BEFORE THE FLORIDA
PUBLIC SERVICE COMMISSION

DOCKET NO. 110309-EI
FLORIDA POWER & LIGHT COMPANY

IN RE: FLORIDA POWER & LIGHT COMPANY'S
PETITION TO DETERMINE NEED FOR
MODERNIZATION OF PORT EVERGLADES PLANT

DIRECT TESTIMONY & EXHIBITS OF:

JOHN C. GNECCO IV, P.E.

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

FLORIDA POWER & LIGHT COMPANY

DIRECT TESTIMONY OF JOHN C. GNECCO IV, P.E.

DOCKET NO. 11_____-EI

NOVEMBER 21, 2011

Q. Please state your name and business address.

A. My name is John C. Gnecco IV, P.E. My business address is Florida Power & Light Company, 700 Universe Boulevard, Juno Beach, Florida, 33408.

Q. By whom are you employed and what position do you hold?

A. I am employed by Florida Power & Light Company (FPL or the Company) as the Director of Project Development for fossil generation including the proposed Port Everglades Next Generation Clean Energy Center (PEEC).

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

A. I lead FPL's efforts to develop fossil generation including new plants and the modernization of older plants. I have overall responsibility for the modernization of FPL's plant at Port Everglades.

Q. Please describe your education and professional experience.

A. I received a Bachelor of Science in Civil Engineering from Merrimack College in 1980. Additionally, I am a Registered Professional Engineer in the State of Florida and a member of the American Society of Civil Engineers and the Structural Engineering Institute.

Throughout the 31 years of my career, I have been involved in the development, design, engineering, and construction of electric power plants, in which I have held numerous positions. Over the last 15 years I have been responsible for the design, engineering, and development of two advanced combustion turbine (CT) simple cycle projects and eleven combined cycle (CC) projects totaling over 13,000 MWs of electrical generating capacity. These projects include modernization projects at FPL's Fort Myers, Sanford, Cape Canaveral, and Riviera Beach sites, along with new CC plants located at FPL's Turkey Point, Martin, Manatee, and West County (Palm Beach County) sites.

Q. Are you sponsoring any exhibits in this case?

A. Yes. I am sponsoring Exhibits JCG-1 through JCG-9, which are attached to my direct testimony.

Exhibit JCG-1	Typical 3x1 CC Unit Process Diagram
Exhibit JCG-2	FPL Operational Combined Cycle Plants and FPL Combined Cycle Construction Projects in Progress
Exhibit JCG-3	Aerial View of Existing Facility
Exhibit JCG-4	PEEC Rendering
Exhibit JCG-5	PEEC Vicinity Map
Exhibit JCG-6	PEEC Power Block Arrangement
Exhibit JCG-7	PEEC Operating Characteristics
Exhibit JCG-8	PEEC Expected Construction Schedule
Exhibit JCG-9	PEEC Construction Cost Components

Q. What is the purpose of your testimony?

A. The purpose of my direct testimony is two-fold. First, I provide a summary of the generation alternatives that were evaluated in arriving at the decision to pursue the proposed PEEC Project and why the CC technology and modernization process was selected to meet FPL's need for generation capacity in 2016. Second, I describe the Project in detail, including a description of the site, the applied technology, water usage, air emissions, transmission tie-in, certification and permit plan, construction schedule, and the Project costs and benefits.

Q. Please summarize your testimony.

A. FPL plans to modernize the existing Port Everglades power plant site, which currently includes four steam units dating from the 1960s into a modern, highly efficient, lower-emission next generation clean energy center using the latest CC technology. The proposed modernization will result in increased power generation without using any additional land or water sources, while incurring only minimal electrical and fuel infrastructure costs. PEEC is expected to have an in-service date of June 2016.

The modernized plant will deliver low cost, highly efficient, and cleaner energy to FPL's customers. The plant will use approximately 35% less fuel for an equivalent amount of energy production. The plant will be configured with three of the latest generation CTs and three heat recovery steam generators (HRSGs) combined with one steam turbine generator. Using natural gas CC technology is accepted by the Florida Department of Environmental Protection (FDEP) and the United States Environmental Protection Agency (EPA) as the Best Available Control Technology (BACT) for controlling air emissions. Per the direct testimony of FPL witness Kosky, the plant will minimize air emissions and will be among the cleanest fossil fueled power plants in Florida. No additional water sources will be required. The modernized plant will continue to draw water from existing sources and will not exceed existing permitted water limits.

As stated in the direct testimony of FPL witness Enjamio, this Project will result in significant economic and non-economic benefits to FPL's customers. The site aesthetics will improve significantly, greatly benefiting this waterfront area where one of the primary industries is tourism. The existing 343 foot tall stacks will be replaced with new stacks lower than 150 feet, and the number of stacks will be reduced from four to three. PEEC will also result in a number of significant public welfare benefits, including the creation of an estimated 650 direct jobs at its peak and an estimated $20 million in new tax revenue to local governments and school districts.

The new CC units will use natural gas as the primary fuel and also will be capable of burning a light fuel oil, more specifically an ultra-low sulfur distillate with a maximum sulfur content of 0.0015%, as a back-up fuel. Due to its location on the coast of Florida, the plant will be able to receive back-up fuel from waterborne deliveries and trucks, a significant advantage compared to inland plants which are restricted to only truck deliveries. The ability to receive waterborne deliveries is particularly valuable in emergency situations.

