BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 130007-EI
FLORIDA POWER & LIGHT COMPANY

JUNE 28, 2013

ENVIRONMENTAL COST RECOVERY

TESTIMONY & EXHIBITS OF:

MICHAEL DEBOCK

IN SUPPORT OF PETITION FOR APPROVAL OF NO_2 COMPLIANCE PROJECT

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

FLORIDA POWER & LIGHT COMPANY

DIRECT TESTIMONY OF MICHAEL DEBOCK

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Q. **Please state your name and business address.**

A. My name is Michael DeBock, and 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") as the Senior Director of Business Development.

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

A. I lead FPL's efforts to develop business opportunities and infrastructure projects, including new plants and upgrades to older plants.

Q. **Please describe your education and professional experience.**

A. I received a Bachelor's of Science degree from the United States Military Academy at West Point. I have completed executive education at the Columbia University, and I am currently in the Executive MBA program at the Florida Atlantic University. I have been employed by NextEra Energy since 2004 and have served in various capacities including the integrated supply chain and business development functions in the US, Canada, and Europe.

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 new advanced combustion turbines ("CTs") that FPL proposes to install at the

Lauderdale ("PFL") and Ft. Myers ("PFM") plant sites under the NO_2 Compliance Project. Second, I describe the activities that will take place at each of the project sites in detail, including a description of the sites, the applied technology, fuel, air emissions, transmission tie-in, certification and permit plans, construction schedule, and the NO_2 Compliance Project costs and benefits.

Q. Please summarize your testimony.

A. FPL plans to retire existing gas turbine peaking units ("GTs") at PFL, Port Everglades ("PPE"), and PFM and install modern CTs at PFL and PFM. No change out of the GT combustion technology will occur at PPE, because FPL has evaluated alternative construction scenarios and concluded that it will be more cost-effective to consolidate the CTs for Broward County at PFL. The new CTs are much more efficient and have lower NO_2 emissions, so they will allow FPL to comply with the new 1-hour NO_2 standard that is discussed in the testimony of FPL witness LaBauve. The new CTs will not require any additional land and only minimal electrical and fuel infrastructure changes. FPL has committed to the Florida Department of Environmental Protection ("DEP") to bring the new units in-service by December 2016 and will be permitted to leave the GTs in service during construction of the new units to ensure system stability and reliable service. As stated in the direct testimony of FPL witness Enjamio, replacing the existing GTs with the new CTs is the most cost-effective alternative to meet the new 1-hour NO_2 standard and offers significant non-economic benefits in comparison to the other alternatives as well.

The new CT units will use natural gas as the primary fuel when available and also will be capable of burning a light fuel oil, more specifically ultra-low sulfur distillate with a maximum sulfur content of 0.0015%, as a back-up fuel. Both projects will utilize existing fueling infrastructure to the greatest extent possible and will receive back-up fuel from truck deliveries.

FPL has significant experience building and operating CT plants to achieve the best possible efficiencies. Further, FPL has proven its ability to upgrade 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.

Q. Are you sponsoring any exhibits in this case?

A. Yes. I am sponsoring Exhibits MD-1 through MD-7, which are attached to my direct testimony.

Exhibit MD-1	Typical CT Unit Process Diagram
Exhibit MD-2	CT Operating Characteristics
Exhibit MD-3	FPL Operational Combustion Turbine Units
Exhibit MD-4	Aerial View of PFL Facility
Exhibit MD-5	Construction Cost Components for PFL
Exhibit MD-6	Aerial View of PFM Facility
Exhibit MD-7	Construction Cost Components for PFM

I. DESCRIPTION OF GENERATION TECHNOLOGY

Q. Please provide an overview of combustion turbine technology.

A. As shown in Exhibit MD-1, a CT works by compressing 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.

Q. Please describe the improvements in the combustion technology for the new CTs that reduce emissions in comparison to the design of the existing GTs.

