

**BEFORE THE FLORIDA
PUBLIC SERVICE COMMISSION**

**DOCKET NO. 09 0172 EI
FLORIDA POWER & LIGHT COMPANY**

**IN RE: FLORIDA POWER & LIGHT COMPANY'S
PETITION TO DETERMINE NEED FOR
FLORIDA ENERGYSECURE LINE**

DIRECT TESTIMONY & EXHIBITS OF:

DR. ROSEMARY MORLEY

DOCUMENT NO. DATE

03068-09 4/7/09
FPSC - COMMISSION CLERK

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

FLORIDA POWER & LIGHT COMPANY

DIRECT TESTIMONY OF DR. ROSEMARY MORLEY

DOCKET NO. 09 _____-EI

Q. Please state your name and business address.

A. My name is Dr. Rosemary Morley, and my business address is Florida Power & Light Company, 700 Universe Blvd., Juno Beach, Florida 33408.

Q. By whom are you employed and what is your position?

A. I am employed by Florida Power & Light Company ("FPL" or the "Company") as the Director of Load Forecasting and Analysis.

Q. Please describe your duties and responsibilities as FPL's Director of Load Forecasting and Analysis.

A. I am responsible for the development of FPL's peak demand, energy, customer and economic forecasts.

Q. Please describe your educational background and professional experience.

A. I hold a bachelor's degree (B.A.) with honors in economics from the University of Maryland and a master's degree (M.A.) in economics from Northwestern University. In 2005, I earned a Doctorate in Business Administration (D.B.A.) from Nova Southeastern University. I began my career with FPL in 1983 as an Assistant Economist. I have since held a variety of positions in the forecasting, planning, and regulatory areas.

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1 Between 1996 and 2007, I was the Rate Development Manager for FPL.
2 During that time, I testified on a number of issues, including the forecast of
3 billing determinants by rate class and the Company's load research studies. I
4 am a member of the National Association of Business Economists and the
5 Institute of Business Forecasting and Planning.

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

7 A. Yes. I am sponsoring the following exhibits which are attached to my direct
8 testimony:

- 9
- 10 ▪ RM-1 Actual and Forecasted Summer Peak (MW)
 - 11 ▪ RM-2 Summer Peak Forecasting Error
 - 12 ▪ RM-3 Annual Percent Change in Florida's Population
 - 13 ▪ RM-4 Historical Population Growth
 - 14 ▪ RM-5 Annual Change in Population, Long-term
15 Moving Averages
 - 16 ▪ RM-6 University of Florida's Population Under-
17 Forecast
 - 18 ▪ RM-7 Total Average Customers
 - 19 ▪ RM-8 Real Household Disposable Income
 - 20 ▪ RM-9 Real Price of Electricity
 - 21 ▪ RM-10 Impact of the Appliance Efficiency Standards
 - 22 ▪ RM-11 New Wholesale Contracts
 - 23 ▪ RM-12 Summer Peak Load per Customer (kW)

- 1 ▪ RM-13 Summer Peak Load (MW)
- 2 ▪ RM-14 Long-Term Growth in Summer Peak (MW)
- 3 ▪ RM-15 Changes in Forecasted Summer Peak Since the
- 4 2008 Ten-Year Site Plan
- 5 ▪ RM-16 Winter Peak Load (MW)
- 6 ▪ RM-17 Long-Term Growth in Winter Peak (MW)
- 7 ▪ RM-18 Net Energy for Load Use Per Customer (kWh)
- 8 ▪ RM-19 Net Energy for Load (GWh)
- 9 ▪ RM-20 Long-Term Growth in Net Energy for Load
- 10 (GWh)
- 11 ▪ RM-21 Changes in Forecasted Net Energy for Load
- 12 Since the 2008 Ten-Year Site Plan

13 **Q. What is the purpose of your testimony?**

14 **A.** The purpose of my testimony is to (i) describe FPL’s load forecasting process,

15 (ii) identify the underlying methodologies and assumptions, (iii) present FPL’s

16 long-term load forecast and (iv) describe how that forecast differs from the

17 load forecast filed in the 2008 Ten-Year Site Plan.

18 **Q. Please summarize your testimony.**

19 **A.** My testimony examines the factors which drive FPL’s customer and load

20 growth. Based on reasonable assumptions and recognized forecasting

21 methods, FPL’s forecast shows that the conditions leading to declines in load

22 growth recently experienced will dissipate in the next few years. Although

23 below the level assumed in the 2008 Ten-Year Site Plan, substantial long-run

1 growth is still projected for the system. Between 2008 and 2018, FPL is
2 projecting a 2.2% annual increase in the summer peak, or a cumulative
3 increase of 5,083 MW. Over the longer term, the absolute increase will be
4 even more substantial. Between 2008 and 2025, FPL is projecting a 2.3%
5 annual increase in the summer peak, or a cumulative increase of 9,913 MW.
6 By 2030, the summer peak is projected to reach 33,931 MW or a cumulative
7 increase of 12,871 MW over the 2008 summer peak.

8

9

BACKGROUND

10

11 **Q. What principles does FPL rely on in developing its load forecast?**

12 A. FPL relies on three principles in developing its load forecast. First, a load
13 forecast depends on an understanding of the underlying data. As a result, the
14 most relevant and timely data should be carefully examined. This includes a
15 review not only of the variables to be forecasted, but also of the factors which
16 may influence future values. Accordingly, FPL reviews demographic and
17 economic projections from a number of industry experts, including the
18 University of Florida and Global Insight. Second, a load forecast should be
19 based on statistically sound models. In this regard, FPL relies on
20 econometrics as the primary tool for projecting future levels of customers and
21 sales. An econometric model is a numerical representation, obtained through
22 statistical estimation techniques, of the degree of relationship between a
23 dependent variable, e.g., net energy for load (NEL), and the independent

1 (explanatory) variables. FPL has consistently relied on econometric models
2 for various planning purposes and the modeling results have been reviewed
3 and accepted by the Florida Public Service Commission (“FPSC” or
4 “Commission”) in past proceedings. Third, a load forecast must reflect sound
5 judgment. While intangible, sound judgment is critical, particularly during
6 periods of rapid change and uncertainty.

7 **Q. What are the principal components of the long-term load forecast?**

8 A. The principal components of the long-term forecast are total customers,
9 summer peak, winter peak and NEL. The summer peak, winter peak and NEL
10 are forecasted on a per customer basis. Thus, the customer forecast in
11 combination with the summer peak per customer forecast yields the summer
12 peak forecast. A similar approach is used in forecasting the winter peak and
13 NEL.

14 **Q. How accurate has FPL’s load forecast been historically?**

15 A. Based on a review of FPL’s Ten-Year Site Plans, the accuracy of the short-
16 term forecast has been very good with a one year-ahead error in absolute
17 terms of 2.3% since 1989. Longer-term accuracy has proven more
18 challenging, with a ten year-ahead forecasting error in absolute terms of
19 10.5%.

20 **Q. Why has the longer term accuracy proven more challenging?**

21 A. The factors driving the demand for electricity (e.g., population growth, the
22 economy, the price of electricity) are subject to increasing uncertainty as the
23 forecasting horizon expands. For example, customer growth next year will be

1 influenced by next year's population growth, which in turn will be influenced
2 by actual population levels this year. However, a forecast of customer growth
3 ten years from now must consider multiple years of population growth and
4 this year's actual population level is likely to have a progressively smaller
5 impact on future population growth as time goes on.

6 **Q. Has there been any pattern in the direction of variances in the long-term**
7 **forecast?**

8 A. Yes. Based on the Ten-Year Site Plans filed between 1989 and 1999, the
9 long-term summer peak has been consistently under-forecasted. This is
10 illustrated by Exhibits RM-1 and RM-2, which compare actual peaks with
11 what had been forecasted for that year ten years prior. Given the recent
12 slowdown in load growth, the direction of future forecasting errors is subject
13 to great uncertainty. On the other hand, as I discuss later in my testimony, the
14 recent slowdown in load growth has been influenced by factors which are
15 expected to dissipate over time and return FPL's load growth to more
16 historically typical levels. To the extent the rebound in usage exceeds current
17 expectations, future values for the summer peak may again exceed forecasted
18 levels.

1 **CUSTOMER GROWTH FORECAST**

2

3 **Q. How many customers receive their electric service from FPL and where**
4 **are they located?**

5 A. FPL currently serves about 4.5 million customers. This amounts to a
6 population of almost nine million people. FPL's service territory covers
7 approximately 27,650 square miles within peninsular Florida, which ranges
8 from St. Johns County in the north to Miami-Dade County in the south, and
9 westward to Manatee County. FPL serves customers in 35 counties within
10 this region.

11 **Q. What customer growth has FPL experienced historically?**

12 A. FPL has historically experienced significant customer growth, averaging a
13 2.6% annual growth rate since 1980 or an average increase of 83,000
14 customers per year. Cumulatively, more than 2.3 million customers have been
15 added since 1980, more than doubling FPL's customer base.

16 **Q. What customer growth has FPL experienced recently?**

17 A. By historical standards, FPL has experienced minimal customer growth since
18 2007. During 2008, FPL's customer base increased by only 0.3% or 13,000
19 customers. The slowdown in customer growth has been driven by the short-
20 term reductions in population growth stemming from the current recession.

1 **Q. How does FPL forecast customer growth?**

2 A. As noted above, customer growth is primarily determined by changes in
3 population. Accordingly, FPL forecasts total customers using an econometric
4 model with population and seasonal factors as the explanatory variables.

5 **Q. What population growth has Florida experienced historically?**

6 A. Florida has experienced substantial long-term population growth. The State's
7 population has nearly doubled since 1980, an increase of over nine million.
8 As Exhibit RM-3 shows year-to-year growth has been cyclical with
9 population growth falling during recessions and rebounding thereafter. In
10 addition, over the long-term the annual percentage rate of population growth
11 has tended to drift downward over time. However, in absolute terms, the
12 annual increase in population growth has been more stable. Exhibit RM-4
13 shows that annual absolute increases in population have been very large until
14 the current recession. A moving average of a series is sometimes calculated to
15 distinguish the underlying trend in a series from its cyclical pattern. As
16 Exhibit RM-5 shows, on a moving average basis, the annual increase in
17 Florida's population growth has been fairly consistent, averaging between
18 300,000 and 350,000 in most years since 1985.

19 **Q. What source does FPL rely on for its population projections?**

20 A. FPL relies on population projections produced by the Bureau of Economic
21 and Business Research of the University of Florida. In addition, FPL reviews
22 other factors which may influence population projections, including economic
23 forecasts and historical trends in population growth.

1 **Q. How accurate has the University of Florida been in its population**
2 **projections?**

3 A. On the one hand, the University of Florida's short-term forecasting accuracy
4 has been impressive. Based on population projections since 1991, the
5 University of Florida has on average forecasted population on a year-ahead
6 basis within 0.9% of actuals. However, longer-term forecasting has proven
7 more challenging. Based on population projections since 1991 and a ten-year
8 forecasting horizon, the University of Florida has on average forecasted long-
9 term population within 5.9% of actuals. Moreover, these long-term
10 population projections from the University of Florida have been consistently
11 below actuals. Exhibit RM-6 shows that since 1991 the forecast error has
12 averaged nearly a million people short of actual, based on a ten-year
13 forecasting horizon. Of course, it is not known whether this trend in under-
14 forecasting long-term population growth will continue. Nevertheless,
15 historical performance suggests that there has been some tendency to
16 underestimate long-term population growth.

