

**BEFORE THE FLORIDA
PUBLIC SERVICE COMMISSION**

**DOCKET NO. 080677-EI
FLORIDA POWER & LIGHT COMPANY**

**IN RE: PETITION FOR RATE INCREASE BY
FLORIDA POWER & LIGHT COMPANY**

TESTIMONY & EXHIBITS OF:

GEORGE K. HARDY

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1 **BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

2 **FLORIDA POWER & LIGHT COMPANY**

3 **DIRECT TESTIMONY OF GEORGE K. HARDY**

4 **DOCKET NO. 080677-EI**

5

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

7 A. My name is George K. Hardy. My business address is 700 Universe Boulevard,
8 Juno Beach, Florida, 33408.

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

10 A. I am employed by Florida Power & Light Company (“FPL” or the “Company”) as
11 Vice President of Power Generation Operations.

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

13 A. I am responsible for the overall management and direction of the non-nuclear
14 power plants for the Company. This fleet consists of approximately 20,000 MW
15 of electric generating capability including combined cycle, traditional fossil fuel
16 fired steam boilers, aero-derivative and large frame, simple cycle gas turbine
17 technologies.

18 **Q. Please describe your educational background and professional experience.**

19 A. I received a Bachelor of Science in Mechanical Engineering from North Carolina
20 State University, and am a Graduate of the Leadership Institute of Boston
21 University’s School of Business. My professional background with FPL involves
22 technical, managerial, and commercial experience in progressively more-
23 demanding assignments over more than 20 years. This includes operations,

1 maintenance, engineering, and business management roles. My progression of
2 responsibilities includes: Lead Design Engineer of the Power Resources
3 Department, Maintenance and Production Manager of Martin (combined cycle)
4 Plant, General Manager of Power Generation's Steam "Fleet Team", General
5 Manager of Manatee (steam) Plant, General Manager of Due Diligence and New
6 Plant Design, Director of Contracts, General Manager of Martin Plant site, Vice
7 President of Technical Services, and currently Vice President of Florida Power &
8 Light's Power Generation Operations with over 700 employees.

9 **Q. Are you sponsoring any exhibits in this case?**

10 A. Yes. I am sponsoring the following exhibits:

- 11 • GKH-1 – Changes in FPL Fossil Generating Capability
- 12 • GKH-2 – FPL Fossil Net Heat Rate Comparison
- 13 • GKH-3 – FPL Fossil 5-Year Cumulative Percent Reduction in
14 Emission Rates
- 15 • GKH-4 – FPL Fossil 5-Year Cumulative CO₂ Greenhouse Gas
16 Avoided
- 17 • GKH-5 – FPL Fossil Availability Comparison
- 18 • GKH-6 – FPL Fossil Forced Outage Rate Comparison
- 19 • GKH-7 – FPL Change in Fossil Capacity-Managed per Employee
- 20 • GKH-8 – FPL Fossil Total Non-Fuel O&M Cost Comparison
- 21 • GKH-9 – FPL Fossil Base Non-Fuel O&M Cost Comparison

22 **Q. Are you sponsoring or co-sponsoring any Minimum Filing Requirements**
23 **(MFRs) filed in this case?**

1 A. Yes. I am sponsoring the following MFR:

- 2 • B-18 – Fuel Inventory by Plant

3 I am co-sponsoring the following MFRs:

- 4 • B-12 – Production Plant Additions
5 • B-13 – Construction Work in Progress (Test and Subsequent Years)
6 • C-8 – Details of Changes in Expenses
7 • C-41 – O&M Benchmark Variance by Function (Test and Subsequent
8 Years)

9 I am also co-sponsoring the following West County Energy Center Adjustment
10 Schedules:

- 11 • B-6 – Jurisdictional Separation Factors – Rate Base
12 • B-8 – Monthly Plant Balances Test Year – 13 Months
13 • C-4 – Jurisdictional Separation Factors – Net Operating Income

14 In addition, I am co-sponsoring the following 2009 supplemental MFR schedules
15 that FPL has agreed with the Florida Public Service Commission (“FPSC” or
16 “Commission”) Staff and the Office of Public Counsel to file:

- 17 • B-13 – Construction Work in Progress
18 • C-15 – Industry Association Dues
19 • C-41 – O&M Benchmark Variance by Function

1 **Q. What are the purpose and key points of your testimony?**

2 A. My testimony addresses three major areas: 1) FPL's fossil generation system
3 performance, 2) FPL's fossil non-fuel operating and maintenance (O&M)
4 expenses and (non-construction) capital expenditures, including the effect of
5 adding approximately 3,600 MW of cleaner, highly efficient combined cycle
6 generating capability, including Turkey Point Unit 5 and West County Energy
7 Center (West County) Units 1 and 2 between 2006 and 2010, and 3) the
8 construction capital and first year non-fuel O&M costs of placing an additional
9 1,200 MW into commercial operation in 2011 with West County Unit 3.

10

11 The Power Generation Division is responsible for the operation and maintenance
12 of FPL's fossil power plants. Through its leadership, management systems, and
13 processes, the Power Generation Division has helped successfully defer the need
14 for new generating units and avoid costs by improving the performance of FPL's
15 existing fossil fleet. Not only has FPL's fossil fleet operating performance
16 improved over time, it has also consistently exceeded industry averages, and has
17 been frequently ranked "Best-in-Class" when compared to other large generating
18 fossil fleets within the industry.

19 **Q. Please summarize your testimony.**

20 A. In just more than 20 years, FPL's fossil plant capacity will have doubled from
21 10,700 MW in 1990 to 21,400 MW in 2011 with the addition of West County
22 Unit 3, and evolved from conventional steam technology to primarily modern
23 combined cycle technology. Based on the Federal Energy Regulatory

1 Commission's Electric Power Production classifications of fossil Steam
2 Production and Other Production (i.e. combined cycle, simple cycle, and gas
3 turbine units), FPL's fossil capacity will have been distinctively transformed from
4 about an 80:20 mix to a 30:70 mix of "Steam" vs. "Other" (see Exhibit GKH-1).

5
6 Both the doubling of FPL's fossil generating capacity to serve FPL's long term
7 customer electricity needs, and the dramatic transformation of its generating mix
8 to predominantly cleaner and highly efficient combustion turbine-based
9 technology, typically in combined cycle configuration, are key drivers of FPL's
10 fossil fleet trends in non-fuel O&M expenses and capital expenditures.

11
12 The impressive performance of FPL's fossil fleet of generating units is evident in
13 FPL's consistent industry-leading results. As illustrated in Exhibit GKH-2, FPL's
14 fossil fleet net heat rate, a reflection of generating efficiency, improved almost 19
15 percent over the 1990 to present timeframe (and by 10 percent over the five year
16 period from 2002-2007 alone). Such excellent performance results in
17 significantly lower fuel costs and reduced emission rates.

18
19 For example, in a system such as FPL's, with approximately \$5 billion of fossil
20 fuel costs in 2007, a 10 percent heat rate improvement translates into \$500 million
21 per year of fuel cost savings to customers.

1 As represented in Exhibit GKH-3, emission rates have also dropped significantly
2 over the 2002 to 2007 timeframe, contributing to a cleaner environment. For
3 example, FPL's 19 percent reduction in its fossil Carbon Dioxide (CO₂) emission
4 rates over this five year period is estimated to have avoided a cumulative 30
5 million tons of CO₂ releases, resulting in less greenhouse gas emissions (refer to
6 Exhibit GKH-4). FPL's fossil system fuel cost savings and emission benefits
7 from efficiency improvements will continue to grow as new and modernized units
8 are placed in service.

9
10 As shown in Exhibits GKH-5 and GKH-6, over the last decade, FPL's fossil fleet
11 has also averaged excellent plant availability of over 92 percent Equivalent
12 Availability Factor (EAF) and reliability performance of approximately 2
13 percent Equivalent Forced Outage Rate (EFOR), compared to fossil industry
14 averages of 87 percent EAF and 7 percent EFOR. This outstanding plant
15 availability and reliability performance allows FPL to continue to provide
16 customers with the cleanest, most fuel-efficient generation that can be produced
17 from its fossil fleet, and pass along the resulting fuel savings to our customers.
18 Further, the high availability and low forced outage rates of FPL's fossil units
19 have helped FPL avoid or defer the need to add additional capacity to the system.

20
21 What makes FPL's fossil plant performance more noteworthy is that, in addition
22 to significant improvements in performance, FPL has been able to reduce fossil
23 "Total" (i.e. Base Rate plus Environmental and Capacity Clauses) non-fuel O&M

1 cost per unit of capacity by more than 40 percent, from almost \$19/installed kW
2 in 1990 to under \$11/kW at the present time (see Exhibit GKH-8). Another
3 indication of FPL's superior performance is that FPL's \$11/kW fossil cost was
4 approximately \$20/kW lower in 2007 than the fossil industry average \$/kW, as
5 well as what FPL's fossil \$/kW cost would be if escalated at the Consumer Price
6 Index (CPI) from 1990 over the same timeframe. This average \$20/kW
7 difference represents significant annual fossil non-fuel O&M cost avoidance
8 (nearly \$400 million/year presently) for a fossil fleet the size of FPL's
9 (approximately 20,000 MW of generating capacity). Contributing to this
10 excellent performance is Power Generation's consistent improvement in
11 workforce staffing. Since 1990 and through 2011, the level of fossil capacity-
12 managed per employee is projected to increase from approximately 5
13 MW/employee to 20 MW/employee (see Exhibit GKH-7).