FPL has significant experience building and operating CC plants to achieve the best possible efficiencies. Further, FPL has proven its ability to modernize older plants and construct new plants on time and on budget to achieve greater efficiencies and cost savings for its customers. Accordingly, FPL is confident of the accuracy of its construction cost estimates and projected unit capabilities.

I. SELECTION OF GENERATION TECHNOLOGY AND DECISION TO PURSUE PLANT MODERNIZATION

Q. Please describe the term "modernization."

A. Modernization involves the dismantlement of one or more existing generation units, while leaving intact certain components such as the cooling water intake and discharge infrastructure, followed by the installation of a new CC generation unit.

Q. Please describe the generating alternatives which were considered and evaluated by FPL to meet FPL's need for generation capacity in 2016.

A. As discussed in the direct testimonies of FPL witnesses Silva and Enjamio, four alternatives exist, three of which meet FPL's long term generation requirements. These alternatives include the modernization of the Port Everglades site, bringing gas/oil fired steam generators out of Inactive Reserve and returning them to active service, or construction of a new CC unit at a greenfield site (FPL or third-party built). However, construction of a new CC unit at a greenfield site at a non-coastal location would yield 15 MW less overall capacity than the PEEC plan due to the need for construction and operation of cooling water towers.

The remaining alternative, building a greenfield CT facility, only defers the need to construct one of the three alternatives discussed in this testimony.

Q. What considerations were used in determining if a new CC unit at a greenfield site (FPL or third party built) was a viable alternative?

A. FPL built or a third party built greenfield site CC units were removed from consideration as viable alternatives for multiple reasons, including the initial capital cost if built within FPL's Southeast Florida area and the added transmission infrastructure costs if built outside of FPL's Southeast Florida area. The Southeast Florida area of FPL's transmission system is the region south and east of, and including FPL's Corbett Substation; geographically, this includes a portion of southern Palm Beach County and all of Broward and Miami-Dade Counties.

Based on FPL's own investigation into the availability of other viable sites (FPL built or third party built facility), it was determined that there are no viable sites located within the proximity of FPL's Southeast Florida area that have the attributes and resources of the Port Everglades site. Initial capital costs associated with building a greenfield site within FPL's Southeast Florida area would greatly exceed that of the proposed PEEC Project due to the increased costs associated with (1) adequate land size and zoning, (2) access to fuel transportation infrastructure (gas pipeline), (3) transmission facilities, and (4) water supply.

Meeting the necessary supply capacities and pressures to operate a greenfield CC facility in the Southeast Florida area would require a pipeline extension by one of the two gas transporters into this region of the state at a cost in excess of $600 million. This estimate is based on conceptual pipe sizing, routing, and field studies conducted by independent pipeline engineers and constructors along with FPL engineers, environmental specialists, and construction personnel. The conceptual routing was selected so as to avoid highly congested areas, along with paralleling and co-locating with existing linear facilities, while also including the necessary compression to supply gas at a western Broward County site.

FPL identified in a siting study a total of three (3) 100-acre plus sites that could be acquired and developed by a third party with zoning for industrial use, suitable for power generation, and central to FPL's Southeast Florida area in Broward County. These sites all have values that exceed $20 million. Such sites would also need to acquire a viable water source and need to interconnect into the existing transmission system. FPL estimates the transmission interconnection cost to be as much as $75 million and generic integration costs in the range of $290 to $406 million in order to bring to FPL's system the required generation to match the reliability of the generation located at the Port Everglades site, as described in the direct testimony of FPL witness Modia.

Also, if either PEEC or a greenfield facility is not built in FPL's Southeast Florida area by 2020, there will be an imbalance of FPL customer demand versus FPL generation capacity that will require an estimated $638 million in transmission infrastructure build-out. FPL has performed extensive analyses to determine these costs, as discussed in the direct testimony of FPL witness Modia.

FPL has performed extensive analyses to develop all of the cost estimates provided in the Petition, my testimony, and the testimonies of other FPL witnesses. Unless otherwise specified, the costs are presented in 2016 dollars.

Q. Why was bringing gas/oil fired steam generators out of Inactive Reserve and returning them to active service not considered the best alternative?

A. Bringing traditional oil or natural gas fired steam generator technologies out of Inactive Reserve was removed from consideration for multiple reasons, including the initial capital cost, increased operation and maintenance costs, and the environmental impacts. First, due to the current condition of these vintage units, multiple upgrades, rebuilds, or equipment replacements would be necessary to improve their reliability necessary for additional extended operation. Second, FPL has performed extensive analyses to determine the cost to bring these units out of Inactive Reserve as well as the cost associated with their operation for the next 15 to 30 years. In addition to the added operation costs associated with steam generation over CC generation, there is a higher fuel cost associated with operating these steam units due to their low fuel efficiency. New CC units (such as the PEEC unit) will be approximately 35% more fuel efficient than steam units. Lastly, the environmental profile for gas and oil steam generators is less desirable than for natural gas fired CC generators of similar size, as discussed in the direct testimony of FPL witness Kosky.

Q. Please describe why the modernization of the Port Everglades site was found to be the best alternative to meet FPL's need for generation capacity in 2016.

A. FPL selected modernizing Port Everglades with CC technology as the best generation alternative because of its multiple advantages. Site specific advantages include location in the Southeast Florida area, land size, zoning, existing natural gas infrastructure, existing electrical transmission infrastructure, and water access. Economic advantages include low capital costs, fuel costs, and operations and maintenance (O&M) costs.

