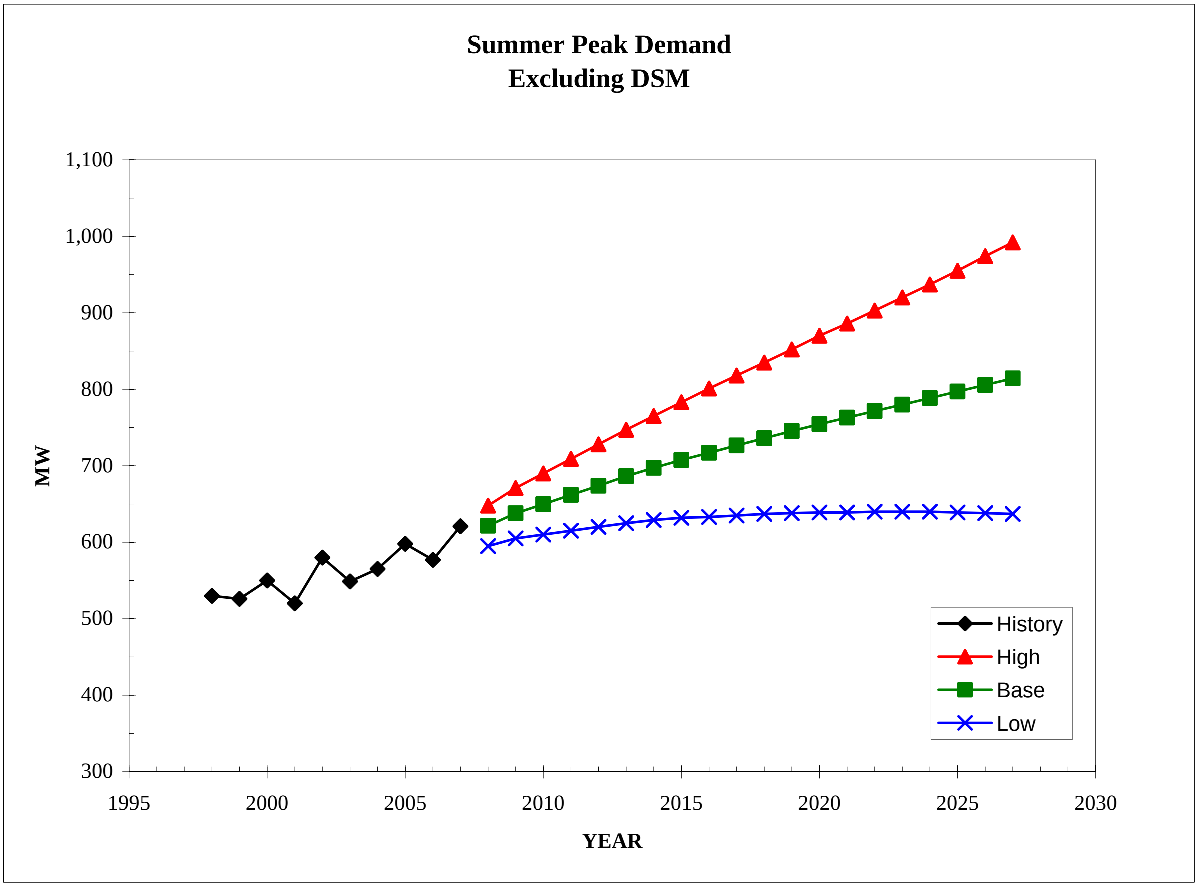
2008 LOAD AND ENERGY FORECAST REPORT



CITY OF TALLAHASSEE

ELECTRIC UTILITY

SYSTEM PLANNING

DECEMBER 2008

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EXECUTIVE SUMMARY

The City of Tallahassee, Electric Utility ("City") completes an annual Load and Energy Forecast ("Forecast"), which contains its projections of future demand and energy consumption for a 20-year period. The Forecast is a key input in determining resource requirements for the electric system.

Development of the Forecast consists of two parts: 1) technical review of the forecasting models and assumptions which is referred to as the "ex-post analysis" and 2) the actual calculation of the Forecast. Depending upon the outcome of the technical review, revisions to the econometric model may be necessary. The Forecast calculation methodology consists of thirteen multi-variable regression models. Projections for Residential Customers, Commercial Customers, Residential Sales, General Services Non-Demand Sales, General Service Demand Sales, General Service Large Demand Sales, Street and Security Light Sales, sales to four of the City's largest customers, Summer Peak Demand and Winter Peak Demand are produced using linear regression models that incorporate historical growth, normalized weather patterns, population statistics and economic factors. Beginning with the 2005 forecast, projections of meters by customer class replaced projections of customers by class due to a change in internal utility accounting practices.

The following report will discuss the Forecast, the results of the ex-post analysis, the forecasting models and the comparison of history, the current Forecast and past Forecasts.

The results of the Forecast are shown in various tables throughout the report. Energy projections are at the sales level and the demand projections are at the generation level, excluding the impacts of Demand Side Management (DSM). However, there is graphical analysis of both energy and demand projections with the effects of DSM.

CHAPTER I

System Demand and Energy Forecast

1.0 Summary

The following is a summary of the process used to develop the City of Tallahassee, Electric Utility's ("City") system Load and Energy Forecast ("Forecast") for the period 2008 through 2027. Table 1.1 depicts the 2008 Load Forecasting Model Flowchart developed by R.W. Beck Inc. This Forecast includes projected energy requirements for all of the major customer classes, and three of our largest customers. It also includes the seasonal (summer and winter) peak demand projections for the system as a whole. The projections of energy and demand are made under "base case" conditions. That is, under the most likely conditions of weather, population growth, price of electricity, and temperature. This report summarizes the results under the base case, compares them to various benchmarks (including the previous year's forecast), and describes the forecasting methods employed.

The primary purpose of developing the Forecast is for use in determining the electric generating resources that will be needed to meet the future requirements of the City's customers. The greatest electric demand each year is expected to occur during the summer and therefore planning for new resource additions is based on the summer peaks. Considering the base Forecast presented in this study and the City's available resources over the next several years, a need for new resources will exist in future years.

The Forecast is only a prediction of future electric requirements. The ex-post analysis indicates that the forecast equations are reasonably good predictors and the City should continue to use them (with minor adjustments as needed) in future forecast studies.

The results of the 2008 Forecast are shown in Table 1.2. The energy numbers represent energy at the sales level, excluding the effects of demand-side management (DSM). The numbers shown for demand are at the generation level, again excluding the effects of DSM. Table 1.3 and 1.4 list key explanatory variables that are used in each model and the sources of the Forecast model inputs, respectively. In Table 1.3, fluctuations in the historical winter peak demand values (Table 1.2) caused a decrease in the coefficient of determination (R-squared) versus the previous Forecast.

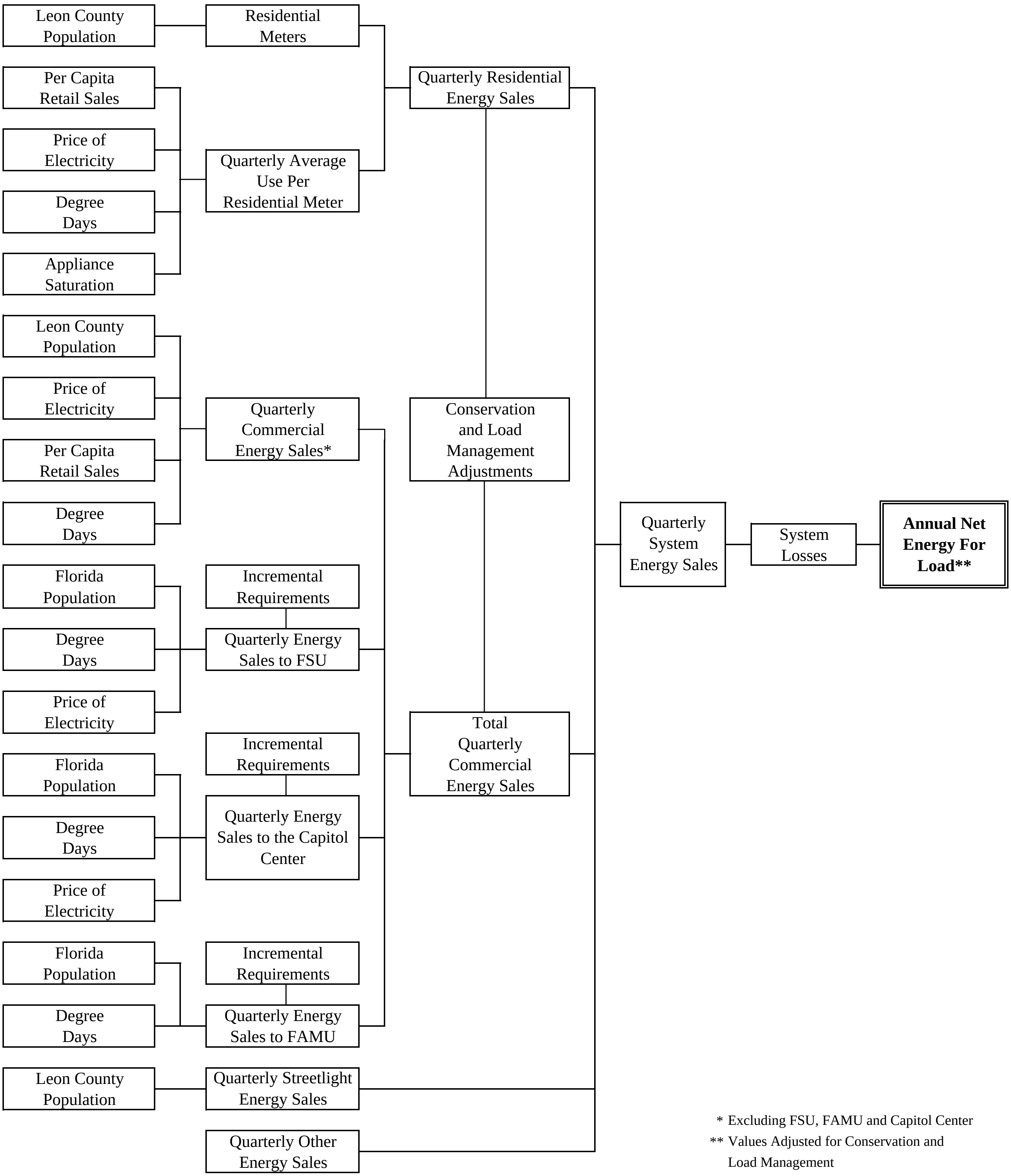
A DSM portfolio was developed and utilized in the 2004 Integrated Resource Plan (IRP) study, which identified the maximum achievable DSM potential for the City. Table 1.5 represents the maximum achievable DSM impact as a reduction to the load and energy forecasted values.

Sales without DSM are projected to increase by 473 GWh from calendar year 2008-2017. This represents a total increase of 17.1% and an annual average growth rate (AAGR) of 1.8%. Peak demand, excluding DSM, is projected to increase in ten years by 104 MW for summer and 98 MW for winter. For the period from calendar year 2008-2017 this represents a total increase of 16.7% and an AAGR of 1.7% for summer and a total increase of 17.5% and an AAGR of 1.8% for winter.