17 **Q. How often does the University of Florida revise its population**
18 **projections?**

19 A. Population projections from the University of Florida have been somewhat
20 dynamic in recent years. The University of Florida typically projects
21 statewide population growth at least once a year. Between November 2007
22 and October 2008, the University of Florida released four sets of baseline
23 population projections. In each case, the revised population projections

1 indicated a progressively lower outlook for the state's population growth. The
2 October 2008 population projections were the most recent projections
3 available at the time FPL developed its load forecast.

4 **Q. What is the short-term outlook for population growth in the University of**
5 **Florida's October 2008 projections?**

6 A. The University of Florida's October 2008 baseline projections indicate record
7 low growth through 2010. Specifically, the University of Florida estimates
8 the State's population grew by only 127,000 in 2008 versus a long-run
9 average between 300,000 and 350,000. The University of Florida projects a
10 continuation of this trend in 2009 with a projected population increase of only
11 75,000.

12 **Q. What explains this substantially lower than average growth in the short-**
13 **term?**

14 A. According to the Office of Economic and Demographic Research, the current
15 economic recession accounts for much of this slowdown. Historically, most
16 of Florida's population growth has come from net migration (the number of
17 permanent residents moving into versus out of the state). Much of the State's
18 in-migration, in turn, has been driven by job growth. The current recession
19 has significantly reduced employment opportunities and therefore curtailed
20 the migration of job seekers into the state. In addition, the nationwide housing
21 slump has made it difficult for both retirees and working age adults to relocate
22 to Florida. Consequently, the University of Florida is projecting minimal net

1 migration through 2010. As the economy improves after 2010, the University
2 of Florida is projecting a modest increase of in-migration.

3 **Q. What is the long-term outlook for population growth in the University of**
4 **Florida's October 2008 projections?**

5 A. Over the long-term, the University of Florida is projecting that the State's
6 population growth, both in terms of percentage growth and absolute numbers,
7 will remain below historical averages. As shown in Exhibit RM-3, the
8 University of Florida's October 2008 projections show that even with a
9 rebound in population growth in 2012 and 2013, the percentage increase will
10 remain at historic lows. The University of Florida's projected 1.65%
11 population growth in 2012 is the highest growth rate in the forecasting
12 horizon. This peak rate of population growth in the forecasting horizon is
13 below the low-point in population growth experienced during any prior
14 recession since 1970. In terms of absolute increases, the University of Florida
15 is projecting that population growth peaks at 321,000 in 2013 and the rate of
16 increase declines thereafter. As a result, the University of Florida's projected
17 population growth is less than 255,000 between 2008 and 2018. By contrast,
18 the State's long-term population growth has averaged between 300,000 and
19 350,000.

20 **Q. Is FPL proposing any adjustments to the University of Florida's October**
21 **2008 population projections?**

22 A. Yes. FPL is proposing to adjust the population projections between 2012 and
23 2022 based on the more robust population growth which has historically

1 occurred after recessions. Due to the current economic recession, many baby
2 boomers are delaying retirement. When the economy recovers, an increase in
3 the in-migration of retirees could be expected. A silver lining in the current
4 housing contraction is an improvement in the relative affordability of housing
5 in Florida. Florida has experienced larger decreases in home prices relative to
6 most areas of the country. This improvement in the relative affordability of
7 housing should make Florida a more attractive destination for both retirees
8 and working age adults when the economy recovers. In addition, recent
9 national surveys suggest that despite the recession-induced slowdown in
10 mobility, almost one-half of all Americans are expressing an interest in
11 moving within the next five years. Moreover, these same national surveys
12 show that Americans continue to rank Florida as one of the most desirable
13 places to live in the country. Thus, the data suggest that there is a degree of
14 pent-up demand in terms of in-migration which should be taken into account.
15 FPL's adjustment to the University of Florida's population forecast takes this
16 pent-up demand into account.

17 **Q. Is the population forecast reflecting FPL's adjustment consistent with**
18 **historical trends?**

19 A. Yes. With FPL's adjustment, the projected population growth in the long-
20 term returns to a more historically typical level of 335,000 between 2008 and
21 2018. As shown in Exhibit RM-5, FPL's projected level of population growth
22 is consistent with long-term patterns in population growth. By contrast, the
23 population forecast from the University of Florida suggests the level of

1 population growth, on a moving average basis, will be permanently below its
2 historical average. At the same time, as shown in Exhibit RM-3, FPL's
3 projected population growth reflects the long-term trend of a gradual
4 deceleration in the percentage rate of growth following a post-recession
5 rebound in population.

6 **Q. Have electric utilities in Florida ever utilized population projections that**
7 **differ from the baseline projections developed by the University of**
8 **Florida?**

9 A. Yes. A review of the 2008 Ten-Year Site Plans shows that electric utilities
10 have utilized population projections that differ from the baseline projections
11 developed by the University of Florida. In some cases, utilities use an
12 alternative vendor. However, in other cases, utilities develop their own
13 population projections either by blending alternative projections or by
14 incorporating input from in-house experts. For example, one utility develops
15 its own population projections by combining high-band, low-band and
16 baseline population projections from the University of Florida with weights
17 based on historical growth rates. In FPL's case, the University of Florida's
18 baseline population projection was used in the 2008 Ten-Year Site Plan.
19 However, this was not always the case. In past years, FPL has developed its
20 own population projections and in some cases utilized the University of
21 Florida's high-band projections.

1 **Q. What is FPL's forecast of total customers?**

2 A. As shown on Exhibit RM-7, the total number of customers is projected to
3 increase at an annual rate of 1.6% between 2008 and 2018 or about 79,000
4 customers per year. This absolute level of customer growth is maintained
5 over the longer-term even as the percentage increase gradually declines. Total
6 customer growth between 2008 and 2025 is projected to increase at an annual
7 rate of 1.5% or about 79,000 customers per year.

8 **Q. How does FPL's forecast of total customers compare with historical
9 trends?**

10 A. FPL's forecast of total customers is consistent with a long-run trend that
11 indicates a gradual deceleration in percentage growth rates over time.
12 Nevertheless, the absolute increases in customers projected are comparable to
13 the levels experienced historically.

14 **Q. Is FPL's projected number of total customers reasonable?**

15 A. Yes. In the short-term, the forecast incorporates the most recent population
16 projections from the University of Florida available at the time the forecast
17 was developed. The longer term forecast is consistent with long-term average
18 population growth. The customer forecast is also based on sound statistical
19 methods previously reviewed and approved by the Commission. In addition,
20 a comparison of the forecasted number of total customers with long-term
21 trends indicates that the forecast is reasonable.

1 **SUMMER PEAK DEMAND FORECAST**

2

3 **Q. What growth in summer peak demands has FPL experienced**
4 **historically?**

5 A. Summer peak demands have grown at an average annual rate of 2.8% or
6 408 MW per year since 1980. Effectively, this rate means that FPL's summer
7 peak demand has been doubling every 25 years.

8 **Q. What factors accounted for this growth?**

9 A. Population growth and an expanding economy are the two principal drivers
10 behind this growth. During much of this time, Florida was one of the fastest
11 growing states in the country. Population growth, in turn, spurred economic
12 growth. As described by the Office of Economic and Demographic Research,
13 population growth has traditionally been one of the primary drivers of the
14 state's economic growth. Net migration, in particular, stimulated demand for
15 housing and services, key sectors of the state's economy. An expanding
16 economy stimulated demand for goods and services of all kinds, including
17 electricity.

18 **Q. What growth in summer peak demand has FPL experienced recently?**

19 A. Summer peak demand has been stagnant since 2005. The 2008 summer peak,
20 for example, was more than 1,000 MW below its 2005 level.

1 **Q. What factors explain the stagnant growth in the summer peak demand in**
2 **recent years?**

3 A. To a large extent, the factors which have driven long-term growth have also
4 been depressing the short-term growth in the summer peak demand. Reduced
5 population growth and the economic slowdown are responsible for much of
6 the stagnation in the summer peak demand. The housing crisis has also
7 reduced electricity demands temporarily. By contrast, changes in the
8 appliance stock, which also reduce peak demands, are likely to have a more
9 long-term effect. FPL's forecasting methodology strives to take into account
10 both the short-term and long-term factors likely to influence summer peak
11 demand.

12 **Q. What is FPL's method of forecasting summer peak demand?**

13 A. The primary determinants of summer peak demand include the economy,
14 weather, the price of electricity, changes in the appliance stock and the
15 addition of new wholesale contracts. Accordingly, FPL forecasts summer
16 peak per customer using an econometric model with explanatory variables
17 representing the economy, weather and the real price of electricity. In
18 combination with the customer forecast, the projected summer peak per
19 customer yields a preliminary projection of the summer peak. The
20 preliminary projection is then adjusted for changes in the appliance stock, the
21 temporary effects of the current housing crisis and the addition of new
22 wholesale contracts in order to obtain the forecasted summer peak demands.

1 **Q. What is FPL's outlook for real household disposable income?**

2 A. As shown in Exhibit RM-8, real household income is projected to grow at an
3 annual rate of 1.3% between 2008 and 2018. As the impact of the current
4 slowdown dissipates the annual growth between 2008 and 2025 rises to 1.6%.

5 **Q. How does FPL's forecast of real household disposable income compare**
6 **with long-term growth experienced historically?**

7 A. As shown in Exhibit RM-8, the 1.3% projected annual growth between 2008
8 and 2025 is below the 2.0% average growth experienced since 1982.
9 Nevertheless, the forecasted absolute increase in real household disposable
10 income is close to its historical average. Over the longer-term, real household
11 disposable income is projected to increase at an annual rate of 1.6% between
12 2008 and 2025. As shown in Exhibit RM-8, the absolute increases in real
13 household disposable income between 2008 and 2025 are projected to exceed
14 the average growth experienced since 1982.

15 **Q. What weather assumptions did FPL assume for the summer peak**
16 **projections?**

17 A. In its summer peak projections, FPL uses the average temperature on the day
18 of the peak and the sum of the cooling degree hours in the day prior to the
19 peak. In forecasting these weather variables, FPL relies on a normal weather
20 outlook. Normal weather is based on historical averages since 1989.

- 1 **Q. What pricing assumptions did FPL assume for the summer peak**
2 **projections?**
- 3 A. FPL uses the real price of electricity as an explanatory variable in forecasting
4 energy use per customer. The real price of electricity is determined by
5 adjusting the nominal price for inflation. The forecasted price of electricity is
6 consistent with fuel cost projections incorporated in FPL's most recent fuel
7 filing. As shown in Exhibit RM-9, the real price of electricity is projected to
8 increase at an annual rate of 1.6% between 2008 and 2018. Over the longer
9 term, a 1.1% increase in the real price of electricity is projected between 2008
10 and 2025.
- 11 **Q. How does FPL capture the influence of changes in the appliance stock**
12 **and efficiency standards in its forecast?**
- 13 A. FPL incorporates changes in the appliance stock into its econometric model.
14 FPL relies on estimates developed by ITRON, a leading energy consulting
15 firm. ITRON's estimates quantify the reduction in energy use resulting from
16 federally-mandated efficiency standards, such as those codified in the
17 National Energy Policy Act (NEPACT) and the Energy Independence and
18 Security Act (EISA). ITRON's estimates also incorporate the impact of
19 compact fluorescent light bulbs, which are projected to significantly reduce
20 lighting loads in advance of the new incandescent standards required in EISA.
- 21 **Q. Are there any other factors influencing summer peak demands?**
- 22 A. Yes. The housing crisis has had an impact on electricity usage. This is most
23 directly seen in the number of homes left vacant as a result of the housing

1 crisis. This increase in the number of empty homes has spurred an
2 unprecedented increase in the number of inactive meters. In many cases,
3 however, these empty homes continue to be counted as active FPL accounts
4 because the electricity has not been disconnected. By maintaining an active
5 electric account, the owners of these homes are able to show the home to
6 potential buyers and avoid the mildew damage that occurs without proper
7 ventilation. Accordingly, an adjustment has been made to the projected 2009
8 and 2010 summer peak to account for this phenomenon. The influence of
9 empty homes is expected to dissipate in 2011 and after 2012 no impact on the
10 summer peak is projected.