Q. Please describe the combined cycle technology that will be used for PEEC.

A. As shown in Exhibit JCG-1, a CC unit is a combination of CTs, heat recovery steam generators (HRSGs), and a steam-driven turbine generator (STG). Each of the CTs compresses outside air into a combustion area where fuel, typically natural gas or light fuel oil, is burned. The hot gases from the burning fuel-air mixture drive a turbine, which, in turn, directly rotates a generator to produce electricity. The exhaust gas produced by each turbine, where the temperature is approximately 1,200°F, is passed through a HRSG before exiting the stack at less than 200° F. The energy extracted by the HRSG produces steam, which is used to drive an STG. The recovery of waste heat from the CTs for utilization in an STG improves the overall plant efficiency beyond that of just CTs or just conventional steam electric generating units.

Each CT/HRSG combination is called a "train." The number of CT/HRSG trains used establishes the general size of the STG. For the proposed PEEC Project, three CT/HRSG trains will be connected to one STG, giving rise to the characterization of the Project as a "three on one" (3x1) CC unit.

Q. What level of operating efficiency is anticipated for the Project?

A. In general, modern CC plants can be expected to achieve a fuel to electrical energy conversion rate (heat rate) of less than 7,000 Btu/kWh, as opposed to values in the 10,000 Btu/kWh range for conventional steam-electric generating units. FPL anticipates that the modernized unit will have an average base heat rate as low as 6,330 Btu/kWh (based on an average ambient air temperature of 75°F) over the life of this Project. The proposed 3x1 CC unit will therefore produce the same amount of energy as a similarly sized conventional steam plant using approximately 35% less fuel. As discussed in FPL witness Silva's direct testimony, the addition of this highly efficient unit to the FPL system is projected to improve the overall system heat rate by approximately 1.3% when compared to returning the old steam units to service.

Q. Are there operational advantages to utilizing a multi-train (multiple CTs combined with a singular ST) combined cycle technology?

A. Yes. An advantage of the multi-train CC arrangement is that it allows for greater flexibility in matching unit output to generation requirements over time. This is possible because each of the CTs and the ST can be independently controlled allowing the unit greater flexibility in matching the load requirements at any given point in time.

Q. Does FPL have experience in building and operating combined cycle power plants similar to the proposed PEEC facility?

A. Yes. FPL has extensive experience in building CC plants on time and under budget. FPL's first CC plant (Putnam Units 1 & 2) went into service in 1976. As shown in Exhibit JCG-2, FPL has 12,685 MW (net summer) of CC capacity in service, and the addition of the Cape Canaveral Next Generation Energy Center (June 2013) and the Riviera Beach Next Generation Energy Center (June 2014) will add another 2,422 MW, for a total of over 15,000

MW.

FPL's current CC plants utilize CTs from various manufacturers. These include 30 General Electric (GE) 7FA CTs, 9 Mitsubishi M501G CTs, 4 Mitsubishi/Westinghouse 501F CTs, and 4 Westinghouse 501B CTs.

In addition to its CC operating experience, FPL has extensive experience operating simple-cycle CTs, which comprise the "front end" of the CC "train" (i.e., no HRSG or STG). FPL has operated ten GE 7FA CTs in simple-cycle mode at its Fort Myers and Martin plant sites in Florida. FPL also has been operating 48 smaller simple-cycle gas turbine units for approximately 41 years.

Q. Please describe FPL's track record in building and operating combined cycle units.

A. FPL has consistently demonstrated its ability to cost-effectively construct reliable and efficient plants that save money for customers over the project lives. For example, in 1994 FPL began commercial operation of two new CC units at FPL's Martin plant and, just two years later, FPL was awarded Power magazine's Power Plant of the Year Award for world-class performance in operation and maintenance (O&M) and availability for those units. Other FPL CC projects have been recognized. Both the Fort Myers Repowering Project and Sanford Repowering Projects were recognized by Power magazine as "Top Plant" of the year in 2003 and 2004, respectively. The Turkey Point

Expansion Project (Turkey Point Unit 5) was recognized by Power Engineering magazine as the "Best of the Year" gas-fired project in 2007. The West County Energy Center was also recognized as a "Top Plant" in 2010 by Power magazine.

To ensure ongoing best-in-class performance in today's highly competitive electricity generating industry, FPL focuses on excellence in people, technology, business, and operating processes. FPL promotes a shift team concept in its power plants that emphasizes empowerment, engagement, and accountability, with an understanding that each employee has the necessary knowledge, skill, and motivation to perform any required task. This multifunctional, team-driven, and well-trained workforce is the key to FPL's ability to consistently meet and often exceed plant performance objectives.

With world-class operational skills from which to draw, FPL maximizes the value of its existing and new assets by employing the best practices that underlie its industry leading positions. FPL's fossil-fueled fleet continues to achieve an Equivalent Availability Factor (EAF) of 92.7% averaged over the past 10 years compared with the U.S. industry average EAF of 87.1%.

Q. Please describe how FPL monitors the operational performance of its power plant.

A. FPL uses technology to optimize plant operations, gain process efficiencies, and leverage the deployment of technical skills as demand for services increases. For example, the Company's Fleet Performance and Diagnostics Center (FPDC) in Juno Beach, Florida, provides FPL with the capability to monitor every plant in its system, including PEEC. FPL can compare the performance of like components on similar generating units, determine how it can make improvements, and often prevent problems before they occur. Live video links can be established between the FPDC and plant control rooms to immediately discuss challenges that may arise, thus enabling FPL to prevent, mitigate, and/or solve problems. In 2001, FPL earned an Industry Excellence Award from the Southeast Electric Exchange for the FPDC.