14
15 FPL's fossil non-fuel O&M expenses will increase in the coming years as a result
16 of adding 4,800 MW of new generating capacity and performing major
17 maintenance to its fleet. However, on a \$/kW basis, FPL's fossil Total non-fuel
18 O&M costs for 2010-2011 are expected to remain well below both the fossil
19 industry average and what the O&M cost would be if escalated by CPI from 1990
20 (see Exhibit GKH-8). Also, FPL's projected fossil "Base" (i.e. Total less
21 Environmental and Capacity Clauses) non-fuel O&M \$/kW compares favorably
22 with CPI for 2010 and 2011 (see Exhibit GKH-9).

1 Base capital expenditures are also increasing in the coming years primarily due to
2 the need to purchase combustion turbine (CT) wear parts to effectively maintain
3 FPL's growing fleet of combined cycle generating units.

4
5 Thus, while FPL has provided customers with excellent cost control and plant
6 operating performance, an increase in the level of expenditures is required to
7 operate and maintain FPL's growing fossil fleet of cleaner and more efficient
8 generating units.

9
10 Lastly, the construction estimates and operating and maintenance costs for West
11 County Unit 3 remain consistent with the estimates provided to the Commission
12 in Docket No. 080203-EI.

13

14 **FPL'S FOSSIL GENERATION SYSTEM PERFORMANCE**

15

16 **Q. What indicators does FPL use to measure the operating performance of its**
17 **fleet of fossil generating units?**

18 A. FPL uses a number of indicators to measure the performance of its fossil fleet.
19 These indicators include EAF to measure unit availability, EFOR to measure unit
20 reliability, Net Heat Rate (British Thermal Units (Btu)/kWh) to measure unit
21 efficiency, and cost (non-fuel O&M \$/installed kW of capacity) to measure the
22 effectiveness of resource management and utilization.

1 As shown on several exhibits within this testimony, FPL's fossil fleet
2 performance in these measures is compared against both our own long term
3 historical performance as well as that of the fossil industry.

4 **Q. Please define the indicators used to measure plant availability and reliability.**

5 A. EAF is a measure of the percent capacity available from a generating unit to
6 provide electricity throughout the year, regardless of whether the generating unit
7 is actually called upon to operate. Planned and Forced outages are the main
8 components typically associated with measuring FPL's fossil EAF. EAF is
9 reported in terms of the hours in a given period (e.g., a year) that a generating unit
10 is available to deliver electricity, as a percentage of all the hours in the period.
11 FPL strives for, and has achieved, high fossil EAF.

12

13 EFOR is a measure of a generating unit's inability to provide electricity when it
14 was scheduled to operate. EFOR is reported in terms of the hours when a
15 generating unit could not deliver electricity as a percentage of all the hours during
16 which that unit was called upon to operate. Since lower EFOR results in greater
17 availability of the most-efficient generating capacity serving customers, FPL
18 strives for, and has achieved, low fossil EFOR.

19 **Q. Has the EAF of FPL's fossil plants improved over time?**

20 A. Yes. As shown in Exhibit GKH-5, FPL has improved the EAF of its fossil fleet
21 from less than 82 percent in 1990 to over 92 percent in 2008.

1 **Q. How does the EAF of FPL’s fossil plants compare to that of others in the**
2 **industry?**

3 A. FPL’s fossil fleet has maintained an industry-leading position in EAF. As shown
4 in Exhibit GKH-5, FPL's fossil plants have performed significantly better than the
5 fossil industry average. Over the last decade, from 1998 through 2007, the fossil
6 industry EAF averaged 87 percent, while FPL’s fossil unit performance averaged
7 over 92 percent. FPL’s fossil EAF performance has also been either “Best-In-
8 Class” or “Top-Decile” for nine of the last ten years.

9 **Q. Has the EFOR of FPL’s fossil plants also improved over time?**

10 A. Yes. As shown in Exhibit GKH-6, the EFOR of FPL's fossil plants have been
11 exceptionally low. Even at this excellent performance level, FPL’s fossil fleet
12 EFOR has improved from an average of approximately 3 percent during the
13 1990’s to an average of about 2 percent during the last decade.

14 **Q. How does the EFOR of FPL’s fossil plants compare to that of others in the**
15 **industry?**

16 A. FPL’s fossil EFOR performance has significantly outperformed the fossil industry
17 average, as shown in Exhibit GKH-6. Over the last ten-year period from 1998
18 through 2007, FPL’s fossil plant EFOR averaged 2 percent, and was less than
19 one-third the fossil industry EFOR average of 7 percent. FPL’s fossil EFOR
20 performance has also been either “Best-in-Class” or “Top Decile” for eight of the
21 last ten years.

1 **Q. What is the significance of FPL's fossil EAF and EFOR performance to this**
2 **case?**

3 A. During the early 1990s, FPL's fossil system EAF and EFOR improvements
4 helped defer the need for new capacity additions. Currently, with the progressive
5 transformation of its fossil generating fleet to cleaner combined cycle units, FPL's
6 excellent fossil EAF and EFOR performance results in more opportunity for this
7 highly efficient capacity to be operating, minimizing customer fuel costs and
8 emissions.

9 **Q. How did FPL's EAF and EFOR improvement actions also help avoid or**
10 **defer the need for new generating capacity?**

11 A. By the early 1990s, FPL had improved its fossil plant availability which allowed
12 the Power Generation Division to implement a program known as Perfect
13 Execution of Peak Operations (PEPO). The PEPO program was designed to
14 systematically assess the peak generating capacity of units within their design
15 capabilities. This program allowed the Power Generation Division to operate its
16 fossil units at peak capacity during high load demand periods. The PEPO
17 program raised FPL's level of confidence in the reliability of these peaking
18 megawatts to the point that they could be included in the rated capacity for our
19 fossil fleet when determining the need for new generating capacity. In the mid-
20 1990s, PEPO was integrated into the normal operation and rating of the fossil
21 units and made over 600 MW available to FPL. Over the last 15 years, FPL has
22 been able to utilize this philosophy of providing peak capacity, amounting to over

1 1,700 MW of additional generating capability benefiting customers through the
2 present time.

3 **Q. What indicator does FPL use to measure the efficiency of its fossil fleet?**

4 A. FPL's indicator of fossil efficiency is net heat rate, which is calculated by
5 dividing the total heat input in Btu, from fuel used each year by FPL's fossil fleet,
6 by the net kWh of electricity produced from those units. The lower the heat rate
7 is, the more efficient the generating fleet.

8 **Q. Please show how the efficiency of FPL's fleet of fossil generating fleet has
9 improved over time.**

10 A. The trend in efficiency of FPL's fossil generating fleet is provided in Exhibit
11 GKH-2. Since 1990, FPL has improved the net heat rate of its fossil fleet from
12 10,214 Btu/kWh to 8,318 Btu/kWh in 2008, almost a 19 percent improvement in
13 efficiency. With the addition of the West County Units 1, 2, and 3, the net heat
14 rate of FPL's fossil fleet is expected to drop further, providing even better
15 efficiency to benefit the customer.

16 **Q. How does FPL's fossil plant net heat rate performance compare to other
17 utilities?**

18 A. As shown in Exhibit GKH-2, FPL's fossil fleet net heat rate compares extremely
19 favorably to the industry. The industry average for all representative fossil plants
20 exhibited little long term improvement and has remained above 10,000 Btu/kWh.
21 FPL's fossil fleet average net heat rate improved 10 percent over five years alone
22 (between 2002 and 2007) from 9,237 to 8,324 Btu/kWh. FPL's fossil net heat

1 rate performance has also been either “Best-in-Class” or “Top Decile” among
2 public electric utilities in every one of the last ten years.

3 **Q. What actions has FPL taken, or does FPL plan to take, to improve overall**
4 **fossil fleet efficiency performance (e.g., improvements in system heat rate)?**

5 A. In the power generation industry, the natural course of events is for power plants
6 to suffer deterioration in performance as they age and experience wear and tear.
7 The ongoing challenge is to minimize the rate of heat rate degradation and restore
8 it when possible. So, restoring performance actually represents an improvement
9 in an operating environment that otherwise would result in decline. FPL works
10 diligently to minimize degradation of, and to restore, this lost generating unit
11 performance. This has been accomplished through practices such as condition-
12 based maintenance.

13

14 However, the major step-change system heat rate performance gains have been
15 achieved through plant modernizations (conversions of conventional plants to
16 combined cycle technology) and the addition of new, highly efficient generating
17 technology. FPL is a leader in converting older power plants to modern combined
18 cycle technology, which significantly increases the efficiency of these plants and
19 reduces emissions.

20 **Q. Can you provide an example of how an improved net heat rate benefits**
21 **FPL’s customers?**

22 A. Yes. For example, if fossil net heat rate improves 10 percent, this means that,
23 assuming nothing else changes, the system now requires 10 percent less fuel to

1 produce the same amount of kilowatt-hours. If fossil system fuel costs prior to
2 efficiency gain equal \$100 million per year, then the 10 percent heat rate
3 improvement would produce \$10 million in fuel savings per year to customers.
4 Likewise, scaling up to a system such as FPL's, with approximately \$5 billion
5 fossil fuel cost in 2007, this 10 percent net heat rate improvement results in \$500
6 million per year of fuel cost savings to customers.

