

# City and Utilities Commissions Joint Workshop

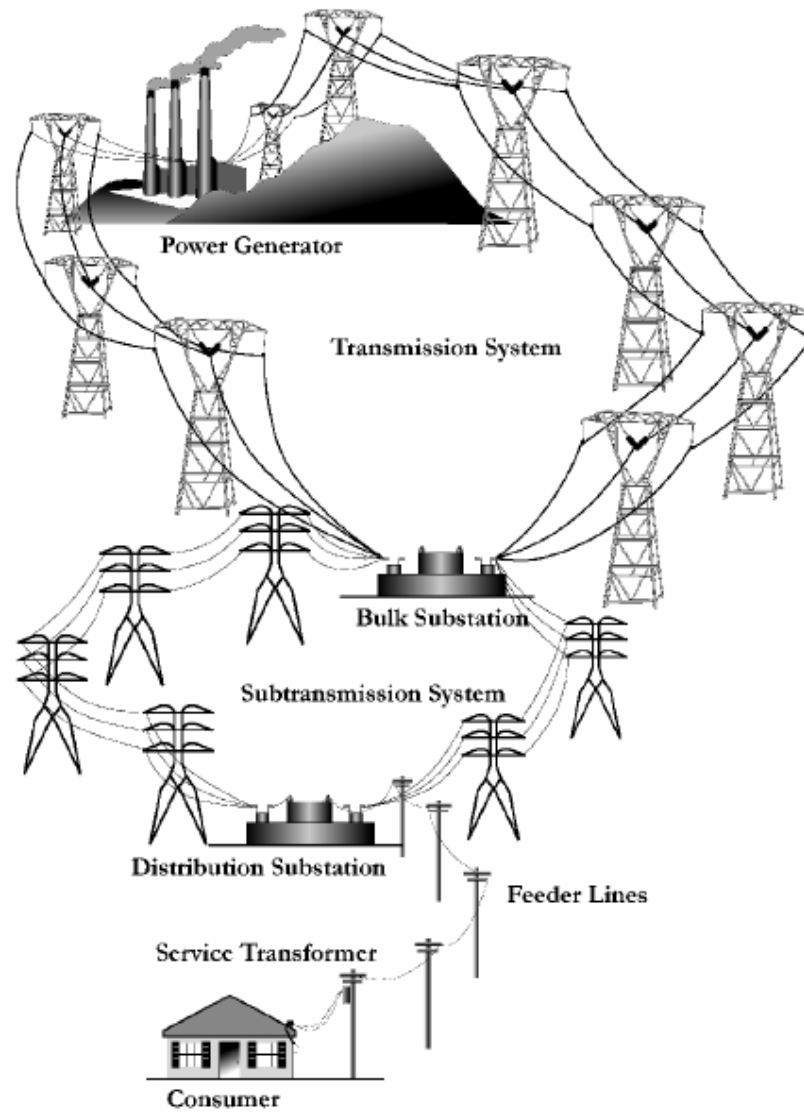
January 11, 2007

Generation and Supply Discussion

Coronado Civic Center, 223 Flagler Avenue

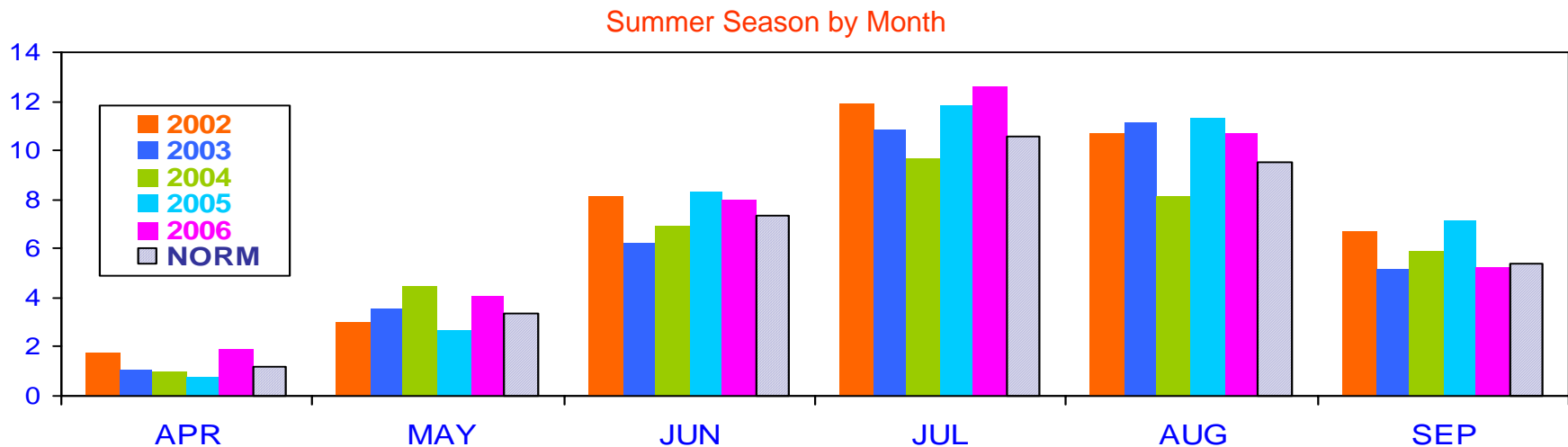
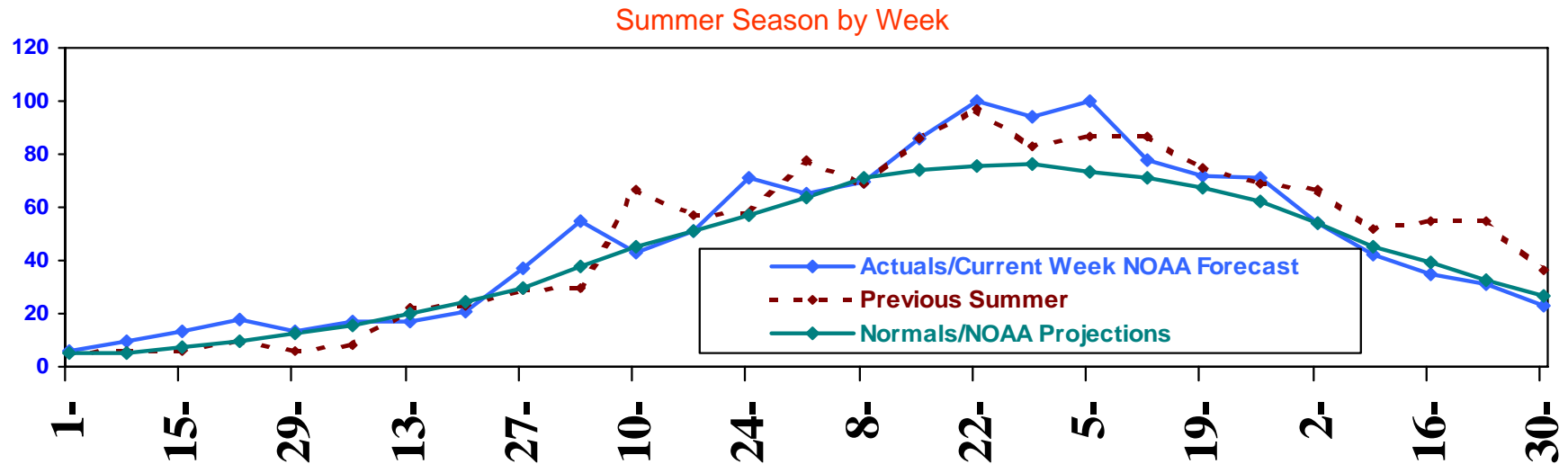
Draft Information--Validation in Process

## An Electric Power System



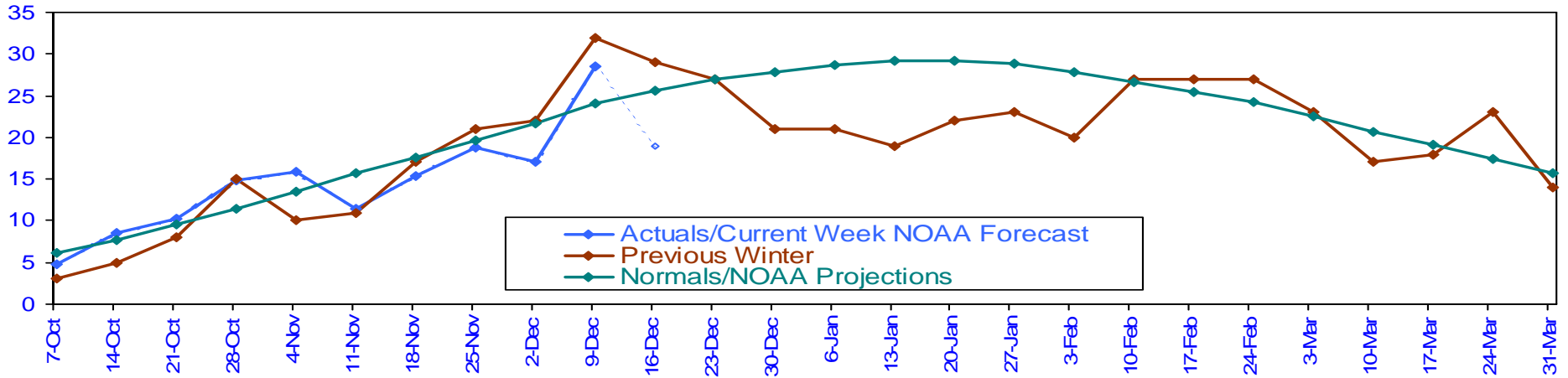
Source: Congressional Budget Office based on a figure from EPRI PEAC Corporation.

# Weather - U.S. Cooling Degree-Days (Daily average population-weighted)

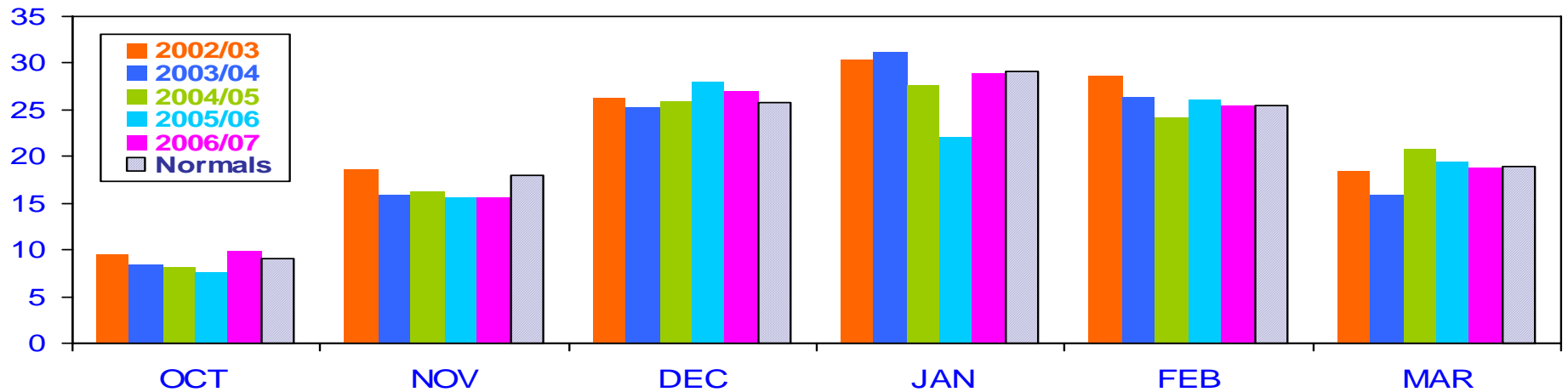


Source: National Oceanic and Atmospheric Administration, National Weather Service  
[http://www.ccc.ncep.noaa.gov/products/analysis\\_monitoring/cdus/degree\\_days/](http://www.ccc.ncep.noaa.gov/products/analysis_monitoring/cdus/degree_days/)

# Population-Weighted Heating Degree Days – Daily Average Basis



Winter Season by Month

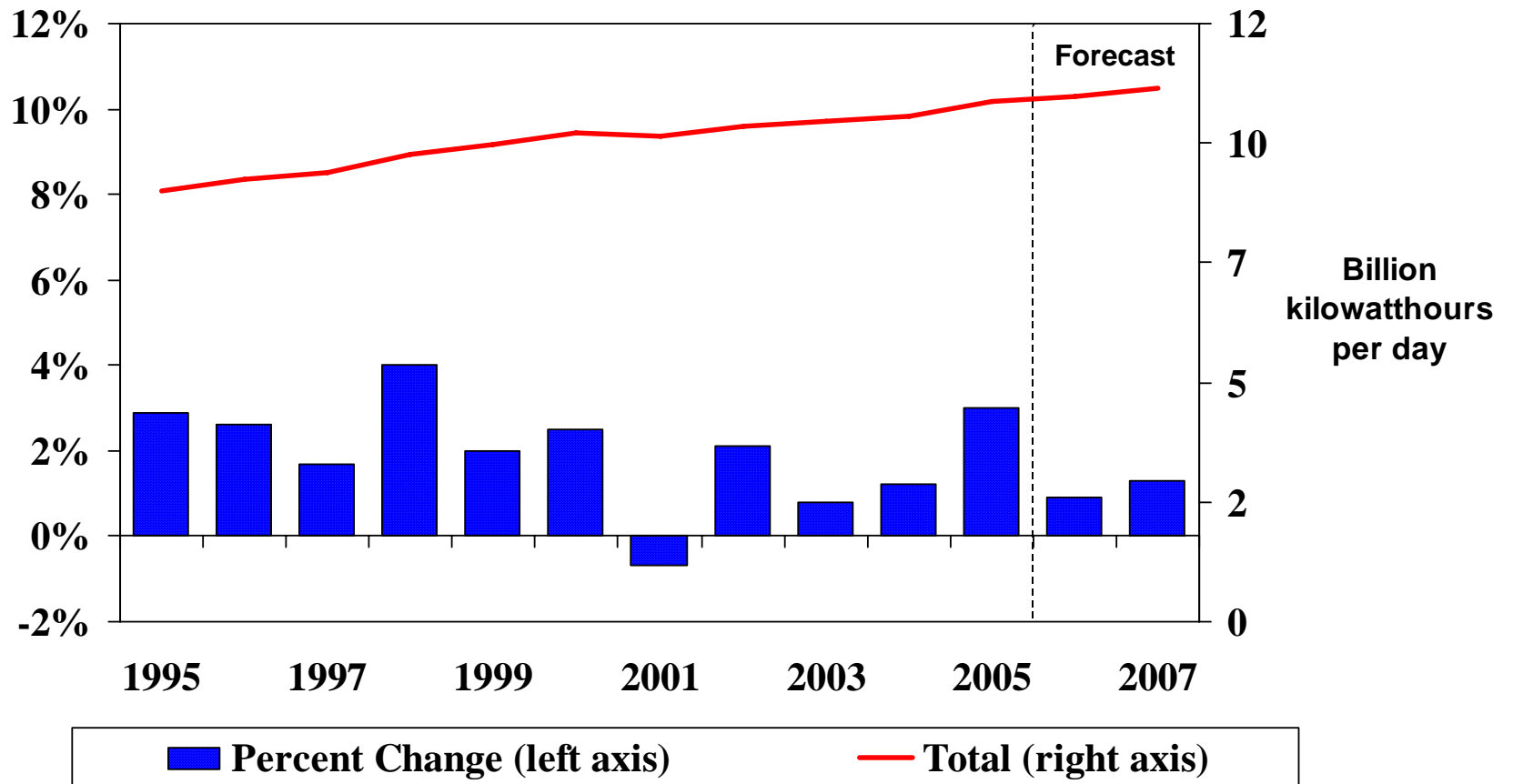


Source: National Oceanic and Atmospheric Administration, National Weather Service