Q. Please describe FPL's record in the modernization of older power generation facilities to modern, state-of-the-art units.

A. FPL has been recognized by the industry for its capabilities in modernizing older generation units to state-of-the-art high-capacity, high-efficiency CC units. Since 1993, FPL has modernized older generation units at Lauderdale (1993), Ft. Myers (2001), and Sanford (2003) and is in the process of modernizing Cape Canaveral (2013) and Riviera (2014). The modernization of all of these projects has resulted in the improvement of the system-wide efficiency resulting in costs savings to FPL's customers.

II. PEEC PROJECT

Q. Please describe the existing facilities at the Port Everglades plant site.

A. The Port Everglades power plant is located on 92.5 acres, southwest of the

Port Everglades Inlet within the Port of Port Everglades jurisdictional boundaries shown in Exhibit JCG-3. The plant currently consists of two nominal 200 MW (Units 1 and 2) and two nominal 400 MW (Units 3 and 4) conventional dual-fuel fired steam boilers, along with a bank of twelve 30 MW aero derivative gas turbines used for supplying quick start peak power to the grid. Each of the four conventional steam boilers can burn #6 fuel oil and natural gas. The four Port Everglades steam units have a combined peak summer rating of 1,187 MW and a winter rating of 1,193 MW with an average heat rate of approximately 9,800 Btu/kWh. Due to the age and efficiency of these units, they currently see limited usage.

Q. Please describe the proposed PEEC Project in more detail.

A. As previously indicated, the generation facilities at Port Everglades will be renamed the Port Everglades Next Generation Clean Energy Center or PEEC. Upon modernization, PEEC will be a 3x1 CC plant consisting of three advanced CTs, each with dry-low NO_x combustors and three HRSGs, which will use the waste heat energy from the CTs to produce steam to be utilized in a new steam turbine generator. The aesthetics of the plant, and consequently the surrounding areas, will improve significantly, as shown in Exhibit JCG-4. The four existing 343 foot stacks will be replaced with three stacks with heights of less than 150 feet. The location and power block arrangement of PEEC are shown on Exhibit JCG-5 and Exhibit JCG-6, respectively.

Each CT unit is projected to utilize inlet air evaporative cooling. Evaporative coolers achieve cooling using water evaporation to remove heat from the inlet air. This allows additional power to be produced during periods of high ambient air temperature.

The evaporative coolers normally would be utilized when the ambient air temperature is greater than 60° F. Given an average annual temperature for the FPL system of approximately 75° F, the output and heat rate benefits of evaporative cooler operation are included in the summer peak capacity of about 1,277 MW for PEEC and a base operation heat rate as low as 6,330 Btu/kWh.

PEEC, with a summer peak capacity of about 1,277 MW from the base operations mode, will be among the most efficient electric generators in Florida. The unit will have an estimated equivalent availability factor of approximately 95.4%, an estimated average forced outage factor of approximately 1.1%, and a planned outage factor of 3.5%. The expected operating characteristics are shown in Exhibit JCG-7. As discussed in the testimonies of FPL witnesses Silva and Enjamio, the construction of PEEC in 2016, with its resulting efficiencies and fuel cost savings, will result in savings to FPL customers ranging from $425 million to $838 million CPVRR over the life of the plant when compared to the alternative resource plans.

The advancements in the performance of CTs continue to evolve in the market place. FPL is considering a number of advanced CT designs and has not yet made a final decision for the PEEC Project; the actual CT selection will be based on a competitive bid process, ensuring the greatest cost benefit to the customer. However, for the purpose of FPL's analyses, we have used projected costs and operating characteristics consistent with a 3x1 combined cycle unit with "J" CT technology. In the event FPL finalizes a selection of a CT design other than the "J" class technology, FPL would make an informational filing to the Commission, as discussed in the direct testimony of FPL witness Silva.

Q. Please describe the types of fuel PEEC will be capable of using and how they will be supplied.

A. The Project will use natural gas as the primary fuel source and will be capable of using light fuel oil, more specifically a distillate fuel oil with a maximum sulfur content of 0.0015%, as a back-up fuel. The existing natural gas pipeline will be used, but additional gas compression infrastructure will be required, costing an estimated $48 million. PEEC will be able to receive light fuel oil from waterborne deliveries, which is a significant advantage over inland plants. In addition, back-up fuel can be trucked to the site and stored on-site. Back-up fuel will be stored in sufficient quantities to allow operation, at full capacity, for seventy-two (72) hours of continuous operation in the event of a natural gas supply disruption.

Q. Please describe the projected air emissions for PEEC.

A. PEEC will result in cleaner electricity production, as discussed in the direct testimony of FPL witness Kosky. The use of natural gas as a primary fuel source with light fuel oil, as described above, as a back-up fuel combined with combustion control technologies will minimize air emissions from the unit and ensure compliance with applicable emission limiting standards. Using these fuels minimizes emissions of SO_2, particulate matter, and other fuel-bound contaminants. Combustion controls similarly minimize the formation of NO_x, and the combustor design will limit the formation of carbon monoxide and volatile organic compounds. When firing natural gas, NO_x emissions will be controlled using dry-low NO_x combustion technology and Selective Catalytic Reduction (SCR). Water injection and SCR will be used to reduce NO_x emissions during operations when using light fuel oil as back-up fuel. These design alternatives are accepted by the FDEP and EPA as the Best Available Control Technology for air emissions. Modernization will minimize emissions while balancing economic, environmental, and energy impacts. Taken together, the design of PEEC will incorporate features that will make it among the most efficient and cleanest power plants in the nation.