7
8 In addition, as mentioned above, system enhancements through power plant
9 modernizations and additions of cleaner, highly efficient generating technology
10 have had the added significant benefit of reducing FPL's fossil generation air
11 emission rates. As shown in Exhibit GKH-3, FPL's fossil system air emission
12 rates, over the five year period from 2002 to 2007, were reduced by
13 approximately 19 percent for Carbon Dioxide (CO₂), and by about 50 percent for
14 both Nitrogen Oxides (NO_x) and Sulfur Dioxide (SO₂). FPL's 19 percent
15 reduction of its fossil CO₂ emission rates over this five year period is estimated to
16 have avoided the release of over 30 million cumulative tons of CO₂ (see Exhibit
17 GKH-4) resulting in a significant reduction in greenhouse gas emissions and
18 contributing to a cleaner environment. The modernization of the existing Cape
19 Canaveral and Riviera Power Plants further exemplify FPL's commitment to
20 environmental sustainability.

1 **Q. Please summarize your position on the performance of FPL's fossil**
2 **generating system.**

3 A. FPL has maintained an extremely reliable power generating system for many
4 years. FPL has significantly improved the operating performance and efficiency
5 of its fossil generating units in all areas, and surpasses industry performance,
6 frequently achieving "Best-in-Class" or "Top-Decile" performance.

7

8 **FPL's FOSSIL NON-FUEL O&M EXPENSES AND CAPITAL EXPENDITURES**

9

10 **Q. What has been FPL's experience with non-fuel O&M expenses associated**
11 **with fossil units in recent years?**

12 A. FPL has worked aggressively to reduce and contain costs. FPL's fossil total non-
13 fuel O&M expense, measured in dollars per installed kW of generating capacity,
14 has declined 19 percent over the last decade from \$12.8/kW in 1998 to \$10.4/kW
15 in 2007. Over the longer period from 1990 to 2007, FPL prudently and
16 successfully leveraged the economies of scale of its existing sites to reduce fossil
17 Total non-fuel O&M cost per kW of installed capability by over 40 percent (from
18 almost \$19/kW to under \$11/kW) as shown in Exhibit GKH-8. This is superior
19 performance considering FPL was approximately \$20/kW lower in 2007 than
20 both the industry average fossil non-fuel O&M cost and what FPL's fossil non-
21 fuel O&M cost would be if escalated at CPI over the same timeframe. For a
22 fossil fleet the size of FPL's (approximately 20,000 MW of generating capacity),
23 this represents significant annual fossil non-fuel O&M cost avoidance of nearly

1 \$400 million. Contributing to this excellent performance is Power Generation's
2 improving workforce staffing optimization trend since 1990 (see Exhibit GKH-7)
3 showing that by 2011, FPL's fossil capacity-managed per employee is projected
4 to be four times higher than the rate achieved in 1990 (from approximately 5
5 MW/employee to 20 MW/employee).

6 **Q. What steps has FPL taken to reduce fossil non-fuel O&M expenses**
7 **associated with maintaining the fleet?**

8 A. To control costs, FPL transitioned its fossil plant major maintenance overhaul
9 philosophy from calendar-based to condition-based overhaul intervals, adopted
10 "Centralized Major Maintenance" and "Fleet Team" approaches, is leveraging
11 contracts for goods and services during overhaul seasons resulting in more-
12 favorable pricing and contract terms, and introduced quality practices known as
13 "Six Sigma" to help execute outages more efficiently and effectively. "Six
14 Sigma" is discussed in the testimony of FPL witness Bennett.

15

16 By doing overhauls on condition-based intervals, FPL can optimize the life of
17 existing plant components while improving plant reliability and availability. The
18 Centralized Maintenance concept transitioned the fleet from an approach where
19 each site independently allocated its overhaul resources, to an approach where
20 overhaul resources are optimized at the system level. The Fleet Team approach,
21 in which FPL organizes its technical support groups around the major plant
22 components such as boilers, CTs and generators, improves the replication and
23 standardization of best practices across the fleet.

1 FPL further enhanced its fleet maintenance performance with the creation of the
2 Fleet Performance and Diagnostic Center (FPDC). Critical fossil plant operating
3 parameters are monitored “24/7” online. Automated statistical analysis detects
4 any slight change in performance and alerts employees. FPL can also analyze the
5 equipments’ ability to perform according to its rated specifications and evaluate
6 ways to improve efficiencies. The goal is to identify equipment degradation far
7 enough in advance of a failure so corrective measures can be put in place. These
8 initiatives and efforts are focused on achieving process control and preventing
9 failures from occurring.

10

11 The Power Generation Division’s mission and commitment to the customer can
12 be summarized in two words: Deliver Certainty - the certainty that our generating
13 units are cost-effective, efficient, available, and reliable to meet the needs of our
14 customers.

15 **Q. Can improvements in maintenance processes continue to enable FPL to keep**
16 **the level of O&M expenses relatively constant?**

17 **A.** No. While condition-based maintenance has optimized the useful life of plant
18 components, with the addition of 4,800 MW of new generation, FPL must
19 perform additional maintenance consistent with the scale of its expanded fleet in
20 order to maintain the reliable service of its fossil system. Despite FPL’s
21 continuing maintenance improvement processes, fossil non-fuel O&M expenses
22 are forecast to increase from 2006 through 2011. These increases are primarily
23 due to long-term infrastructure investments in new generating plant additions and

1 condition-based maintenance of the fossil fleet. These cost increases are dictated
2 by the fact that FPL's number of high-efficiency CTs more than doubled between
3 2000 and 2006 (from 15 to 36), and will more than triple between 2000 and 2011
4 (from 15 to 49) with the completion of West County Unit 3.

5 **Q. Please discuss the comparison of FPL's 2010 and 2011 fossil Base non-fuel**
6 **O&M for the FERC Steam Production and Other Production functional**
7 **areas to the Commission's benchmarks (on MFR C-41) using 2006 as the**
8 **benchmark year.**

9 A. FPL's overall fossil Base O&M compares favorably with the Commission's
10 benchmarks, as explained below.

11

12 Comparing FPL's projected 2010 and 2011 fossil Base non-fuel O&M expenses
13 to the Commission's benchmarks for the FERC Steam and Other functional areas
14 indicates that FPL's Steam expenses are approximately \$24 million and \$28
15 million below the 2010 and 2011 benchmarks. Conversely, FPL's Other O&M
16 expenses are approximately \$33 million and \$52 million above the respective
17 2010 and 2011 benchmarks. These results are not surprising considering both the
18 dramatic growth of FPL's Other generating capacity and the transformation of
19 FPL's fossil generating mix from predominantly Steam to primarily highly
20 efficient Other capacity (as shown earlier in Exhibit GKH-1).

21

22 However, FPL's fossil generation fleet is operated and maintained as a
23 combination of Steam units and Other units for availability, reliability, and cost

1 with centralized support for engineering, environmental, quality, maintenance
2 planning/execution, production assurance, and business services. The fleet is not
3 managed at a FERC function level of Steam vs. Other, but as a portfolio of units.
4 If one were to compare FPL's fossil Base non-fuel O&M for the combined Steam
5 and Other functions to the CPI inflation benchmark at the portfolio level, FPL's
6 projected Base O&M for 2010 is a total \$9.2 million over the benchmark. This
7 \$9.2 million variance is the result of higher costs incurred to operate and maintain
8 long term infrastructure investments, such as the 3,600 MW of new generating
9 capacity added from 2006 through 2010, including Turkey Point Unit 5 in 2007
10 and West County Units 1 and 2 in 2009. FPL's fossil portfolio's Base non-fuel
11 O&M cost on a \$/kW basis (as shown in Exhibit GKH-9) increases only four
12 percent, from \$9.8/kW in 2006 to \$10.2/kW in 2010. In contrast, inflation as
13 measured by CPI is projected to increase 11 percent during this period. FPL's
14 costs are projected to increase at a rate so far below CPI inflation for this period
15 because of cost reductions FPL is undertaking in anticipation of removing two
16 Steam plant sites from service in 2011 for scheduled modernization.

17
18 Of course, eliminating costs for two Steam plant sites is not something that FPL
19 can do year after year, so this cost-reduction pattern cannot be sustained over a
20 more extended time frame. As Exhibit GKH-9 reflects, FPL's fossil Base non-
21 fuel O&M returns to normally-anticipated levels in 2011 due to both the increased
22 number of planned CT outages associated with the expanded combined cycle fleet
23 and the addition of O&M costs for the new, high efficiency West County Unit 3

1 when it becomes fully operational that year. High efficiency combined cycle
2 units like West County Unit 3 generate large fuel savings for FPL's customers,
3 but they also require more maintenance than FPL's older, simpler but less-
4 efficient units.