Total calendar year energy sales, including the DSM portfolio, are projected to increase 150 GWh, which represents a total increase of 5.4% and an AAGR of 0.6% over the 2008-2017 period. Summer and winter peak demands are projected to decrease by 11 MW and 8 MW, respectively, for the same ten-year period. For the period from calendar year 2008-2017 this represents a total decrease of 1.8% and an AAGR of –0.2% for summer and a total decrease of 1.4% and an AAGR of –0.2% for winter. The DSM portfolio causes the downward trend in the summer and winter peaks over the next 10-year period.

CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Model Flowchart



* Excluding FSU, FAMU and Capitol Center
** Values Adjusted for Conservation and Load Management

CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Base Case
Net Energy for Load and Seasonal Demand
Excluding DSM

Year	Fiscal Year Total Energy Sales (MWh)	Fiscal Year Total Net Energy for Load (MWh)	Fiscal Year Load Factor (%)	Calendar Year Total Energy Sales (MWh)	Calendar Year Total Net Energy for Load (MWh)	Calendar Year Load Factor (%)	System Summer Peak (MW)	System Winter Peak (MW)
2008	2,756,822	2,920,672	53.64%	2,772,037	2,936,791	53.94%	622	560
2009	2,820,378	2,988,005	53.47%	2,836,379	3,004,957	53.77%	638	576
2010	2,881,467	3,052,725	53.63%	2,893,140	3,065,092	53.85%	650	587
2011	2,929,437	3,103,546	53.53%	2,942,885	3,117,793	53.77%	662	598
2012	2,984,526	3,161,909	53.56%	2,998,015	3,176,200	53.80%	674	610
2013	3,040,077	3,220,762	53.56%	3,053,329	3,234,801	53.80%	686	622
2014	3,095,971	3,279,978	53.69%	3,108,136	3,292,866	53.90%	697	632
2015	3,145,275	3,332,212	53.76%	3,156,574	3,344,183	53.95%	708	641
2016	3,190,054	3,379,652	53.80%	3,200,824	3,391,062	53.99%	717	650
2017	3,234,505	3,426,745	53.84%	3,245,365	3,438,251	54.03%	726	658
2018	3,279,321	3,474,225	53.89%	3,290,274	3,485,829	54.07%	736	667
2019	3,324,514	3,522,104	53.94%	3,335,564	3,533,810	54.12%	745	675
2020	3,369,360	3,569,615	54.02%	3,379,801	3,580,677	54.19%	754	683
2021	3,411,757	3,614,532	54.09%	3,422,178	3,625,572	54.25%	763	691
2022	3,454,718	3,660,046	54.16%	3,465,140	3,671,088	54.32%	771	698
2023	3,497,643	3,705,523	54.23%	3,508,256	3,716,766	54.39%	780	706
2024	3,541,400	3,751,880	54.31%	3,552,023	3,763,135	54.48%	789	714
2025	3,585,048	3,798,123	54.40%	3,595,783	3,809,496	54.56%	797	721
2026	3,628,738	3,844,409	54.48%	3,639,643	3,855,963	54.64%	806	729
2027	3,673,092	3,891,399	54.56%	3,684,194	3,903,162	54.72%	814	737

CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Key Explanatory Variables

Model Name	Leon County Population	Residential Customers	Total Customers	Cooling Degree Days	Heating Degree Days	Tallahassee Per Capita Taxable Sales	Price of Electricity	State of Florida Population	Minimum Winter Peak day Temp.	Maximum Summer Peak day Temp.	Appliance Saturation	R Squared [1]
Residential Customers	X											0.994
Residential Consumption		X		X	X	X	X				X	0.927
Florida State University Consumption				X			X	X				0.930
State Capitol Consumption				X			X	X				0.892
Florida A & M University Consumption				X				X				0.926
Street Lighting Consumption	X											0.961
General Service Non-Demand Customers		X										0.996
General Service Demand Customers		X										0.987
General Service Non-Demand Consumption	X			X	X	X	X					0.956
General Service Demand Consumption	X			X	X							0.979
General Service Large Demand Consumption	X			X	X							0.921
Summer Peak Demand			X							X	X	0.899
Winter Peak Demand									X		X	0.654

[1] R Squared, sometimes called the coefficient of determination, is a commonly used measure of goodness of fit of a linear model. If the observations fall on the model regression line, R Squared is 1. If there is no linear relationship between the dependent and independent variable, R Squared is 0. A reasonably good R Squared value could be anywhere from 0.6 to 1.

CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Sources of Forecast Model Input Information

	Energy Model Input Data	Source
1.	Leon County Population	City Planning Office
2.	Talquin Customers Transferred	City Power Engineering
3.	Cooling Degree Days	NOAA reports
4.	Heating Degree Days	NOAA reports
5.	AC Saturation Rate	2005 Appliance Saturation Study
6.	Heating Saturation Rate	2005 Appliance Saturation Study
7.	Real Tallahassee Taxable Sales	Department of Revenue
8.	Florida Population	Governor's Office of Budget & Planning
9.	State Capitol Incremental	Department of Management Services
10.	FSU Incremental Additions	FSU Planning Department
11.	FAMU Incremental Additions	FAMU Planning Department
12.	GSLD Incremental Additions	Planning Department of each entity
13.	Other Commercial Customers	System Planning/ Utility Accounting
14.	Tall. Memorial Curtailable	System Planning/ Utility Accounting
15.	System Peak Historical Data	System Planning
16.	Historical Customer Service Points by Class	System Planning/ Utility Accounting
17.	Historical Customer Energy Usage by Class	System Planning/ Utility Accounting
18.	GDP Forecast	Governor's Planning & Budgeting Office
19.	CPI Forecast	Governor's Planning & Budgeting Office
20.	Florida Taxable Sales	Governor's Planning & Budgeting Office
21.	Interruptible, Traffic Light Sales, & Security Light Additions	System Planning/ Utility Accounting
22.	Historical Residential Real Price of Electricity	Calculated from Revenues, KWh sold, and CPI
23.	Historical Commercial Real Price Of Electricity	Calculated from Revenues, KWh sold, and CPI

TABLE 1.5

CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Base Case
Net Energy for Load and Seasonal Demand
Excluding and Including DSM

Year	Calendar Year Total Energy Sales Excluding DSM (MWh)	Calendar Year Total DSM Sales Adjustment (MWh)	Calendar Year Total Energy Sales Including DSM (MWh)	Calendar Year Net Energy for Load Including DSM (MWh)	Summer Peak Excluding DSM (MW)	Winter Peak Excluding DSM (MW)	Total DSM Summer Peak Adjustment (MW)	Total DSM Winter Peak Adjustment (MW)	Summer Peak Including DSM (MW)	Winter Peak Including DSM (MW)
2008	2,772,037	(6,720)	2,765,317	2,929,671	622	560	(2)	(2)	620	558
2009	2,836,379	(27,999)	2,808,380	2,975,294	638	576	(11)	(11)	627	565
2010	2,893,140	(64,398)	2,828,742	2,996,866	650	587	(30)	(28)	620	559
2011	2,942,885	(111,996)	2,830,889	2,999,141	662	598	(50)	(47)	612	551
2012	2,998,015	(145,594)	2,852,421	3,021,953	674	610	(63)	(59)	611	551
2013	3,053,329	(184,793)	2,868,536	3,039,025	686	622	(74)	(69)	612	553
2014	3,108,136	(223,991)	2,884,145	3,055,562	697	632	(86)	(80)	611	552
2015	3,156,574	(263,190)	2,893,384	3,065,350	708	641	(97)	(91)	611	550
2016	3,200,824	(296,789)	2,904,035	3,076,634	717	650	(108)	(100)	609	550
2017	3,245,365	(330,387)	2,914,978	3,088,227	726	658	(117)	(108)	609	550
2018	3,290,274	(363,986)	2,926,288	3,100,210	736	667	(125)	(116)	611	551
2019	3,335,564	(391,985)	2,943,579	3,118,528	745	675	(133)	(123)	612	552
2020	3,379,801	(419,984)	2,959,817	3,135,732	754	683	(140)	(129)	614	554
2021	3,422,178	(447,983)	2,974,195	3,150,964	763	691	(148)	(136)	615	555
2022	3,465,140	(470,382)	2,994,758	3,172,749	771	698	(153)	(141)	618	557
2023	3,508,256	(492,781)	3,015,475	3,194,697	780	706	(159)	(147)	621	559
2024	3,552,023	(515,180)	3,036,843	3,217,335	789	714	(165)	(152)	624	562
2025	3,595,783	(537,579)	3,058,204	3,239,966	797	721	(171)	(158)	626	563
2026	3,639,643	(559,978)	3,079,665	3,262,703	806	729	(177)	(163)	629	566
2027	3,684,194	(559,978)	3,124,216	3,309,902	814	737	(177)	(163)	637	574

CHAPTER II

Ex-post Analysis

2.0 Introduction

An ex-post analysis of fiscal year 2007 was conducted to determine the accuracy of the 2007 Forecast models prior to using these models to generate the 2008 demand and energy forecasts. An ex-post analysis consists of comparing projections of seasonal peak demand and annual energy sales based alternately on the projected and actual values of the Forecast's explanatory variables. The actual values represent data from the current year and the projected values are from the previous year's Forecast. Inserting the current year's data values into the previous years' forecasting model derives the ex-post projections. The percent by which the Forecast based on the current year's data values is over/under that based on the projected data values determines if modifications to the models are necessary. If the Forecast generated using the actual data values is over/under that based on the projected data values by 2% or more a review of the models is initiated. Based upon the results of the ex-post analysis, it was determined that several regression coefficients needed to be revised, which led to revised Forecast models for 2008. Table 2.1 compares FY 2007 actual energy sales to projected energy sales and the ex-post projections.

Table 2.2 consists of explanatory variables that are used to provide information pertaining to weather patterns and economic indications. Table 2.2 compares actual FY 2007 explanatory variable data with the projections made in the FY 2007 Load and Energy Forecast. Table 2.3 is actual peak demand vs. projected and ex-post projected demand for both winter and summer.

2.1 Results

As mentioned previously in section 2.0, the results of the ex-post analysis determine if modifications to the model are necessary. However, prior to making modifications to the model, variables such as revenue, consumption, the consumer price index (CPI), population and taxable sales are used to derive the real price of electricity and real Tallahassee taxable sales per capita in Table 2.2.

Preparation of the ex-post analysis involves updating historical data, retrieving current University of Florida Bureau of Economic and Business Research (BEBR) reports, City/County planning population estimates, City of Tallahassee system data, CPI and metropolitan statistical area (MSA) data. Actual and projected data are input into the ex-post model and the percent over/under is calculated. In Table 2.1, the percent over/under for large customers' energy sales is significant because the projections included future additions that did not materialize. Security lighting (line 10) has been combined with Street lighting (line 14) in order to allow a comparison with actual values reported by Utility Business and Customer Services (UBCS). Traffic Control's (line 11) projection was 14.2% higher than the actual consumption. The City's Traffic Control Division is in the process of replacing bulbs in the traffic signals with light-emitting diode (LED) fixtures, which caused a decrease in consumption. Line 14 of Table 2.1 is represented as zeroes in the ex-post analysis. However, street lighting data is required in several reports to other governmental reporting agencies, thus UBCS provided separate data sets for the preparation of the Forecast as well as other reports.

In Table 2.2, the projection of the real price of electricity to residential and commercial customers was understated. CPI, revenue and consumption are used to derive the real price of electricity. The CPI value is difficult to project, leaving room for fluctuation in the calculation. Projections for variables such as heating degree-days (HDD), cooling degree-days (CDD) and temperature are based on historical five-year averages.