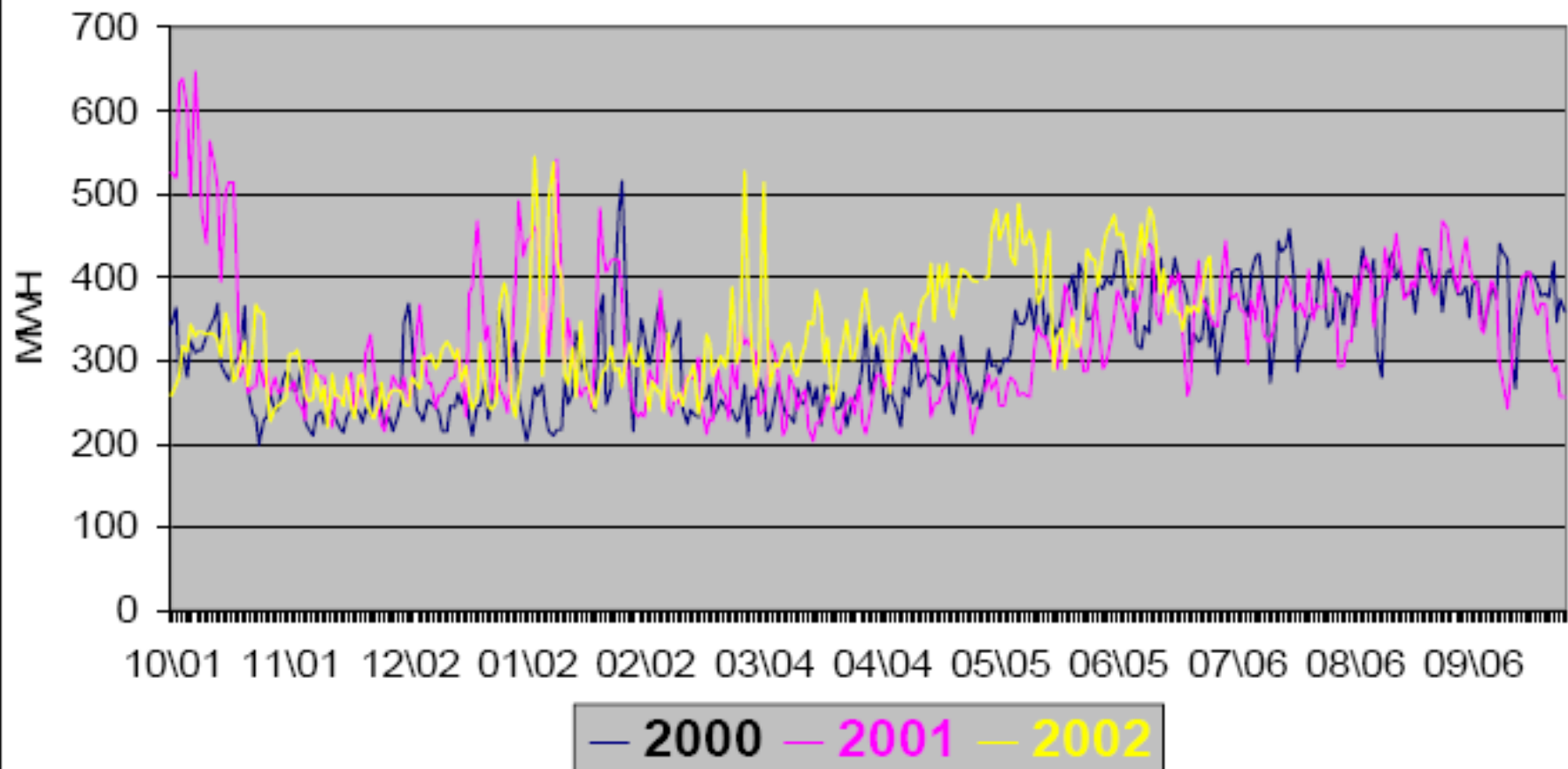
Short-Term Energy Outlook, December 2006



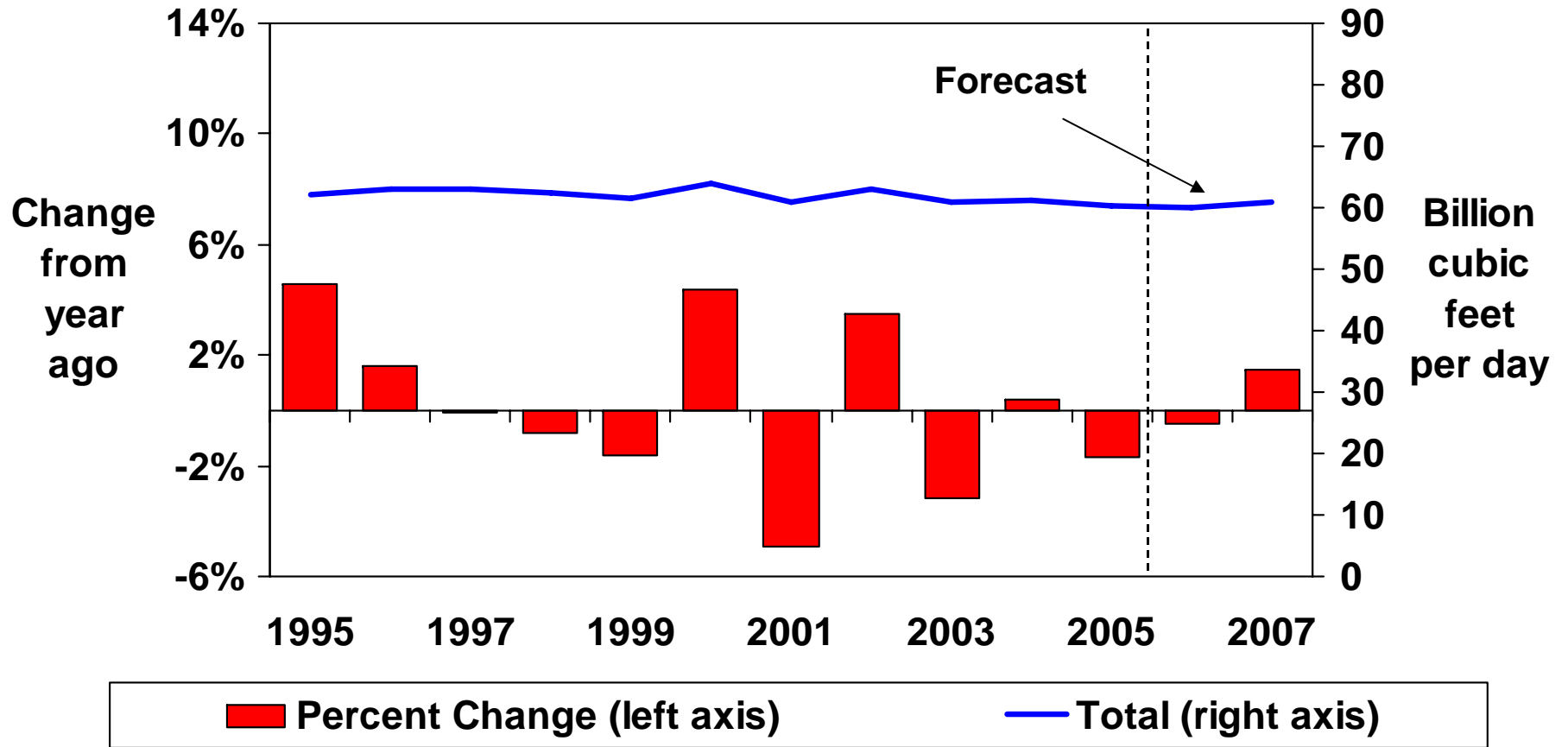
# Total U.S. Electricity Consumption Growth (Change from Previous Year)



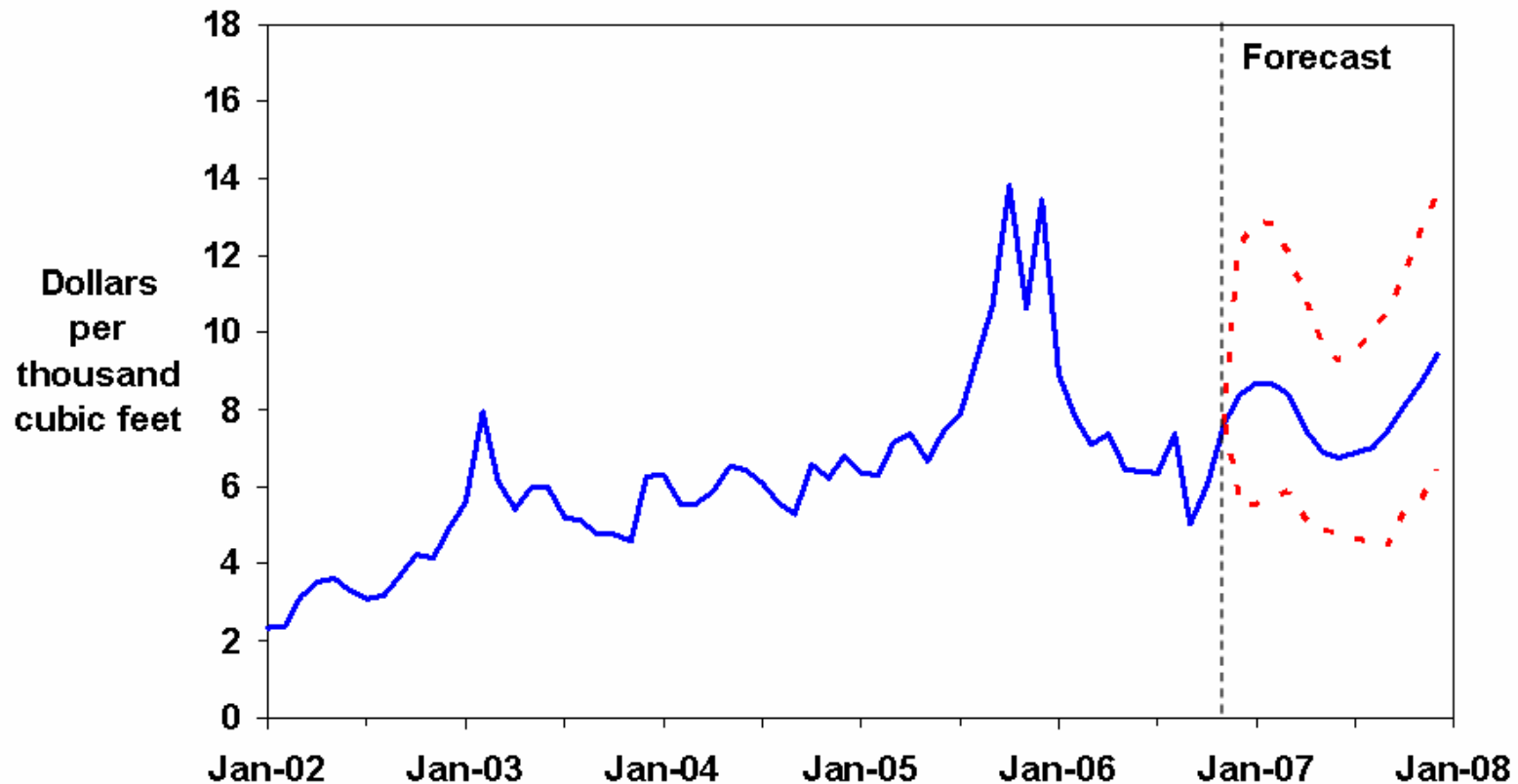
## Example of system peak variations over a three year period