11 **Q. Is FPL making any adjustments for the addition of new wholesale**
12 **contracts in its forecast?**

13 A. Yes. FPL is adjusting its load forecast to include three new wholesale
14 contracts. First, a 75 MW power sale to Seminole Electric Cooperative is
15 projected for the period December 2008 through December 2009. Second,
16 partial requirements service to the Lee County Cooperative begins in 2010.
17 Lee County is projected to add 212 MW to the summer peak in 2010. Lee
18 County is projected to begin full requirements service in 2014 when its
19 summer peak contribution increases to 853 MW. Finally, a 200 MW contract
20 with Seminole Electric Cooperative is projected to begin in 2014.
21 Exhibit RM-11 shows the new wholesale load FPL is projecting. An
22 adjustment was also made for the termination of the Key West power sales
23 agreement in 2013.

1 **Q. Is FPL making any other adjustments to its forecast of summer peak**
2 **demands?**

3 A. Yes. FPL is also adjusting its forecast of summer peak demands for the impact
4 of plug-in hybrid vehicles. By 2018, about 49 MW of additional load is
5 projected as a result of plug-in hybrids. By 2025, that amount is expected to
6 increase to almost 200 MW. Nevertheless, plug-in hybrids are not expected to
7 add more than 1% to summer peak demand until 2030.

8 **Q. What is FPL's forecast for the summer peak demand per customer?**

9 A. As shown in Exhibit RM-12, summer peak demand per customer is projected
10 to remain flat through 2013. Due to the addition of new wholesale load,
11 summer peak per customer is forecasted to increase significantly in 2014.
12 Thereafter, moderate growth is projected. Summer peak per customer is
13 projected to increase by 0.6% between 2008 and 2018. This represents an
14 increase from the 0.2% growth rate experienced historically. The addition of
15 new wholesale load is primarily responsible for the higher than historical
16 growth rates.

17 **Q. What is FPL's forecast for the summer peak demands?**

18 A. As shown in Exhibit RM-13, summer peak demands are projected to increase
19 at an annual rate of 2.2% between 2008 and 2018 or an annual increase of 508
20 MW. This amounts to a cumulative increase of 5,083 MW over the 2008
21 summer peak. Between 2008 and 2025, summer peak demands are projected
22 to increase at an annual rate of 2.3% or an annual increase of 583 MW. By
23 2025, the cumulative increase over the 2008 summer peak is projected to be

1 9,913 MW. As shown in Exhibit RM-14, by 2030 the summer peak is
2 expected to reach 33,931 MW, a 12,871 MW increase over the 2008 summer
3 peak.

4 **Q. Are FPL's demand-side management (DSM) programs reflected in this**
5 **forecast of summer peak demands?**

6 A. Existing programs and participation levels are included in this forecast of
7 summer peak demands. Incremental DSM is not reflected in this forecast of
8 summer peak demands. As discussed by FPL witness Enjamio, in the
9 resource planning process, incremental DSM is treated as an additional
10 supply-side resource option.

11 **Q. How does FPL's forecast for the summer peak demands compare with**
12 **historical trends?**

13 A. The initial years of the forecast are consistent with the minimal growth in
14 summer peak that FPL has experienced since 2006. The forecast of the
15 summer peak between 2008 and 2018 is consistent with two long-term trends,
16 namely that the percentage increases in load tend to decelerate over time while
17 the absolute level of increase remains high. Accordingly, the summer peak
18 averaged a 2.8% growth rate between 1980 and 2008, which is somewhat
19 higher than the 2.2% rate projected between 2008 and 2018. At the same
20 time, the summer peak averaged an annual increase of 408 MW between 1980
21 and 2008, which is less than the 508 MW projected between 2008 and 2018.

1 **Q. How does FPL's forecast for the summer peak demands compare with**
2 **the previously-filed forecast of summer peak demands?**

3 A. Due largely to lower loads in the initial years of the forecast, FPL's forecast of
4 summer peak demands is lower than the forecast filed in the 2008 Ten-Year
5 Site Plan. FPL witness Stubblefield discusses how the reduction in the load
6 forecast relative to the one filed in the 2008 Ten-Year Site Plan affected the
7 scenarios requested in the Bid Solicitation process. Exhibit RM-15 compares
8 FPL's forecast of summer peak demands with the forecast filed in the 2008
9 Ten-Year Site Plan. The Exhibit shows that by 2018, FPL's forecast of
10 summer peak demand is 3,182 MW below the level forecasted in last year's
11 Ten-Year Site Plan. Nevertheless, after the economy and population growth
12 rebound, both sets of forecasts share similar percentage growth rates.

13 **Q. Is FPL's projected summer peak demand reasonable?**

14 A. Yes. FPL's projected summer peak demand is based on reasonable
15 assumptions, is consistent with historical experience, and relies on the
16 forecasting methods previously reviewed and accepted by the Commission.

17

18

WINTER PEAK DEMAND

19

20 **Q. What is FPL's process for forecasting winter peak demands?**

21 A. Like the system summer peak model, the winter peak model is also an
22 econometric model. The winter peak model is a per-customer model that
23 includes two weather-related variables: the average temperature on the peak

1 day and heating degree hours the day before and the morning of the peak. The
2 model also has an economic term, real household disposable income. In
3 addition, adjustments are made to the projected winter peak demand for
4 changes in appliance efficiency, the temporary impact of empty houses and
5 for additional wholesale contracts.

6 **Q. What is FPL's projected winter peak demand?**

7 A. As shown in Exhibit RM-16, the winter peak demand is projected to increase
8 at an annual rate of 2.7% or 541 MW annually between 2008 and 2018.
9 Slightly higher absolute increases are projected over the longer term. The
10 winter peak demand is projected to increase at an annual rate of 2.4% or
11 525 MW annually between 2008 and 2025. As shown in Exhibit RM-17, the
12 winter peak is expected to reach 29,352 MW by 2030, an 11,297 MW increase
13 over the 2008 winter peak.

14 **Q. How does FPL's forecast of winter peak demands compare with historical
15 trends?**

16 A. Since 1980, the winter peak has increased at an average annual rate of 2.2% or
17 297 MW a year. This historical growth rate is influenced by the unusually
18 mild winter peaks experienced in recent years. Temperatures on the day of
19 the winter peak have been higher than normal since 2004. As a result, the
20 forecasted growth rates in the winter peak are somewhat higher than the 1980
21 through 2008 average growth rate.

1 **Q. Is FPL's projected winter peak demand reasonable?**

2 A. Yes. FPL's projected winter peak demand is based on reasonable
3 assumptions, is consistent with historical experience and relies on the
4 forecasting methods previously reviewed and accepted by the Commission.

5

6

FORECAST OF NEL

7

8 **Q. How does FPL forecast energy sales?**

9 A. FPL forecasts energy sales using an econometric model for NEL, which is the
10 energy generated net of plant use. An econometric model for NEL is more
11 reliable than models for billed energy sales because the explanatory variables
12 can be better matched to usage. This is so because the NEL data do not have
13 to be attuned to account for billing cycle adjustments, which might distort the
14 real time match between the production and consumption of electricity.

15 **Q. What growth in NEL has FPL experienced historically?**

16 A. Between 1980 and 2008, NEL grew at an annual rate of 3.0%. Effectively,
17 this rate meant FPL's NEL has been doubling every 23 years.

18 **Q. What factors accounted for this growth?**

19 A. Consistent with the historical increases in summer peak demands previously
20 discussed, population growth and an expanding economy are the two principal
21 drivers behind the growth in NEL FPL has experienced historically.

1 **Q. What growth in NEL has FPL experienced recently?**

2 A. FPL's NEL declined in 2008 following below average growth in 2006 and
3 2007. The cyclical declines in population and economic growth we are
4 currently experiencing have contributed to the stagnation in NEL in recent
5 years.

6 **Q. What are the primary determinants of energy use per customer?**

7 A. The primary determinants of energy use per customer include the economy,
8 weather, the price of electricity, changes in the appliance stock and the
9 addition of new wholesale contracts. Accordingly, FPL's forecast of energy
10 use per customer reflects each of these factors. FPL forecasts energy use per
11 customer using an econometric model with explanatory variables representing
12 a number of these factors. The remaining factors are used to adjust the results
13 of the econometric model.

14 **Q. How does FPL measure the influence of the economy in forecasting
15 energy use per customer?**

16 A. FPL measures the influence of the economy using real household disposable
17 income, consistent with its summer peak demand model.

18 **Q. How does FPL measure the influence of weather in forecasting energy use
19 per customer?**

20 A. FPL measures the influence of weather based on cooling and heating degree
21 hours. Historical cooling and heating degree hours are explanatory variables
22 in the energy use per customer model. The forecasted number of cooling and
23 heating degree hours is based on twenty year averages.

1 **Q. What pricing assumptions did FPL assume in forecasting energy use per**
2 **customer?**

3 A. FPL uses the real price of electricity as an explanatory variable in forecasting
4 energy use per customer. The real price of electricity is consistent with
5 assumptions used in the summer peak model. In the case of energy use per
6 customer, the real price of electricity is based on a rolling 12-month average.

7 **Q. What adjustments are made in forecasting NEL?**

8 A. Consistent with the adjustments used in forecasting summer peak demands,
9 adjustments are made for changes in the efficiency of the appliance stock, for
10 the temporary impact of empty homes, for the addition of new wholesale
11 contracts and for plug-in hybrids. The adjustment for empty homes is a short-
12 term adjustment which does not affect NEL after 2011. The additional load
13 from plug-in hybrids is expected to be at or below 1% of NEL through 2030.

14 **Q. What is FPL's forecasted energy use per customer?**

15 A. As shown in Exhibit RM-18, FPL is forecasting almost flat energy use per
16 customer through 2013. With the addition of new wholesale load, energy use
17 per customer increases significantly in 2014. Moderate growth is projected
18 thereafter. Between 2008 and 2018, a 0.1% annual growth in energy use per
19 customer is projected. This growth rate is projected to increase to 0.4%
20 between 2008 and 2025.

21 **Q. What is FPL's forecast of NEL?**

22 A. As shown in Exhibit RM-19, FPL is forecasting an annual increase of 1.8% in
23 NEL between 2008 and 2018 with NEL reaching 132,136 GWh in 2018.

1 Between 2008 and 2025, a 2.0% annual growth rate is expected with NEL
2 reaching 154,863 GWh by 2025. As shown in Exhibit RM-20, by 2030 NEL
3 is expected to reach 167,114 GWh, a 56,111 GWh increase from the level in
4 2008.

5 **Q. How does FPL’s forecast of NEL compare with historical trends?**

6 A. The forecast of net energy between 2008 and 2018 is consistent with two
7 long-term trends, namely that the percentage increases in load tend to
8 decelerate over time while the absolute level of increase remains high.
9 Accordingly, net energy averaged a 3.0% growth rate between 1980 and 2008,
10 significantly higher than the 1.8% rate projected between 2008 and 2018. At
11 the same time, NEL averaged an absolute annual increase of 2,234 GWh
12 between 1980 and 2008, which is close to the 2,113 GWh projected between
13 2008 and 2018.