A. Combustion controls in the new CTs minimize the formation of NO_x, and the combustor design will limit the formation of carbon monoxide and volatile organic compounds. Water injection will be used to further reduce NO_x emissions during operations when using light fuel oil as back-up fuel. This design alternative is accepted by the DEP and U.S. Environmental Protection Agency ("EPA") as the Best Available Control Technology for air emissions.

Q. What level of operating efficiency is anticipated for the new CTs that will be used for the NO_2 Compliance Project?

A. In general, modern CT units can be expected to achieve a fuel to electrical energy conversion rate (heat rate) generally in the 10,000 to 11,000 Btu/kWh range, as opposed to values in the 13,000 – 17,000 Btu/kWh range for GTs like those found at PFM, PFL, and PPE. The actual 2012 average heat rates for PFL, PFM and PPE GTs were in the 18,000 – 19,000 Btu/kWh range. The new CTs take advantage of multiple technical advancements that have occurred since the existing GTs were designed and constructed. The first advancement is an efficiency improvement in the aerodynamic design of the compressor which allows for an increase in air flow and reduces overall drag in the CT. Secondly, in the turbine's hot section, improvements have been made in the metallurgy and combustion control technologies which allow for the increases in firing temperature and result in an increase in output and thermodynamic efficiency. These high efficiencies contribute to the clean emissions profile for the CTs; all else equal, the less fuel that has to be burned to produce a given electrical output, the smaller the amount of air emissions that will result.

The advancements in the performance of CTs continue to evolve in the marketplace. FPL is considering a number of advanced CT designs and has not yet made a final decision for the NO_2 Compliance 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, FPL has used projected costs and operating characteristics consistent with modern F technology CTs. The design of the new CTs will incorporate features that will make them among the cleanest and most efficient peaking units in the nation.

Q. What types of fuel will the new CTs be capable of using?

A. The CTs will be dual fuel-capable. They will use natural gas as the primary fuel source when it is available and will use Ultra Low Sulfur Distillate ("ULSD") with a maximum sulfur content of 0.0015%, as a back-up fuel. Existing natural gas pipelines will be used at both locations. Using these fuels minimizes emissions of SO_2, particulate matter, and other fuel-bound contaminants. The CTs at both PFL and PFM will receive back-up fuel by truck and the site will have sufficient storage to allow operation, at full capacity, for seventy-two (72) hours.

Q. Are there operational advantages to using CTs rather than combined cycle ("CC") or other base-load type plants to serve the reliability needs that are now served by the existing GTs?

A. Yes. Traditionally a CC unit takes over five years to develop and construct, resulting in the earliest possible plant being commissioned in mid-2019, over two years past the required compliance date of December 31, 2016. Building a single CC unit to replace the GTs peaking capacity would require FPL to incur substantial incremental transmission costs and would require significant additional infrastructure costs. An additional advantage of having multiple CTs compared to a larger single CC unit is the flexibility in matching unit output to generation requirements over time. Additionally, the CTs proposed for this project have extremely fast start-up times, which allow them to exceed 50% load in less than 10 minutes with natural gas, making them good candidates for peaking units.

Q. Does FPL have experience in building power plants utilizing combustion turbine technology?

A. Yes. FPL has extensive experience building simple-cycle CTs, as well as building CTs as the "front end" of a CC unit. FPL has a history of building plants on time and under budget, with the latest example being the construction and completion of the Cape Canaveral Energy Center in 2013 as a CC unit and Fort Myers 3A & 3B as simple-cycle CTs in 2003.

FPL's first CC plant (Putnam Units 1 & 2) went into service in 1976. As shown in Exhibit MB-3, FPL has 13,895 MW (net summer) of CC capacity in service, and the addition of Riviera Beach Next Generation Energy Center (June 2014) and Port Everglades Next Generation Energy Center (June 2016) will add another 2,489 MW, for a total of over 16,000 MW of CC capacity.