5
6 FPL's fossil portfolio 2011 Base O&M request will be \$24.2 million over the
7 portfolio's combined (Steam plus Other) inflation benchmark. However, from
8 2006 thru 2011 the fossil fleet will have added over 4,800 MW of clean and fuel
9 efficient combined cycle capacity. This \$24.2 million variance is essentially the
10 result of higher costs incurred to operate and maintain the 4,800 MW of new
11 generating capacity added from 2006 through 2011 including Turkey Point Unit 5
12 in 2007, West County Units 1 and 2 in 2009 and West County Unit 3 in 2011.
13 Consistent with the above explanation, FPL's fossil portfolio's Base non-fuel
14 O&M cost on a \$/kW basis (as shown in Exhibit GKH-9) will have increased only
15 14 percent from \$9.8/kW in 2006 to \$11.2/kW in 2011. This 2006 to 2011
16 increase is consistent with inflation for this period.

17
18 Recapping, FPL's fossil fleet's historical performance in \$/kW demonstrates
19 FPL's ability to cost-effectively operate and maintain the fleet as a fossil portfolio
20 of Steam and Other Production Units. The associated Base non-fuel O&M costs
21 on a \$/kW basis are consistent with CPI growth for the period 2006 thru 2011,
22 while the 4,800 MW of capacity additions during the 2006 thru 2011 period
23 provide FPL customers with cleaner and fuel efficient generating capacity.

1 **Q. Why did FPL use \$/kW as the basis for justifying Base non-fuel O&M**
2 **expenses that exceed the FPSC benchmark calculation (MFR C-41)?**

3 A. In the 1983 FPL Rate Case (Docket No. 830465-EI), the Commission established
4 the Base non-fuel O&M benchmark, which gave the production plant category
5 only CPI inflation as an expense escalator with no additional escalator for
6 customer growth. However, at that time, the Commission recognized the need for
7 FPL to incur over time the rising expenses associated with new plant additions.
8 FPL's use of \$/kW is a good metric to normalize for the effect of growth in Base
9 non-fuel O&M expenses that are due to adding electric generating capability.

10 **Q. What actions has FPL undertaken to reduce non-fuel O&M costs in light of**
11 **the economic downturn?**

12 A. FPL reviewed its operating fleet and has determined that some of its older, less-
13 efficient units should be placed into Inactive Reserve status. This would enable
14 the units to return to service when needed in the future to satisfy load growth, as
15 well as, with adequate notice, meet FPL's reliability needs under extended,
16 significantly-changed load and resource conditions in the near term. This plan
17 permits FPL to reduce steam plant operations and maintenance costs, and will
18 allow FPL to redeploy this skilled workforce within the business unit and reduce
19 contractor usage for unit outages. In addition, FPL has been able to reduce the
20 spending plans at the four units located at the Cape Canaveral and Riviera sites,
21 because they are scheduled to be taken off-line beginning in 2010 and 2011 for
22 the FPSC-approved modernizations. Together, these actions are expected to
23 reduce non-fuel O&M costs on FPL fossil Steam units by approximately \$10

1 million in 2010 and by approximately \$12 million in 2011, when compared to
2 2006 expenses.

3 **Q. What assurance can you provide that FPL's 2010 and 2011 forecasts for non-**
4 **fuel O&M expenses are reasonable?**

5 A. First, the Company's historical performance demonstrates its ability to cost-
6 effectively manage its resources while achieving industry-leading performance in
7 the areas of EAF, EFOR, and net heat rate.

8
9 Second, even with the inclusion of the new units in 2007 (Turkey Point Unit 5)
10 and in 2009 (West County Units 1 and 2), FPL is forecasting its 2010 fossil Base
11 non-fuel O&M (see Exhibit GKH-9) at only \$10.2/kW, representing only a four
12 percent increase over the four year period from 2006, and averaging one percent
13 per year. Similarly, even with the inclusion of the new West County Unit 3 in
14 2011, FPL is projecting its Base non-fuel O&M cost to be \$11.2/kW in 2011,
15 which is expected to be consistent with inflation when comparing back to 2006
16 (as shown on Exhibit GKH-9). Moreover, throughout the 2008-2011 timeframe,
17 FPL's Total fossil non-fuel O&M cost in \$/kW is expected to still remain
18 approximately \$20/kW below what the cost would have been if escalated by CPI
19 since 1990. Also, by 2011, FPL's Total fossil non-fuel O&M cost of \$12.1/kW is
20 also projected to remain at least 35 percent below FPL's own 1990 \$/kW level
21 (from Exhibit GKH-8). This further exemplifies FPL's continued commitment to
22 control and contain costs.

1 Third, FPL has the processes, procedures, and structure in place, such as
2 condition-based maintenance, Central Maintenance organization, overhaul
3 services contract leveraging, Six Sigma techniques, the Fleet Performance and
4 Diagnostic Center, and Fleet Teams to continue to manage, assess, and sustain the
5 outstanding performance of FPL's fossil generation portfolio. FPL's team is
6 committed to maintaining the industry-leading performance it has achieved with
7 excellent availability, reliability, efficiency, and low cost.

8 **Q. Please summarize FPL's fossil (non-construction) Base capital expenditures**
9 **required to sustain or improve its fossil fleet for the period 2006-2010 and**
10 **2010-2011?**

11 A. FPL's annual fossil Base capital expenditures are projected to increase from
12 approximately \$218 million to \$258 million between 2006 and 2010, and to \$318
13 million by 2011.

14 **Q. What are the capital expenditure drivers for sustaining FPL's fossil fleet?**

15 A. As previously illustrated in Exhibit GKH-1, from 1990 to 2011 FPL's fossil
16 generation system will have both doubled in magnitude and evolved to a fleet of
17 primarily clean and highly efficient combustion turbine-based other capacity. The
18 cost to sustain the growing CT-based combined cycle fleet is the primary driver of
19 fossil (non-construction) Base capital expenditure growth in 2010 and 2011.

20

21 FPL's number of high efficiency CTs more than doubled between 2000 and 2006
22 (from 15 to 36), and will more than triple between 2000 and 2011 (from 15 to 49)
23 with the completion of West County Unit 3. Since these CTs run in base-loaded

1 combined cycle configuration, with at least 30 percent lower heat rate than
2 conventional plants, FPL's customers benefit with avoided fuel cost and
3 emissions. However, the increasing number of CTs in FPL's system comes with
4 the greater need to undertake maintenance outages to replace wear parts needed to
5 sustain the performance of these plants, even within two years after going on-line.

6

7 Such outages are typically driven by runtime-based maintenance requirements on
8 these advanced, highly efficient CTs during their operating cycle. This allows
9 FPL to continue providing its customers with the most efficient generation from
10 the fleet. The purchase of CT outage wear parts for FPL's combined cycle fleet is
11 the primary cost driver of the increase from 2006 to 2011.

12

13 While capital expenditures necessary to sustain the performance of FPL's CT
14 fleet are substantial, the benefits to customers from such performance are real
15 (including avoided fuel cost and emissions). With the growing number of CTs in
16 FPL's fleet, these expenditures are needed for FPL to sustain the excellent
17 performance of its fleet and continue to provide customers with clean and fuel-
18 efficient generation into the future.

19 **Q. Has FPL undertaken any steps to control or reduce capital expenditures in**
20 **light of the economic downturn?**

21 **A.** Yes. As explained previously, FPL reviewed its operating fleet and has
22 determined that some of its older, less efficient units should be placed into
23 Inactive Reserve status. This would enable the units to return to service when

1 needed in the future to satisfy load growth, as well as, with adequate notice, meet
2 FPL's reliability needs under extended, significantly changed load and resource
3 conditions in the near term. In addition, FPL has been able to reduce the spending
4 plans at the four units located at the Cape Canaveral and Riviera sites because
5 they are scheduled to be taken off-line beginning in 2010 and 2011 for the FPSC-
6 approved modernizations. These combined actions are expected to reduce outage
7 work on FPL's steam units and will decrease the annual capital expenditures by
8 approximately \$35 million in 2010 and by approximately \$40 million in 2011,
9 when compared to 2006 expenditures.

10
11 **WEST COUNTY ENERGY CENTER UNIT 3**

12
13 **Q. Is the currently forecasted cost of adding West County Unit 3 consistent with**
14 **Docket No. 080203-EI and the Commission's Final Order (No PSC-08-0591-**
15 **FOF-EI issued September 12, 2008) granting FPL's petition for a**
16 **determination of need for the proposed unit?**

17 **A.** Yes. The currently-forecasted cost of adding West County Unit 3 is consistent
18 with the estimated amount of \$865 million in the Commission's Order to provide
19 the 1,219 MW of additional clean, highly efficient generating capacity in June
20 2011.

1 **Q. What are FPL's forecasted annual operating expenses for the first full year**
2 **of operation for West County Unit 3?**

3 A. The first full year of non-fuel O&M expenses (FERC account 546 through 554)
4 for West County Unit 3 is expected to be \$8.8 million.