Table 2.3 shows the summer peak ex-post projection exceeded the actual summer peak by 2.7%. Based upon the criteria listed in section 2.0, projections exceeding a 2.0% increase/decrease warrant review and possible revisions to the summer peak demand model.

Revisions to the regression coefficients are based upon the magnitude of any disparity between actual and projected values. Based upon the winter peak ex-post projection exceeding the actual winter peak demand by more than 2%, modifications to the regression coefficients in the 2008 winter peak demand model were necessary. In order to maintain accuracy within the models, continuous updating of historical data for the regression model is a vital part of the Forecast.

Graph 2.1 represents the percentage of energy consumption for each customer class on our system. Listed individually, Residential (RS) consumption is the largest portion of the graph, with General Service Demand (GSD) having the second largest amount of consumption. Florida A&M University, Florida State University, the State Complex and Tallahassee Memorial Hospital are listed separate from other General Service Large Demand (GSLD) customers.

TABLE 2.1

CIY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Actual Energy Sales vs. Projected and Ex-post
Fiscal Year 2007

Line No.	Customer Class	Actual (MWh)	Projected [5] (excluding DSM) (MWh)	Ex-post Projections (excluding DSM) (MWh)	% Projected Over/(Under) Actual	% Ex-post Projected Over/(Under) Actual
1	Residential	1,093,439	1,137,832	1,129,874	4.1%	3.3%
2	General Service Non-Demand [1]	211,979	213,075	206,150	0.5%	(2.7%)
3	General Service Demand [1]	678,491	686,368	676,401	1.2%	(0.3%)
4	Florida State University [2]	164,057	169,383	169,948	3.2%	3.6%
5	Florida A & M University [2]	58,777	61,487	61,767	4.6%	5.1%
6	State Capitol Center [2]	138,242	135,266	135,642	(2.2%)	(1.9%)
7	Other Large Demand [3]	277,618	304,429	300,597	9.7%	8.3%
8	Total Large Demand [1]	638,694	670,565	667,954	5.0%	4.6%
9	Interruptible	46,121	55,715	55,715	20.8%	20.8%
10	Security Lighting	28,477	28,571	28,571	0.3%	0.3%
11	Traffic Control	1,227	1,401	1,401	14.2%	14.2%
12	Curtailable Tallahassee Memorial	28,949	27,227	27,227	(5.9%)	(5.9%)
13	Total Commercial	1,630,433	1,668,397	1,648,894	2.3%	1.1%
14	City Street Lighting [4]	0	0	0	0.0%	0.0%
15	Total Energy Sales	2,727,377	2,820,754	2,793,293	3.4%	2.42%

[1] Includes interdepartmental sales.
[2] Includes main meter Large Demand only. Capitol Center projected sales adjusted to consistent basis.
[3] Includes Other large demand sales plus incremental additions or deletions
[4] City street lighting accounts have been collapsed with Security lighting
[5] Projected 2007 Electric System load forecast sales estimates.

CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

2007 Load Forecast Comparison
Projected vs. Actual
Explanatory Variables

Fiscal Year 2007

Line No.	Variable Description	Actual	Projected	% Over/(Under) Actual
1	Heating Degree Days	1,501	1,545	2.9%
2	Cooling Degree Days	2,790	2,601	(6.8%)
3	Real Residential Price Electricity [1] [2] (mills/kwh)	67.44	63.34	(6.1%)
4	Real Commercial Price of Electricity [1] [2] (mills/kwh)	58.57	55.15	(5.8%)
5	Real Tallahassee Taxable Sales per capita [1] (millions)	$1,654	$1,725	4.3%
6	Residential Meters [1]	93,258	93,303	0.0%
7	Leon County Population	277,300	281,300	1.4%
8	Minimum Temperature Winter Peak Day	23	22	(4.3%)
9	Maximum Temperature Summer Peak Day	99	98	(1.0%)

[1] Based on quarterly average. Deflated to 1982 dollars.
[2] Price of electricity estimates include both base and fuel-related revenues.

CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

2007 Load Forecast Comparison
Projected vs Actual Peak Demand

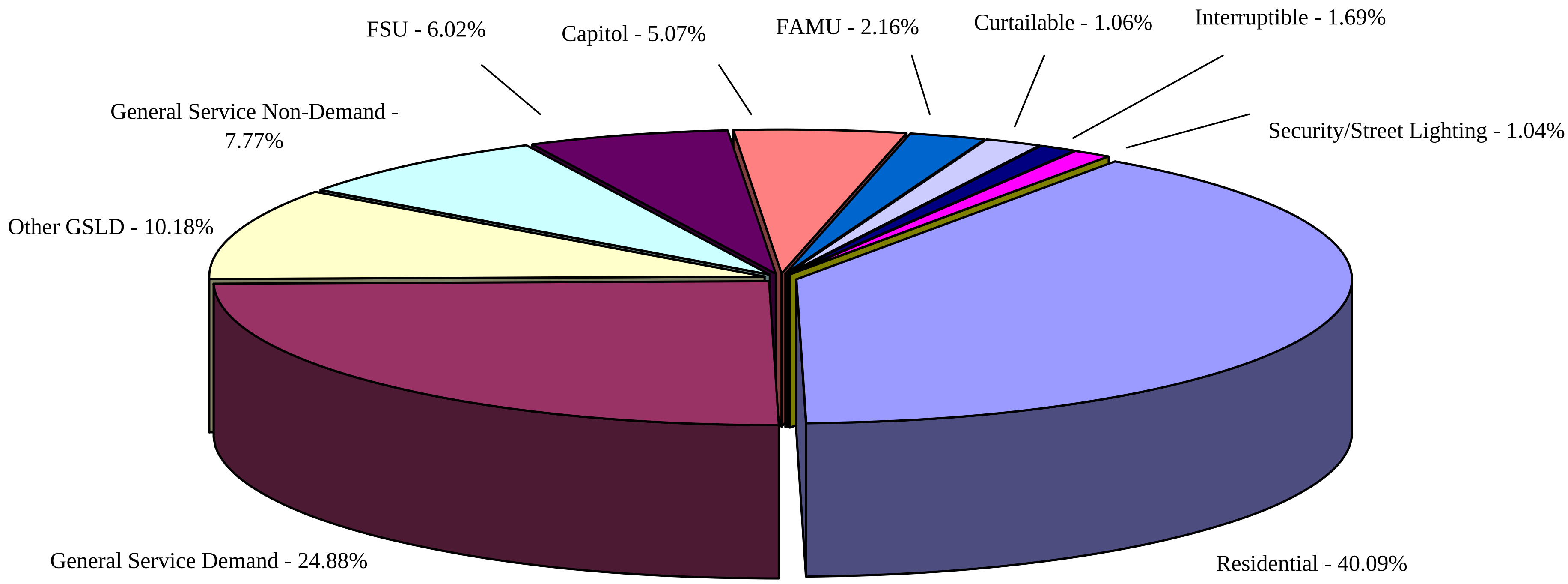
Fiscal Year 2007

	Actual (MW)	Projected (excluding DSM) (MW)	Ex-post Projections (excluding DSM) (MW)	% Projected Over/(Under) Actual	% Ex-post Projected Over/(Under) Actual
Winter Peak	529	554	536	4.7%	1.3%
Summer Peak	621	610	604	(1.8%)	(2.7%)

GRAPH 2.1

CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Fiscal Year 2007 Energy Sales
by Customer Rate Class



Total Energy Sales = 2,727 GWh

CHAPTER III

Load and Energy Forecast Models

3.0 Methodology

The Forecast is developed utilizing a methodology that the City first employed in 1980, and has updated and revised every one or two years. The methodology consists of thirteen multi-variable linear regression models based on detailed examination of the system's historical growth, usage patterns and population statistics. Several key regression formulas utilize econometric variables.

Table 1.3 lists the econometric-based linear regression forecasting models that are used as predictors. Note that the City uses regression models with the capability of separately predicting commercial meters and consumption by rate sub-class: general service non-demand (GS), general service demand (GSD), and general service large demand (GSLD). These, along with the residential (RS) class, represent the major classes of the City's electric customers. In addition to these customer class models, the City's forecasting methodology also incorporates energy sales projections for interruptible and curtailable customers, traffic, street and security lighting. An "X" on the table indicates the key explanatory variables used in each of the models.

Table 1.4 documents the City's internal and external sources for historical and forecast economic, weather and demographic data. These tables summarize the details of the models used to generate the system customer (meter), consumption and seasonal peak load forecasts. In addition to those explanatory variables listed, a component is also included in the models that reflect the acquisition of certain Talquin Electric Cooperative (Talquin) customers over the study period consistent with the territorial agreement negotiated between the City and Talquin and approved by the Florida Public Service Commission (FPSC).

The customer (meter) models are used to predict number of meters by customer class, which in turn serve as input into the customer class consumption models. The customer class consumption models are aggregated to form a total base system sales forecast. The effects of DSM programs and system losses are incorporated in this base forecast to produce the system net energy for load (NEL) requirements.

Since 1992, the City has used two econometric models to separately predict summer and winter peak demand. Table 1.3 also shows the key explanatory variables used in the demand models. As a single Load Serving Entity the City counts its customer demand once and only once, on an aggregated and dispersed basis, in developing its actual and forecast customer demand values. No demand data is included for any non-member entities in the City's electric service area. As discussed in Section 2 the ex-post analysis suggested a need for the winter peak demand model to be refined resulting in a 2008 winter peak demand forecast that is lower than the projections made in the 2007 Forecast.

One of the most significant input assumptions for the 2008 forecast were the incremental load modifications at Florida State University (FSU), Florida A&M University (FAMU), Tallahassee Memorial Hospital (TMH) and the State Capitol Center. These four customers represent approximately 14% of the City's energy sales. Their incremental additions are highly dependent upon annual economic and budget constraints, which would cause fluctuations in their demand projections if they were projected using a model. Therefore, each entity submits their proposed incremental additions/reductions to the City and these modifications are included as submitted in the Forecast.

The City believes that the inclusion of these incremental additions/ reductions, utilizing the five-year average of the actual temperature at the time of seasonal peak demand, the routine update of forecast model coefficients and other minor model refinements have improved the accuracy of its forecast so that they are more consistent with the historical trend of growth in seasonal peak demand and energy consumption.

3.1 Uncertainty to the Forecast

To provide a sound basis for planning, forecasts are derived from projections of the driving variables obtained from reputable sources. However, there is significant uncertainty in the future level of such variables. To the extent that economic, demographic, weather, or other conditions occur that are different from those assumed or provided, the actual load can be expected to vary from the forecast. For various purposes, it is important to understand the amount by which the forecast can be in error and the sources of error.

To capture this uncertainty, the City produces high and low range results that address potential variance in driving population and economic variables from the values assumed in the base case. The base case forecast relies on a set of assumptions about future population and economic activity in Leon County. However, such projections are unlikely to exactly match actual experience.

Population and economic uncertainty tends to result in a deviation from the trend over the long term. Accordingly, separate high and low forecast results were developed to address population and economic uncertainty. These ranges are intended to capture approximately 80% of occurrences (i.e., 1.3 standard deviations). The high and low forecasts shown in this year’s report use statistics provided by Woods & Poole Economics, Inc. (Woods & Poole) to develop a range of potential outcomes. Woods & Poole publishes several statistics that define the average amount by which various projections they have provided in the past are different from actual results. The City’s load forecasting consultant, R.W. Beck, interpreted these statistics to develop ranges of the trends of economic activity and population representing approximately 80% of potential outcomes. These statistics were then applied to the base case to develop the high and low net energy for load and seasonal peak demand forecasts presented in Table 3.1 and Graphs 3.1-3.3.