FPL has installed CTs from several manufacturers. These include 30 General Electric (GE) 7FA CTs, 9 Mitsubishi M501G CTs, 3 Siemens 8000H CTs, 4 Mitsubishi/Westinghouse 501F CTs, and 4 Westinghouse 501B CTs.

Q. Please describe FPL's history of operating plants that utilize CT technology.

A. FPL is currently operating two GE 7FA CTs in simple-cycle mode at PFM and a total of 50 CTs in CC configurations. Some of these CC units once operated as CTs in simple-cycle mode until conversion to CC units.

FPL has consistently demonstrated its ability to construct and operate reliable and efficient plants in a cost-effective manner 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. 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 for our customers, 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 92.4% averaged over the past 10 years compared with the U.S. industry average EAF of 87.1%.

II. NO_2 COMPLIANCE ACTIVITIES AT PFL

Q. Please describe the existing facilities at the PFL site.

A. PFL is located on 392 acres, directly West of Fort Lauderdale/Hollywood International airport and Southeast of the I-595 and Turnpike intersection. The plant site currently consists of two 442 MW CC units (Units 4 and 5), along with a bank of twenty four 35 MW GTs used for supplying quick start peak power to the grid. All of the units can burn light oil and natural gas. The two CC units have a combined peak summer rating of 884 MW and a winter rating of 966 MW with an average heat rate of approximately 7,650 Btu/kWh. The GT units have a combined peak summer rating of 840 MW and a winter rating of 918 MW with an average heat rate of approximately 16,000 Btu/kWh.

Q. What changes will be made at PFL under the NO_2 Compliance Project?

A. Upon completion of the NO_2 compliance activities, PFL will consist of the existing CC units plus five new CTs. The location of PFL and the proposed location of the new units are shown on Exhibit MD-4.

CTs under consideration may utilize inlet air evaporative cooling (or fogging). Evaporative cooling uses water to lower the temperature of the combustion turbine inlet air. The cooler inlet air allows greater combustion air mass flow and results in greater power generation outputs during typical high ambient air temperatures.

Advancements in the performance of CTs continue to evolve in the marketplace. FPL is considering a number of advanced CT designs and has not yet made a final decision for the PFL CTs; 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, projected costs and operating characteristics consistent with a modern F technology CT were used. If FPL ultimately chooses a different CT technology, FPL will make an informational filing in the ECRC docket explaining the basis for its choice and describing any differences in the number of CTs and/or the total MW capacity as a consequence of the selected technology.

Q. Why is FPL not proposing to locate some of the new Broward County CTs at PPE?

A. FPL has evaluated alternative construction scenarios and concluded that it will be more cost-effective to consolidate the CTs for Broward County at PFL for three reasons: (i) the increased economies of scale that can be achieved by constructing, operating, and maintaining the CTs at one site, (ii) the better resources for operating and maintaining the CTs that are available at the PFL site, and (iii) the need to avoid interference with the modernization construction project that is under way at PPE.

Q. How will the new CTs at PFL interconnect to FPL's transmission network?

A. The new CTs at the PFL plant site will interconnect into the existing 138 kV and 230 kV substations existing on site. Limited on site work will be required for this interconnection with no off site work anticipated.

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

A. FPL intends to pursue a DEP site certification modification since the PFL site is an existing certified site. Concurrently, FPL will file for state and federal regulatory approvals through submittal of an air construction permit application, Green House Gas permit application, Army Corp permit application, and application for modification of the existing Industrial Wastewater Facility permit.

Q. What is the proposed construction schedule for the PFL CTs?

A. FPL will commence construction of the PFL CTs upon receipt of the necessary regulatory approvals, which FPL anticipates will occur by March 1, 2015, and those CTs will achieve commercial operation by December 2016.

Q. In addition to the environmental benefits, what other public welfare benefits will the PFL NO_2 compliance activities provide?