5 **Q. Are these first full year of non-fuel O&M expenses reasonable?**

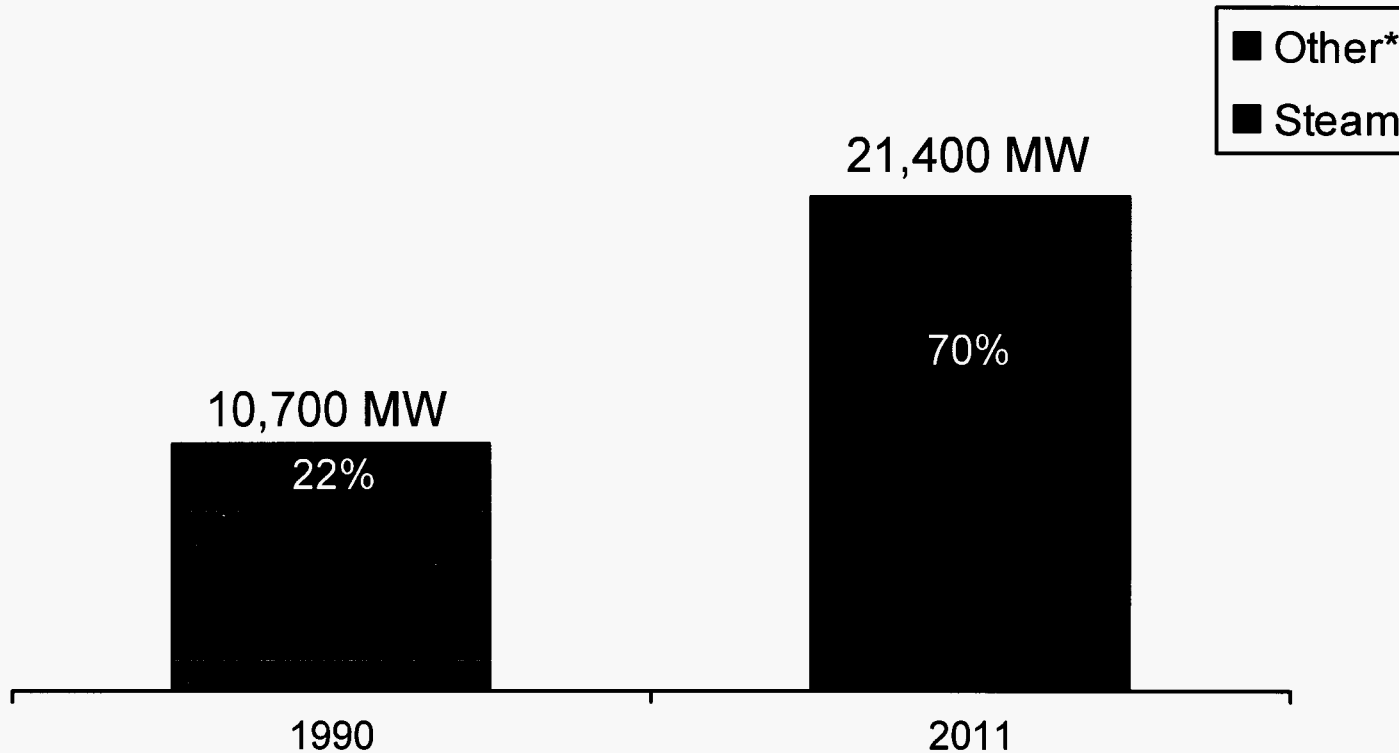
6 A. Yes. These non-fuel O&M expenses are consistent with the cost estimates
7 associated with FPL's Petition to Determine Need for West County Unit 3 as
8 provided to the Commission.

9 **Q. Does this conclude your direct testimony?**

10 A. Yes.

From 1990 to 2011, FPL's fossil capacity will have doubled and evolved from traditional "Steam" to modernized combustion turbine-based (i.e. "Other") technology

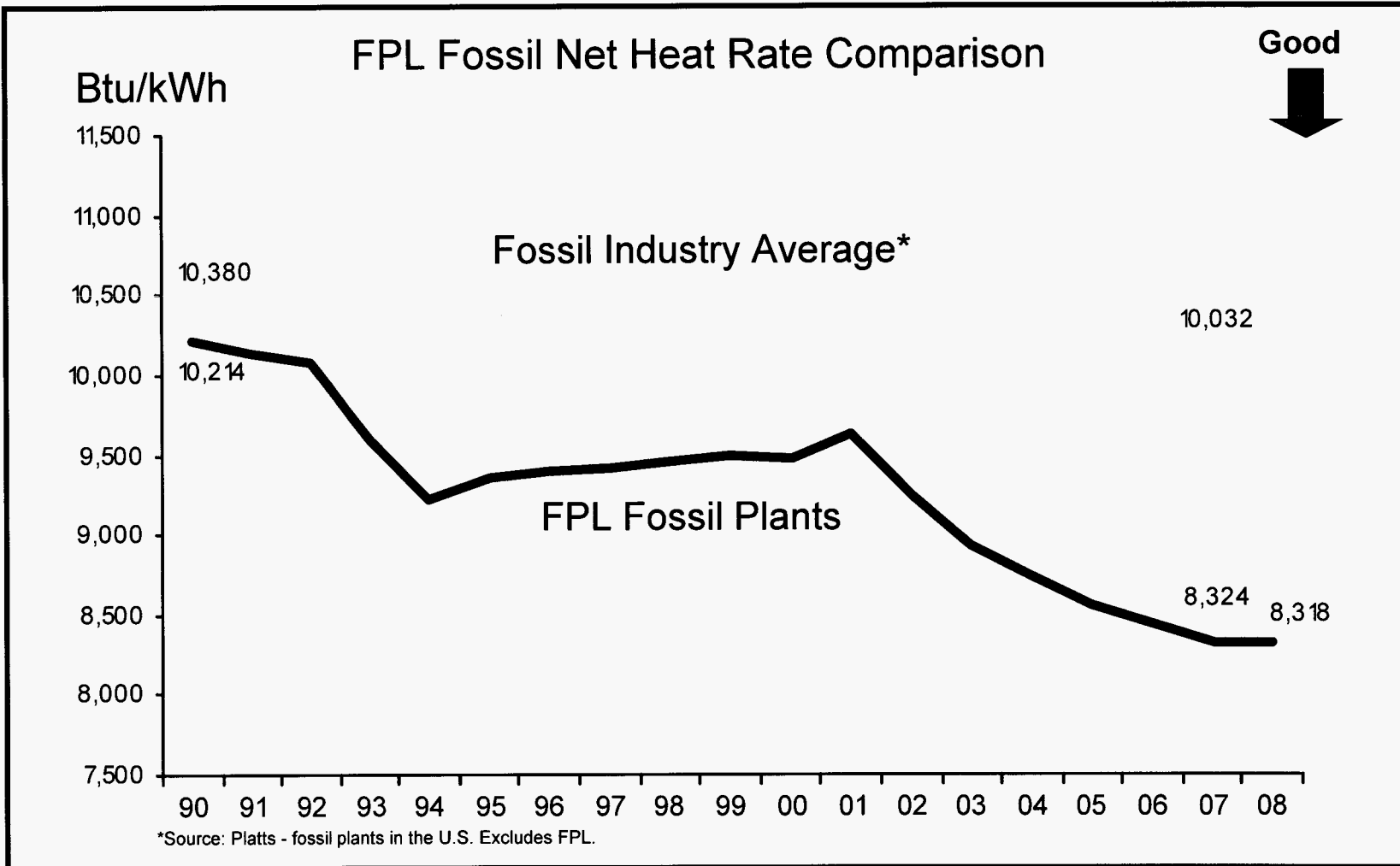
Changes in FPL Fossil Generating Capability (by FERC "Steam" and "Other" Production Categories)



*FERC "Other" Production capacity represents combined cycle, simple cycle, and gas turbine units in FPL's fossil fleet.

FPL's investment in its fossil fleet provides customers with reliable, cost effective, cleaner and more-efficient generating capability

FPL's fossil heat rate, reflecting fuel consumption efficiency, has improved nearly 19% since 1990 and is significantly better than the fossil industry average