3.2 Modifications to Regression Coefficients

The econometric model contains regression coefficients calculated by R.W. Beck. In addition to any changes resulting from the ex-post analysis the regression coefficients may also be revised based upon the historical growth of the customer base as well as usage patterns. This allows the values to correspond to the trend previously followed. Several of the coefficients in the 2008 Load Forecasting model were modified based upon historical energy usage patterns.

3.3 Peak Demand Models

The design of the peak demand model was described in section 3.0. Scheduled additions, as well as growth rate, load factor and NEL are also included in the peak demand model. Scheduled additions are submitted by the Planning Department of each large entity such as FAMU, FSU and TMH. The calculations of summer peaks encompass the maximum temperature on day of peak, price of electricity, 3rd quarter customers (meters), growth rate and several regression coefficients. The resulting base case peak demand projections are input into the Forecast summary sheet.

In order to derive the peak demand model sensitivity cases, the temperature and the number of customers (meters) are adjusted in the seasonal peak demand forecast models.

3.4 Adjustments for Demand-Side Management (DSM) Programs

The City currently offers a variety of DSM programs to its residential and commercial customers to improve the efficiency of customers' end-use of energy resources when such improvements provide a measurable economic and/or environmental benefit to the customers and the City utilities. During the 2004 IRP Study the City tested potential DSM measures (conservation, energy efficiency, load management, and demand response) for cost-effectiveness utilizing an integrated approach that is based on projections of total achievable capacity and energy reductions and their associated annual costs developed specifically for the City. The measures were combined into bundles affecting similar end uses and /or having similar costs per kWh saved. The City intends to extend the existing DSM program and has begun implementing specific groups of additional measures that achieve the capacity benefit and energy savings projected in the IRP Study.

Energy and demand reductions attributable to the proposed DSM portfolio have been incorporated into the future load and energy forecasts. Table 3.2 displays the estimated energy and demand savings associated with the menu of DSM measures. The figures on these tables reflect the cumulative annual impacts of the proposed DSM portfolio on system energy and demand requirements.

Within thirty days of a request the City will provide documentation of how the demand and energy effects of DSM programs are addressed and its amount of interruptible demands and Direct Control Load Management (DCLM) to Transmission Operators, Balancing Authorities, and Reliability Coordinators as defined in the North American Electric Reliability Corporation (NERC) Glossary of terms.

3.5 Reporting

The City annually and within thirty days of a request reports historical and forecast demand and energy information to the Florida Reliability Coordination Council (FRCC), the Regional Reliability Organization (RRO) for peninsular Florida, for inclusion in the Regional Load and Resource Plan. The FRCC aggregates the information annually reported by electric utilities in the region in the Regional Load and Resource Plan and provides it to the NERC and the Florida Public Service Commission

(FPSC). The City also compiles historical and forecast demand and energy information on an individual utility basis in its annual Ten Year Site Plan (TYSP) report to the FPSC.

Within thirty days of its completion and approval copies of the City's TYSP are also annually distributed to the Resource Planner, Transmission Planner and Load-Serving Entity. Other FRCC electric utilities are provided a copy of the City's TYSP upon request. As separate representatives of the City Electric Utility act as the Planning Authority, Resource Planner, Transmission Planner and Load-Serving Entity (among other NERC-defined entities) this and other data distribution is simply accomplished via inter-office communication.

The data items reported to each of the aforementioned entities include but are not limited to integrated hourly demands in megawatts (MW) for the prior year, monthly and annual peak hour actual demands in MW and net energy for load in gigawatt-hours (GWh) for the prior year and forecast for the next two years, annual peak hour forecast demands (summer and winter) in MW and annual net energy for load in GWh for ten years into the future, and how the demand and energy effects of DSM programs (such as conservation, time-of-use rates, interruptible Demands, and Direct Control Load Management) are addressed in the forecast.

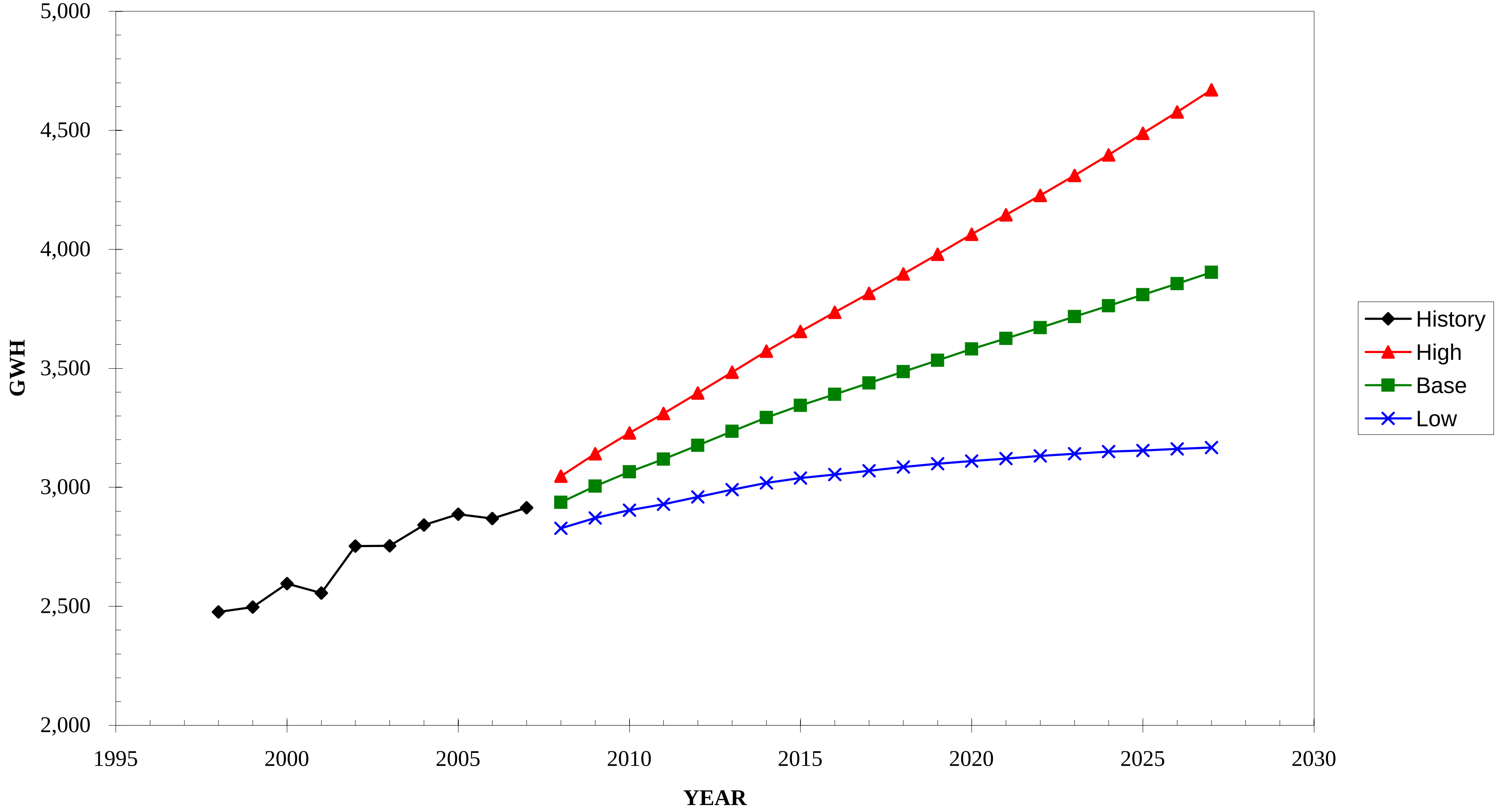
CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Base, High and Low Case
Net Energy for Load and Seasonal Demand
Excluding DSM

	Calendar Year Net Energy For Load (MWh)			Summer Peak Demand (MW)			Winter Peak Demand (MW)		
Year	Base	High	Low	Base	High	Low	Base	High	Low
2008	2,936,791	3,046,613	2,828,127	622	648	595	560	572	549
2009	3,004,957	3,140,743	2,870,746	638	671	605	576	593	559
2010	3,065,092	3,228,102	2,904,140	650	690	610	587	609	563
2011	3,117,793	3,309,626	2,928,608	662	709	615	598	627	569
2012	3,176,200	3,395,999	2,959,679	674	728	620	610	644	574
2013	3,234,801	3,483,446	2,990,147	686	747	625	622	662	580
2014	3,292,866	3,571,657	3,018,896	697	765	629	632	678	584
2015	3,344,183	3,655,091	3,039,045	708	783	632	641	694	586
2016	3,391,062	3,735,613	3,053,423	717	801	633	650	709	588
2017	3,438,251	3,815,187	3,069,369	726	818	635	658	724	589
2018	3,485,829	3,896,083	3,084,897	736	835	637	667	739	591
2019	3,533,810	3,979,565	3,098,796	745	852	638	675	755	592
2020	3,580,677	4,063,571	3,110,123	754	870	639	683	770	593
2021	3,625,572	4,144,291	3,120,870	763	886	639	691	785	593
2022	3,671,088	4,226,626	3,131,403	771	903	640	698	799	593
2023	3,716,766	4,310,093	3,141,292	780	920	640	706	814	594
2024	3,763,135	4,396,624	3,149,715	789	937	640	714	830	593
2025	3,809,496	4,486,937	3,155,009	797	955	639	721	845	593
2026	3,855,963	4,577,318	3,160,907	806	974	638	729	861	592
2027	3,903,162	4,669,833	3,166,817	814	992	637	737	878	591