A. The PFL compliance activities will result in a number of significant public welfare benefits. First, the proposed activities will result in economic benefits associated with the construction and operation of the new CTs. The construction of the new CTs will create hundreds of direct jobs at its peak and also support numerous local businesses. In addition, in their first full year of operation, the new CTs are estimated to produce an additional $9 million in new tax revenue to local governments and school districts.

Q. What does FPL estimate that construction of the PFL CTs will cost?

A. A summary of estimated costs is shown on Exhibit MD-5. FPL estimates that the total cost will be $518 million. Principal components include the power block at $475 million and transmission interconnection and integration at $43 million. The actual costs of construction will be reported to the Commission each year as part of the normal ECRC true-up process.

Q. Please describe the processes FPL will use to ensure that the costs for the PFL CTs are prudently incurred and reasonable.

A. A majority of the costs associated with this project relate to the CTs, Generator Step-up ("GSU") transformers, and Engineering, Procurement and Construction ("EPC") contractor. The contracts for these goods and services will be selected based on a competitive bid process, ensuring the greatest cost benefit to the customer. This is consistent with the procedures used in the modernization projects that have been completed or are in the process of being built. FPL is confident of the accuracy of its construction cost estimates and projected unit capabilities and will utilize its existing experiences in building CTs and upgrading older plants on time and on budget.

III. NO_2 COMPLIANCE ACTIVITIES at PFM

Q. Please describe the existing facilities at the PFM site.

A. PFM is located on 460 acres, east of I-75 just off of State Road 80. The plant site currently consists of a nominal 1,400 MW CC (Unit 2), two 150 MW CTs (Units 3A & 3B), along with a bank of twelve 54 MW gas turbines GTs used for supplying quick start peak power to the grid. All of the units can burn light oil and natural gas, except the twelve GTs which only burn light oil. The CC unit has a peak summer rating of 1,432 MW and a winter rating of 1,490 MW with an average heat rate of approximately 7,250 Btu/kWh. The existing CTs have a combined peak summer rating of 316 MW and a winter rating of 352 MW with an average heat rate of approximately 10,850 Btu/kWh. The GT units have a combined peak summer rating of 648 MW and a winter rating of 710 MW with an average heat rate of approximately 15,000 Btu/kWh.

Q. Please describe the proposed PFM GTs in more detail.

A. Upon completion of the PFM NO_2 compliance activities, PFM will consist of the existing CC and CT units plus three new CTs. The location of PFM and the proposed location of the new units are shown on Exhibit MD-6.

CT units being considered may utilize inlet air evaporative cooling (or fogging). Evaporative cooling uses water to lower the temperature of the combustion turbine inlet air. The cooler inlet air allows greater combustion air mass flow and results in greater power generation outputs during typical high ambient air temperatures.

Advancements in the performance of CTs continue to evolve in the marketplace. FPL is considering a number of advanced CT designs and has not yet made a final decision for the PFL CTs; the actual CT selection will be based on a competitive bid process, ensuring the greatest cost benefit to the customer. For the purpose of FPL's analyses, projected costs and operating characteristics consistent with a GE 7FA.05 CT technology have been used. As with PFL, if FPL ultimately chooses a different CT technology, FPL will make an informational filing in the ECRC docket explaining the basis for its choice and describing any differences in the number of CTs and/or the total MW capacity as a consequence of the selected technology.

Q. How will the new CTs at PFM be interconnected to FPL's transmission network?

A. The new CTs at the PFM plant site will interconnect into the existing 230 kV substations on site. Limited on site work will be required for this interconnection, with no off site work anticipated.

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

A. FPL intends to pursue individual permits through Lee County and the DEP. Concurrently, FPL will file for state and federal regulatory approvals through submittal of an air construction permit application, Green House Gas permit application, Army Corp permit application, and application for modification of the existing Industrial Wastewater Facility permit.