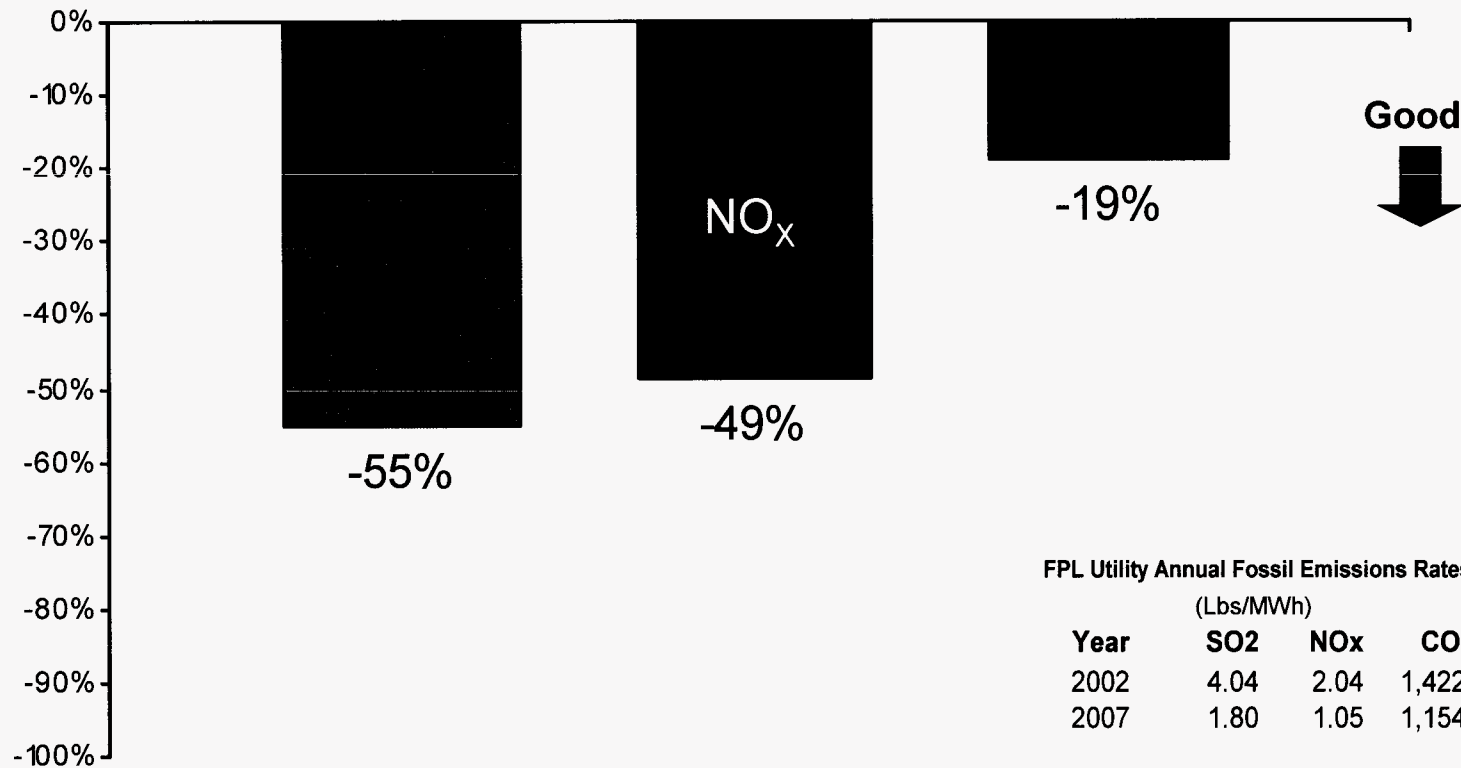


Docket No. 080677-E1
FPL Fossil Net Heat Rate Comparison
Exhibit GKH-2, Page 1 of 1

FPL's outstanding and highly efficient fossil fleet results in significantly less fuel costs and reduced emission rates

FPL has significantly reduced fossil emission rates in the recent five year period through the use of cleaner, highly efficient combined cycle technology

FPL Fossil 5-Year Cumulative Percent Reduction in Emission Rates



FPL Utility Annual Fossil Emissions Rates (Lbs/MWh)

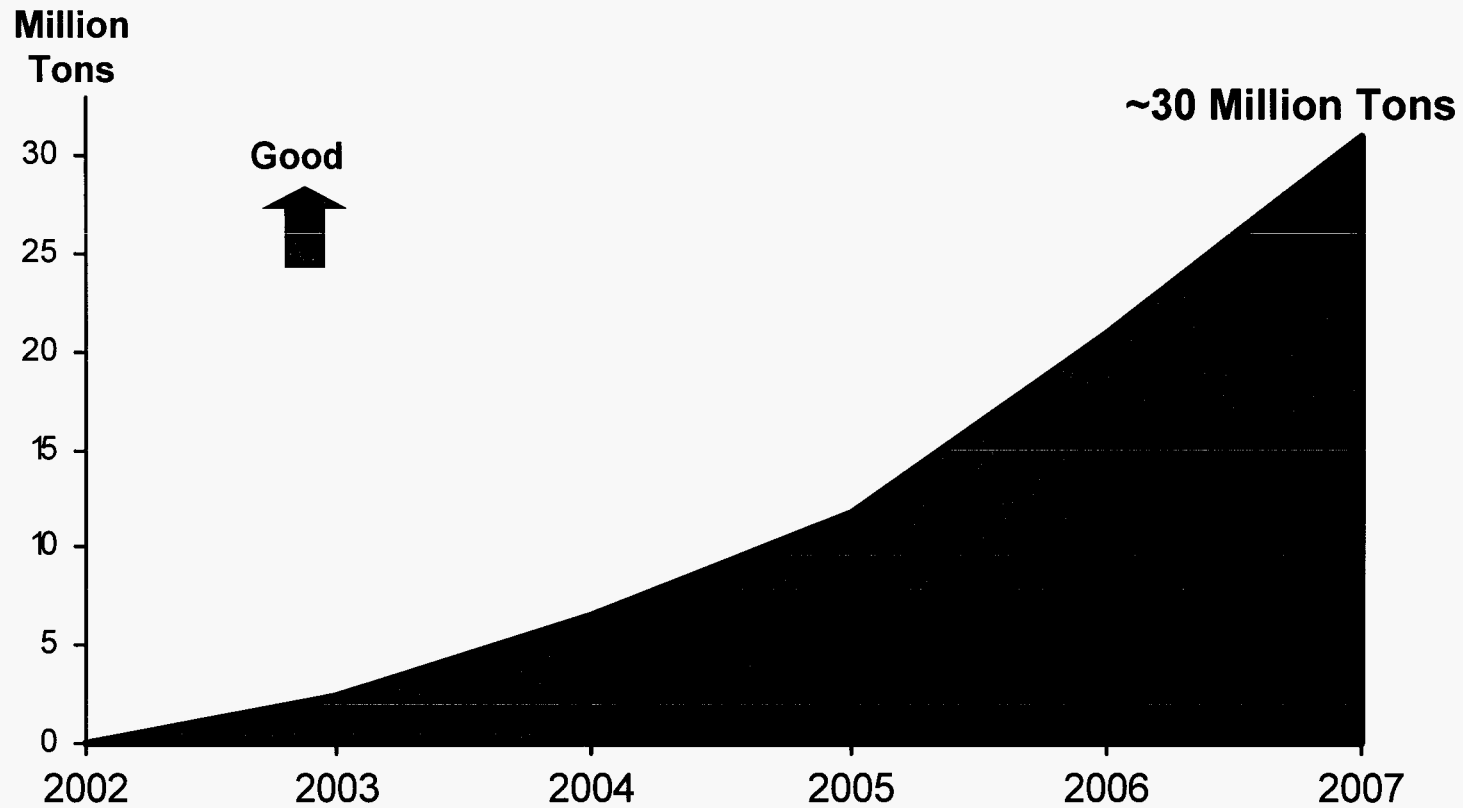
Year	SO ₂	NO _x	CO ₂
2002	4.04	2.04	1,422
2007	1.80	1.05	1,154

Source: FPL Environmental Dept. (Note: Emission rates represent FPL's capacity ownership share.)

Lowering emission rates significantly avoids pollutant and greenhouse gas releases, contributing to a cleaner environment for FPL customers

FPL reduced its fossil CO₂ emission rate almost 19% in five years through more highly efficient generation, avoiding over 30 million cumulative tons of CO₂ releases

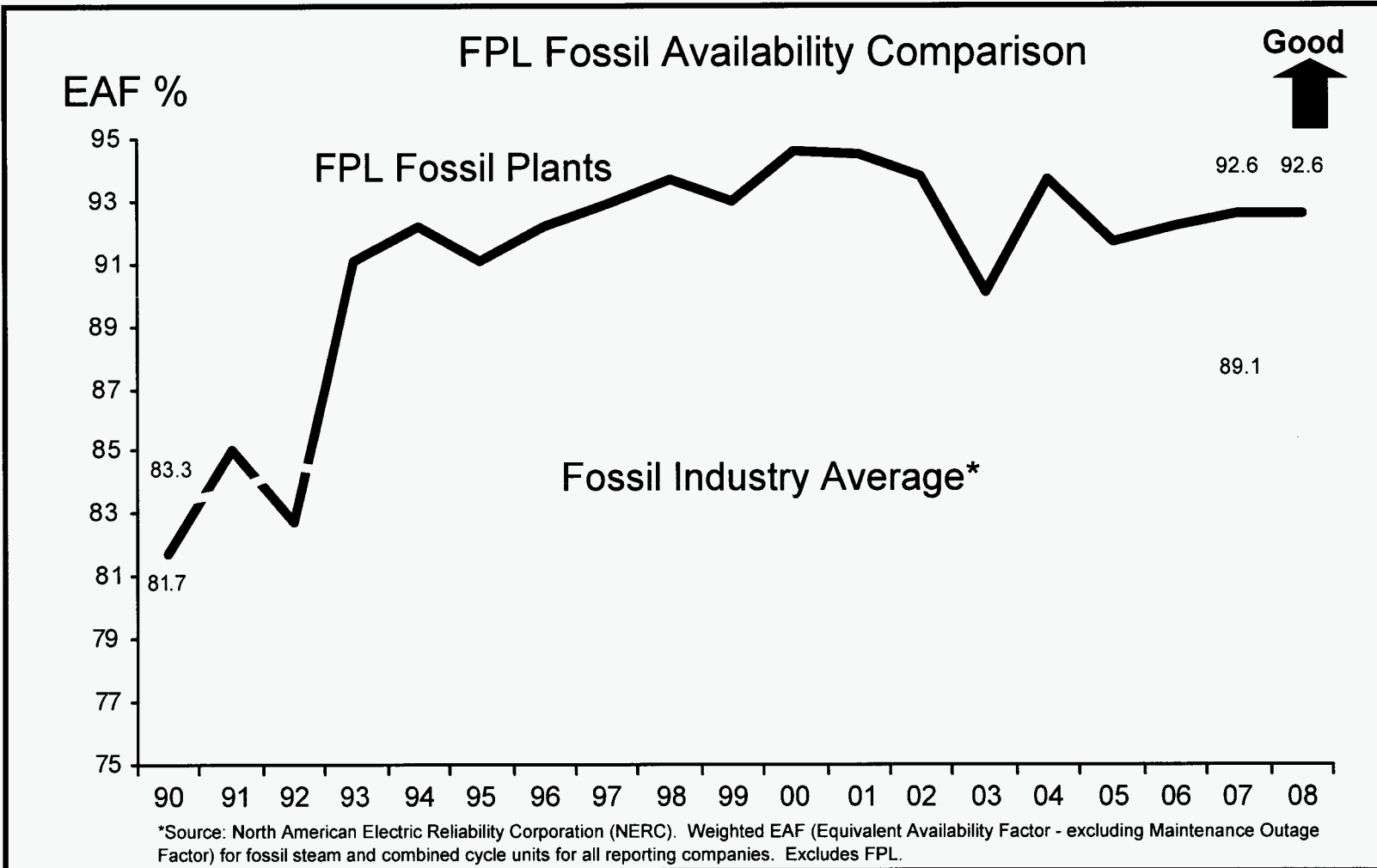
FPL Fossil 5-Year Cumulative CO₂ Greenhouse Gas Avoided