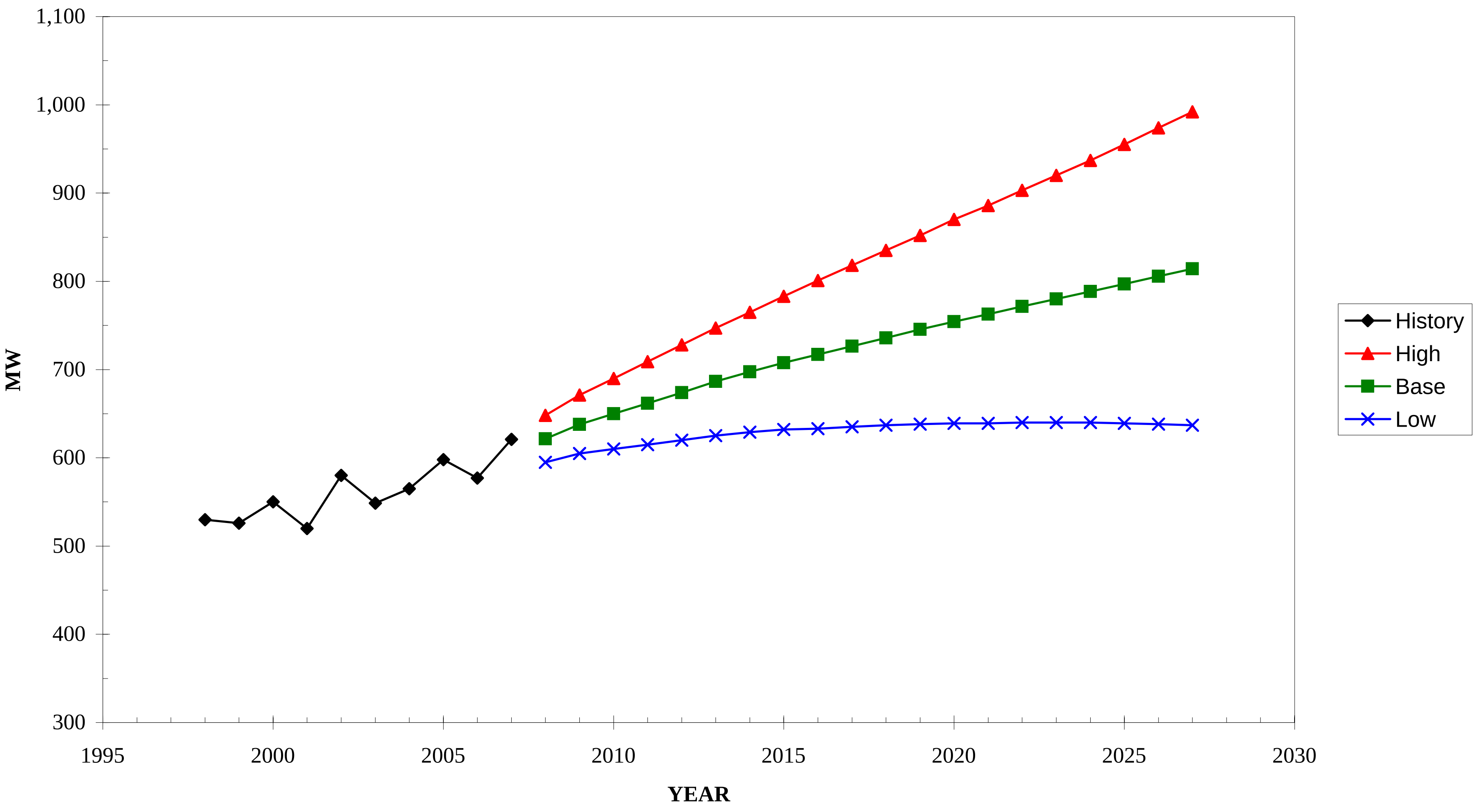
CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Calendar Year Net Energy for Load
Excluding DSM



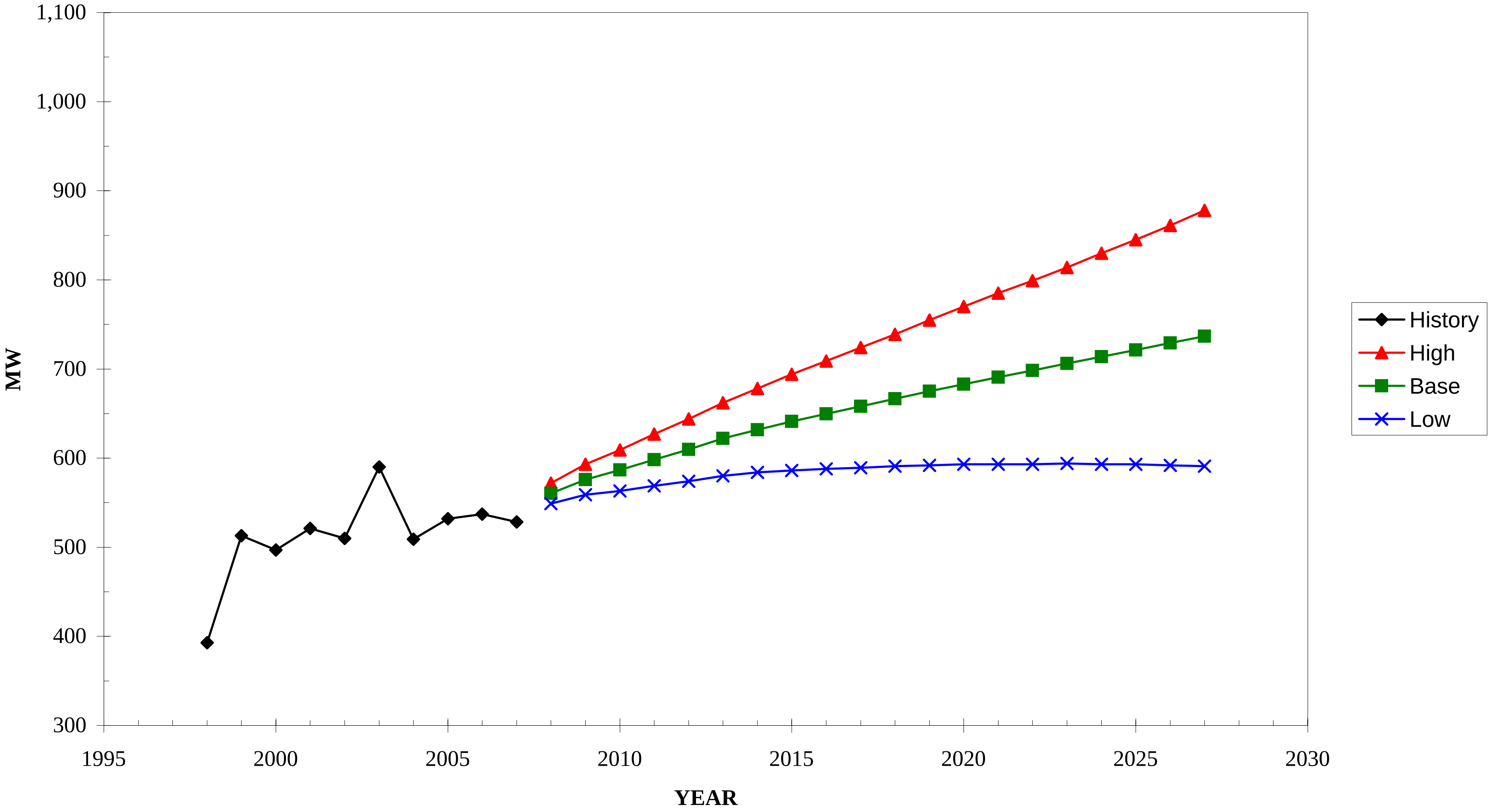
CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Summer Peak Demand
Excluding DSM



CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Winter Peak Demand
Excluding DSM



CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Estimated DSM Energy and Demand Savings

Year	Calendar Year Total DSM Sales Savings (MWh)	Total DSM Summer Peak Savings (MW)	Total DSM Winter Peak Savings (MW)
2008	6,720	2	2
2009	27,999	11	11
2010	64,398	30	28
2011	111,996	50	47
2012	145,594	63	59
2013	184,793	74	69
2014	223,991	86	80
2015	263,190	97	91
2016	296,789	108	100
2017	330,387	117	108
2018	363,986	125	116
2019	391,985	133	123
2020	419,984	140	129
2021	447,983	148	136
2022	470,382	153	141
2023	492,781	159	147
2024	515,180	165	152
2025	537,579	171	158
2026	559,978	177	163
2027	559,978	177	163

CHAPTER IV

History vs. Forecast Model Comparisons

4.0 Introduction

This section presents comparisons of our forecasted and historical data. This comparison allows us to determine how accurate the models have been, as well as how modifications made in the current forecasting year compare to the historical trend. Review of customer sales and seasonal peak demand data is necessary in order to adjust coefficients that drive the corresponding forecast models

Upon completion of modifications to the regression coefficients in the forecast models, a comparison of the 2007 and 2008 Forecasts was completed, deriving Table 4.1. The lower winter temperatures and heating degree days observed in recent years appear to have contributed in part to the lower projections of total energy sales, net energy for load and winter peak demand in the 2008 Forecast versus the 2007 Forecast.

4.1 Summary of Comparisons

Comparisons of projections from the 2004 to 2008 Ten Year Site Plan are shown in Graphs 4.1 through 4.8. The data represented in the Ten Year Site Plans were derived in the corresponding years' Forecast. Graphs 4.1-4.4 depict the historical (1998-2007) and projected (2008-2017) number of customers (meters) and energy sales for the residential and commercial customer classes. The transition between accounting for the number of customers to the number of customer meters made in the Customer Information System (CIS) by the Utility Business and Customer Service (UBCS) Division is evident in Graphs 4.1 and 4.2 beginning in 2005. The 2007 and 2008 residential and commercial energy usage projections shown in Graphs 4.3-4.4 include the impacts expected from the DSM portfolio developed as part of the 2004 IRP Study, which in large part explains the decrease in the residential and commercial energy sales in those forecasts versus 2004-2006 forecasts.

Graphs 4.5-4.8 compare the 2004-2008 forecasts for total energy sales, net energy for load, summer peak demand and winter peak demand including DSM impacts. Again, the 2007 and 2008 projections reflect the impacts expected from the DSM portfolio developed as part of the 2004 IRP Study. Due to the significant peak reductions expected from the DSM portfolio projected seasonal peak demands are expected to level off starting in 2011 and remain essentially constant through 2017. Graphs 4.9-4.10 compare the 2007 and 2008 forecasts of summer and winter peak demand, respectively, without the impacts expected from the DSM portfolio developed as part of the 2004 IRP Study.

Graph 4.11 depicts the daily peak demands for calendar year 2007. Graph 4.12 reflects the hourly load data obtained on the respective dates of the 2006/7 winter and 2007 summer peak demands. Graph 4.12 shows that while the winter peak duration is short the hotter days of summer have sustained periods of high demand.

CDD and HDD data is displayed in Graph 4.13. CDD and HDD represent the total number of hours within the year customers would have been likely to heat or cool buildings. HDD and CDD data is utilized as indication of weather patterns, which drive customer energy consumption. A comparison of Graph 4.13 and 4.14 (discussed below) from 1998 until 2007 reveals comparable trends indicating CDD as a driver of customer consumption.

Graph 4.14 depicts average consumption per residential customer (meter) including the historical and forecast impacts of DSM and compares these statistics to the energy consumption per residential customer in the State of Florida as reported in the Florida Reliability Coordinating Council (FRCC) 2007 Load and Resource Plan. Excluding DSM impacts, the City follows the state of Florida trend, but reflecting a lower consumption per customer. Multi-family dwellings are believed to contribute to the City's lower average energy consumption per residential customer. Implementation of the DSM portfolio would result in a further substantial reduction compared to average customer consumption for Florida.

A comparison of the City of Tallahassee's and the FRCC historical and projected summer load factors are represented in Graph 4.15. Load factors measure the degree to which generating facilities are being utilized. Net Energy for Load shows continuous growth historically and throughout the 2008-2017 period for both data sets. Trend lines were also established for both data sets. The City's historical trend deviates from the FRCC's trend. The FRCC trend line has a small slope reflecting consistent growth rates for consumption and summer peak demand over time. The City's trend line has a larger slope that reflects a slower growth rate for consumption than for peak demand due to greater anticipated DSM impacts on peak demand than on consumption. This gradual increase in load factors for future years suggests the potential for better utilization of resources.

CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

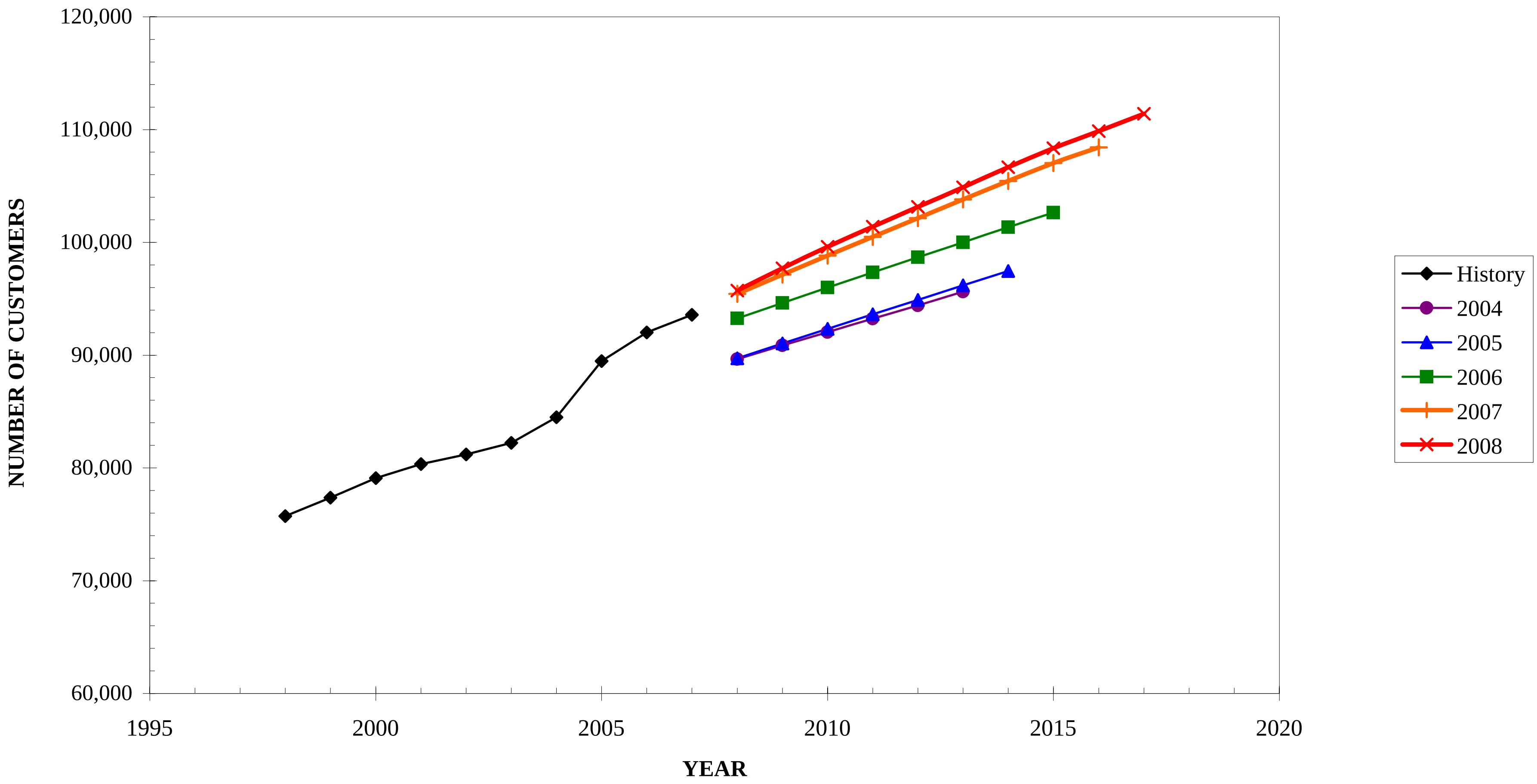
Differences Between 2008 and 2007 Forecasts of
Total Energy Sales, Net Energy for Load and Seasonal Peak Demand
Excluding DSM
(Negative Values Indicate 2008 Forecast Lower Than 2007 Forecast)

	Calendar Year Total Energy Sales			Calendar Year Net Energy for Load			Summer Peak Demand			Winter Peak Demand		
Year	2,008 Forecast (MWh)	2,007 Forecast (MWh)	Difference (MWh)	2,008 Forecast (MWh)	2,007 Forecast (MWh)	Difference (MWh)	2,008 Forecast (MW)	2,007 Forecast (MW)	Difference (MW)	2,008 Forecast (MW)	2,007 Forecast (MW)	Difference (MW)
2007	NA	2,841,757	NA	NA	3,010,655	NA	NA	610	NA	NA	528	NA
2008	2,772,037	2,915,056	(143,019)	2,936,791	3,088,310	(151,519)	622	622	(0)	560	570	(10)
2009	2,836,379	2,983,443	(147,063)	3,004,957	3,160,761	(155,804)	638	634	4	576	586	(10)
2010	2,893,140	3,048,822	(155,682)	3,065,092	3,230,027	(164,935)	650	646	4	587	602	(15)
2011	2,942,885	3,115,402	(172,517)	3,117,793	3,300,563	(182,770)	662	659	3	598	618	(20)
2012	2,998,015	3,184,359	(186,344)	3,176,200	3,373,620	(197,419)	674	672	2	610	635	(25)
2013	3,053,329	3,252,462	(199,133)	3,234,801	3,445,770	(210,969)	686	683	3	622	649	(27)
2014	3,108,136	3,316,499	(208,363)	3,292,866	3,513,613	(220,747)	697	694	3	632	663	(31)
2015	3,156,574	3,378,390	(221,815)	3,344,183	3,579,182	(234,999)	708	704	4	641	677	(36)
2016	3,200,824	3,436,111	(235,287)	3,391,062	3,640,334	(249,271)	717	713	4	650	689	(39)
2017	3,245,365	3,494,440	(249,075)	3,438,251	3,702,129	(263,879)	726	722	4	658	700	(42)
2018	3,290,274	3,553,409	(263,134)	3,485,829	3,764,603	(278,773)	736	732	4	667	712	(45)
2019	3,335,564	3,613,057	(277,493)	3,533,810	3,827,796	(293,986)	745	741	4	675	724	(49)
2020	3,379,801	3,671,846	(292,045)	3,580,677	3,890,080	(309,402)	754	750	4	683	736	(53)
2021	3,422,178	3,727,952	(305,774)	3,625,572	3,949,520	(323,948)	763	758	5	691	747	(56)
2022	3,465,140	3,784,810	(319,670)	3,671,088	4,009,757	(338,669)	771	766	5	698	757	(59)
2023	3,508,256	3,842,422	(334,167)	3,716,766	4,070,794	(354,028)	780	775	5	706	768	(62)
2024	3,552,023	3,900,856	(348,834)	3,763,135	4,132,701	(369,566)	789	783	6	714	778	(64)
2025	3,595,783	3,960,268	(364,485)	3,809,496	4,195,643	(386,148)	797	791	6	721	789	(68)
2026	3,639,643	4,020,139	(380,495)	3,855,963	4,259,073	(403,110)	806	800	6	729	799	(70)
2027	3,684,194	NA	NA	3,903,162	NA	NA	814	NA	NA	737	NA	NA

GRAPH 4.1

CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

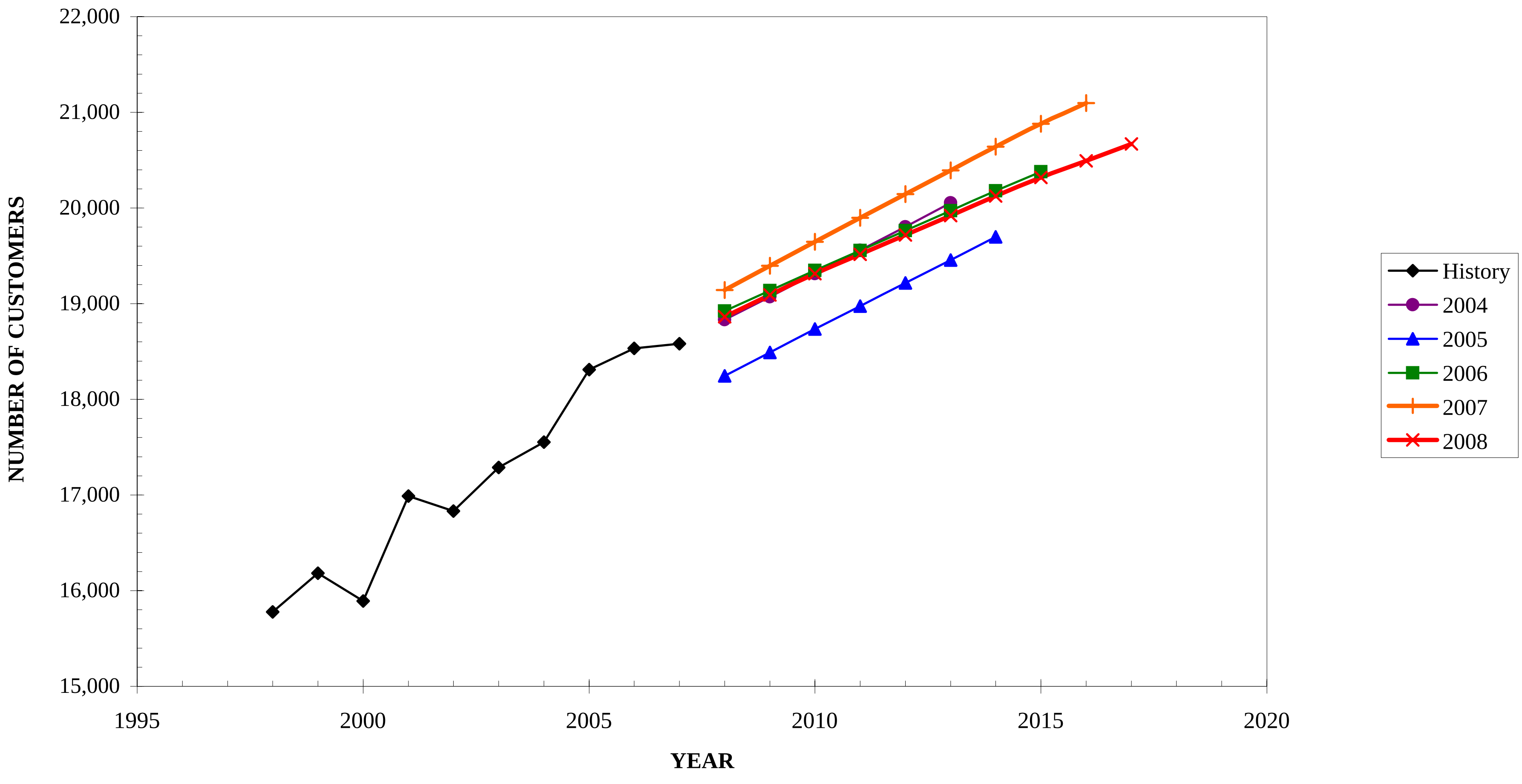
Comparison of 2004-2008 Forecasts of
Residential Meters*



*Starting with 2005 forecast, meters rather than customers are forecast.

CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Comparison of 2004-2008 Forecasts of
Commercial Meters*

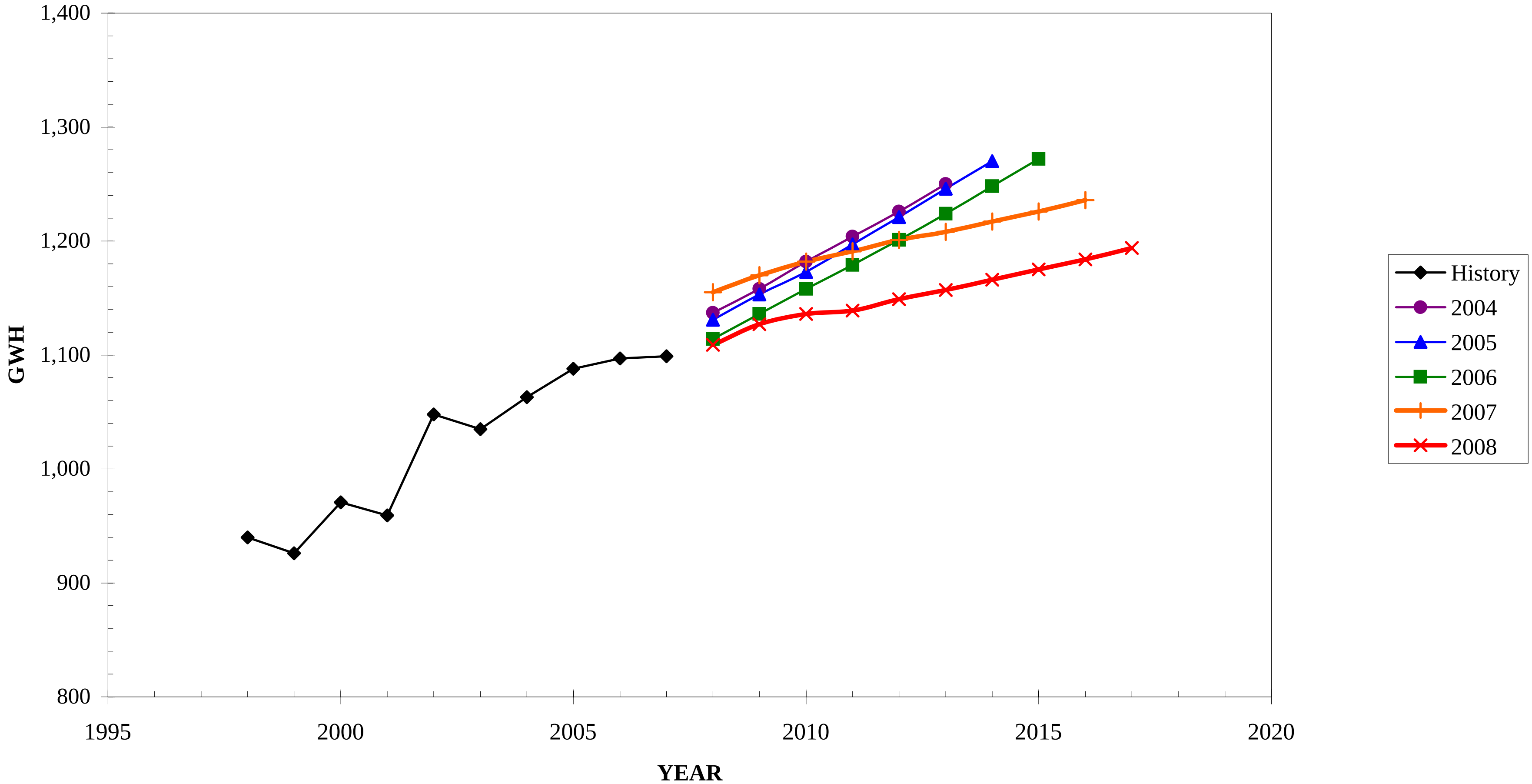


*Starting with 2005 forecast, meters rather than customers are forecast.

GRAPH 4.3

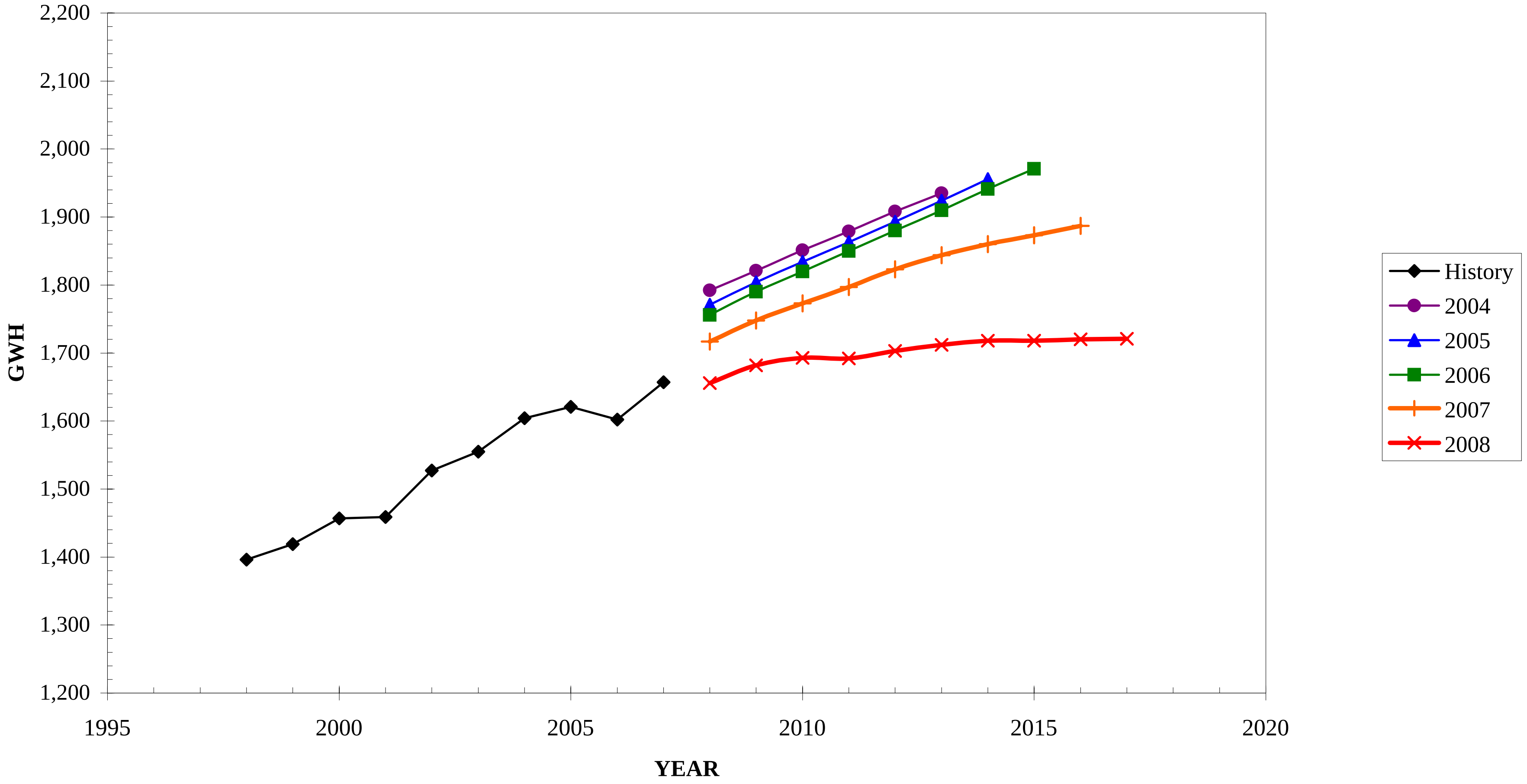
CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Comparison of 2004-2008 Forecasts of
Residential Energy Sales
Including DSM



CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

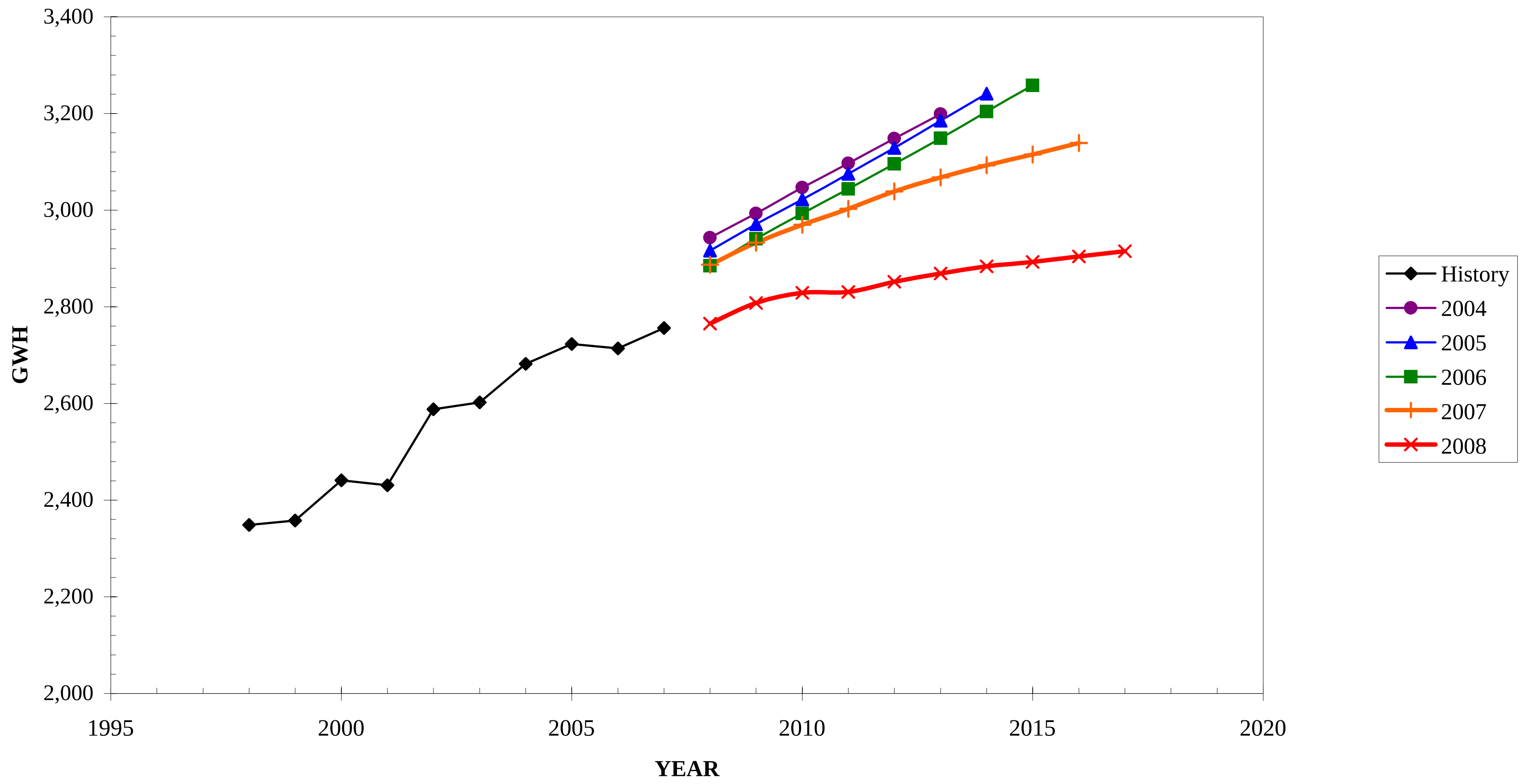
Comparison of 2004-2008 Forecasts of
Commercial Energy Sales
Including DSM