# Total U.S. Natural Gas Consumption Growth

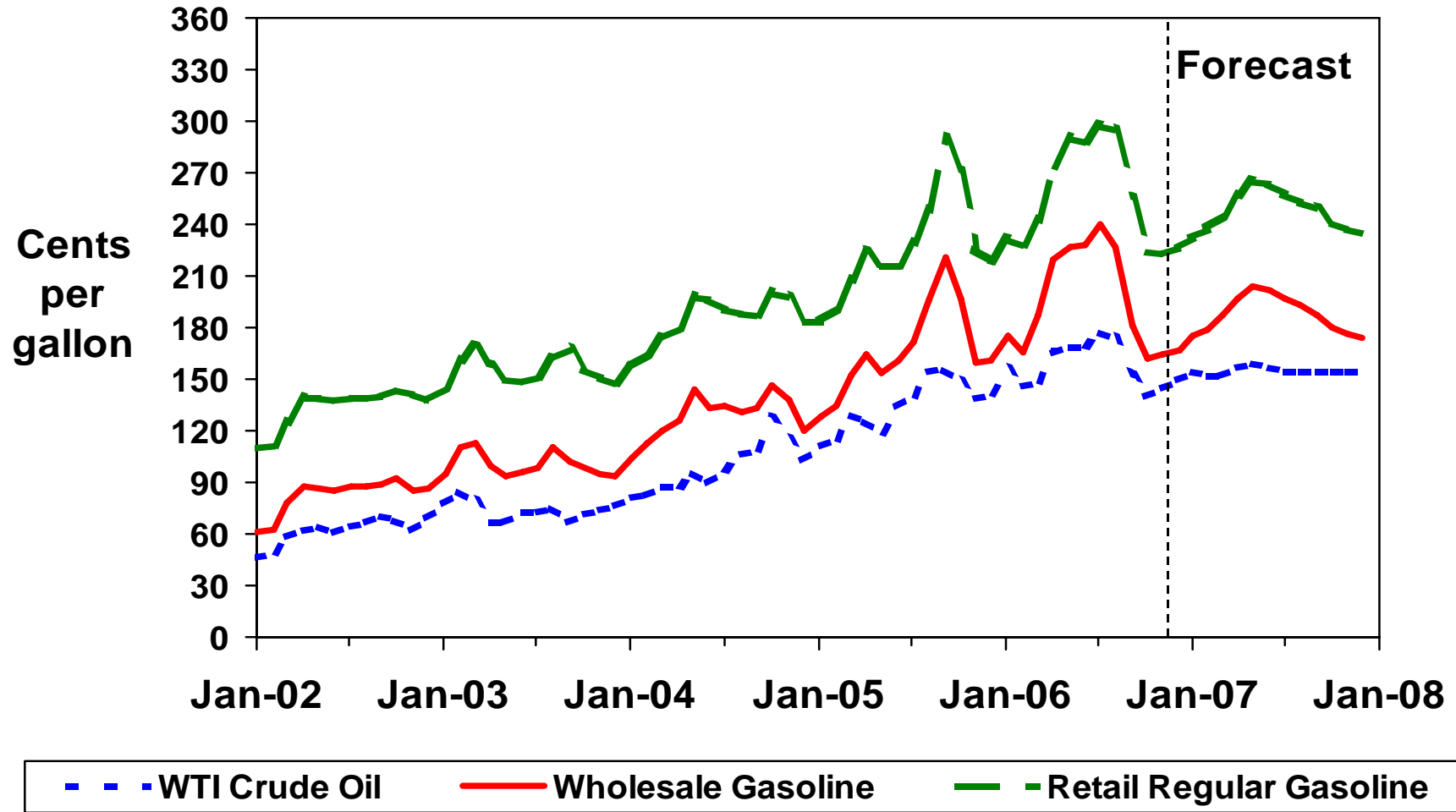


## Natural Gas Henry Hub Spot Prices (Base Case and 95% Confidence Interval\*)

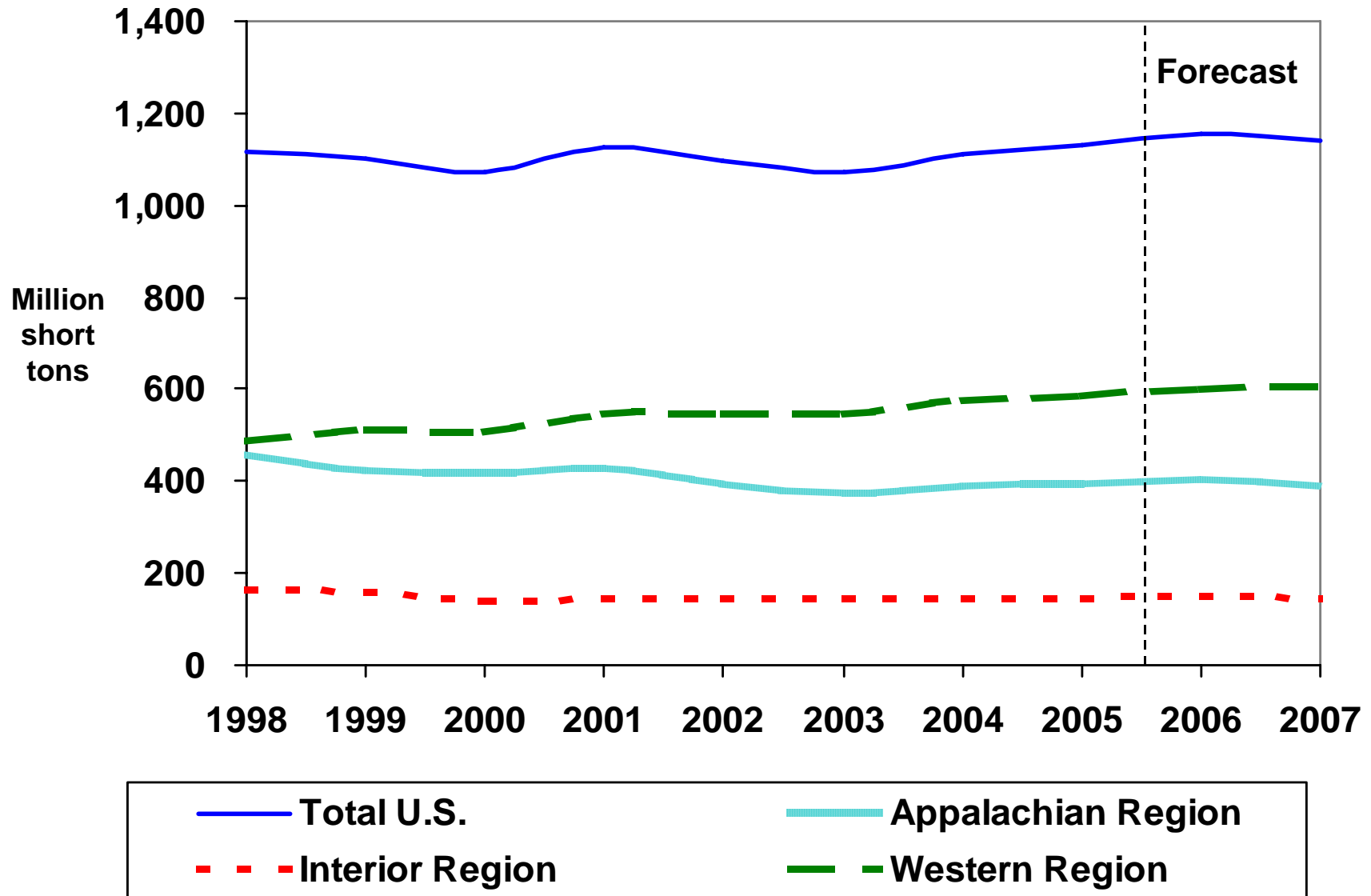


\*The confidence intervals show +/- 2 standard errors based on the properties of the model.

## Gasoline and Crude Oil Prices



# U.S. Coal Production



# Why Are Electricity Prices Increasing?

## “ Overview of Findings

*Fuel and Purchased Power Cost Increases Have Been Enormous and Are the Largest Cause of Recent Electric Cost Increases.* On an industry-wide basis, our analysis finds that fuel and purchased power costs account for roughly 95 percent of the cost increases experienced by utilities in the last five years. The increases in the cost of these fuels have been unprecedented by historical standards, affecting every major electric industry fuel source:

- Natural gas, which accounts for nearly 20 percent of all generation, experienced a more than 100-percent increase in spot prices between 2003 and 2005 and a more than 300-percent increase since 1999. Real natural gas prices are now at their highest level in modern history. High and volatile gas prices have a particularly strong impact on electricity prices because gas-fired generators set the prices for a large percentage of the time in many short-term or spot power markets around the country.
- Oil, which is still a significant utility fuel in several parts of the country, is now at record price levels. The prices of oil-based fuels delivered to electric generators rose about 50 percent between 2003 and 2005, and are now at the highest nominal levels ever recorded. Increased oil prices also have a significant impact on other fuel costs; for example, they drive up the costs of mining and shipping coal.
- Coal, which accounts for half of all power produced in the United States today, has risen 20 percent in delivered price in the last two years alone. In some areas, the increase has been much higher. For example, spot coal prices from the Powder River Basin have increased about 100 percent since 2003.
- The price of uranium, the primary component of nuclear fuel, which represents 19 percent of all generation, also has increased by about 40 percent since 2001.

These fuel price increases, in turn, have impacted the cost of power purchased by many utilities. The price of purchased spot power has increased between 200 and 300 percent in many power markets across the United States. Finally, the industry is using increasing amounts of renewable and distributed generation resources, which have valuable attributes but generally cost more than conventional energy sources. “

Brattle Group June,2006

Reprinted with the permission of the Edison Foundation

“Additional Generating Plants Will Be Needed To Meet Demand.

Increased Transmission Investments Are Necessary

Sales Growth, the Demand For Higher Quality Power, and Storm Recovery Costs Are Driving Distribution Investment. Industry spending on the distribution systems that deliver power to each customer has followed a generally steady upward trend for the last twenty years.

Environmental Investments Add Significant Costs. New environmental requirements...are prompting substantial environmental investments. ... These investments, while large, could be dwarfed by the costs of Complying with potential mandatory carbon dioxide (CO<sub>2</sub>) emission reductions,....

The Utility Industry’s Overall Financial Condition is Sound, Though Not As Secure As It Had Been Before Prior Periods of Capital Investment. With reasonable cost recovery, the industry as a whole should have the ability to make the necessary, cost-effective investments. However, the industry has proportionately less “headroom” to make investments without rate relief, and certain portions of the industry are already below investment grade and therefore cannot weather greater financial impairment.

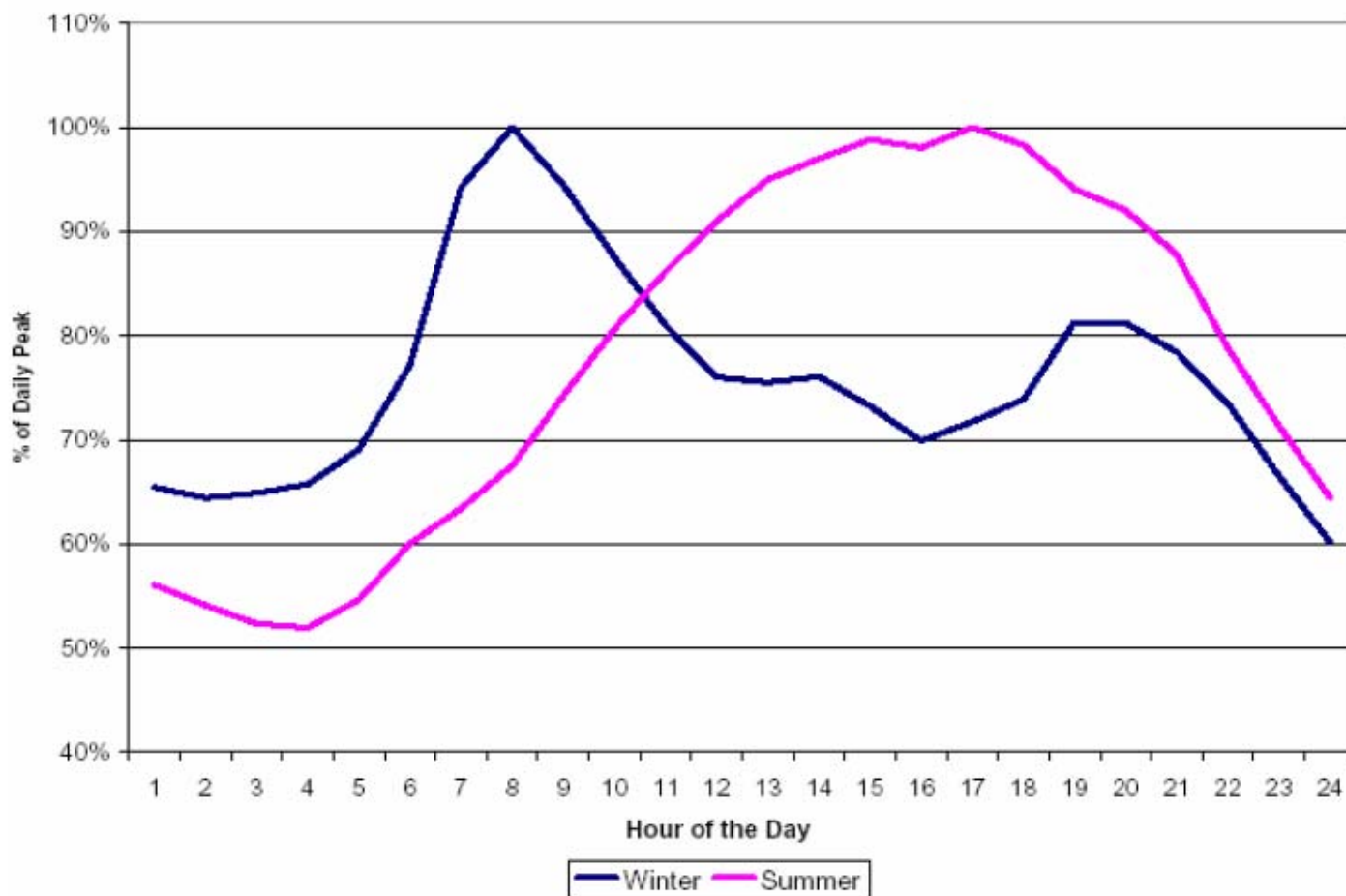
The overall picture emerging from these conclusions is that the electric power industry faces a situation in which significant investments are needed, and rate increases will be necessary to finance them. These investments will diversify supply away from natural gas, reduce future fuel costs, provide greater reliability and power quality, and lessen environmental impacts. Without these investments, one or more of these investment objectives will be impaired.”

Brattle Group June, 2006

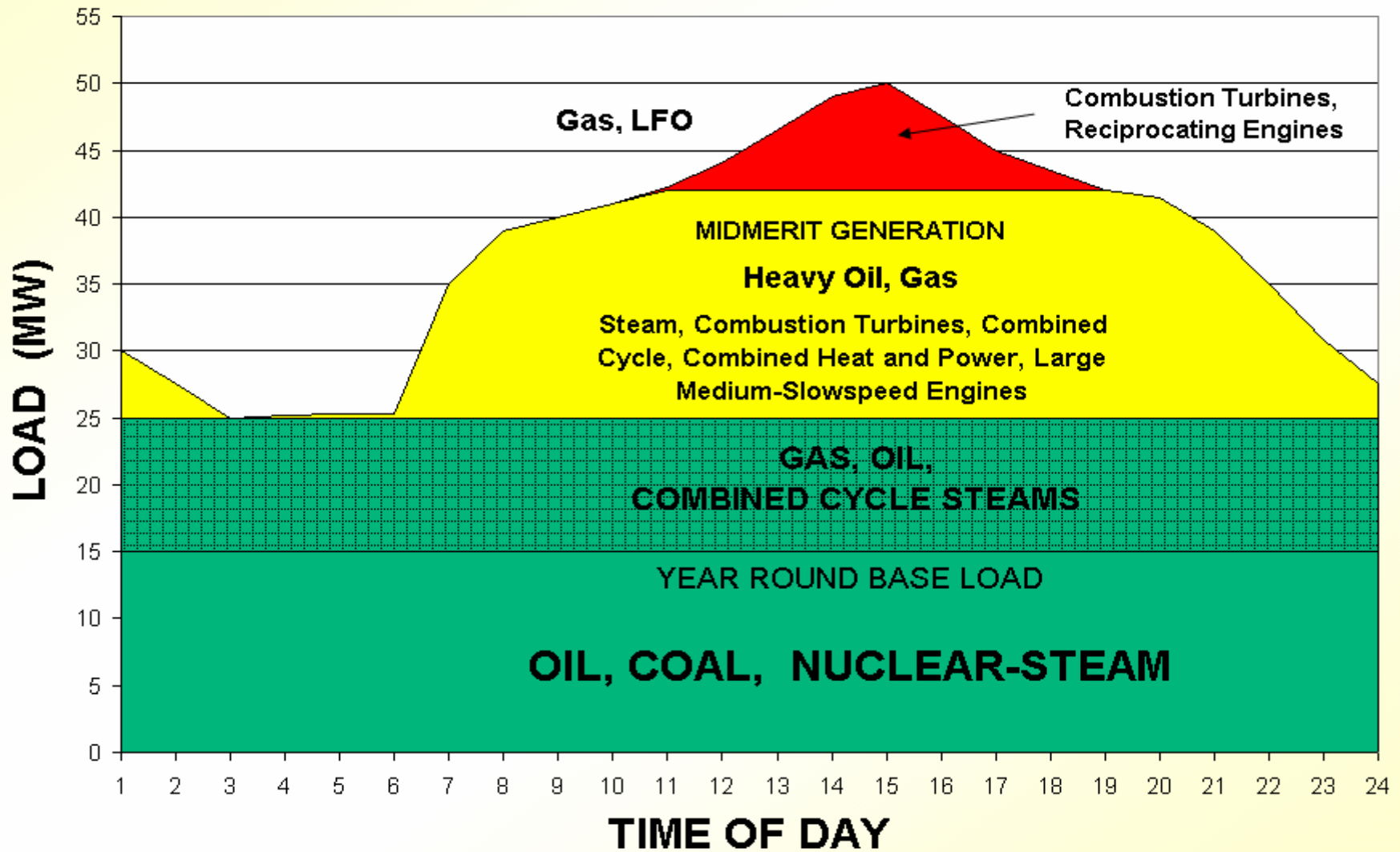
Reprinted with the permission of the Edison Foundation

