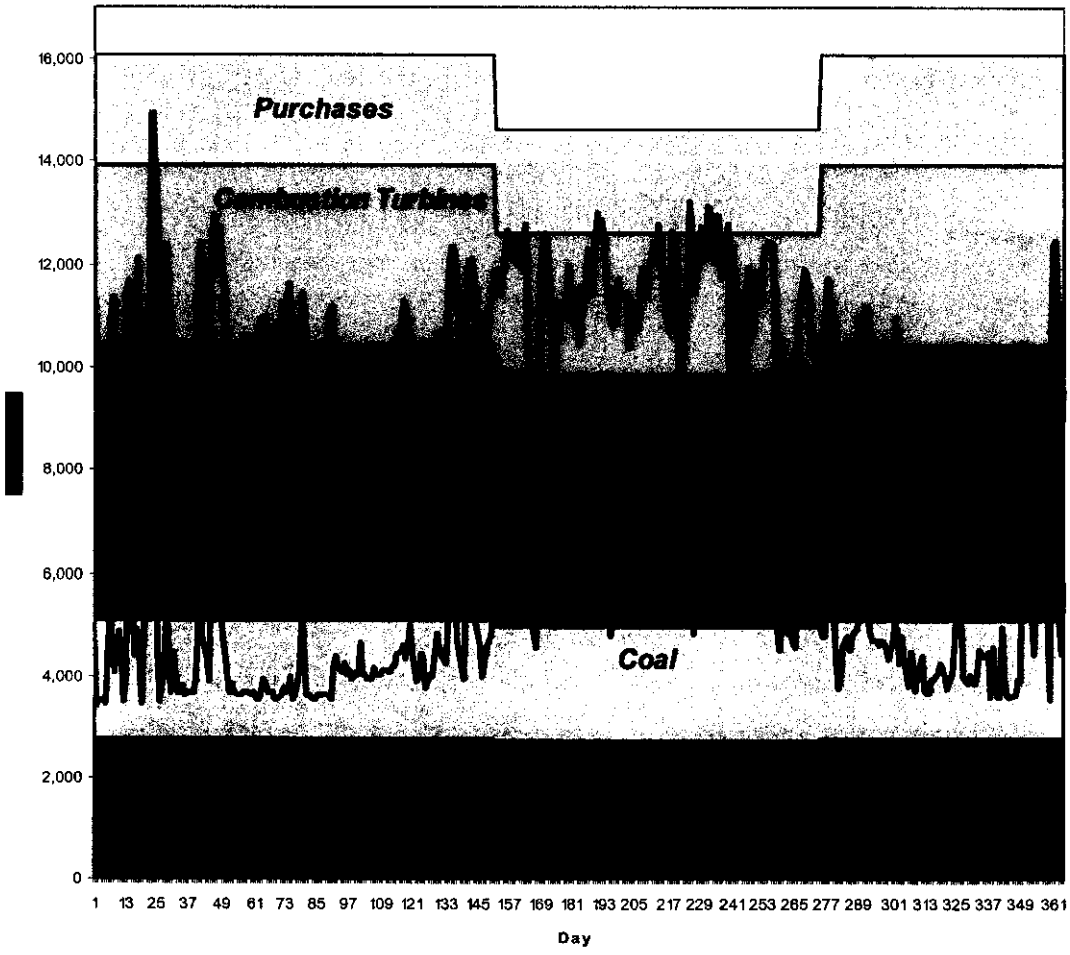




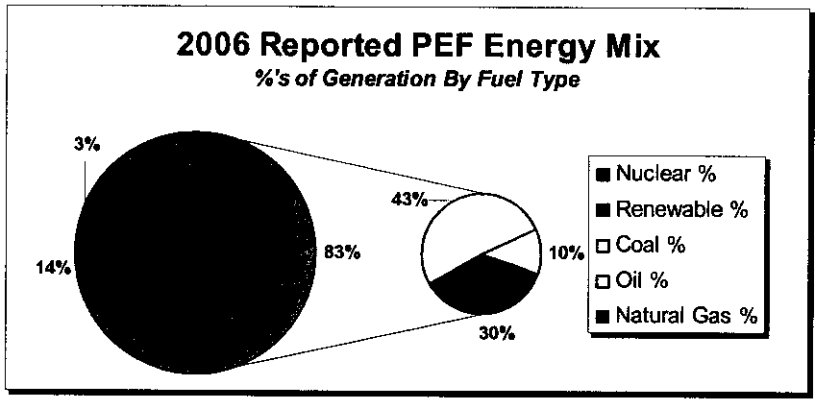
Nuclear Fuel Forecast



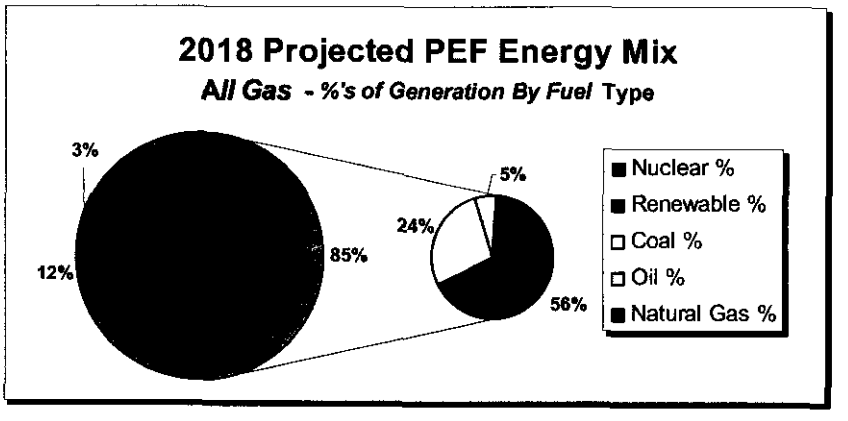
2018 PEF Daily System Load Forecast
Base Case (Generation Illustrated with No Outage)



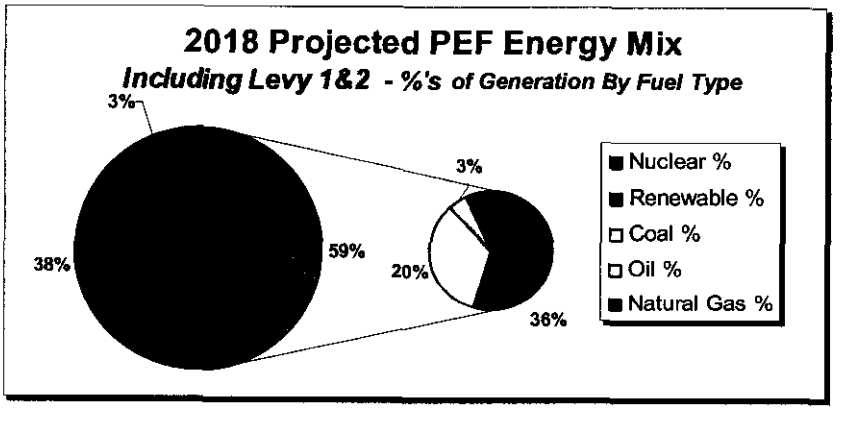
PEF's 2006 Energy Mix.



PEF's 2018 Energy Mix Without Levy Units 1 and 2



PEF's 2018 Energy Mix With Levy Units 1 and 2



CPVRR of PEF Expansion Plan.

Levy 1&2 Nuclear Economic Benefits Assessment
Mid Reference Fuel and Fuel Sensitivities - Full Ownership
Comparison of Nuclear Expansion vs All Gas Reference Case
Base Year Cumulative PV Benefits ($2007 in Millions)

Base Capital Reference Case	*Low Fuel Reference*	***Mid Fuel Reference***	*High Fuel Reference*
No CO_2	**($6,416)**	**($2,888)**	**$2,635**
Bingaman Specter CO_2 Case	**($3,834)**	**($343)**	**$5,212**
EPA No CCS CO_2 Case	**($2,684)**	**$793**	**$6,318**
MIT Mid Range CO_2 Case	**$85**	**$3,614**	**$9,077**
Lieberman Warner CO_2 Case	**$2,930**	**$6,380**	**$11,892**