Q. What is the proposed construction schedule for the PFM CTs?

A. FPL will commence the PFM NO_2 compliance activities upon receipt of the necessary regulatory approvals, which FPL anticipates will occur by March 1, 2015, and the new PFM CTs will achieve commercial operation by December 2016.

Q. In addition to the environmental benefits, what other public welfare benefits will the PFM NO_2 compliance activities provide?

A. The compliance activities will result in a number of significant public welfare benefits. First, the proposed activities will result in certain economic benefits associated with the construction and operation of the new units. The construction of the new units will create hundreds of direct jobs at its peak and also support numerous local businesses. In addition, in their first full year of operation, the new CTs are estimated to produce an additional $4 million in new tax revenue to local governments and school districts.

Q. What does FPL estimate that the construction of the PFM CTs will cost?

A. A summary of estimated costs is shown on Exhibit MD-7. FPL estimates that the total cost will be $304 million. Principal components include the power block at $296 million and transmission interconnection and integration at $8 million. The actual costs of construction will be reported to the Commission each year as part of the normal ECRC true-up process.

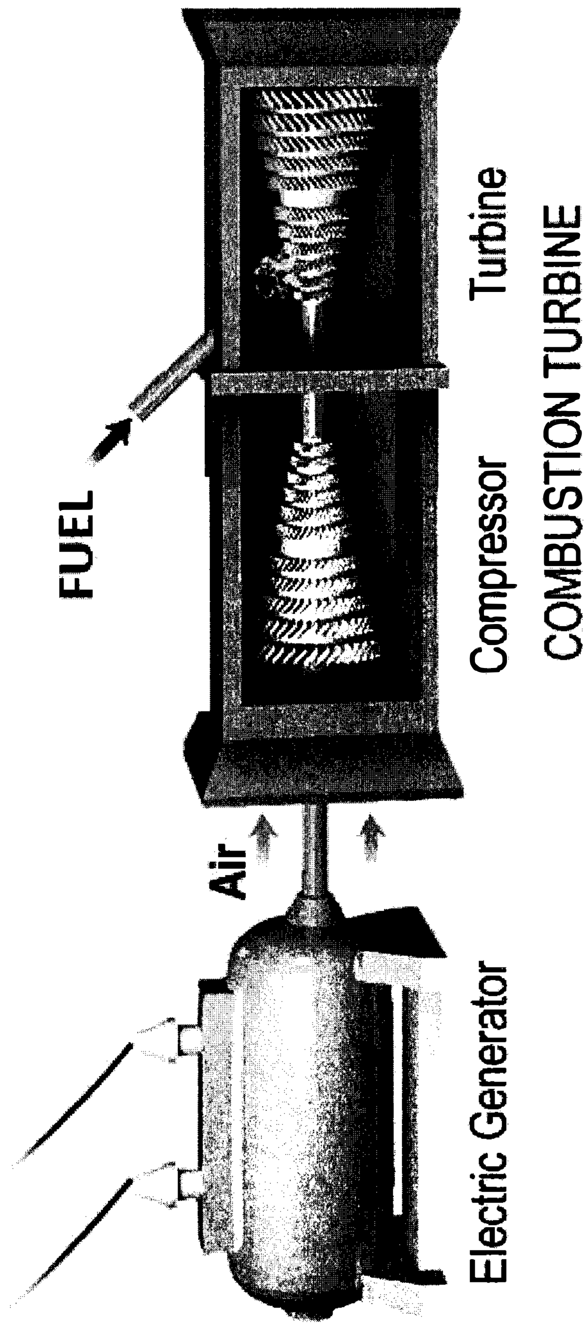
Q. Please describe the processes FPL will use to ensure that the costs for the PFM CTs are prudently incurred and reasonable.

A. A majority of the costs associated with this project relate to the CTs, Generator Step-up ("GSU") transformers, and Engineering, Procurement and Construction ("EPC") contractor. The contracts for these goods and services will be selected based on a competitive bid process, ensuring the greatest cost benefit to the customer. This is consistent with the procedures used in the modernization projects that have been completed or are in the process of being built. FPL is confident of the accuracy of its construction cost estimates and projected unit capabilities and will utilize its existing experiences in building CTs and upgrading older plants on time and on budget.