**Figure 1: Typical Florida Daily Electric Load Shapes**

**Daily Load Shapes for Summer and Winter**

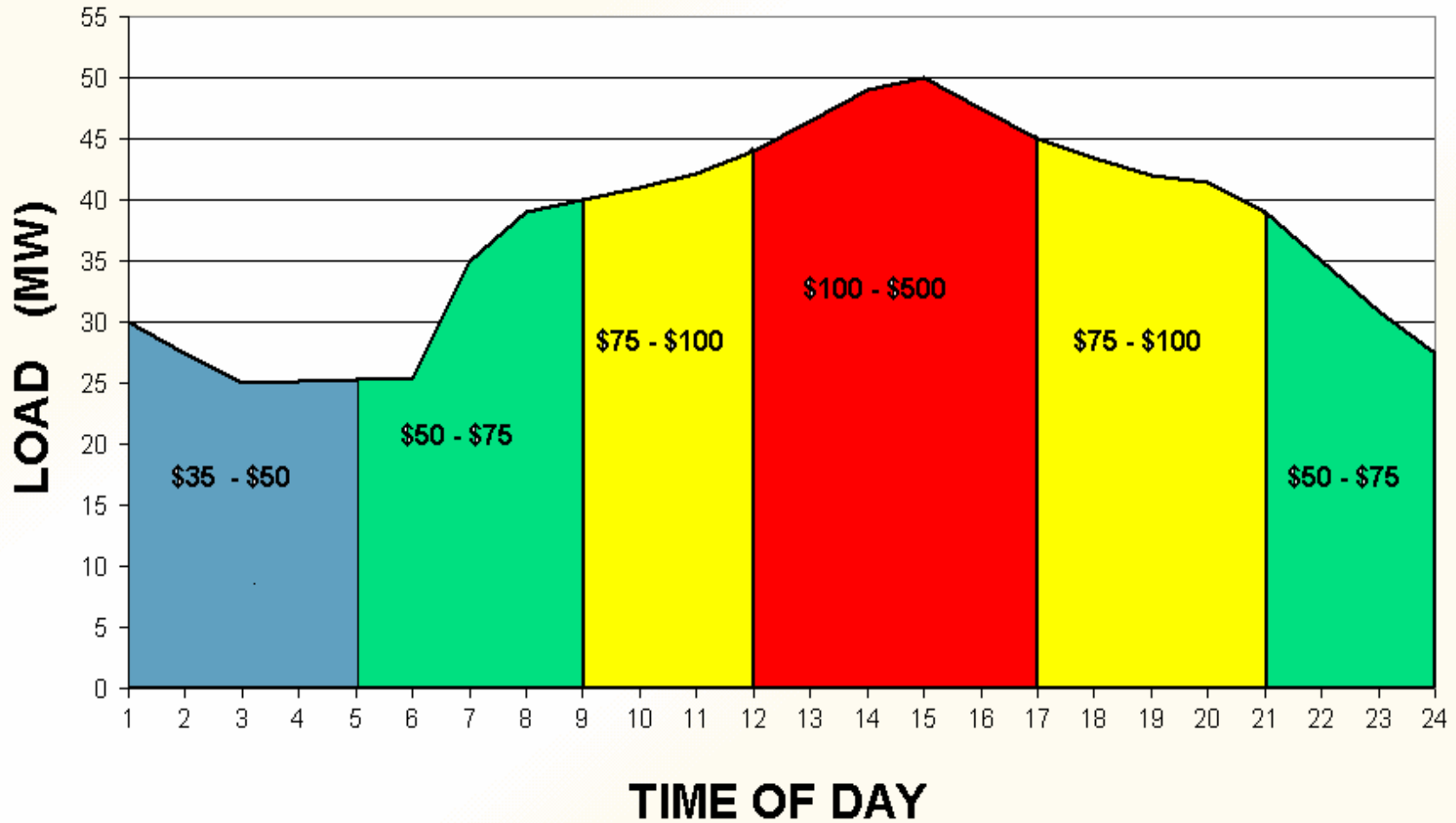


# Generation for Power Supply



Source: Downes and Associates

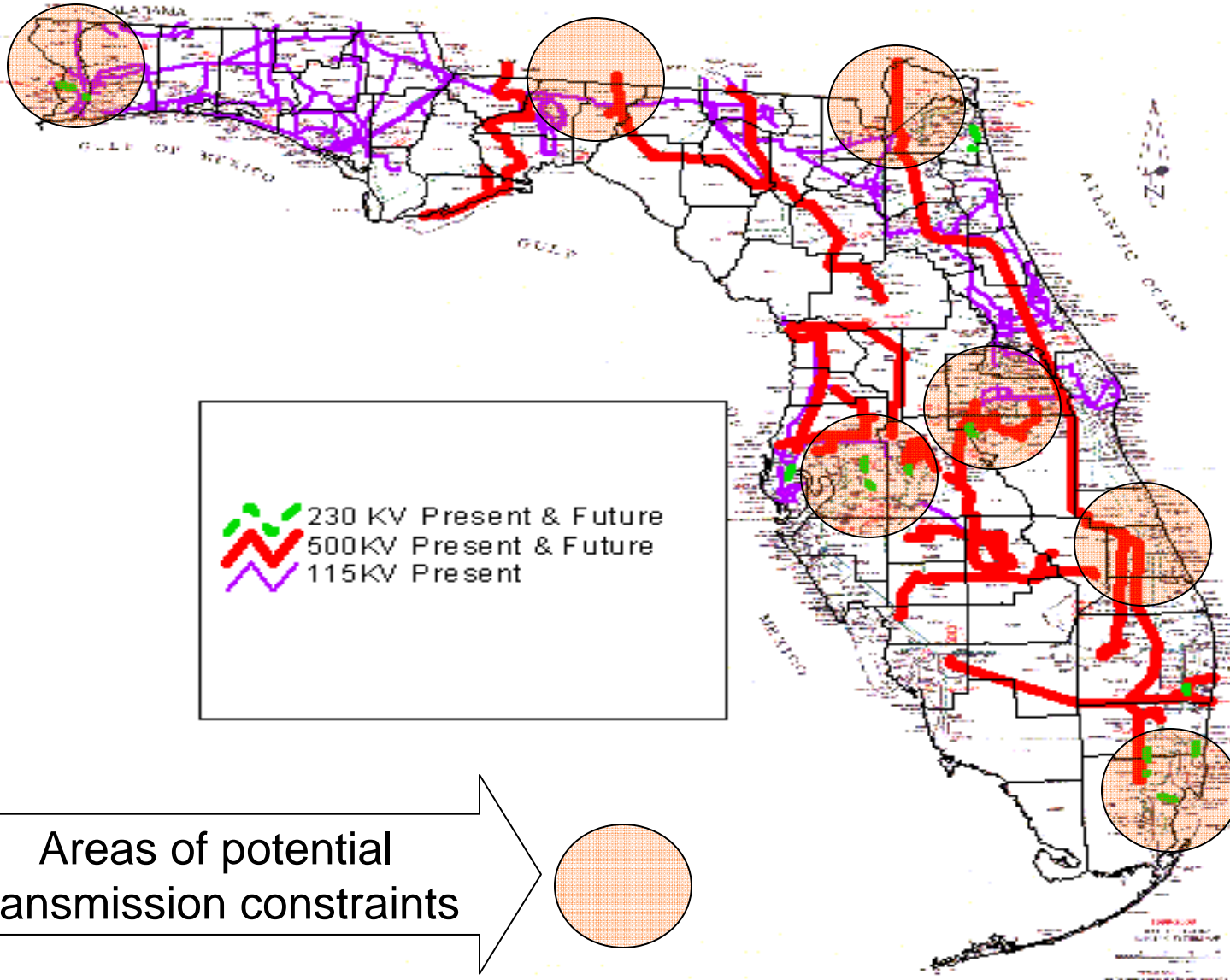
# Municipal Power Supply Cost



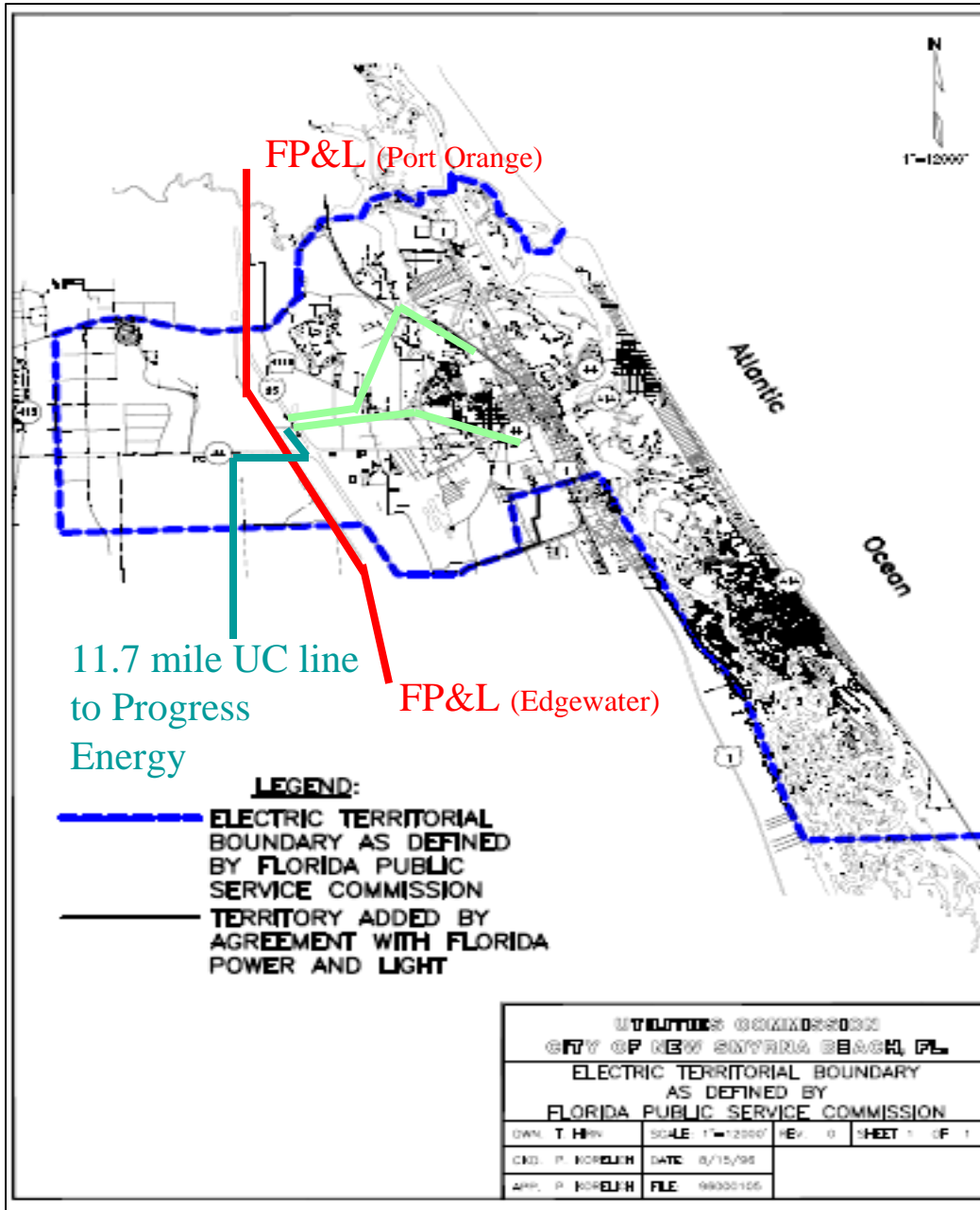
Source: Downes and Associates



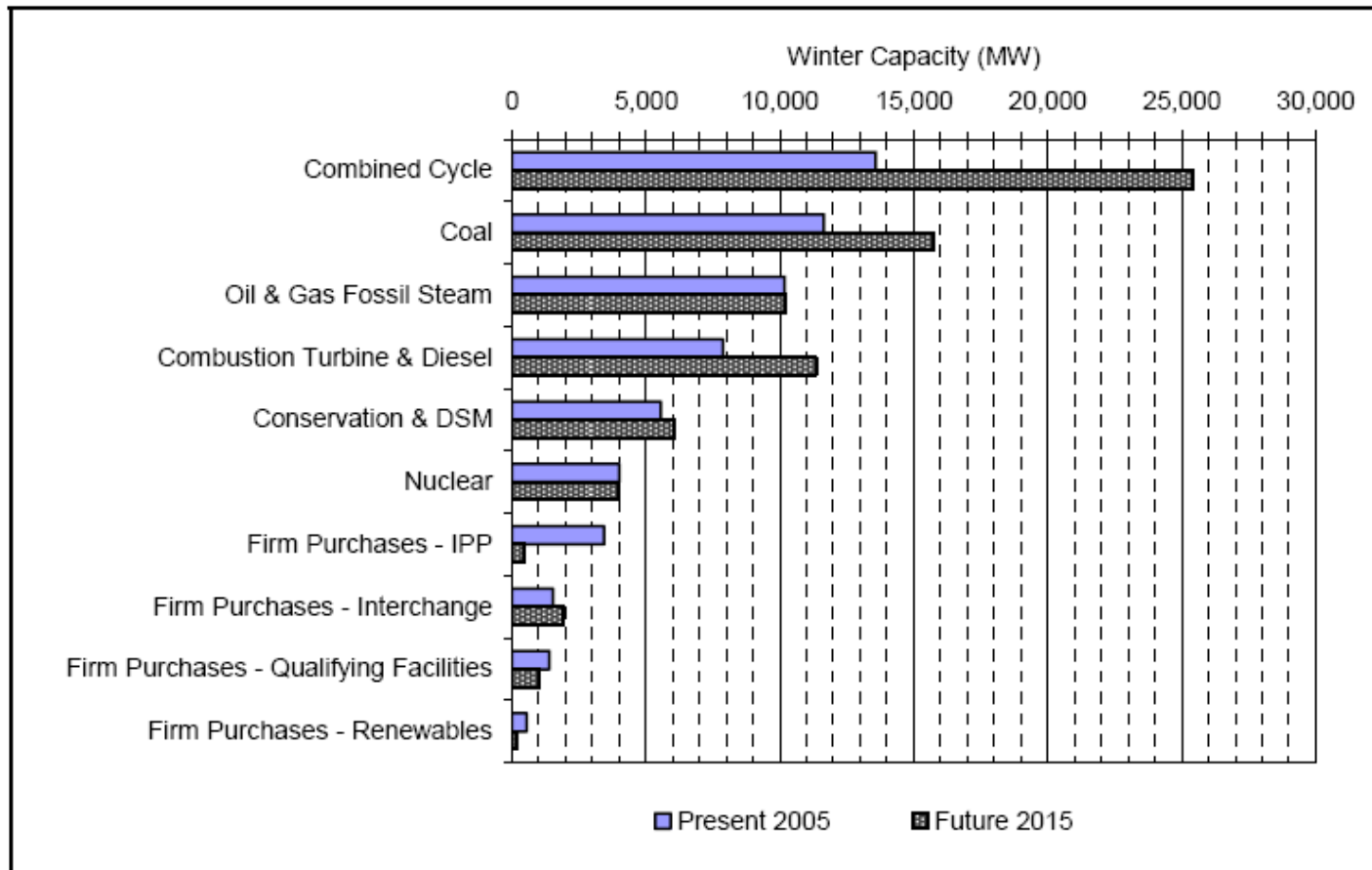
# Florida Transmission Grid 115 & 230 & 500 kV Lines