14 **Q. How does FPL’s forecast of NEL compare with the previously filed
15 forecast?**

16 A. Due in part to lower growth in the initial years of the forecast FPL’s forecast
17 of NEL is below the levels assumed in the 2008 Ten-Year Site Plan. FPL
18 witness Stubblefield discusses how the reduction in the load forecast relative
19 to the one filed in the 2008 Ten-Year Site Plan affected the scenarios
20 requested in the Bid Solicitation process. As shown in Exhibit RM-21, the
21 level of NEL in 2018 in the current forecast is 31,978 GWh below the level
22 assumed in the 2008 Ten-Year Site Plan by 2018. Nevertheless, long-term
23 growth remains robust under the current forecast.

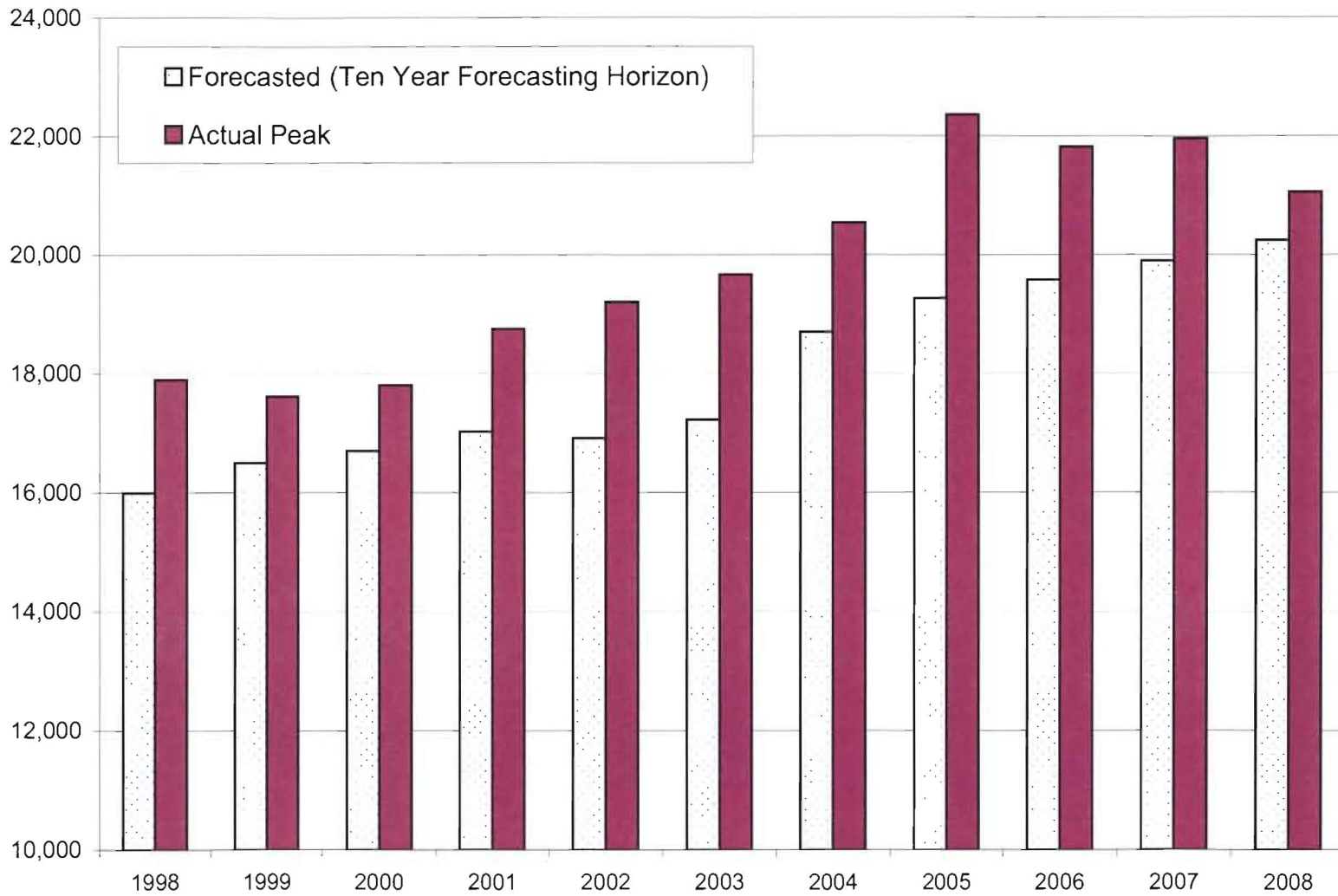
1 **Q. Is FPL's NEL forecast reasonable?**

2 A. Yes. The forecast reflects a careful review of the factors influencing energy
3 use per customer. The forecast is based on sound statistical methods
4 previously reviewed and approved by the Commission. In addition, a
5 comparison of the forecast with historical trends suggests that the forecast is
6 reasonable.

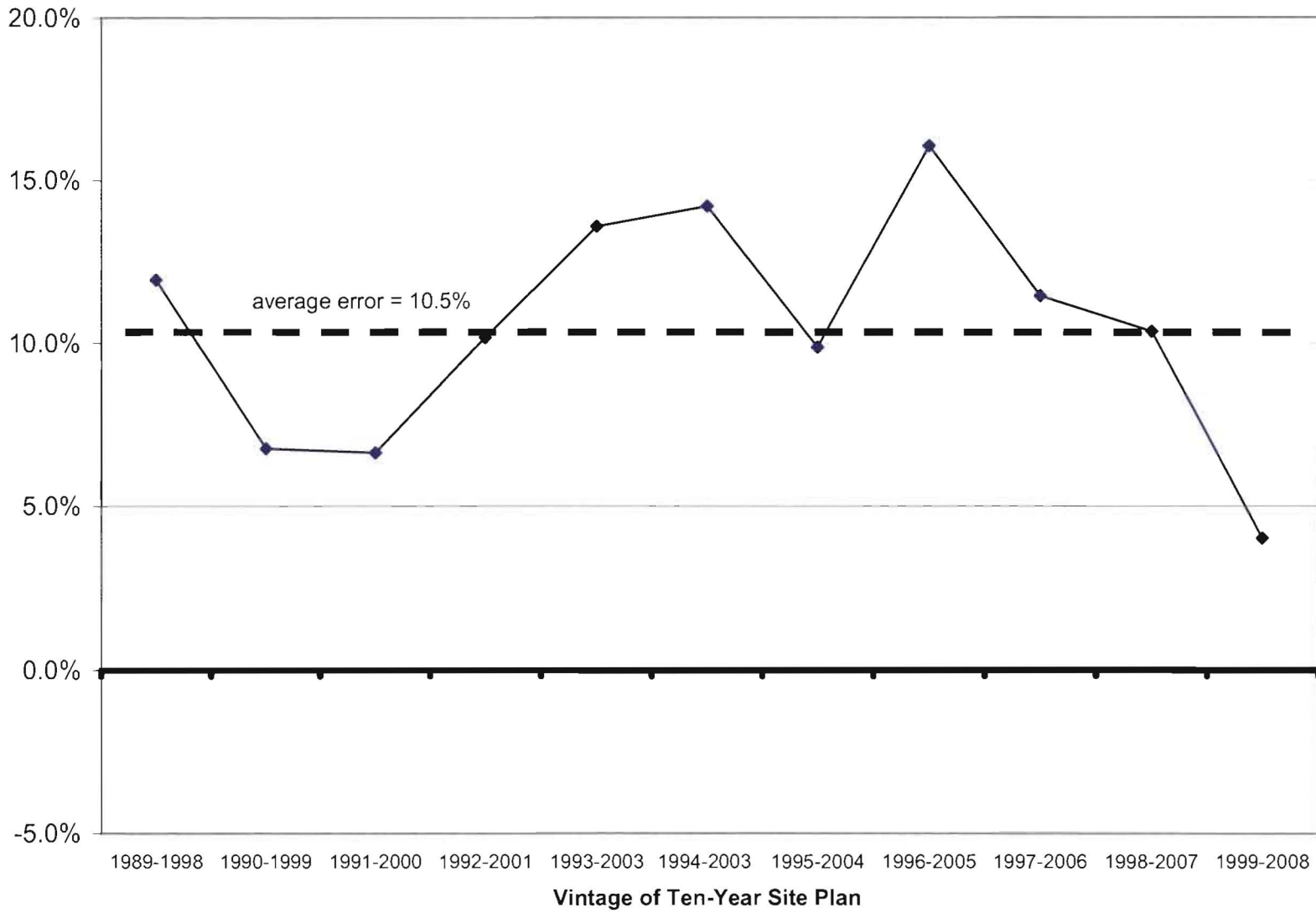
7 **Q. Does this conclude your testimony?**

8 A. Yes.

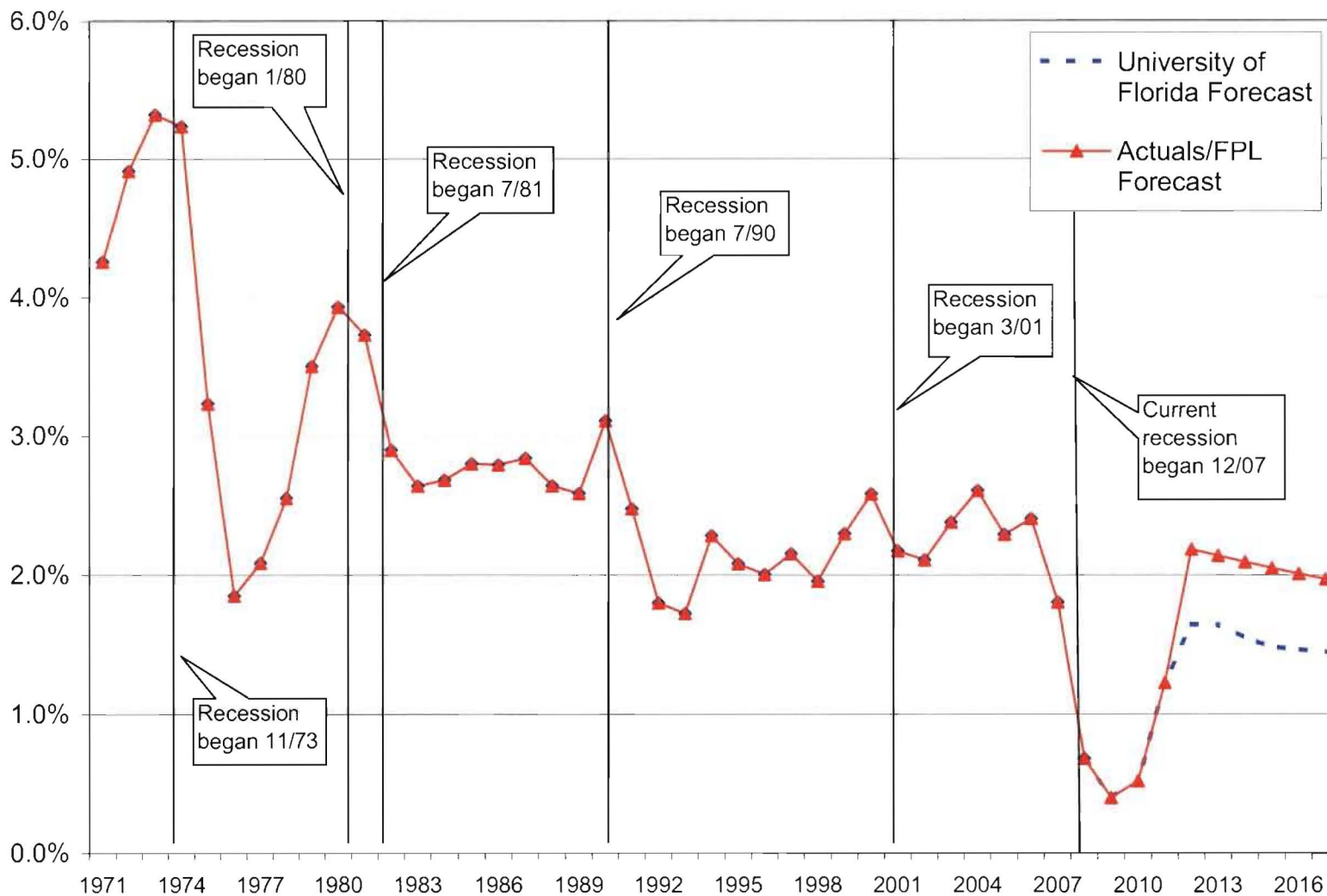
Actual and Forecasted Summer Peak (MW)