Q. What are the water requirements for PEEC and how will they be met?

A. There will be no additional water sources required as a result of this Project. Under its current permit issued by the FDEP, water from Port Everglades (*i.e.,* the Intracoastal Waterway) is and will continue to be used for once-through cooling. After modernization, the amount of cooling water required will be reduced to approximately one half of the current level, ensuring the new facility will not exceed current permit limits. In addition, the existing municipal water supply will be used for industrial processing water, service water, and potable water.

The EPA is currently reviewing Clean Water Act section 316(a) and 316(b) requirements, further detailed in the direct testimony of FPL witness Kosky. While FPL does not expect these requirements to significantly affect PEEC, there is a possibility that changes may occur and that these changes may affect PEEC as well as other FPL generating facilities. FPL will continue to monitor the progress of these issues. In the event of any applicable changes, FPL would assess the most cost-effective means of complying with the new requirements.

Q. How will the PEEC Project be interconnected to FPL's transmission network?

A. After the modernization, two of the PEEC CTs will be connected to the existing Port Everglades 138 kV system switchyard. The third CT and the STG will be connected to the existing Port Everglades 230 kV system switchyard, as discussed in the direct testimony of FPL witness Modia.

Q. What is the current status of the certifications and permits required to begin construction?

A. FPL intends to pursue FDEP site certification under the Florida Electrical Power Plant Siting Act (PPSA). No local rezoning with Broward County is required for this Project. Concurrently, FPL will file for federal regulatory approvals through submittal of an air construction permit application and application for modification of the existing Industrial Wastewater Facility permit. No other major federal approvals will be necessary in order to commence construction.

Q. What is the proposed construction schedule for the PEEC Project?

A. A summary of estimated construction milestone dates is shown on Exhibit JCG-8. FPL will commence the modernization upon receipt of the necessary regulatory approvals, which FPL anticipates will occur by March 2013. FPL also anticipates that demolition of the existing four units and construction of PEEC will require approximately 36 months in total, and that the Project will achieve commercial operation by June 2016.

Q. In addition to the fuel savings and environmental benefits, what other public welfare benefits will PEEC provide?

A. PEEC will result in a number of significant public welfare benefits. First, the proposed modernization will result in certain economic benefits associated with the construction and operation of the new plant. The construction of the new plant would create an estimated 650 direct jobs at its peak and also support numerous local businesses, and the operation of the new plant will enable FPL to provide more capacity to meet the needs of businesses that seek to expand. In addition, in the new plant's first full year of operation, PEEC is estimated to provide more than $20 million in new tax revenue to local governments and school districts.

Q. What does FPL estimate that the PEEC Project will cost?

A. A summary of estimated costs is shown on Exhibit JCG-9. FPL estimates that the total cost will be $1,185.2 million. Principal components include the power block at $1,041.1 million, transmission interconnection and integration at $32.5 million as discussed in the direct testimony of FPL witness Modia, and allowance for funds used during construction (AFUDC) at $111.6 million. FPL will annually report to the Commission's Director of Economic Regulation updates to the budgeted and actual cost of PEEC, compared to the estimated total in-service cost.

III. CONSEQUENCES OF DELAY

Q. What are the likely consequences if the need determination for PEEC is delayed?

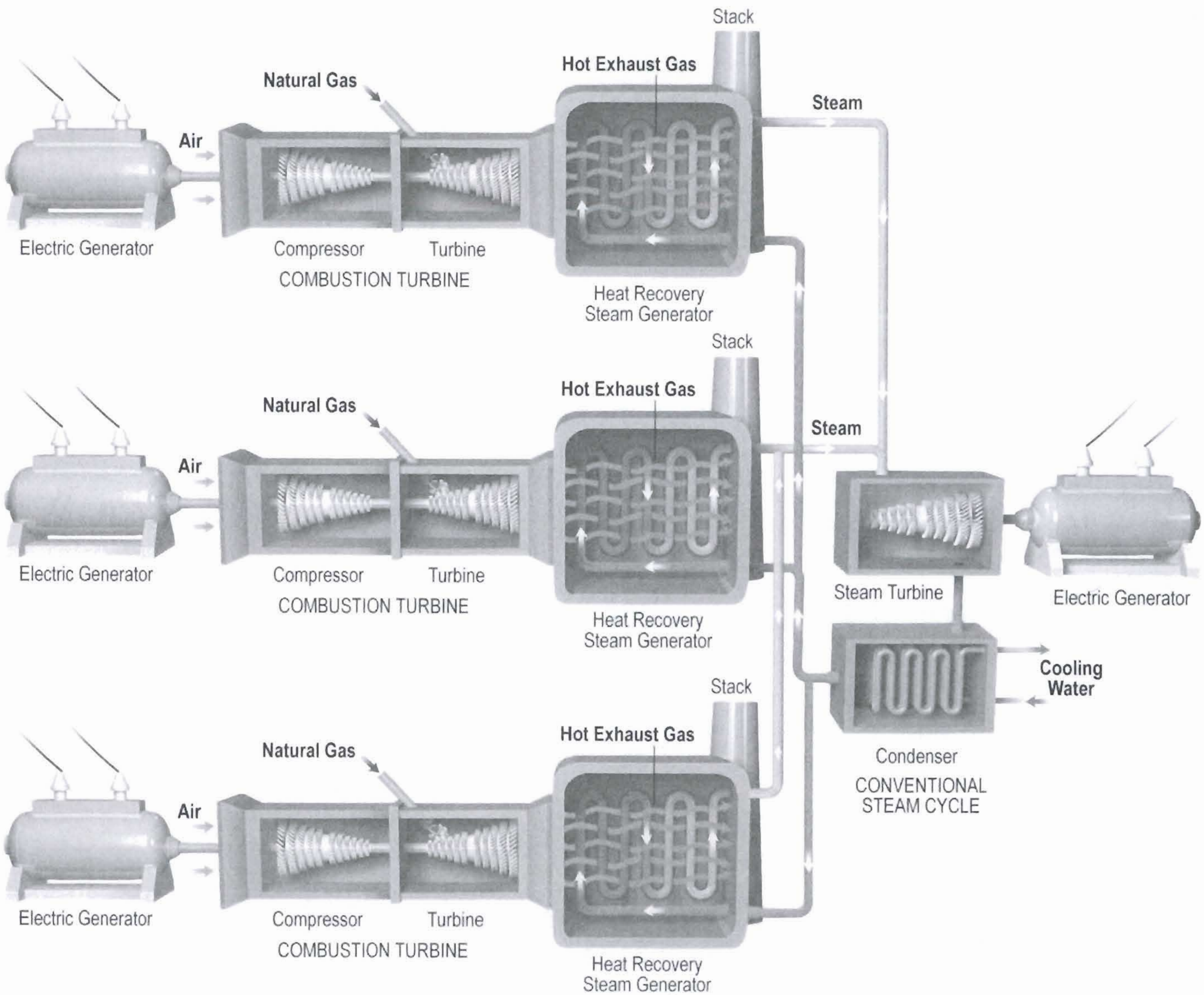
A. FPL has set an in-service date of June 2016 for PEEC. FPL anticipates commencing site work following the receipt of all necessary approvals, anticipated by April 2013, which includes an affirmative final order from the Commission and Site Certification from the FDEP. If the approvals are delayed, FPL's customers will be denied efficient and cost-effective capacity and energy and the previously discussed public welfare benefits. FPL's customers would also incur the impacts from generation shortfalls that affect service reliability.