Areas of potential  
transmission constraints

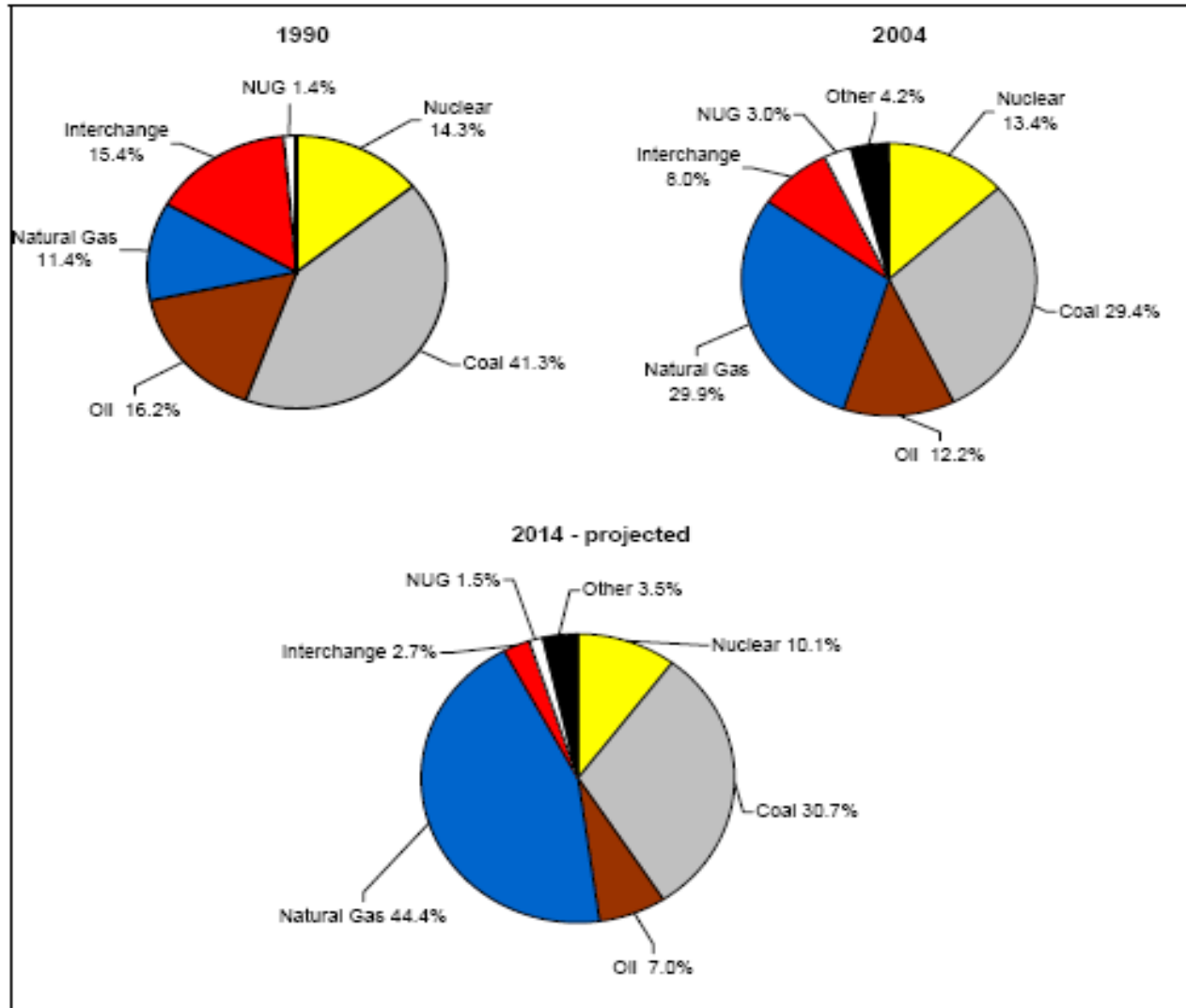


**Figure 2: Florida's Electric Utility Resource Mix**

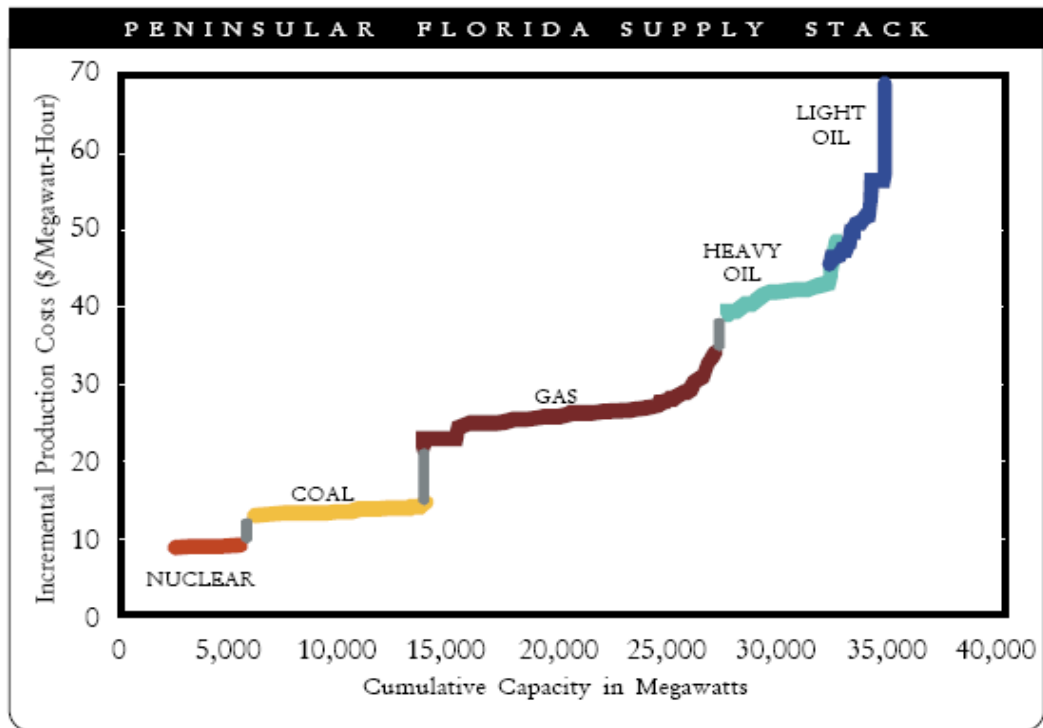


Note: IPP denotes Independent Power Producer

Figure 5. State of Florida – Energy Generation by Fuel Type -- 1990, 2004, and 2014



*Estimated*



Source-Florida Energy Assessment

## Florida Generation Listing



Microsoft Word  
Document

Table 2 lists all proposed generating units in the *Ten-Year Site Plans* that meet the criteria for requiring certification under Florida's Power Plant Siting Act. Solid fuel units are in *bold italics*.

*Table 2. Reporting Utilities – Proposed Generating Units Requiring Certification*

UTILITY	GENERATING UNIT - NAME AND TYPE	WINTER CAPACITY (MW)	PROPOSED IN-SERVICE DATE
Florida Municipal Power Agency	Treasure Coast CC Unit <sup>5</sup>	318	6/2008
Seminole Electric Cooperative	Unsited CC Unit 1	182	11/2008
Seminole Electric Cooperative	Unsited CC Unit 2	182	5/2009
Florida Power & Light Company	West County Unit 1 CC	1,181	6/2009
Progress Energy Florida	Hines Unit 5 CC	548	12/2009
Florida Power & Light Company	West County Unit 2 CC 2	1,181	6/2010
Progress Energy Florida	Hines Unit 6 CC	548	12/2010
<i>Orlando Utilities Commission</i>	<i>Stanton IGCC Unit <sup>6</sup></i>	<i>311</i>	<i>1/2011</i>
<i>Gainesville Regional Utilities</i>	<i>Deerhaven Unit 3 CFB <sup>7</sup></i>	<i>220</i>	<i>6/2011</i>
<i>Florida Municipal Power Agency / JEA / Reedy Creek / City of Tallahassee</i>	<i>North Florida Power Project PC Unit <sup>8</sup></i>	<i>800</i>	<i>3/2012</i>
Progress Energy Florida	Unsited CC Unit 1	548	5/2012
<i>Seminole Electric Cooperative</i>	<i>Seminole Unit 3 PC</i>	<i>750</i>	<i>5/2012</i>
<i>Florida Power &amp; Light Company</i>	<i>Unsited PC Unit 1</i>	<i>855</i>	<i>6/2012</i>
JEA	<i>Unsited CFB Unit</i>	<i>250</i>	<i>12/2012</i>
<i>Florida Power &amp; Light Company</i>	<i>Unsited PC Unit 2</i>	<i>855</i>	<i>6/2013</i>
Seminole Electric Cooperative	Unsited CC Units 3 and 4	364 (total)	11/2013
Tampa Electric Company	Unsited CC Unit 1	502	1/2013
Progress Energy Florida	Unsited CC Unit 2	548	12/2013
Progress Energy Florida	Unsited CC Unit 3	548	5/2014
Seminole Electric Cooperative	Unsited CC Unit 5	182	11/2014
<b>TOTAL REQUIRING CERTIFICATION</b>		<b>1780</b>	

<sup>5</sup> Combined cycle natural gas-fired generating unit

<sup>6</sup> Integrated coal gasification combined cycle generating unit

<sup>7</sup> Circulating fluidized bed, coal-fired generating unit

<sup>8</sup> Pulverized coal-fired generating unit. Based on updated data from August 3, 2005 Commission workshop. TAL's participation in the project is tentative, pending a final decision later this year by the city commission.

# UC Local Generation

1000 Field Street (Field Street Generating Plant)		[ 29d 00' 56" N 80d 55' 51" W]			
Nameplate	Rating (kVA)	Fuel Type	Manufacturer	Year In-Service	Planned Retirement
Field St #1	27,471	#2 Fuel Oil	Alsthom	2001	N/A
Field St #2	25,588	#2 Fuel Oil	Hitachi	2001	N/A

305 Smith Street (Smith Street Generating Station)		[ 29d 01' 04" N 80d 55' 04" W]			
Nameplate	Rating (kW)	Fuel Type	Manufacturer	Year In-Service	Planned Retirement
Smith St #3	840	#2 Fuel Oil	Fairbanks-Morse	1947	N/A
Smith St #4	1,000	#2 Fuel Oil	Superior	1951	N/A
Smith St #6	1,800	#2 Fuel Oil	Enterprise	1955	N/A
Smith St #7	1,800	#2 Fuel Oil	Enterprise	1955	N/A
Smith St #8	1,100	#2 Fuel Oil	GM Cleveland	1962	N/A
Smith St #9	2,000	#2 Fuel Oil	GM-EMD	1966	N/A
Smith St #10	2,000	#2 Fuel Oil	GM-EMD	1966	N/A
Smith St #11	2,000	#2 Fuel Oil	GM-EMD	1966	N/A

2495 North Dixie Freeway (W.E. Swoope Generating Station)		[ 29d 03' 47" N 80d 56' 25" W]			
Nameplate	Rating (kW)	Fuel Type	Manufacturer	Year In-Service	Planned Retirement
Swoope #2	820	#2 Fuel Oil	Fairbanks-Morse	1981	N/A
Swoope #3	2,050	#2 Fuel Oil	Fairbanks-Morse	1983	N/A
Swoope #4	2,275	#2 Fuel Oil	Fairbanks-Morse	1983	N/A

## UNIT HEAT RATES

Field Street #1 - 16,800	Smith Street Baseload units (#3,4,6,7,8) -12,300	Swoope #2 - 11,867
Field Street #2 - 16,800	Smith Street Peakers (#9,10,11) -11,030	Swoope #3 - 11,183
		Swoope #4 - 11,618

## RUN TIMES (HOURS OF GENERATION)

TOTAL Run Hours Calendar 2000	SWP 845	SS 1398	FS 48
TOTAL Run Hours Calendar 2001	SWP 108	SS 275	FS 43
TOTAL Run Hours Calendar 2002	SWP 41	SS 190	FS 57
TOTAL Run Hours Calendar 2003	SWP 124	SS 199	FS 51
TOTAL Run Hours Calendar 2004	SWP 10	SS 380	FS 26
TOTAL Run Hours Calendar 2005	SWP 16	SS 227	FS 13
TOTAL Run Hours Calendar 2006 YTD	SWP 4	SS 117	FS 14

UTILITIES COMMISSION, CITY OF NEW SMYRNA BEACH, FLORIDA  
SYSTEM OPERATIONS

MONTH: December-06

DAILY NET ENERGY FOR LOAD							
Date	CR-3 FPC/NSB	FMPA ST. LUCIE	FPC PR	TECO D	LOCAL GENERATION	MARKET INTERCHANGE	DAILY TOTAL
1	120	173	293	235	-1	131	951
2	120	173	293	235	-1	117	937
3	120	173	243	235	-1	117	887
4	120	173	228	235	0	117	873
5	120	174	229	235	-1	120	877
6	120	173	205	235	-1	127	859
7	120	173	241	235	-1	78	846
8	120	173	270	235	-1	220	1,017
9	120	174	272	235	0	120	921
10	120	157	294	235	-1	40	845
11	120	159	264	235	-1	40	817
12	120	165	274	235	-1	20	813
13	120	175	282	235	0	20	832
14	120	172	281	235	-1	20	827
15	120	173	270	235	-1	68	865
16	120	165	269	235	-1	61	849
17	120	173	232	235	-1	61	820
18	120	174	259	235	0	61	849
19	120	161	276	235	-1	61	852
20	120	166	266	235	-1	66	852
21	120	167	280	235	-1	70	871
22	120	166	278	235	-1	83	881
23	120	168	313	235	0	83	919
24	120	168	276	235	-1	74	872
25	120	168	268	235	-1	91	881
26	120	169	270	235	-1	70	863
27	120	167	341	235	-1	192	1,054
28	120	168	344	235	0	110	977
29	120	169	278	235	-1	70	871
30	120	168	280	235	-1	109	911
31	120	168	292	235	-1	114	928
TOTAL	3,720	5,245	8,461	7,285	-25	2,731	27,417

AVAILABLE CAPACITY AT PEAK					
DAILY PEAK	CR-3 FPC/NSB	FMPA ST. LUCIE	FPC PR	TECO D	REMAINING CAPACITY
53	5	7	15	10	16
47	5	7	15	10	10
48	5	7	15	10	11
46	5	7	15	10	9
45	5	7	15	10	8
45	5	7	15	10	8
45	5	7	15	10	8
55	5	7	15	10	18
45	5	7	15	10	8
44	5	7	15	10	7
46	5	7	15	10	9
45	5	7	15	10	8
48	5	7	15	10	11
45	5	7	15	10	8
43	5	7	15	10	6
45	5	7	15	10	8
46	5	7	15	10	9
48	5	7	15	10	11
48	5	7	15	10	11
46	5	7	15	10	9
48	5	7	15	10	11
52	5	7	15	10	15
47	5	7	15	10	10
47	5	7	15	10	10
47	5	7	15	10	10
47	5	7	15	10	10
58	5	7	15	10	21
46	5	7	15	10	9
47	5	7	15	10	10
50	5	7	15	10	13
52	5	7	15	10	15

CONTRACT TERMS

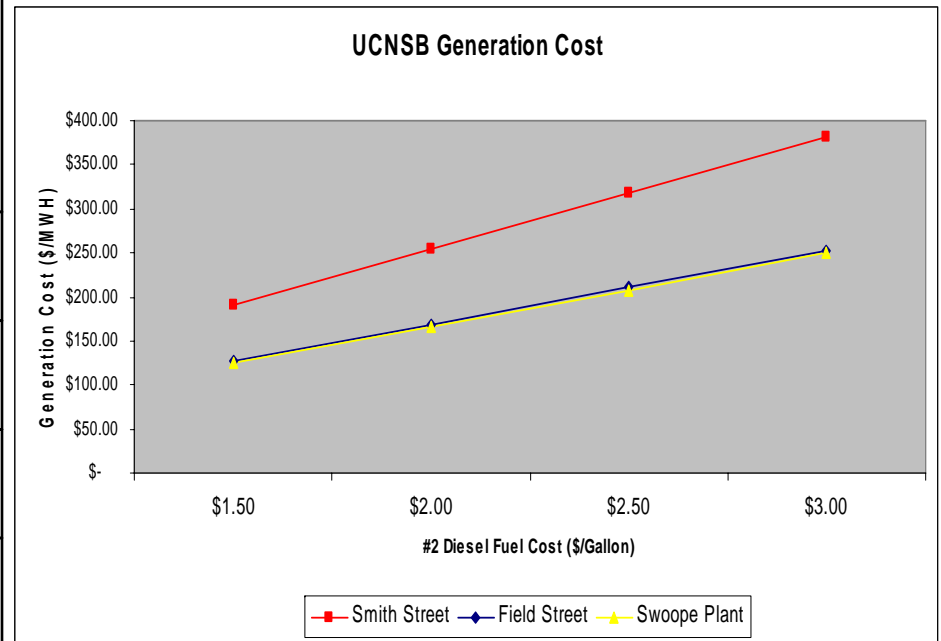
- FR -- Full requirement service agreement
- PR -- Partial requirement service agreement
- Schd D -- Long term firm capacity and energy interchange agreement
- Schd E -- Non-Firm capacity and energy interchange agreement
- Schd F -- Long term non-firm capacity and energy interchange agreement
- Schd G -- Back-up reserve service
- Schd J -- Contract which the terms and conditions are negotiated yearly
- UPS -- Unit Power Sale

## Nuclear Costs Based on FY2006

CR-3 Fuel		\$235,131
CR-3 Cap Imp and O&M		\$1,066,579
<hr/>		
CR-3 TOTAL		\$1,301,710
CR-3 Net Energy	33,467 MWH	
<b>Delivered Energy Cost</b>		<b>\$38.90/MWH</b> (without decommissioning funding)
Decommissioning Fund contributions for FY2006		\$232,547
Revised CR-3 TOTAL		\$1,534,257
<hr/>		
<b>Delivered Energy Cost</b>		<b>\$45.84/MWH</b> (with decommissioning funding)
FMPA St. Lucie Fuel		\$643,419
FMPA/St. Lucie Nonfuel		\$2,700,736
<hr/>		
FMPA/St. Lucie TOTAL		\$3,344,155
FMPA/St. Lucie Net Energy	51,501 MWH	
<b>Delivered Energy Cost</b>		<b>\$64.93/MWH</b>

**Estimated UC Existing Generation  
Cost (\$/MWH)**

#2 Diesel Fuel Cost (\$/Gallon)	Field Street	Smith Street	Swoope Plant
\$ 1.50	\$ 190.38	\$ 126.44	\$ 124.82
\$ 2.00	\$ 253.85	\$ 168.58	\$ 166.43
\$ 2.50	\$ 317.31	\$ 210.73	\$ 208.03
\$ 3.00	\$ 380.77	\$ 252.87	\$ 249.64