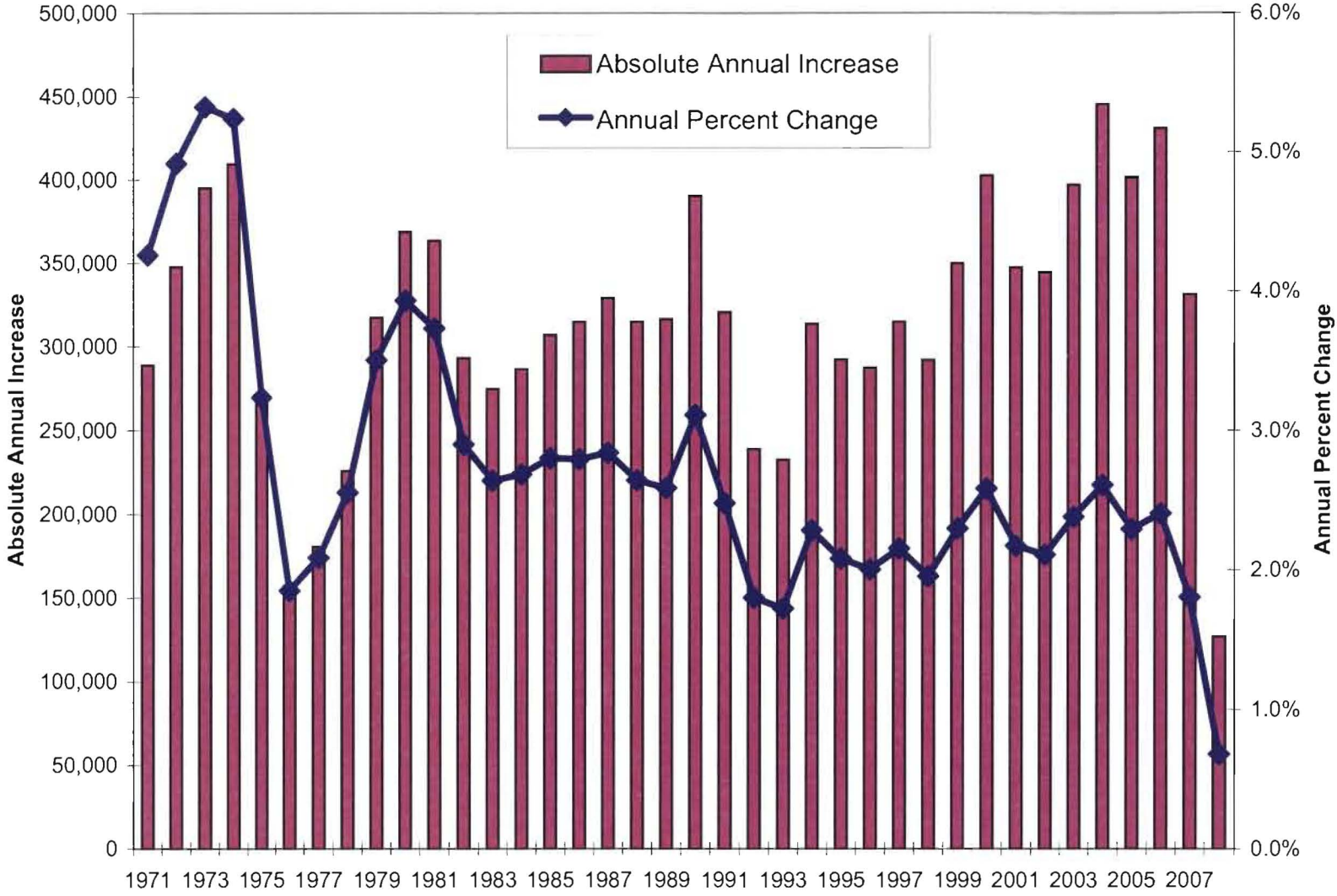
Summer Peak Forecasting Error (Ten Year Forecasting Horizon)



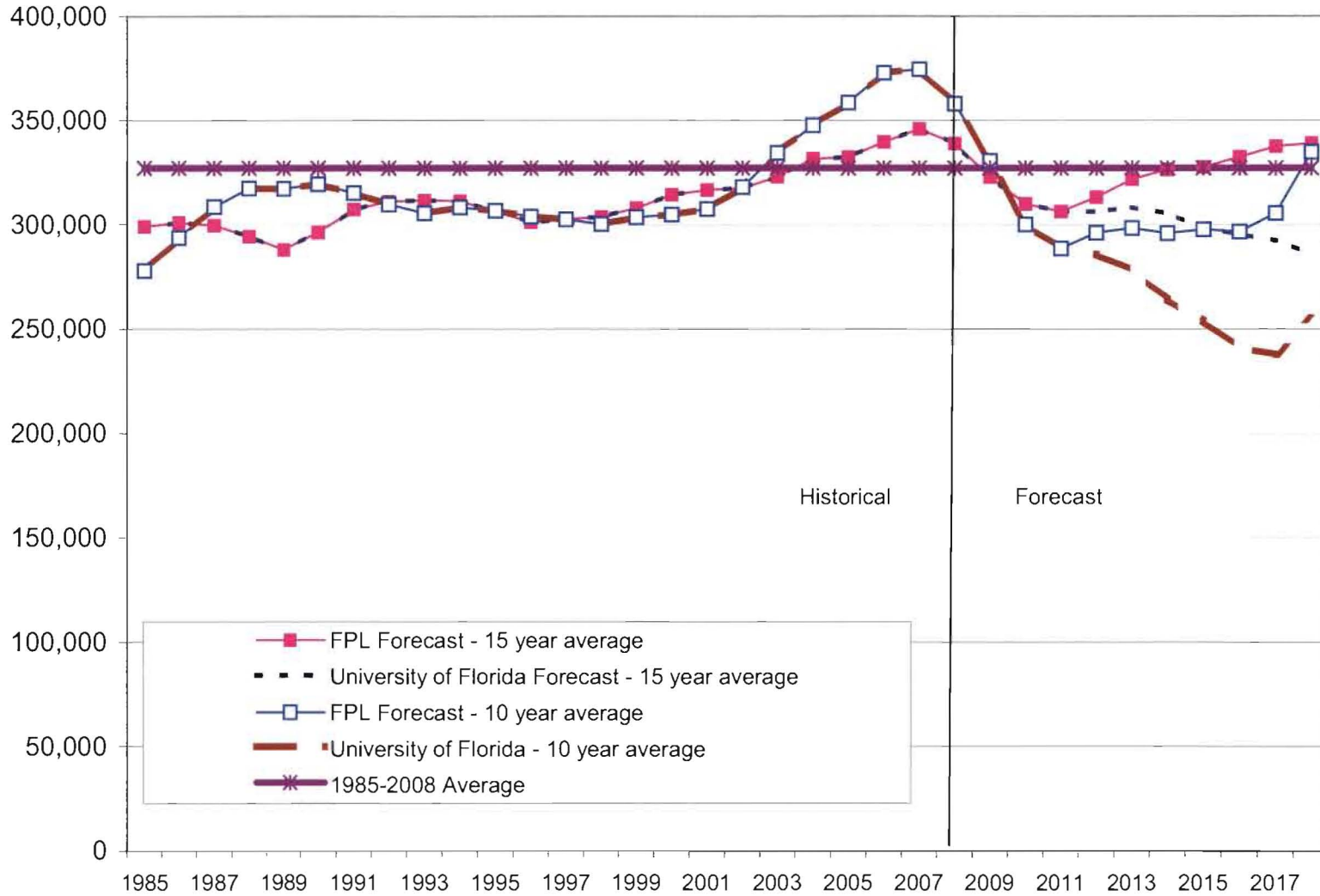
Annual Percent Change in Florida's Population



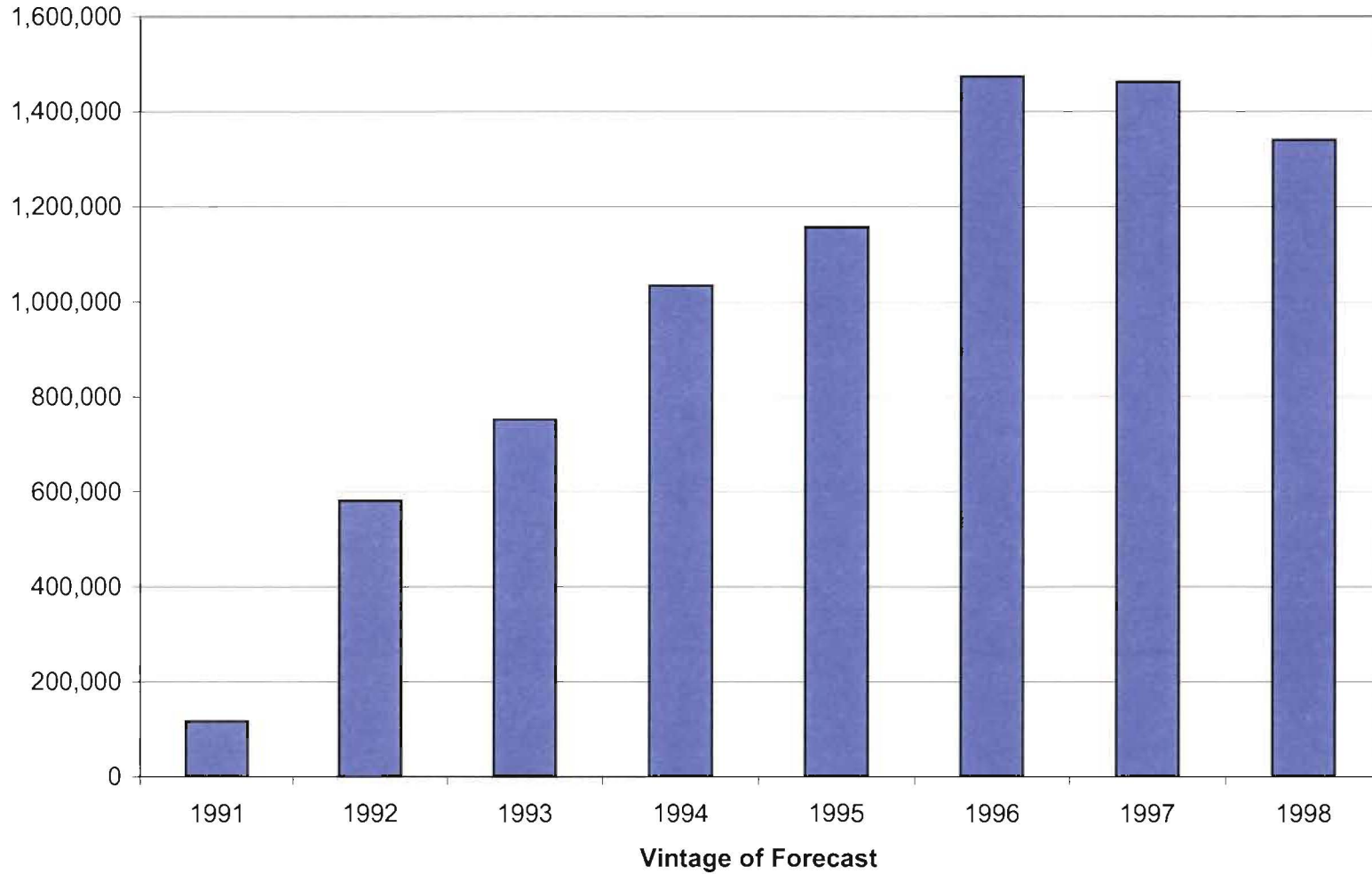
Historical Population Growth



Annual Change in Population Long-Term Moving Averages



University of Florida's Population Under-Forecast (Ten Year Forecast Horizon)