In addition, if PEEC were to be deferred, the cost of building PEEC later would likely be greater than currently projected (especially if the economy improved, and there were increased competition for the necessary labor and materials). Therefore, the adverse consequence of a delay could be significantly greater than reflected above.

Approval without delay will result in customers receiving the cost-savings benefits, emission reductions, and other public welfare benefits described in my direct testimony and the direct testimonies of FPL witnesses Silva, Enjamio, and Kosky.

Q. Does this conclude your testimony?

A. Yes.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Natural Gas
Air
Electric Generator
Compressor
Turbine
COMBUSTION TURBINE
Heat Recovery
Steam Generator

FPL OPERATIONAL COMBINED CYCLE POWER PLANTS

Facility	Location	In-Service Year	Technology	Summer Capacity (MW)	Primary Fuel
West County Unit 3	FL	2010	3x1 combined cycle	1,219	Natural gas
West County Unit 2	FL	2009	3 x 1 combined cycle	1,219	Natural gas
West County Unit 1	FL	2008	3 x 1 combined cycle	1,219	Natural gas
Turkey Point Unit 5	FL	2007	4 x 1 combined cycle	1,148	Natural gas
Martin Unit 8	FL	2005	4 x 1 combined cycle	1,105	Natural gas
Manatee Unit 3	FL	2005	4 x 1 combined cycle	1,111	Natural gas
Sanford Unit 4	FL	2003	4x1 combined cycle	958	Natural gas
Fort Myers Unit 2	FL	2002	6x2 combined cycle	1,432	Natural gas
Sanford Unit 5	FL	2002	4x1 combined cycle	954	Natural gas
Martin Unit 3	FL	1994	2x1 combined cycle	469	Natural gas
Martin Unit 4	FL	1994	2x1 combined cycle	469	Natural gas
Lauderdale Unit 4	FL	1993	2x1 combined cycle	442	Natural gas
Lauderdale Unit 5	FL	1993	2x1 combined cycle	442	Natural gas
Putnam Unit 1	FL	1976	2x1 combined cycle	249	Natural gas
Putnam Unit 2	FL	1976	2x1 combined cycle	249	Natural gas
Total Combined Cycle Capacity In Operation - Summer (net) ➔				12,685	

FPL COMBINED CYCLE CONSTRUCTION PROJECTS IN PROGRESS

Project	Technology	Summer Capacity (MW)	Primary Fuel
Cape Canaveral Energy Center	3x1 combined cycle	1,210	Natural gas
Riviera Beach Energy Center	3 x 1 combined cycle	1,212	Natural gas
Total Combined Cycle Capacity In Construction - Summer (net) ➔		2,422	

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Aerial View of Existing Facility
Exhibit JCG-3, Page 1 of 1