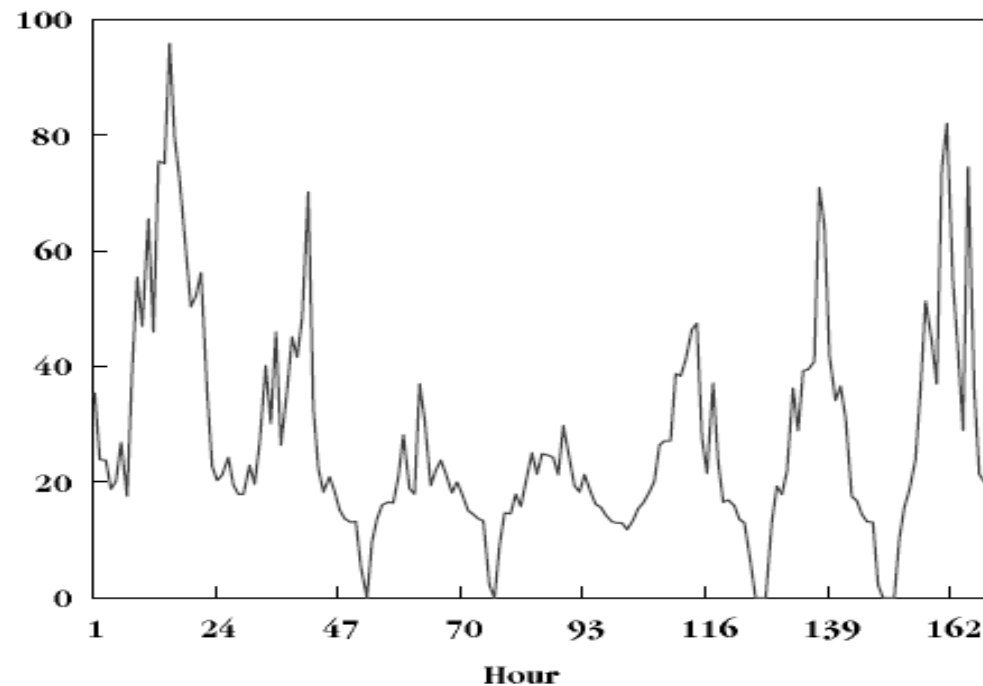
FY 2005 Total Sales 371, 219,399 kwh Total Revenues \$34,544,134.29 9.31 cents/kwh

---

## Volatility in the Spot Price of Electricity

---

(Dollars per megawatt-hour)



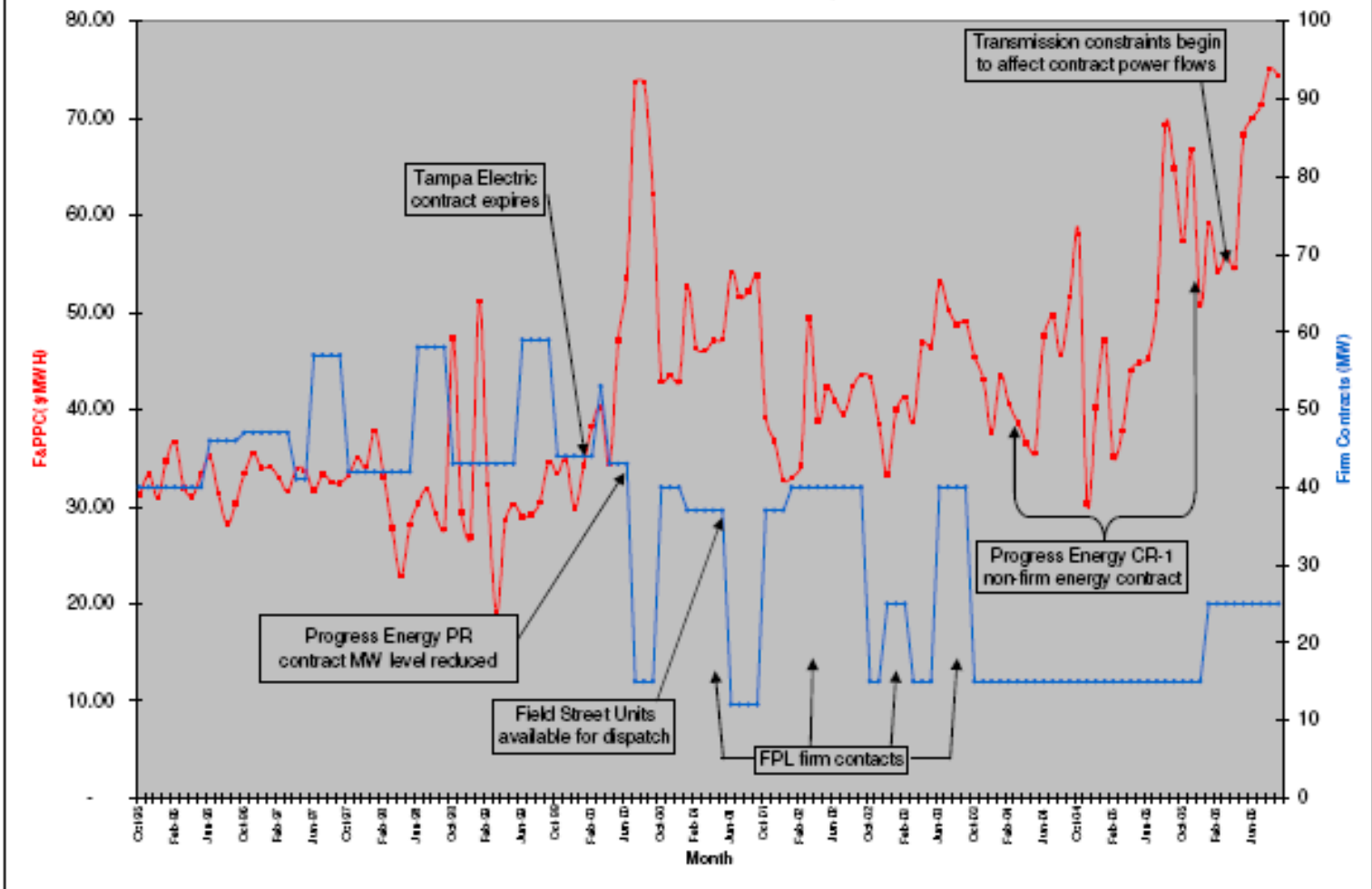
Source: Congressional Budget Office based on data from the PJM Independent System Operator.

Notes: The figure shows the PJM zone-weighted hourly spot price of electricity over the week of August 5, 2002. PJM is the organization responsible for wholesale power sales and transmission in major portions of five mid-Atlantic states and the District of Columbia. The data are available at [www.pjm.com](http://www.pjm.com).

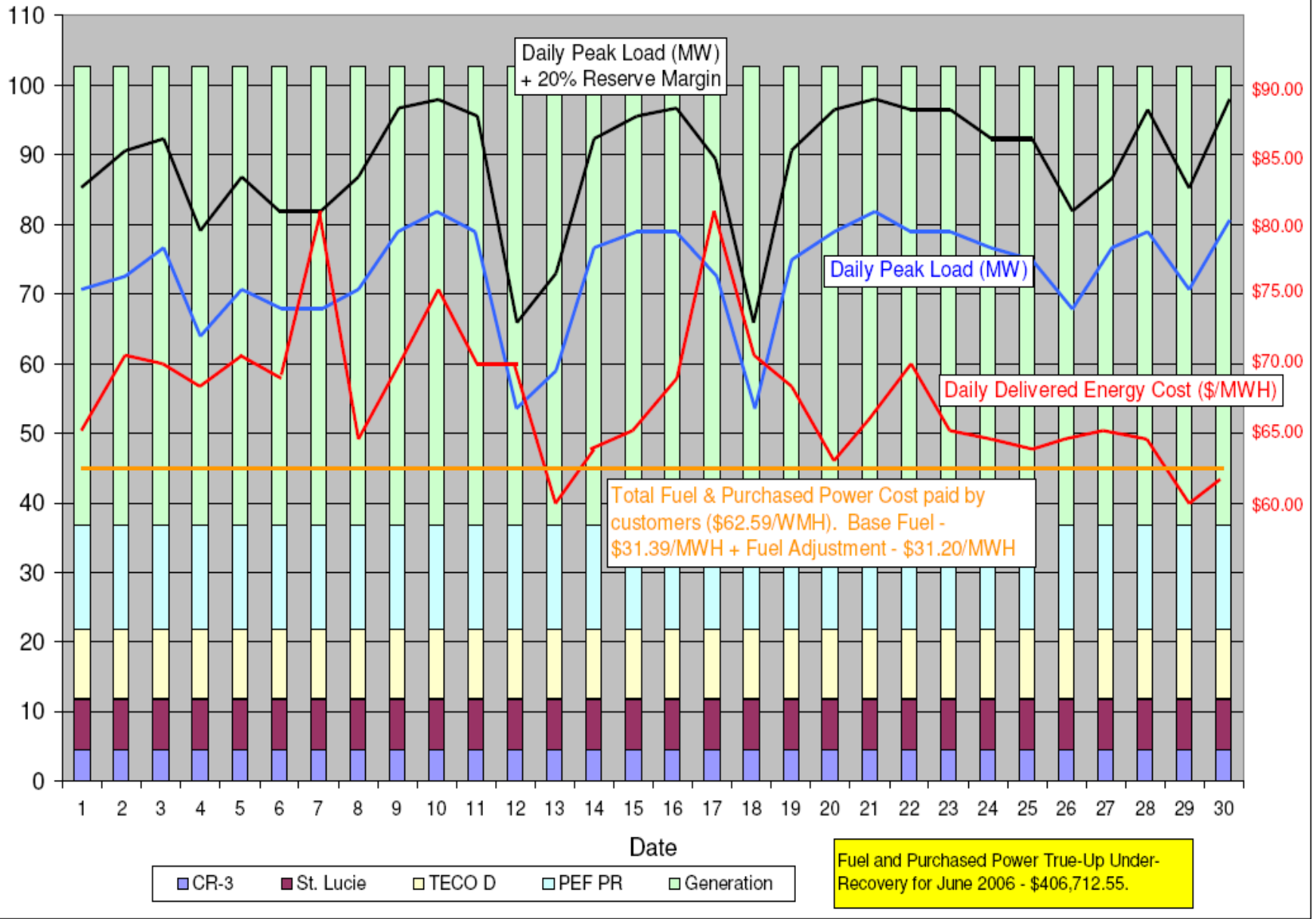
Hourly prices can fall as low as zero because some generators that must run continuously, such as nuclear plants, offer to supply electricity regardless of the price. During some hours, those generators' output may exceed the total demand, resulting in a clearing price of zero.

---

Monthly Fuel & Purchased Power Costs vs. Firm and Nonfirm Capacity



### June 2006 Daily Peak Demands and Available Firm Capacity Resources



UTILITIES COMMISSION, CITY OF NEW SMYRNA BEACH, FLORIDA  
SYSTEM OPERATIONS DIVISION  
E.C.A.C. TRUE-UP CALCULATION

5-Jan-07

ENERGY MONTH	#1 FUEL AND PURCHASED POWER COST \$	#2 PREV. MO. TRUE-UP \$	#3 FUEL AND PURCHASED POWER COST WITH TRUE-UP \$	#4 NET RETAIL SALES kWh	#5 BASE FUEL RECOVERY \$	#6 E.C.A.C. REC. W/O 6% \$	#7 TOTAL FUEL & PURCHASED POWER RECOVERY \$	#8 TRUE-UP (OVER) UNDER RECOVERY MONTH \$	#9 TRUE-UP (OVER) UNDER RECOVERY \$
Sep-05	\$2,529,605.36	\$2,106,820.66	\$4,636,426.02	42,221,237	\$1,405,967.19	\$681,839.06	\$2,087,806.25	\$441,799.11	\$2,548,619.77
Oct-05	\$1,935,364.29	\$2,548,619.77	\$4,483,984.06	37,059,776	\$1,255,955.81	\$598,485.61	\$1,854,441.42	\$80,922.87	\$2,629,542.64
Nov-05	\$1,719,072.73	\$2,629,542.64	\$4,348,615.37	26,602,689	\$901,565.13	\$780,203.51	\$1,681,768.64	\$37,304.09	\$2,666,846.73
Dec-05	\$1,457,521.28	\$2,666,846.73	\$4,124,368.01	25,328,231	\$858,373.75	\$742,826.21	\$1,601,199.96	(\$143,678.68)	\$2,523,168.05
Jan-06	\$1,700,006.28	\$2,523,168.05	\$4,223,174.33	28,685,022	\$972,135.40	\$841,274.16	\$1,813,409.56	(\$113,403.28)	\$2,409,764.77
Feb-06	\$1,531,735.97	\$2,409,764.77	\$3,941,500.74	25,254,574	\$855,877.51	\$740,666.00	\$1,596,543.51	(\$64,907.54)	\$2,344,957.23
Mar-06	\$1,562,051.16	\$2,344,957.23	\$3,907,008.39	27,186,594	\$921,353.67	\$797,328.27	\$1,718,681.94	(\$156,630.78)	\$2,188,326.45
Apr-06	\$1,649,978.70	\$2,188,326.45	\$3,838,305.15	26,450,323	\$896,401.45	\$775,734.92	\$1,672,136.37	(\$22,157.67)	\$2,166,168.78
May-06	\$2,400,202.43	\$2,166,168.78	\$4,566,371.21	29,392,523	\$996,112.60	\$862,023.74	\$1,858,136.34	\$542,066.09	\$2,708,234.87
Jun-06	\$2,750,984.15	\$2,708,234.87	\$5,459,219.02	37,082,347	\$1,256,720.74	\$1,087,550.86	\$2,344,271.60	\$406,712.55	\$3,114,947.42
Jul-06	\$3,152,045.52	\$3,114,947.42	\$6,266,992.94	38,810,964	\$1,315,303.57	\$1,139,247.72	\$2,453,551.29	\$698,494.23	\$3,813,441.65
Aug-06	\$3,227,403.23	\$3,813,441.65	\$7,040,844.88	42,014,724	\$1,423,879.00	\$1,232,207.58	\$2,656,086.58	\$571,316.65	\$4,384,758.30

COL. #1 FROM MONTHLY FUEL & ENERGY DATA FORMS  
COL. #2 FROM TRUE-UP CALCULATION  
COL. #3 COL. #1 + COL. #2  
COL. #4 FROM CONSOLIDATED SALES REPORT  
COL. #5 BASE FUEL COST X SYSTEM LOSS FACTOR X SALES (COL. #4)

September, 2005	0.03139	1.0607	0.0333 X SALES
Oct 2005/Sep 2006	0.03139	1.0798	0.03389 X SALES

COL. #6 kWh SALES X MONTHLY FPPCAC / 1000 / 1.06383  
COL. #7 COL. #5 + COL. #6 = COL. #7  
COL. #8 COL. #1 - COL. #7 = COL. #8  
COL. #9 COL. #3 - COL. #7 = COL. #9

FPPCAC \$/1000 kWh

\$17.18	Sep-05
\$17.18	Oct-05
\$31.20	Nov-05
\$31.20	Dec-05
\$31.20	Jan-06
\$31.20	Feb-06
\$31.20	Mar-06
\$31.20	Apr-06
\$31.20	May-06
\$31.20	Jun-06
\$31.20	Jul-06
\$31.20	Aug-06
\$31.20	Jan-00