TOTAL AVERAGE CUSTOMERS

AVERAGE ANNUAL GROWTH

	Growth	
	Absolute	%
History (1980 to 2008)	83,027	2.6%
Forecast (2008 to 2018)	78,838	1.6%
Forecast (2008 to 2025)	79,020	1.5%

HISTORY

	History	Growth	
		Absolute	%
1980	2,184,974	110,647	5.3%
1981	2,285,187	100,214	4.6%
1982	2,358,167	72,980	3.2%
1983	2,429,688	71,521	3.0%
1984	2,520,523	90,835	3.7%
1985	2,617,556	97,033	3.8%
1986	2,723,555	105,999	4.0%
1987	2,840,207	116,651	4.3%
1988	2,953,663	113,457	4.0%
1989	3,064,436	110,773	3.8%
1990	3,158,817	94,381	3.1%
1991	3,226,455	67,638	2.1%
1992	3,281,238	54,783	1.7%
1993	3,355,794	74,556	2.3%
1994	3,422,187	66,393	2.0%
1995	3,488,796	66,609	1.9%
1996	3,550,747	61,951	1.8%
1997	3,615,485	64,738	1.8%
1998	3,680,470	64,985	1.8%
1999	3,756,009	75,539	2.1%
2000	3,848,350	92,341	2.5%
2001	3,935,281	86,931	2.3%
2002	4,019,805	84,523	2.1%
2003	4,117,221	97,416	2.4%
2004	4,224,509	107,289	2.6%
2005	4,321,895	97,386	2.3%
2006	4,409,563	87,667	2.0%
2007	4,496,589	87,027	2.0%
2008	4,509,729	13,140	0.3%

FORECAST

	Forecast	Growth	
		Absolute	%
2009	4,519,986	10,256	0.2%
2010	4,548,763	28,777	0.6%
2011	4,607,594	58,832	1.3%
2012	4,707,005	99,411	2.2%
2013	4,806,155	99,150	2.1%
2014	4,904,959	98,803	2.1%
2015	5,003,480	98,522	2.0%
2016	5,101,804	98,324	2.0%
2017	5,199,999	98,194	1.9%
2018	5,298,111	98,112	1.9%
2019	5,396,173	98,061	1.9%
2020	5,494,203	98,030	1.8%
2021	5,575,884	81,681	1.5%
2022	5,647,894	72,010	1.3%
2023	5,717,395	69,501	1.2%
2024	5,785,615	68,220	1.2%
2025	5,853,062	67,447	1.2%

REAL HOUSEHOLD DISPOSABLE INCOME (Thousands in Year 2000 \$)

AVERAGE ANNUAL GROWTH

	Growth	
	Absolute	%
History (1982 to 2008)	1.1	2.0%
Forecast (2008 to 2018)	1.0	1.3%
Forecast (2008 to 2025)	1.4	1.6%

HISTORY

	History	Absolute	Growth	
				%
1982	44.3			
1983	46.9	2.6		5.8%
1984	49.1	2.2		4.7%
1985	49.7	0.6		1.3%
1986	50.6	0.9		1.8%
1987	51.4	0.8		1.5%
1988	53.1	1.7		3.3%
1989	54.9	1.8		3.4%
1990	55.1	0.2		0.3%
1991	54.1	-1.0		-1.8%
1992	54.3	0.2		0.4%
1993	54.8	0.6		1.0%
1994	55.5	0.7		1.2%
1995	56.4	0.9		1.7%
1996	56.8	0.4		0.7%
1997	57.4	0.6		1.1%
1998	59.9	2.5		4.3%
1999	60.7	0.8		1.4%
2000	62.4	1.7		2.8%
2001	63.1	0.7		1.0%
2002	64.4	1.3		2.1%
2003	65.3	1.0		1.5%
2004	68.1	2.8		4.2%
2005	69.6	1.5		2.2%
2006	72.7	3.1		4.4%
2007	73.7	1.0		1.4%
2008	73.3	-0.3		-0.5%

FORECAST

	Forecast	Absolute	Growth	
				%
2009	71.6	-1.7		-2.3%
2010	71.2	-0.4		-0.6%
2011	71.7	0.5		0.7%
2012	73.3	1.6		2.2%
2013	74.6	1.3		1.8%
2014	76.6	2.0		2.7%
2015	78.5	1.9		2.5%
2016	80.2	1.7		2.2%
2017	81.9	1.6		2.0%
2018	83.8	1.9		2.3%
2019	85.7	1.9		2.3%
2020	87.6	1.9		2.2%
2021	89.3	1.7		2.0%
2022	91.1	1.8		2.0%
2023	92.8	1.7		1.9%
2024	94.6	1.7		1.9%
2025	96.4	1.8		1.9%

REAL PRICE OF ELECTRICITY (CENTS/kWh)

AVERAGE ANNUAL GROWTH

	<u>Growth</u>	
	<u>Absolute</u>	<u>%</u>
History (1982 to 2008)	-0.1	-1.1%
Forecast (2008 to 2018)	0.1	1.6%
Forecast (2008 to 2025)	0.1	1.1%

HISTORY

	<u>History</u>	<u>Absolute</u>	<u>Growth</u>	
				<u>%</u>
1982	6.7			
1983	6.6	-0.1		-1.0%
1984	7.6	1.0		14.8%
1985	7.7	0.0		0.5%
1986	6.8	-0.8		-10.8%
1987	6.5	-0.3		-4.2%
1988	6.5	-0.1		-1.1%
1989	5.9	-0.5		-8.2%
1990	5.6	-0.3		-5.2%
1991	5.6	-0.1		-1.3%
1992	5.2	-0.3		-6.1%
1993	5.1	-0.1		-2.1%
1994	4.6	-0.5		-9.6%
1995	4.6	0.0		-1.0%
1996	4.7	0.1		3.0%
1997	4.6	-0.1		-2.5%
1998	4.4	-0.2		-4.9%
1999	4.1	-0.3		-6.1%
2000	4.0	-0.1		-2.9%
2001	4.5	0.6		14.2%
2002	4.1	-0.5		-10.5%
2003	4.3	0.3		6.2%
2004	4.4	0.1		2.5%
2005	4.5	0.1		2.7%
2006	5.5	1.0		21.6%
2007	5.1	-0.4		-7.3%
2008	5.0	-0.1		-1.7%

FORECAST

	<u>Forecast</u>	<u>Absolute</u>	<u>Growth</u>	
				<u>%</u>
2009	5.1	0.1		1.6%
2010	5.0	-0.1		-1.4%
2011	5.1	0.1		1.1%
2012	5.3	0.2		3.0%
2013	5.4	0.2		3.4%
2014	5.6	0.2		3.1%
2015	5.7	0.1		2.4%
2016	5.8	0.1		1.2%
2017	5.9	0.1		1.4%
2018	5.9	0.0		0.2%
2019	6.0	0.1		1.3%
2020	5.8	-0.1		-2.2%
2021	5.8	0.0		-0.2%
2022	5.9	0.0		0.7%
2023	5.9	0.0		0.7%
2024	6.0	0.1		2.1%
2025	6.1	0.1		1.3%

IMPACT OF APPLIANCE EFFICIENCY STANDARDS

Summer Peak Impact MW

2009	896
2010	1,099
2011	1,317
2012	1,464
2013	1,639
2014	1,821
2015	1,892
2016	1,969
2017	2,040
2018	2,095
2019	2,151
2020	2,206
2021	2,209
2022	2,209
2023	2,209
2024	2,209
2025	2,209

NEW WHOLESALE CONTRACTS

Summer Peak Impact MW

	Lee County	Seminole
2009	0	75
2010	212	0
2011	215	0
2012	218	0
2013	223	0
2014	853	200
2015	874	200
2016	898	200
2017	925	200
2018	953	200
2019	975	200
2020	1,000	200
2021	1,025	200
2022	1,047	200
2023	1,070	200
2024	1,093	200
2025	1,117	200

SUMMER PEAK LOAD PER CUSTOMER (kW)

AVERAGE ANNUAL GROWTH

	<u>Growth</u>	
	<u>Absolute</u>	<u>%</u>
History (1980 to 2008)	0.01	0.2%
Forecast (2008 to 2018)	0.03	0.6%
Forecast (2008 to 2025)	0.04	0.7%

HISTORY

	<u>History</u>	<u>Absolute</u>	<u>Growth</u>	<u>%</u>
1980	4.40			
1981	4.26	-0.14		-3.2%
1982	4.18	-0.08		-1.9%
1983	4.39	0.21		5.1%
1984	4.07	-0.32		-7.3%
1985	4.07	0.00		-0.1%
1986	4.05	-0.02		-0.6%
1987	4.36	0.32		7.8%
1988	4.19	-0.17		-3.9%
1989	4.38	0.19		4.5%
1990	4.35	-0.03		-0.6%
1991	4.38	0.02		0.5%
1992	4.47	0.09		2.1%
1993	4.55	0.08		1.8%
1994	4.44	-0.11		-2.5%
1995	4.53	0.10		2.2%
1996	4.52	-0.01		-0.2%
1997	4.59	0.07		1.6%
1998	4.86	0.27		5.8%
1999	4.69	-0.17		-3.6%
2000	4.63	-0.06		-1.3%
2001	4.77	0.14		3.0%
2002	4.78	0.02		0.3%
2003	4.78	0.00		-0.1%
2004	4.86	0.09		1.8%
2005	5.15	0.29		6.0%
2006	4.95	-0.21		-4.0%
2007	4.88	-0.06		-1.3%
2008	4.67	-0.21		-4.4%

FORECAST

	<u>Forecast</u>	<u>Absolute</u>	<u>Growth</u>	<u>%</u>
2009	4.67	0.00		0.1%
2010	4.65	-0.02		-0.5%
2011	4.64	-0.01		-0.2%
2012	4.66	0.02		0.5%
2013	4.63	-0.03		-0.7%
2014	4.80	0.17		3.6%
2015	4.83	0.03		0.6%
2016	4.86	0.03		0.6%
2017	4.88	0.03		0.6%
2018	4.93	0.05		1.0%
2019	4.98	0.04		0.8%
2020	5.04	0.07		1.4%
2021	5.10	0.06		1.1%
2022	5.15	0.05		1.0%
2023	5.20	0.05		1.0%
2024	5.24	0.04		0.7%
2025	5.29	0.05		0.9%

SUMMER PEAK LOAD (MW)

AVERAGE ANNUAL GROWTH

	Growth	
	Absolute	%
History (1980 to 2008)	408	2.8%
Forecast (2008 to 2018)	508	2.2%
Forecast (2008 to 2025)	583	2.3%