Aerial View of Existing Facility

Port Everglades Plant
Hollywood, FL

FPL

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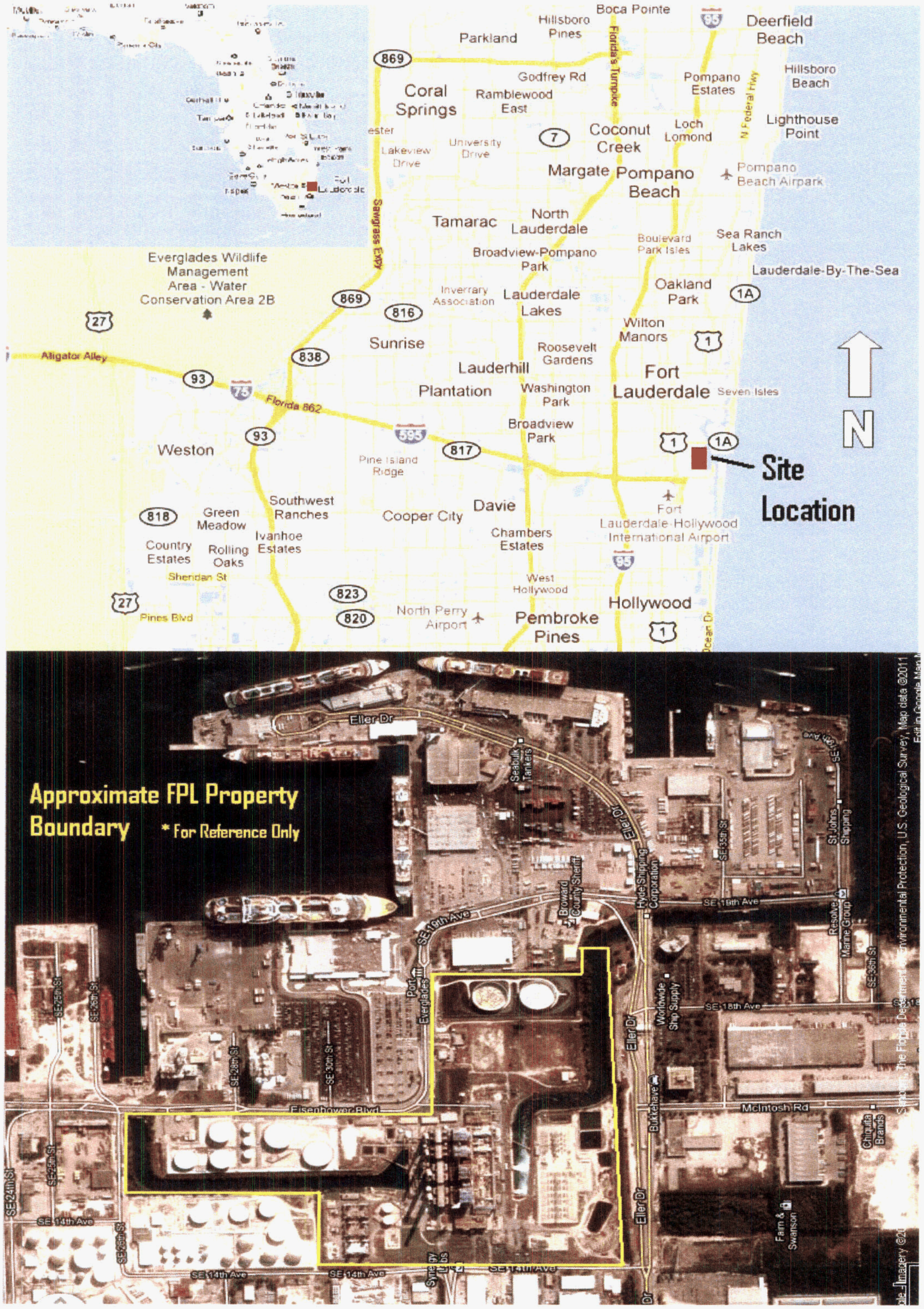
PEEC Rendering
Exhibit JCG-4, Page 1 of 1

PEEC Rendering

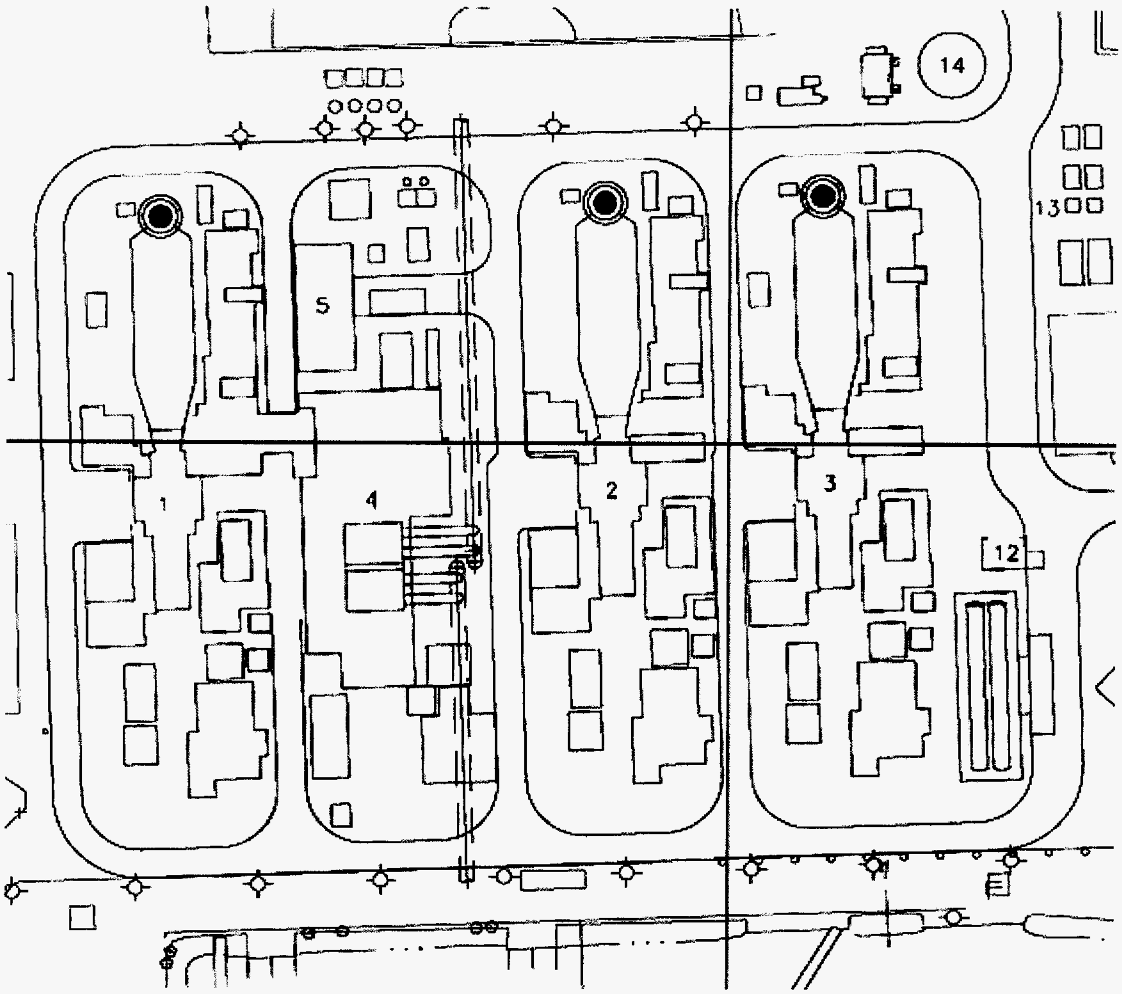
Port Everglades Next Generation Clean Energy Center