UTILITIES COMMISSION, CITY OF NEW SMYRNA BEACH, FLORIDA  
SYSTEM OPERATIONS DIVISION  
E.C.A.C. TRUE-UP CALCULATION

5-Jan-07

ENERGY MONTH	#1 FUEL AND PURCHASED POWER COST \$	#2 PREV. MO. TRUE-UP \$	#3 FUEL AND PURCHASED POWER COST WITH TRUE-UP \$	#4 NET RETAIL SALES kWh	#5 BASE FUEL RECOVERY \$	#6 E.C.A.C. REC. W/O 6% \$	#7 TOTAL FUEL & PURCHASED POWER RECOVERY \$	#8 TRUE-UP (OVER) UNDER RECOVERY MONTH \$	#9 TRUE-UP (OVER) UNDER RECOVERY \$
Sep-04	\$1,803,386.74	\$1,348,864.00	\$3,152,250.74	34,717,404	\$1,142,896.94	\$560,658.19	\$1,703,555.13	\$99,831.61	\$1,448,695.61
Oct-04	\$1,845,763.67	\$1,448,695.61	\$3,294,459.28	33,110,539	\$1,102,580.95	\$534,708.61	\$1,637,289.56	\$208,474.11	\$1,657,169.72
Nov-04	\$759,824.10	\$1,657,169.72	\$2,416,993.82	26,300,052	\$875,791.73	\$424,724.71	\$1,300,516.44	(\$540,692.34)	\$1,116,477.38
Dec-04	\$1,173,146.16	\$1,116,477.38	\$2,289,623.54	25,208,388	\$839,439.32	\$407,095.22	\$1,246,534.54	(\$73,388.38)	\$1,043,089.00
Jan-05	\$1,401,344.88	\$1,043,089.00	\$2,444,433.88	27,446,181	\$913,957.83	\$443,233.78	\$1,357,191.61	\$44,153.27	\$1,087,242.27
Feb-05	\$932,571.10	\$1,087,242.27	\$2,019,813.37	26,705,024	\$889,277.30	\$431,264.69	\$1,320,541.99	(\$387,970.89)	\$699,271.38
Mar-05	\$1,104,000.48	\$699,271.38	\$1,803,271.86	26,393,460	\$878,902.22	\$426,233.18	\$1,305,135.40	(\$201,134.92)	\$498,136.46
Apr-05	\$1,116,377.49	\$498,136.46	\$1,614,513.95	26,353,883	\$877,584.30	\$425,594.04	\$1,303,178.34	(\$186,800.85)	\$311,335.61
May-05	\$1,392,167.71	\$311,335.61	\$1,703,503.32	23,877,781	\$795,130.11	\$385,606.98	\$1,180,737.09	\$211,430.62	\$522,766.23
Jun-05	\$1,652,849.87	\$522,766.23	\$2,175,616.10	31,611,991	\$1,052,679.30	\$510,508.26	\$1,563,187.56	\$89,662.31	\$612,428.54
Jul-05	\$2,393,205.11	\$612,428.54	\$3,005,633.65	37,151,059	\$1,237,130.26	\$599,959.76	\$1,837,090.02	\$556,115.09	\$1,168,543.63
Aug-05	\$3,155,569.32	\$1,168,543.63	\$4,324,112.95	44,839,804	\$1,493,165.47	\$724,126.82	\$2,217,292.29	\$938,277.03	\$2,106,820.66
Sep-05	\$2,529,605.36	\$2,106,820.66	\$4,636,426.02	42,221,237	\$1,405,967.19	\$681,839.06	\$2,087,806.25	\$441,799.11	\$2,548,619.77

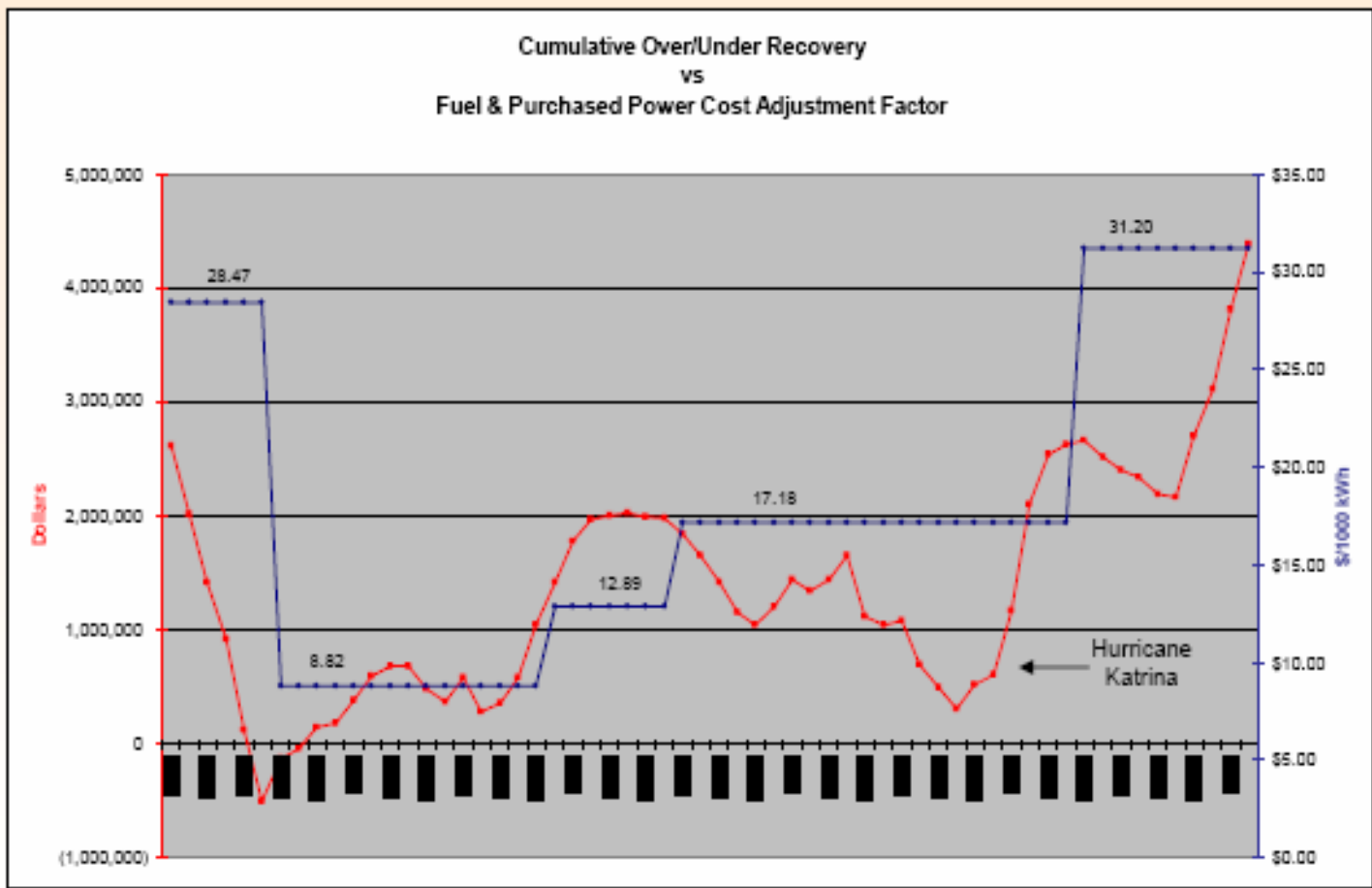
COL. #1 FROM MONTHLY FUEL & ENERGY DATA FORMS  
COL. #2 FROM TRUE-UP CALCULATION  
COL. #3 COL. #1 + COL. #2  
COL. #4 FROM CONSOLIDATED SALES REPORT  
COL. #5 BASE FUEL COST X SYSTEM LOSS FACTOR X SALES (COL. #4)

September, 2004	0.03139	1.0488	0.03292 X SALES
Oct 2004/Sep 2005	0.03139	1.0607	0.0333 X SALES

COL. #6 kWh SALES X MONTHLY FPPCAC / 1000/ 1.06383  
COL. #7 COL. #5 + COL. #6= COL. #7  
COL. #8 COL. #1 - COL. #7 = COL. #8  
COL. #9 COL. #3 - COL. #7 = COL. #9

FPPCAC \$/1000 kWh

\$17.18	Sep-04
\$17.18	Oct-04
\$17.18	Nov-04
\$17.18	Dec-04
\$17.18	Jan-05
\$17.18	Feb-05
\$17.18	Mar-05
\$17.18	Apr-05
\$17.18	May-05
\$17.18	Jun-05
\$17.18	Jul-05
\$17.18	Aug-05
\$17.18	Sep-05



Utilities Commission, City of New Smyrna Beach, Florida

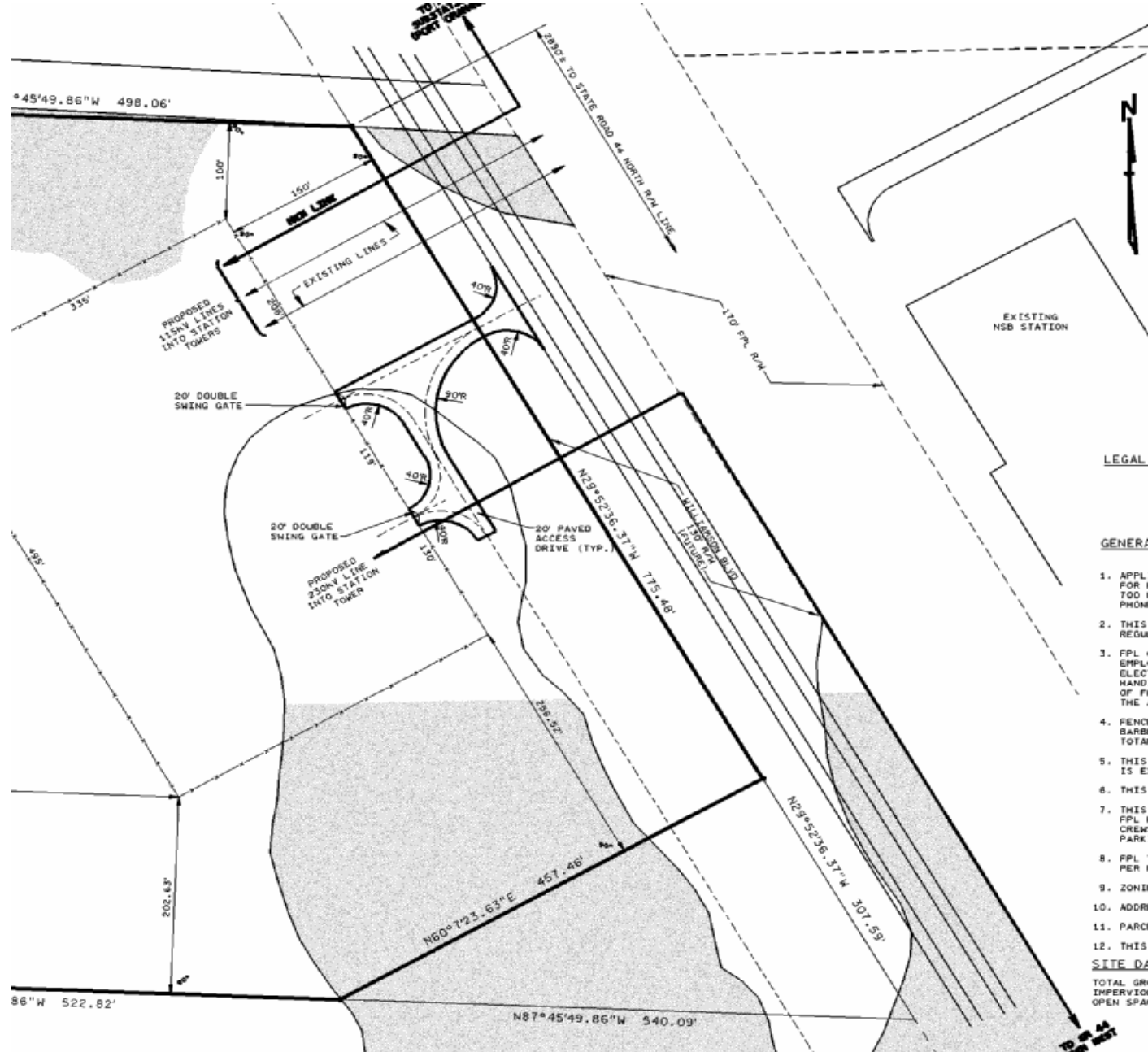


# Generation Strategy 2007-2016 \*

- Improve transmission reliability employing a 230 kV source.
- Secure local or grid contract for additional (20MW) base load power or equity ownership of base load in low risk, low cost plant.
- Secure additional (40 MW) intermediate contracts, 7 X 16 strips short-term, for flexible schedule or seasonal non-firm load.
- Secure additional multi-unit, multi-fuel local peaking and intermediate contract-hedge power (50MW) or joint ownership facility and replacing (20MW) of existing units with new fuel efficient heavy duty simple cycle turbine or lean-burn, low emission reciprocating engines.
- Secure up to (80MW) of local renewable and/or water co-product generation that can load-follow and be classed as firm-dispatch through local private ownership with a UC purchase option or partnership generation contract with the intention to replace or complement intermediate contracts based on generation dispatch capability.
- Sell excess as available.

\* ~2016 Outcome: Base load- 40MW, Intermediate flexible contracts- 40-80MW, Peaking-- 100MW, Renewable-- 80MW.

# FP&L 230 kV Transmission Substation Location



**LEGAL DESCRIPTION:**

**GENERAL NOTES:**

1. APPLICANT AND AGENT: JACK MCNEAL FOR FLORIDA POWER AND LIGHT, OWNER & DEVELOPER, 700 UNIVERSE BLVD., FDP/JS, JUNO BEACH, FLORIDA 33408. PHONE (561)694-4860.
2. THIS UNMANNED FACILITY WILL BE USED FOR TRANSFORMATION, REGULATION, AND DISTRIBUTION OF ELECTRICITY.
3. FPL CERTIFIES THAT THIS FACILITY WILL BE USED ONLY BY EMPLOYEES, AND THE WORK ASSOCIATED WITH HIGH VOLTAGE ELECTRICAL EQUIPMENT CANNOT REASONABLY BE PERFORMED BY HANDICAPPED PERSONS. PURSUANT TO CHAPTER 553.504(1), OF FLORIDA STATUTES, THIS FACILITY IS NOT SUBJECT TO THE ACCESSIBILITY REQUIREMENTS OF THE ADA.
4. FENCE SHALL BE 7'-0" CHAIN LINK WITH 6 STRANDS OF BARBED WIRE ON "V" EXTENSION ARMS TO MAKE AN OVERALL TOTAL HEIGHT OF 8'-0".
5. THIS FACILITY WILL CONSUME NO UNRECOVERABLE ENERGY AND IS EXEMPT FROM THE FLORIDA ENERGY REVIEW CODE.
6. THIS FACILITY WILL GENERATE NO SOLID WASTE.
7. THIS IS AN UNMANNED RESTRICTED ACCESS FACILITY. NO FPL EMPLOYEES REPORT TO THIS LOCATION AND MAINTENANCE CREWS WILL PARK INSIDE THE FENCED AREA. THEREFORE, NO PARKING SPACES WILL BE PROVIDED.
8. FPL TWO-MAN MAINTENANCE CREWS WILL AVERAGE TWO TRIPS PER MONTH TO THIS FACILITY.
9. ZONING DISTRICT:
10. ADDRESS:
11. PARCEL TAX ID NUMBER:
12. THIS PROPERTY LIES IN FLOOD ZONE

**SITE DATA:**

TOTAL GROSS AREA	14.61 ACRES±
IMPERVIOUS AREA	ACRES±
OPEN SPACE/LANDSCAPE AREA	ACRES±

## FUEL COSTS AND HEAT RATES

FUEL	\$MMBU	HEATRATE (BTU/KWH)	COST (\$/MWH)
Nuclear	\$ 0.61	10,400	\$ 6.34
Coal, Steam	\$ 2.00	10,600	\$ 21.20
Natural Gas CC	\$ 10.00	7,500	\$ 75.00
Heavy Oil, CT	\$ 16.00	10,000	\$ 160.00
Light Oil, CT	\$ 14.47	12,300	\$ 177.98
\$2.00/gal (\$1.29-\$156.90) 138,200 BTU/gal	\$ 14.47	16,800	\$ 243.10

# Renewable and Fossil Fuel Relative Costs

<b>Process</b>	<b>Fuel-Type</b>	<b>Fuel Cost/mmbtu</b>	<b>\$/MWH</b>
<b>Process Heat</b>	<b>Waste Heat</b>	<b>Free</b>	<b>\$10</b>
<b>Growers</b>	<b>Crops</b>	<b>\$2.25</b>	<b>\$25</b>
<b>Hydro</b>	<b>Water</b>	<b>Free</b>	<b>\$32</b>
<b>Solid Waste</b>	<b>MSW</b>	<b>Free</b>	<b>\$55</b>
<b>Comb. Cycle</b>	<b>Gas</b>	<b>\$8.00</b>	<b>\$51</b>
<b>Landfill</b>	<b>Methane</b>	<b>Free</b>	<b>\$50</b>
<b>Comb. Tur.</b>	<b>Oil</b>	<b>\$10.00</b>	<b>\$135</b>
<b>Steam</b>	<b>Coal</b>	<b>\$2.00</b>	<b>\$22</b>
<b>Steam</b>	<b>Biodiesel</b>	<b>\$10.00</b>	<b>\$96</b>
<b>Thermal</b>	<b>Solar</b>	<b>Free</b>	<b>\$80</b>
<b>Photovoltaic</b>	<b>Solar</b>	<b>Free</b>	<b>\$320</b>
<b>Wind</b>	<b>Air</b>	<b>Free</b>	<b>\$70</b>

## Comparison of Selected Electricity Generation Technologies

	Capacity (kW)	Capital Cost <sup>a</sup> (\$/kW)	Fuel Cost (\$/kWh)	O&M Cost (\$/kWh)	Service Life (Years)	Heat Rate <sup>b</sup> (Btu/kWh)
Microturbine—Power Only	100	1,485	0.075	0.015	12.5	13,127
Microturbine—CHP	100	1,765	0.035	0.015	12.5	6,166
Gas ICE—Power Only	100	1,030	0.067	0.018	12.5	11,780
Gas ICE—CHP	100	1,491	0.027	0.018	12.5	4,717
Fuel Cell—CHP	200	3,674	0.029	0.010	12.5	5,106
Solar Photovoltaic	100	6,675	0	0.005	20	n.a.
Small Wind Turbine	10	3,866	0	0.005	20	n.a.
Large Wind Turbine	1,000	1,500	0	0.005	20	n.a.
Combustion Turbine—Power Only	10,000	715	0.067	0.006	20	11,765
Combustion Turbine—CHP	10,000	921	0.032	0.006	20	5,562
Combined-Cycle System <sup>c</sup>	100,000	690	0.032	0.006	20	5,642

Source: Congressional Budget Office based on data from the Department of Energy's National Renewable Energy Laboratory and Energy Information Administration; Bergey Windpower Company; and the California Energy Commission.