Note: Avoided emission estimates based on emission rates supplied by FPL Environmental Dept.

Avoiding greenhouse gas emissions through energy efficiency is part of FPL's strategy for contributing to the solution of climate change

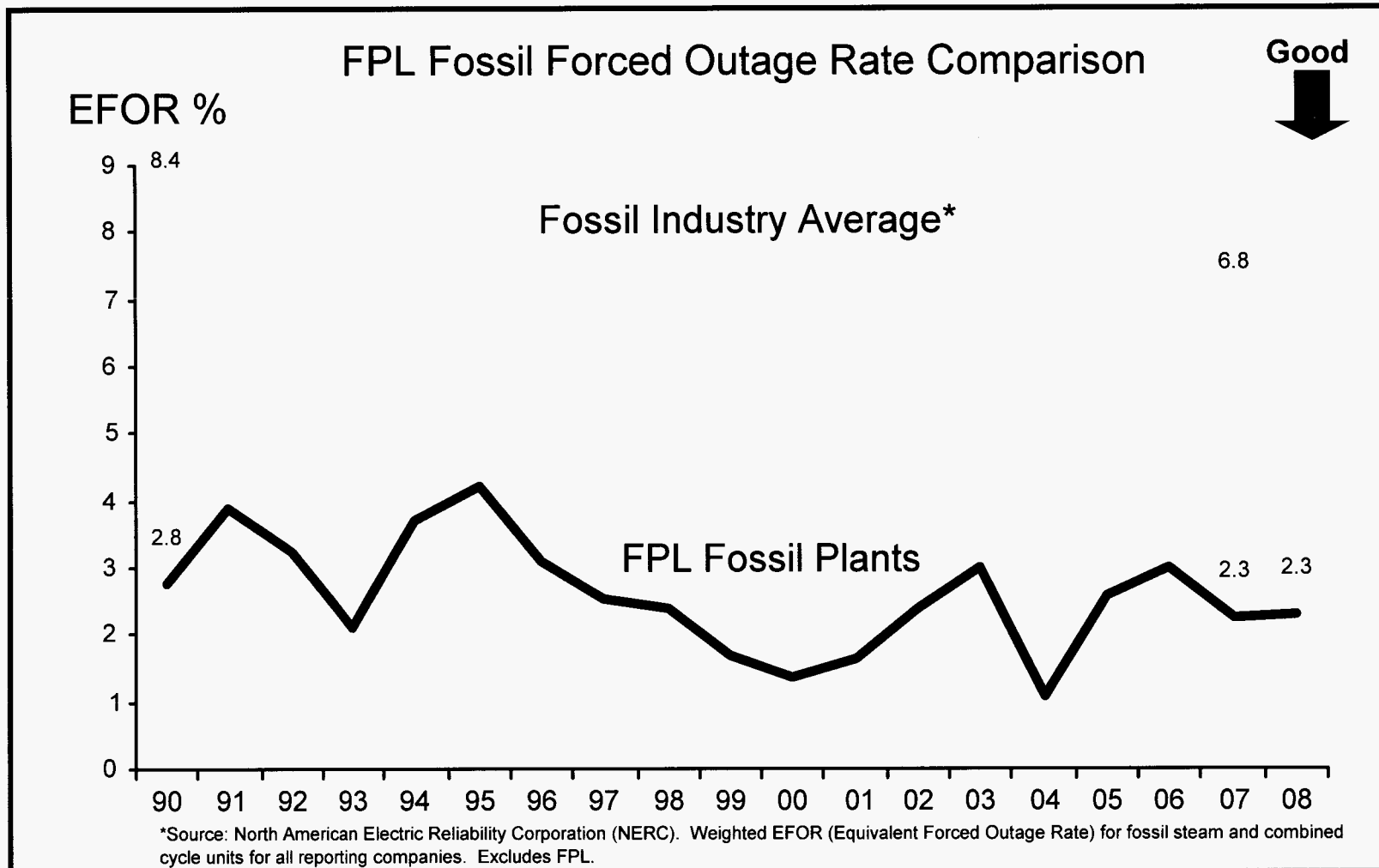
FPL has improved its fossil fleet availability to over 92% and has performed significantly above the fossil industry average



Docket No. 080677-E1
 FPL Fossil Availability Comparison
 Exhibit GKH-5, Page 1 of 1

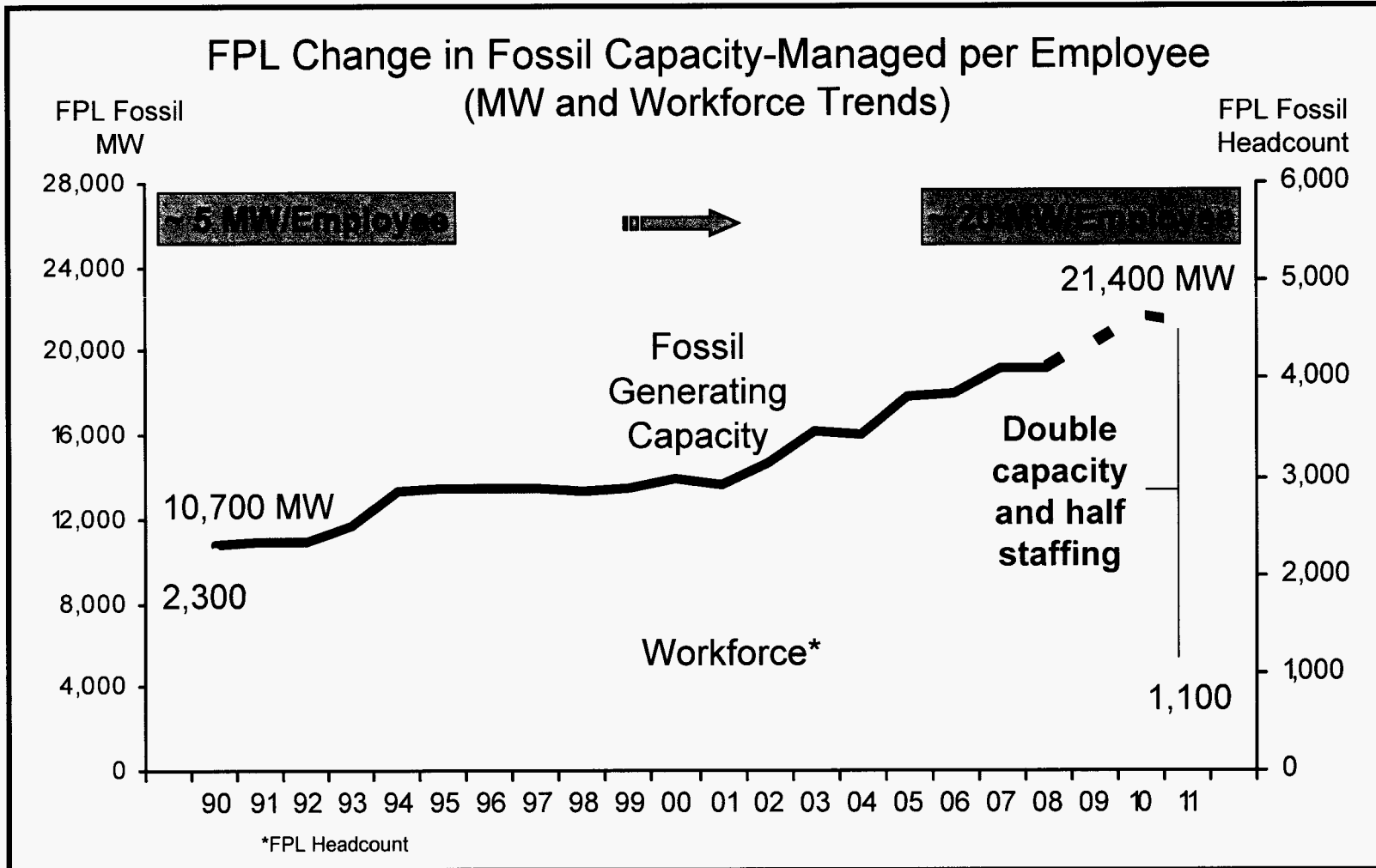
FPL's excellent fossil availability results in more opportunity for highly efficient capacity to be operating, minimizing customer fuel costs and emissions