HISTORY

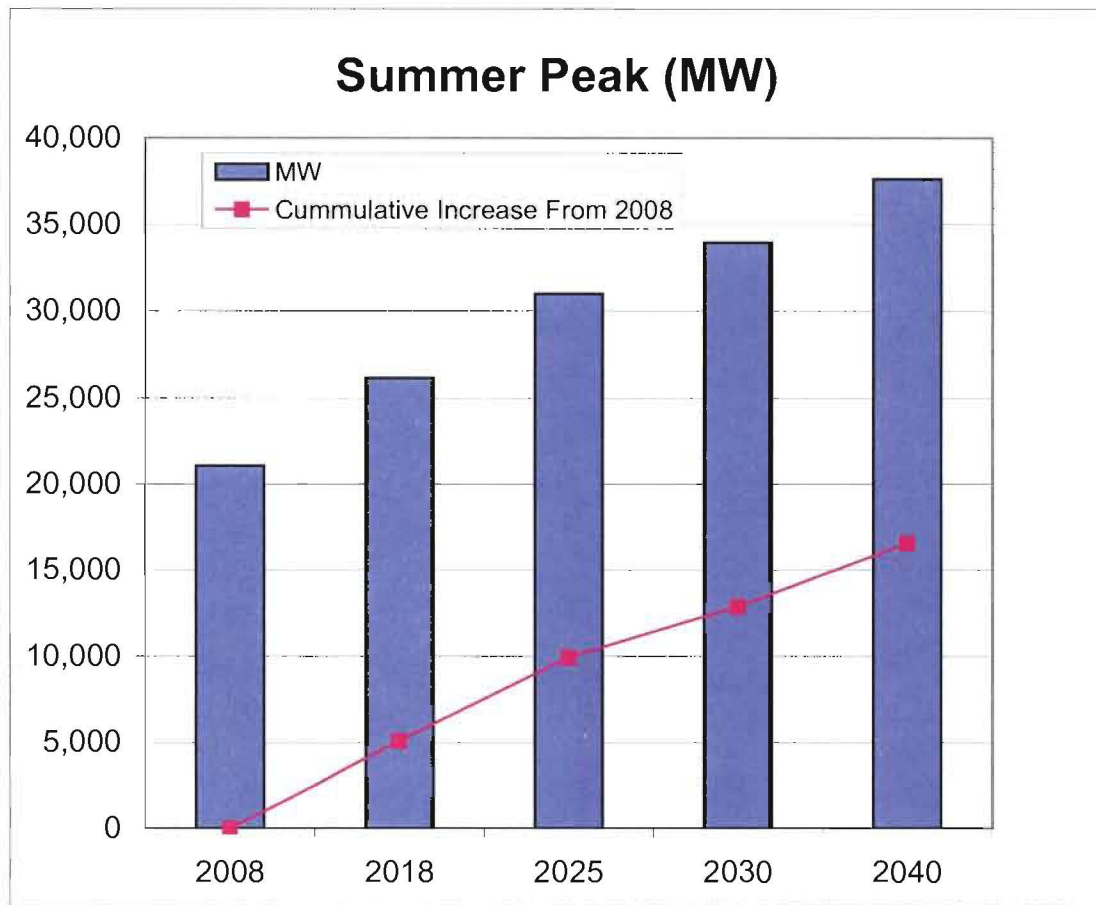
	History	Growth	
		Absolute	%
1980	9,623	973	11.2%
1981	9,738	115	1.2%
1982	9,862	124	1.3%
1983	10,676	814	8.3%
1984	10,270	-406	-3.8%
1985	10,654	384	3.7%
1986	11,022	368	3.5%
1987	12,394	1,372	12.4%
1988	12,382	-12	-0.1%
1989	13,425	1,043	8.4%
1990	13,754	329	2.5%
1991	14,123	369	2.7%
1992	14,661	538	3.8%
1993	15,266	605	4.1%
1994	15,179	-87	-0.6%
1995	15,813	634	4.2%
1996	16,064	251	1.6%
1997	16,613	549	3.4%
1998	17,897	1,284	7.7%
1999	17,615	-282	-1.6%
2000	17,808	193	1.1%
2001	18,754	946	5.3%
2002	19,219	465	2.5%
2003	19,668	449	2.3%
2004	20,545	877	4.5%
2005	22,276	1,731	8.4%
2006	21,819	-457	-2.1%
2007	21,962	143	0.7%
2008	21,060	-902	-4.1%

FORECAST

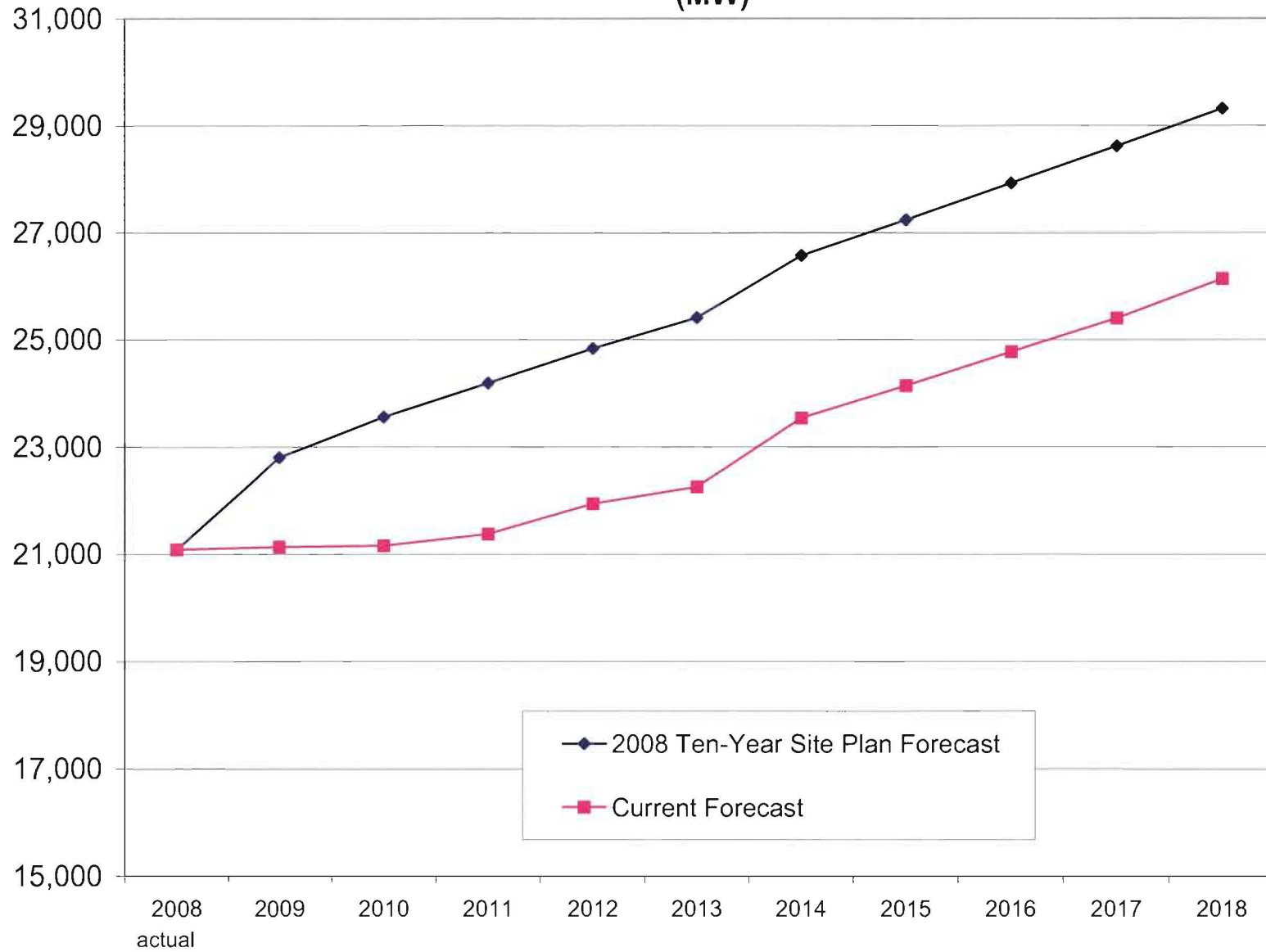
	Forecast	Growth	
		Absolute	%
2009	21,124	64	0.3%
2010	21,147	23	0.1%
2011	21,368	221	1.0%
2012	21,933	565	2.6%
2013	22,249	316	1.4%
2014	23,533	1,284	5.8%
2015	24,142	610	2.6%
2016	24,772	629	2.6%
2017	25,401	629	2.5%
2018	26,143	742	2.9%
2019	26,848	705	2.7%
2020	27,715	867	3.2%
2021	28,449	734	2.6%
2022	29,109	660	2.3%
2023	29,758	650	2.2%
2024	30,339	580	1.9%
2025	30,973	634	2.1%

Long-Term Growth in Summer Peak (MW)

	Level	Cumulative Increase From 2008	Average Annual Growth from 2008
2008	21,060	0	
2018	26,143	5,083	2.2%
2025	30,973	9,913	2.3%
2030	33,931	12,871	2.2%
2040	37,622	16,562	1.8%



Changes in Forecasted Summer Peak Since the 2008 Ten-Year Site Plan (MW)



WINTER PEAK LOAD (MW)

AVERAGE ANNUAL GROWTH

	<u>Growth</u>	
	<u>Absolute</u>	<u>%</u>
History (1980 to 2008)	297	2.2%
Forecast (2008 to 2018)	541	2.7%
Forecast (2008 to 2025)	525	2.4%