Q. Does this conclude your testimony?

A. Yes.

Docket No. 130007-EI
Typical CT Unit Process Diagram
Exhibit MD-1, Page 1 of 1



OPERATIONAL CHARACTERISTICS OF A COMBUSTION TURBINE

Generation Technology – GE 7FA.05

- Combustion Turbine with "***Fast Start***" capabilities

Expected Plant Peak Capacity/ CTG:

	Natural Gas	Oil(ULSD)
Summer (95°F / 50% RH)	192 MW	203 MW
Winter (35°F / 60% RH)	223 MW	221 MW

Projected Unit Performance Data:

Base Average Net Operating Heat Rate (Natural Gas) @ 75°F / 60% RH	10,096 Btu/kWh (HHV)
Base Average Net Operating Heat Rate (Oil: ULSD) @ 75°F / 60% RH	10,430 Btu/kWh (HHV)
Time to reach 50% load (Nat. Gas)	9 minutes
Time to reach 50% load (Oil: ULSD)	14 minutes

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

Fuel	Natural Gas
Natural Gas Consumption	2,029,276 scf/hr
Fuel	Light Oil (ULSD)
Light Oil Consumption	13,900 gal/hr

Expected Base Load Air Emissions @ 75°F:

	Natural Gas	Oil(ULSD)
NO_x (@ 15% O_2)	9 ppmvd	42 ppmvd
CO	9 ppmvd	20 ppmvd
PM_{10}	9.4 lb/hr	37.1 lb/hr
Opacity (%)	10 %	20 %

Water Balance:

- Water- Demineralized water consumed for Oil firing combustor NOx control injection only. Note: Alternate CT designs may have evaporative cooling or fogging of inlet air.

Linear Facilities:

- Light oil delivered to site by truck facilities

FPL OPERATIONAL COMBUSTION TURBINE UNITS

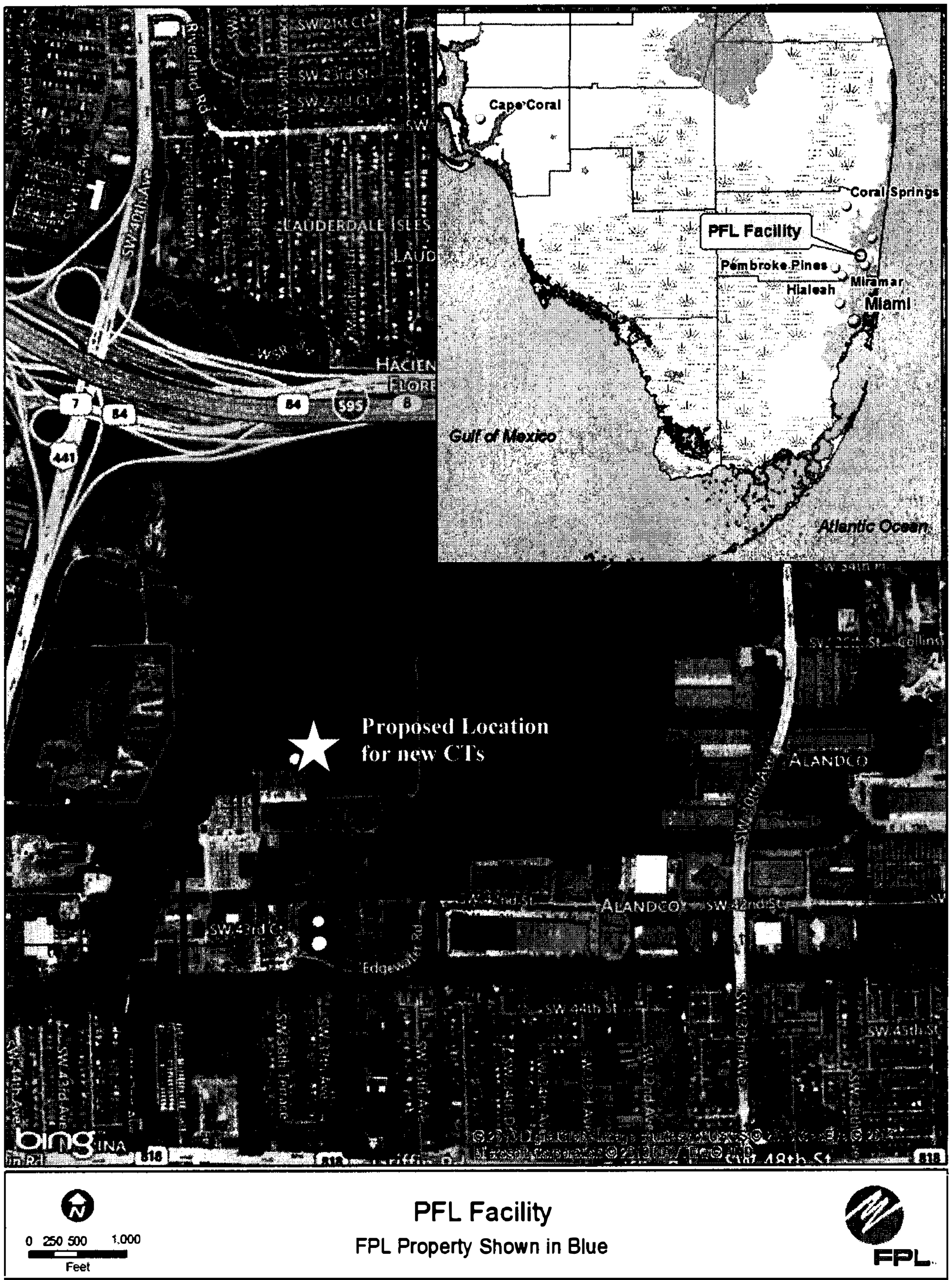
Facility	Location	In-Service Year	Technology	Summer Capacity (MW)	Primary Fuel
Cape Canaveral Energy Center	FL	2013	3x1 combined cycle	1,210	Natural gas
West County Unit 3	FL	2010	3x1 combined cycle	1,219	Natural gas
West County Unit 2	FL	2009	3 x 1 combined cycle	1,219	Natural gas
West County Unit 1	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) ➔				13,895	

FPL COMBINED CYCLE CONSTRUCTION PROJECTS IN PROGRESS

Project	Technology	Summer Capacity (MW)	Primary Fuel
Port Everglades Energy Center	3x1 combined cycle	1,277	Natural gas
Riviera Beach Energy Center	3 x 1 combined cycle	1,212	Natural gas
Total Combined Cycle Capacity In Construction - Summer (net) ➔		2,489	