FPL

PEEC VICINITY MAP



PEEC PROPOSED POWER BLOCK AREA



Item No.	Description
1	Combustion Turbine
2	Combustion Turbine
3	Combustion Turbine
4	Steam Turbine
5	Control/Hurricane Shelter
12	Storage
13	Air Compressors and Receivers
14	Fire Water Storage Tank

PEEC FACT SHEET

Generation Technology - "Three on One" (3x1) Combined Cycle Configuration:

- Three (3) Advanced Combustion Turbines w/ Evaporative Coolers
- Three (3) Heat Recovery Steam Generators with Selective Catalytic Reduction System for NO_x Control
- One (1) Single-Reheat Steam Turbine

Expected Plant Peak Capacity:

Summer (95° F / 50% RH)	1,277 MW
Winter (35° F / 60% RH)	1,429 MW

Projected Unit Performance Data:

Average Forced Outage Rate (EFOR)	1.1%
Average Scheduled Maintenance Outages	18.3 days/yr (3.5% POF)
Average Equivalent Availability Factor (EAF)	95.4%
Base Average Net Operating Heat Rate @ 75° F / 60% RH	6,330 Btu/kWh (HHV)
Annual Fixed O&M – incremental (2016 dollars)	$6.33/kW-yr
Variable O&M – excluding fuel (2016 dollars)	$0.10/MWh

Fuel Type and Base Load Typical Usage @ 75° F:

Primary Fuel	Natural Gas
Natural Gas Consumption	8,171,048 scf/hr
Backup Fuel	Light Oil
Light Oil Consumption	51,873 gal/hr

Expected Base Load Air Emissions Per Train @ 75° F:	**Natural Gas**	**Light Oil**
NO_x (@ 15% O_2)	2 ppmvd	8 ppmvd
CO	9 ppmvd	35 ppmvd
PM_{10}	14.1 lb/hr	38.2 lb/hr
SO_2	16.8 lb/hr	3.6 lb/hr

Water Balance:

- Primary Water Source-Once through cooling
  - Utilizing existing FDEP permit to draw from Port Everglades surface water

Linear Facilities:

- One (1) gas compressor station and existing gas pipeline will serve the site
- Light oil delivered to site by truck and barging facilities

PEEC

EXPECTED CONSTRUCTION SCHEDULE

<table>
<tr><th>Milestone</th><th>Begin</th><th>End</th></tr>
<tr><td>Initiate sequence of HRSG orders (LNTP x 3)</td><td>Feb 13</td><td>Oct 13</td></tr>
<tr><td>Initiate sequence of CT orders (LNTP x 3)</td><td>Oct 12</td><td>Oct 14</td></tr>
<tr><td>Issue LNTP for steam turbine</td><td>Feb 13</td><td>Feb 15</td></tr>
<tr><td>Receive approvals necessary to begin construction</td><td>-</td><td>Mar 14</td></tr>
<tr><td>Site preparation & foundations</td><td>Jun 14</td><td>Feb 15</td></tr>
<tr><td>Balance of Plant</td><td>Jun 14</td><td>Dec 15</td></tr>
<tr><td>Erect HRSGs</td><td>Feb 14</td><td rowspan="4">May 16</td></tr>
<tr><td>Erect CTs</td><td>Dec 14</td></tr>
<tr><td>Erect steam turbine</td><td>Feb 15</td></tr>
<tr><td>Startup</td><td>Jan 16</td></tr>
<tr><td>Commercial Operation</td><td>Jun 16</td><td>-</td></tr>
</table>

LNTP= Limited Notice to Proceed

PORT EVERGLADES ENERGY CENTER
PLANT CONSTRUCTION COST COMPONENTS

	Cost in millions (2016$)
Power Block	$1,041.1
Land	$0
Transmission Interconnect & Integration	$32.5
Third Party Gas Infrastructure	$0
AFUDC	$111.6
Total Plant Cost	$1,185.2*

Note:

*Does not include demolition of existing facility