Notes: kW = kilowatt; kWh = kilowatt-hour; O&M = operation and maintenance; Btu = British thermal unit; CHP = combined heat and power (also known as cogeneration); ICE = internal combustion engine; n.a. = not applicable.

All costs are in 2000 dollars. Fuel costs were calculated on the basis of national average prices for natural gas delivered to commercial customers in 2000.

- a. The cost of acquiring and installing the generating unit. It does not include effects of tax credits or other direct subsidies for specific technologies.
- b. High heat value.
- c. In a combined-cycle system, a combustion turbine is operated in tandem with a steam turbine.

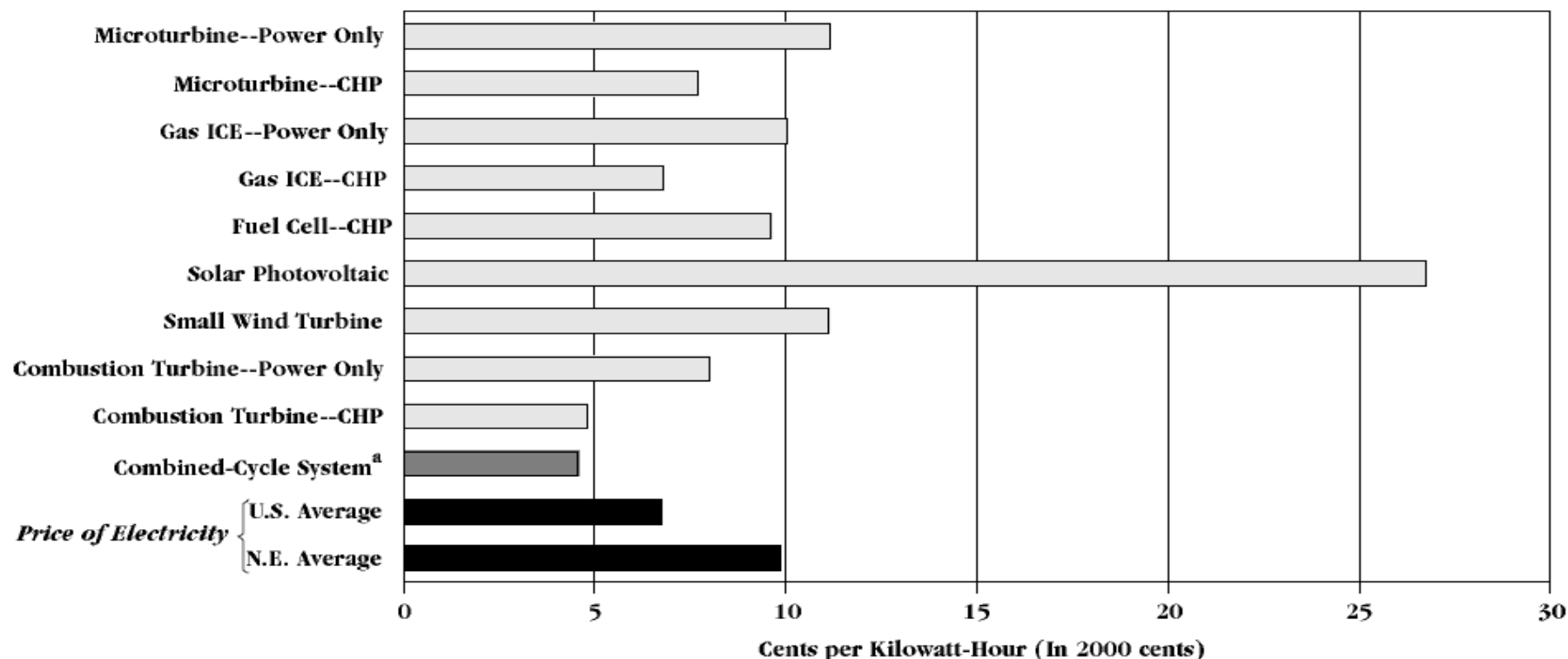
**6.2.3 Characteristics of New and Stock Generating Capacities, by Plant Type**

<u>New Plant Type</u>	2005	2010	<u>2005 Installed Capital Costs of a Typical Power Plant</u>			
	Heat Rate (Btu/kWh)	Heat Rate (Btu/kWh)	Price (\$2004 thousand per MW)	Size (MW)	Cost (\$2004 million)	
Pulverized Coal	8,844	8,763	1,249	600	749	
Coal-Gasification Comb. Cycle	8,309	7,939	1,443	550	794	
Combined Cycle	7,196	7,031	584	250	146	
Advanced Combined-Cycle	6,752	6,577	575	400	230	
Combustion Turbine	10,842	10,664	407	160	65	
Advanced Combustion Turbine	9,227	8,920	385	230	89	
Fuel Cell	7,930	6,960	4,374	10	44	
Wind	10,280	10,280	1,167	50	58	
Advanced Nuclear	10,400	10,400	1,980	1000	1980	
<u>Stock Plant Type</u>	<u>2004</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>
Fossil Fuel Steam Heat Rate (Btu/kWh)	10,681	10,597	10,403	10,162	9,947	9,664
Nuclear Energy Heat Rate (Btu/kWh)	10,439	10,439	10,439	10,439	10,439	10,439

Note(s): This table provides comparisons of electric generating plants. Plant use of electricity is included; however, transmission and distribution losses of the electric grid are excluded.

Source(s) EIA, Assumptions to the AEO 2006, March 2006, Table 48, p. 85 for fossil fuel heat rates, Table 38, p. 73 for other generator data; EIA, AEO 2006, Feb. 2006, Table A2, p. 134-136, and Table A8, p. 147-148.

## Levelized Cost of Selected Technologies Suitable for Distributed Generation



Source: Congressional Budget Office using data on electricity prices from Department of Energy, Energy Information Administration, *Electric Power Annual 2000* (August 2001), Table 21.

Notes: CHP = combined heat and power (also known as cogeneration); ICE = internal combustion engine; N.E. = New England.

The levelized cost is the average cost of electricity (cents per kilowatt-hour) over the operating life of the generation equipment. Future costs and output flows are based on data in Table 2 and are discounted at 7 percent from their present values. The cost estimates assume that the systems powered by fossil fuels will be operated 90 percent of the time and that the wind and solar photovoltaic systems will run 40 percent and 27 percent of the time, respectively. Levelized cost comparisons do not include the effects of tax credits or other direct subsidies for specific technologies.

“Large wind turbine” is not included in the figure (as it is in Table 2) because it is not generally considered to be well-suited to distributed generation applications (typically, it is not located near customers).

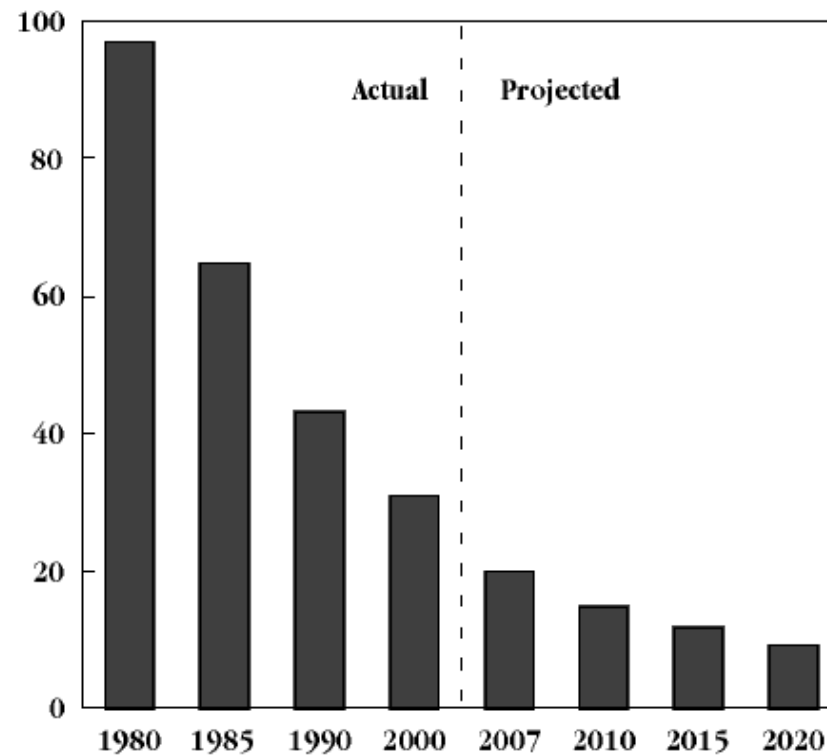
- a. In a combined-cycle system, a combustion turbine is operated in tandem with a steam turbine. The system is included here as a benchmark for the cost of power from new large-scale generators. Transmission and distribution expenses would add an estimated 2.4 cents per kilowatt-hour, on average, to the marginal cost of delivered power.

---

## Levelized Cost of Solar Photovoltaic Electricity, 1980 to 2020

---

(Cents per kilowatt-hour)



Source: Congressional Budget Office based on data from Department of Energy, Office of Energy Efficiency and Renewable Energy, and Electric Power Research Institute, *Renewable Energy Technology Characterizations*, EPRI-TR-109496 (December 1997).

---

		<b>Total Operating Hours Of:</b>	<b>3,000</b>	<b>Gas Price @:</b>	<b>\$5.70</b>	<b>Diesel Price @:</b>	<b>\$0.85</b>
Operating Temperature(F)	100	<b>OPTION 1</b>	<b>OPTION 2</b>	<b>OPTION 3</b>	<b>OPTION 4</b>	<b>OPTION 5</b>	
Type of Unit(s)		<b>GE10B</b>	<b>MAN 32/40</b>	<b>Taurus 60</b>	<b>Taurus 70</b>	<b>Wartsila 32DF</b>	
Number of Units:		<b>2</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>4</b>	
MW of Output		<b>18.53</b>	<b>26.88</b>	<b>19.32</b>	<b>19.51</b>	<b>23.28</b>	
Capital Costs		<b>\$23,157,000</b>	<b>\$38,966,000</b>	<b>\$18,427,925</b>	<b>\$19,551,052</b>	<b>\$20,336,000</b>	
Operating Hours (Gas):		<b>2,500</b>	<b>2,500</b>	<b>2,500</b>	<b>2,500</b>	<b>2,500</b>	
Operating Hours (Diesel):		<b>500</b>	<b>500</b>	<b>500</b>	<b>500</b>	<b>500</b>	
Number of Units:		<b>2</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>4</b>	
Total MW-hr Produced Per Year:		<b>55,602</b>	<b>80,640</b>	<b>57,960</b>	<b>58,536</b>	<b>69,828</b>	
Total Fuel Gas Used Per Yr. (MCF):		<b>601,554</b>	<b>612,492</b>	<b>631,030</b>	<b>557,283</b>	<b>504,984</b>	
Total Fuel Oil Used Per Yr. (Gals):		<b>861,112</b>	<b>858,713</b>	<b>902,244</b>	<b>750,009</b>	<b>733,154</b>	
Total Cost of Gas Used Per Yr:		<b>\$3,428,860</b>	<b>\$3,491,207</b>	<b>\$3,596,869</b>	<b>\$3,176,510</b>	<b>\$2,878,407</b>	
Gas @ \$5.70							
Total Cost of Diesel Used Per Yr:		<b>\$731,945</b>	<b>\$729,906</b>	<b>\$766,907</b>	<b>\$637,508</b>	<b>\$623,181</b>	
Diesel @ \$0.85							
Total Fuel Cost per Year		<b>\$4,160,805</b>	<b>\$4,221,113</b>	<b>\$4,363,776</b>	<b>\$3,814,018</b>	<b>\$3,501,588</b>	
5 Yr Debt Service**		<b>\$9,491,475</b>	<b>\$15,971,189</b>	<b>\$7,553,146</b>	<b>\$8,013,487</b>	<b>\$8,335,218</b>	
Operating Costs for first 5 years		<b>\$21,588,315</b>	<b>\$24,595,200</b>	<b>\$23,040,090</b>	<b>\$20,091,653</b>	<b>\$20,693,430</b>	
Idle Costs for first 5 yrs		<b>\$57,600</b>	<b>\$172,800</b>	<b>\$57,600</b>	<b>\$57,600</b>	<b>\$172,800</b>	
Total Project Cost - 5 Yrs		<b>\$31,137,390</b>	<b>\$40,739,189</b>	<b>\$30,650,836</b>	<b>\$28,162,740</b>	<b>\$29,201,448</b>	
Cost/ MW-hr - Total		<b>\$112</b>	<b>\$101</b>	<b>\$106</b>	<b>\$96</b>	<b>\$84</b>	
Cost/ MW-hr - Operation Only		<b>\$78</b>	<b>\$61</b>	<b>\$80</b>	<b>\$69</b>	<b>\$60</b>	

Source: Downes and Associates

## **WATER CONSUMPTION\*** **CONVENTIONAL POWER PLANTS**

<b>Technology</b>	<b>gallons/kWh</b>	<b>liters/kWh</b>
Nuclear	0.622	2.39
Coal	0.491	1.86
Oil	0.431	1.63
Combined Cycle	0.250	0.95

\* Paul Gipe, WIND ENERGY COMES OF AGE, John Wiley & Sons, 1995

**RESIDENTIAL ELECTRIC RATES 1000/2000 kwh (Approximations)**

	<b>UC-1000/2000</b>	<b>~IOU-1000/2000</b>
<b>Customer Charge</b>	<b>\$5.65/\$5.65</b>	<b>\$5.17/\$5.17</b>
<b>Base Electric Charge</b>	<b>\$76.45/\$152.90</b>	<b>\$47.48/\$94.96</b>
<b>Fuel Adjustment</b>	<b>\$45.29/\$90.58</b>	<b>\$54.20/\$118.40</b>
<b>Fee/(Franchise)</b>	<b>\$7.55/\$14.74</b>	<b>\$5.23/\$9.68 (80%)</b>
<b>NSB Utility Tax</b>	<b>\$6.81/\$13.08</b>	<b>\$4.74/\$9.01 (80%)</b>
<b>Gross Receipts Tax</b>	<b>\$3.23/\$6.30</b>	<b>\$2.69/\$5.46</b>
<b>Fee/Taxes Total</b>	<b><u>\$17.59/\$34.12</u></b>	<b><u>\$15.33/\$29.49</u></b>
<b>Total</b>	<b>\$144.98/\$283.25</b>	<b>\$119.51/\$248.02</b>

~Payroll	\$2,750,000 (electric)	\$--0000
~CIAC	\$2,000,000? (electric)	\$--0000
~Local Purchases	\$1,250,000	\$--0000??
~Property Taxes	\$--0000 (\$33 Mil OCLD/G X 4.04693)	\$~134,000

~Economic Multiplier 7:1

Electric Debt \$33.3 Mil Principal (\$45.7 P&I)

(Sebring) Surcharge ?? (1.5 cents/kwh)