Docket No. 130007 -EI
Aerial View of PFL Facility
Exhibit MD-4, Page 1 of 1

AERIAL VIEW OF PFL FACILITY



CONSTRUCTION COST COMPONENTS FOR PFL

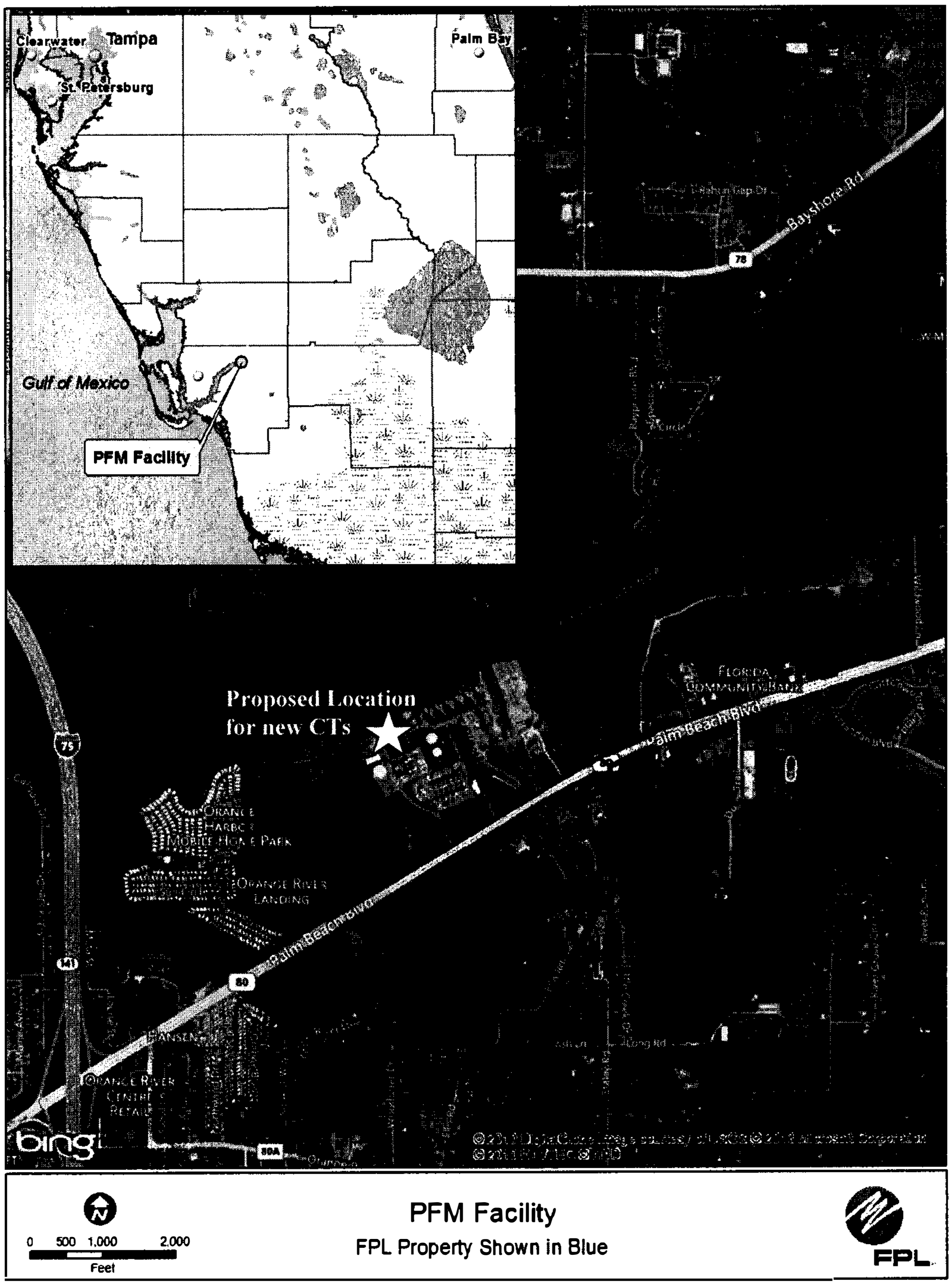
	Cost in millions (2016$)
Power Block	$475
Land	$0
Transmission Interconnect & Integration	$43
Gas Infrastructure	$0
Total Plant Cost	$518*

Note:

*Does not include demolition of existing facilities

Docket No. 130007 -EI
Aerial View of PFM Facility
Exhibit MD-6, Page 1 of 1

AERIAL VIEW OF PFM FACILITY



CONSTRUCTION COST COMPONENTS FOR PFM

	Cost in millions (2016$)
Power Block	$296
Land	$0
Transmission Interconnect & Integration	$8
Gas Infrastructure	$0
Total Plant Cost	$304*

Note:

*Does not include demolition of existing facilities