FPL's fossil fleet's excellent Equivalent Forced Outage Rate averaging 2% during the last ten years is less than one third the fossil industry average failure rate



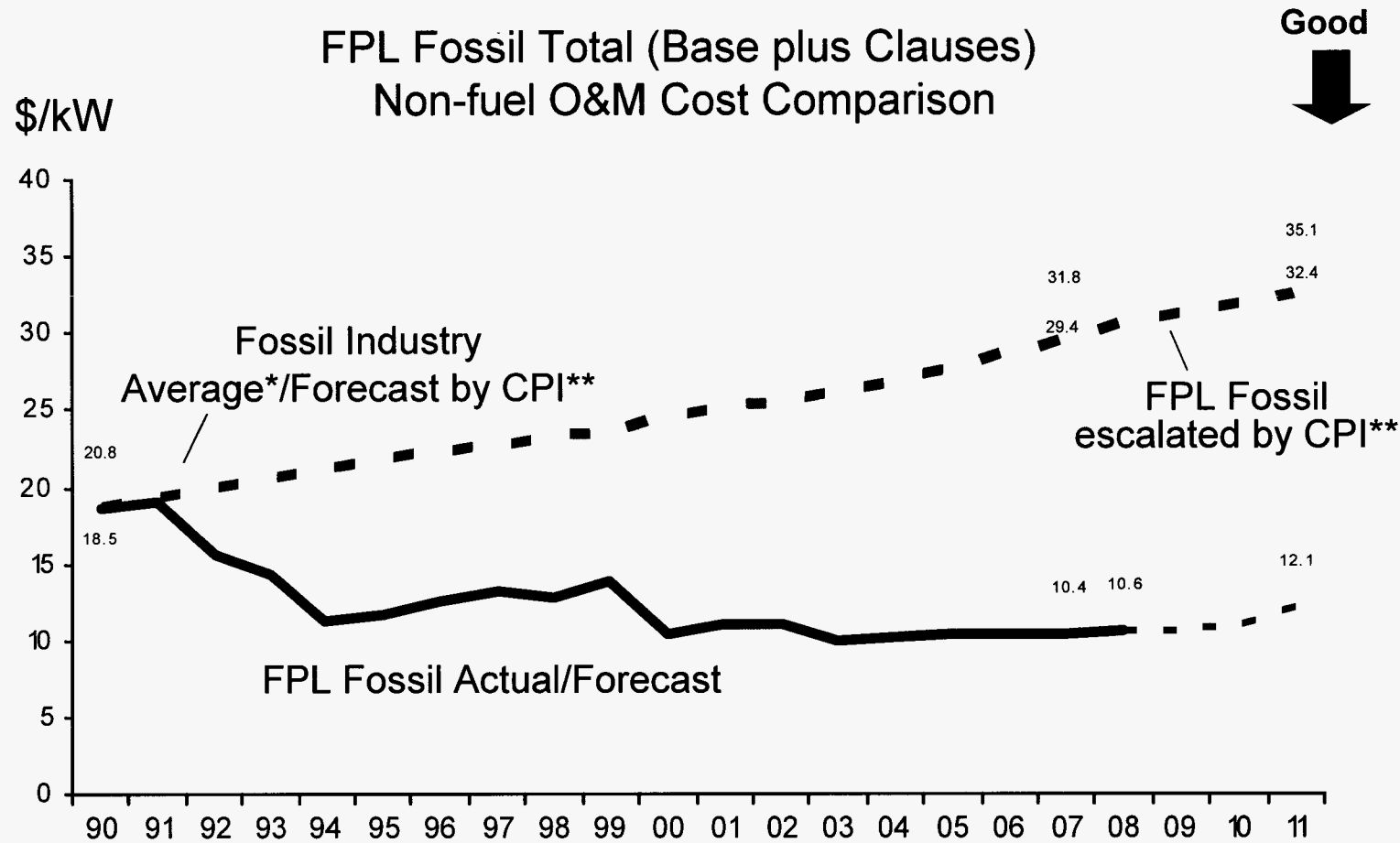
FPL's low fossil fleet EFOR represents better reliability (i.e. less failure), resulting in greater availability of the most-efficient generating capacity serving customers

By 2011, FPL's fossil capacity-managed per employee is projected to be four times higher than the rate achieved in 1990 – from about 5 MW/employee to about 20 MW/employee



Improving generating capacity management results in lower non-fuel O&M cost to FPL customers

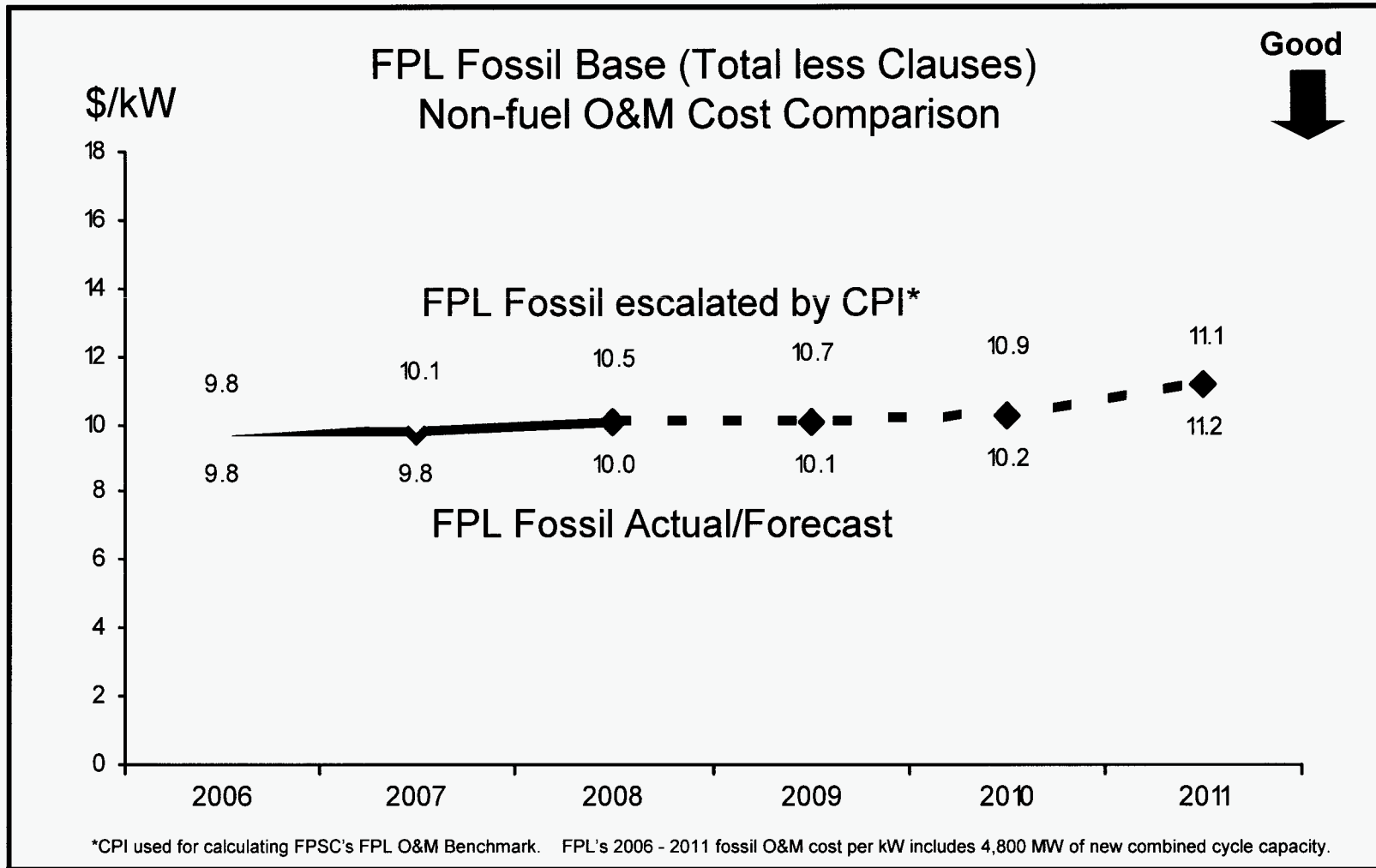
FPL's fossil fleet total non-fuel O&M cost per kW of capacity was reduced over 40% since 1990, and is well below both the corresponding CPI and fossil industry trends



*Source: Platts - FERC Form 1 Steam plus Other cost. (Capacity based on summer capability). Excludes FPL. **CPI used for calculating FPSC's FPL O&M Benchmark

FPL's exemplary non-fuel O&M performance associated with the economies-of-scale of its modernized fossil fleet has avoided significant cost to FPL customers

FPL's fossil "Steam" plus "Other" base non-fuel O&M cost per kW of capacity is projected to be consistent with CPI inflation throughout the 2006-2011 timeframe



FPL's fossil base O&M cost per kW against CPI (which does not consider 4,800 MW of new capacity between 2006 and 2011) reflects FPL's excellent cost management performance