HISTORY

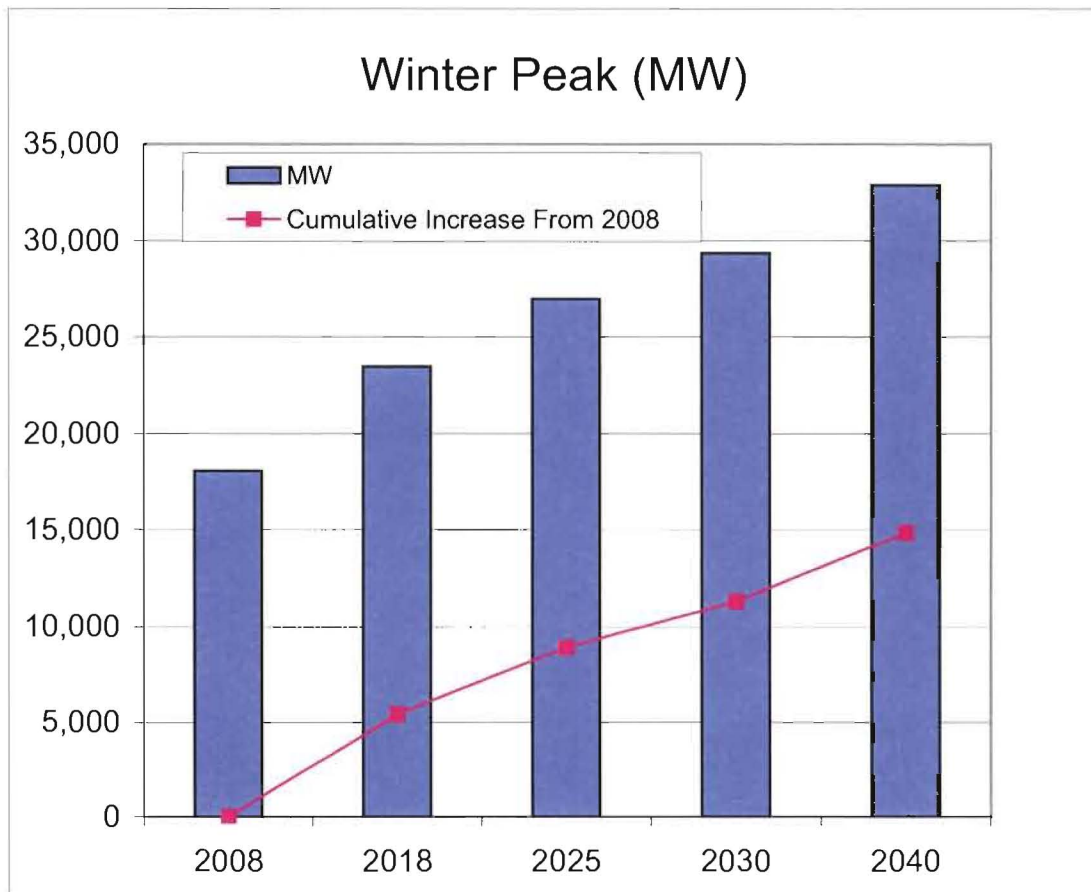
	<u>History</u>	<u>Absolute</u>	<u>Growth</u>	
				<u>%</u>
1980	9,732	941		10.7%
1981	11,360	1,628		16.7%
1982	11,345	-15		-0.1%
1983	9,280	-2,065		-18.2%
1984	11,050	1,770		19.1%
1985	12,533	1,483		13.4%
1986	12,139	-394		-3.1%
1987	10,779	-1,360		-11.2%
1988	12,372	1,593		14.8%
1989	12,876	504		4.1%
1990	16,046	3,170		24.6%
1991	11,868	-4,178		-26.0%
1992	13,319	1,451		12.2%
1993	12,932	-387		-2.9%
1994	12,594	-338		-2.6%
1995	16,563	3,969		31.5%
1996	18,252	1,689		10.2%
1997	17,298	-954		-5.2%
1998	13,060	-4,238		-24.5%
1999	16,802	3,742		28.7%
2000	17,057	255		1.5%
2001	18,199	1,142		6.7%
2002	17,597	-602		-3.3%
2003	20,190	2,593		14.7%
2004	14,752	-5,438		-26.9%
2005	18,108	3,356		22.7%
2006	19,683	1,575		8.7%
2007	16,815	-2,868		-14.6%
2008	18,055	1,240		7.4%

FORECAST

	<u>Forecast</u>	<u>Absolute</u>	<u>Growth</u>	
				<u>%</u>
2009	18,697	642		3.6%
2010	18,790	93		0.5%
2011	19,120	330		1.8%
2012	19,710	590		3.1%
2013	20,098	389		2.0%
2014	21,154	1,056		5.3%
2015	21,882	728		3.4%
2016	22,396	514		2.3%
2017	22,912	516		2.3%
2018	23,466	554		2.4%
2019	24,019	553		2.4%
2020	24,572	552		2.3%
2021	25,089	517		2.1%
2022	25,571	482		1.9%
2023	26,044	473		1.8%
2024	26,512	468		1.8%
2025	26,985	472		1.8%

Long-Term Growth in Winter Peak (MW)

Level	Cumulative Increase From 2008	Average Annual Growth from 2008	
2008	18,055	0	
2018	23,466	5,411	2.7%
2025	26,985	8,930	2.4%
2030	29,352	11,297	2.2%
2040	32,892	14,837	1.9%



NET ENERGY FOR LOAD PER CUSTOMER (kWh)

AVERAGE ANNUAL GROWTH

	<u>Growth</u>	
	<u>Absolute</u>	<u>%</u>
History (1980 to 2008)	87	0.4%
Forecast (2008 to 2018)	33	0.1%
Forecast (2008 to 2025)	108	0.4%

HISTORY

	<u>History</u>	<u>Absolute</u>	<u>Growth</u>	<u>%</u>
1980	22,174			
1981	21,890	-284.05		-1.3%
1982	21,429	-461.16		-2.1%
1983	21,608	179.21		0.8%
1984	21,086	-521.62		-2.4%
1985	21,393	307.14		1.5%
1986	21,394	0.49		0.0%
1987	21,694	300.12		1.4%
1988	21,910	216.57		1.0%
1989	22,828	917.96		4.2%
1990	22,486	-342.45		-1.5%
1991	22,675	189.25		0.8%
1992	22,277	-397.83		-1.8%
1993	22,580	302.81		1.4%
1994	23,487	906.51		4.0%
1995	24,066	579.21		2.5%
1996	23,846	-220.01		-0.9%
1997	24,022	176.35		0.7%
1998	25,177	1,154.72		4.8%
1999	24,350	-826.72		-3.3%
2000	24,943	592.67		2.4%
2001	25,006	62.72		0.3%
2002	25,921	915.84		3.7%
2003	26,327	405.17		1.6%
2004	25,587	-739.41		-2.8%
2005	25,753	165.54		0.6%
2006	25,657	-95.51		-0.4%
2007	25,423	-234.74		-0.9%
2008	24,614	-808.40		-3.2%

FORECAST

	<u>Forecast</u>	<u>Absolute</u>	<u>Growth</u>	<u>%</u>
2009	24,212	-401.71		-1.6%
2010	24,228	15.50		0.1%
2011	24,292	63.81		0.3%
2012	24,392	100.68		0.4%
2013	24,141	-251.07		-1.0%
2014	24,695	553.75		2.3%
2015	24,743	47.65		0.2%
2016	24,752	8.94		0.0%
2017	24,790	38.29		0.2%
2018	24,940	150.21		0.6%
2019	25,089	148.80		0.6%
2020	25,337	247.66		1.0%
2021	25,687	350.52		1.4%
2022	25,935	248.25		1.0%
2023	26,150	214.27		0.8%
2024	26,307	157.79		0.6%
2025	26,458	151.01		0.6%

NET ENERGY FOR LOAD (GWh)

AVERAGE ANNUAL GROWTH

	<u>Growth</u>	
	<u>Absolute</u>	<u>%</u>
History (1980 to 2008)	2,234	3.0%
Forecast (2008 to 2018)	2,113	1.8%
Forecast (2008 to 2025)	2,580	2.0%

HISTORY

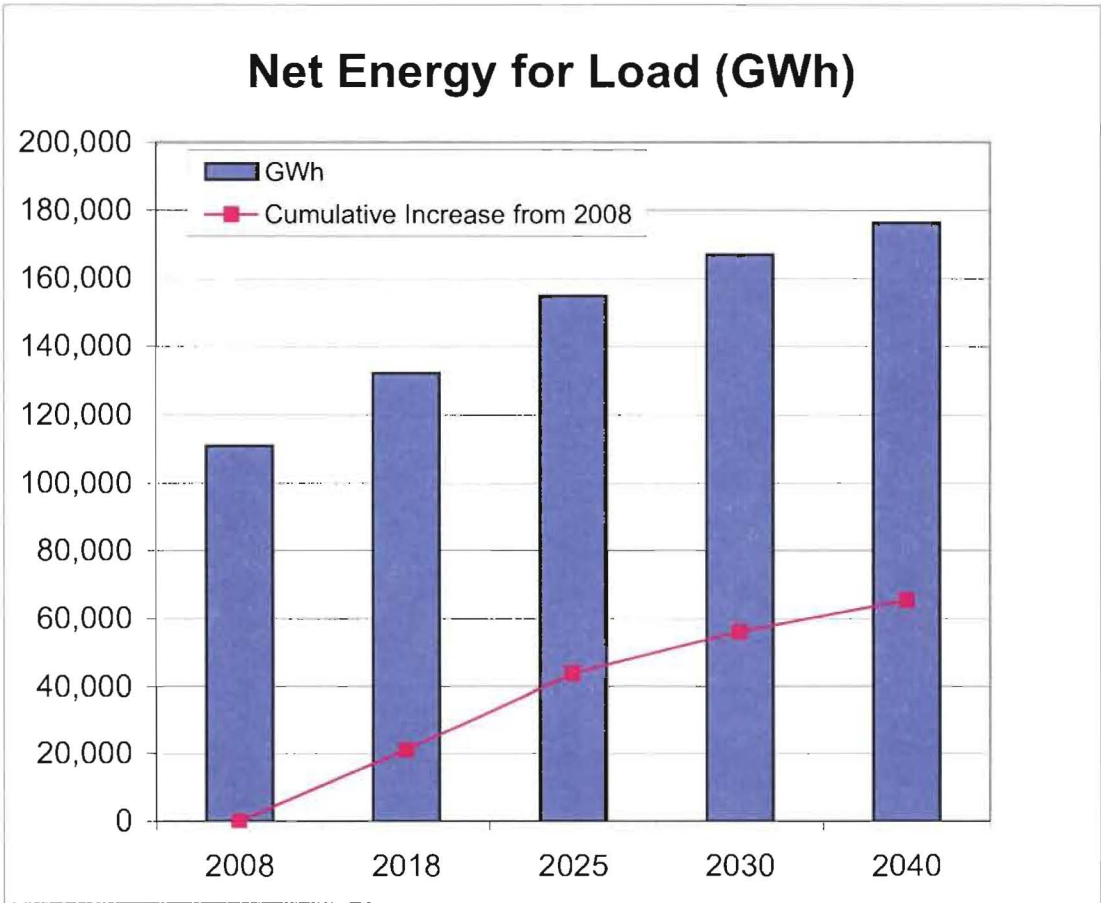
	<u>History</u>	<u>Absolute</u>	<u>Growth</u>	
				<u>%</u>
1980	48,449			
1981	50,022	1,573		3.2%
1982	50,532	510		1.0%
1983	52,500	1,968		3.9%
1984	53,148	648		1.2%
1985	55,998	2,850		5.4%
1986	58,267	2,269		4.1%
1987	61,615	3,348		5.7%
1988	64,716	3,101		5.0%
1989	69,956	5,240		8.1%
1990	71,029	1,073		1.5%
1991	73,160	2,132		3.0%
1992	73,097	-63		-0.1%
1993	75,774	2,677		3.7%
1994	80,376	4,601		6.1%
1995	83,961	3,585		4.5%
1996	84,671	710		0.8%
1997	86,852	2,181		2.6%
1998	92,663	5,811		6.7%
1999	91,460	-1,203		-1.3%
2000	95,989	4,529		5.0%
2001	98,404	2,415		2.5%
2002	104,199	5,795		5.9%
2003	108,393	4,193		4.0%
2004	108,093	-299		-0.3%
2005	111,301	3,207		3.0%
2006	113,137	1,837		1.7%
2007	114,315	1,177		1.0%
2008	111,003	-3,312		-2.9%

FORECAST

	<u>Forecast</u>	<u>Absolute</u>	<u>Growth</u>	
				<u>%</u>
2009	109,440	-1,563		-1.4%
2010	110,207	767		0.7%
2011	111,926	1,719		1.6%
2012	114,815	2,889		2.6%
2013	116,027	1,212		1.1%
2014	121,128	5,101		4.4%
2015	123,800	2,671		2.2%
2016	126,278	2,478		2.0%
2017	128,908	2,630		2.1%
2018	132,136	3,228		2.5%
2019	135,384	3,249		2.5%
2020	139,205	3,820		2.8%
2021	143,229	4,024		2.9%
2022	146,480	3,252		2.3%
2023	149,508	3,028		2.1%
2024	152,205	2,697		1.8%
2025	154,863	2,658		1.7%

Long-Term Growth in Net Energy for Load (GWh)

Level	Cumulative Increase From 2008	Average Annual Growth from 2008
2008	0	
2018	21,133	1.8%
2025	43,860	2.0%
2030	56,111	1.9%
2040	65,415	1.5%



Changes in Forecasted Net Energy For Load Since the 2008 Ten-Year Site Plan (GWh)