GRAPH 4.5

CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

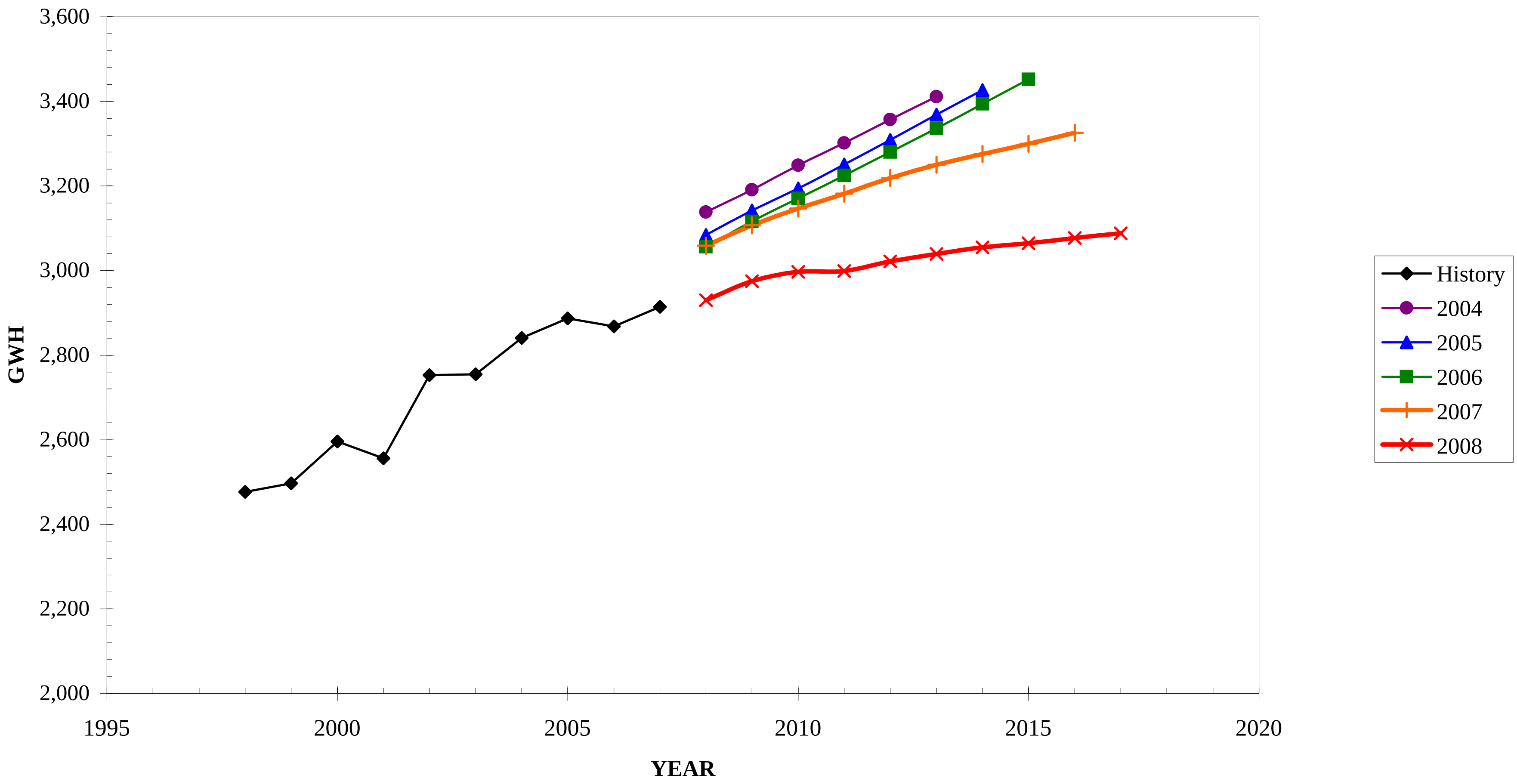
Comparison of 2004-2008 Forecasts of
Total Energy Sales
Including DSM



GRAPH 4.6

CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

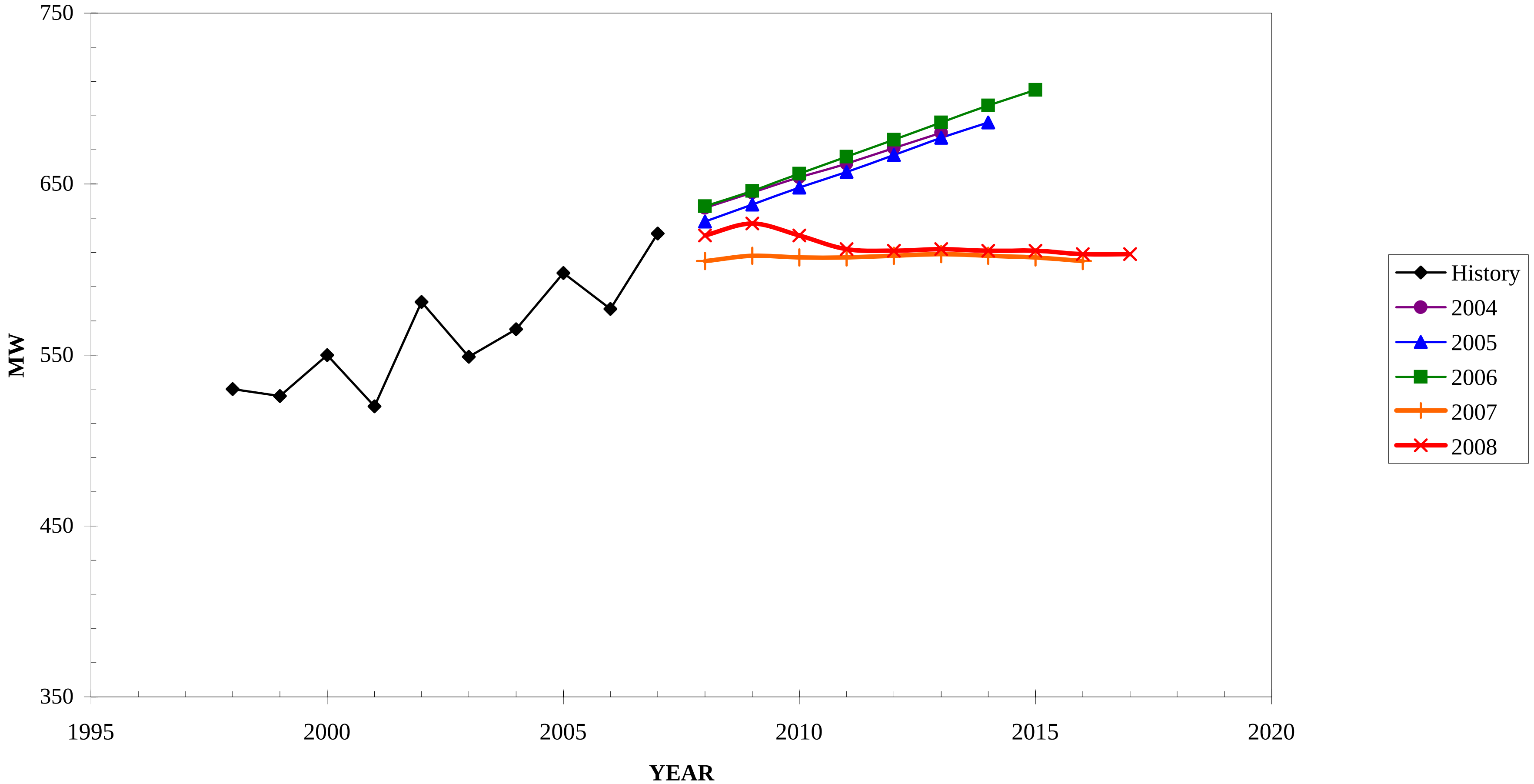
Comparison of 2004-2008 Forecasts of
Net Energy for Load
Including DSM



GRAPH 4.7

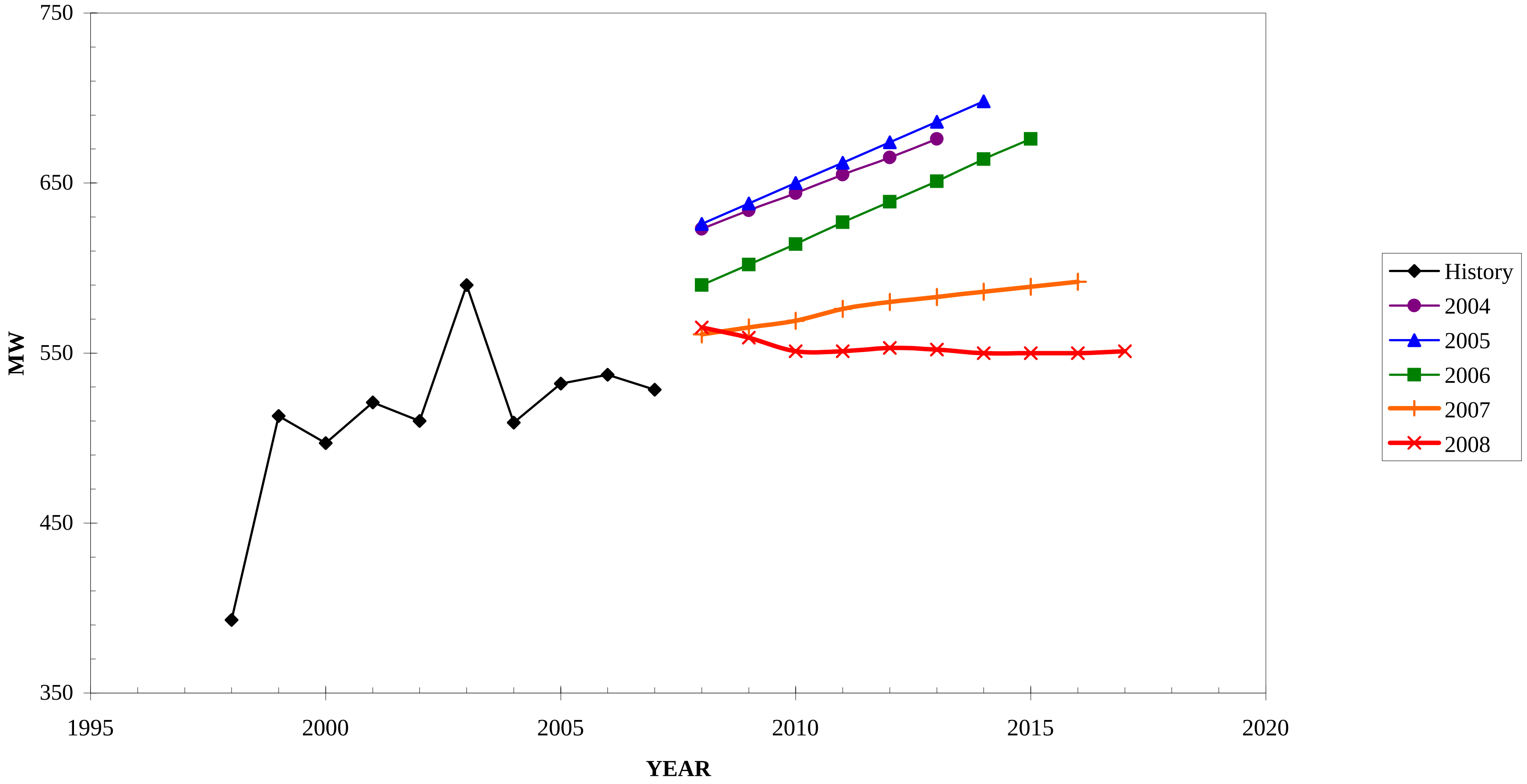
CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Comparison of 2004-2008 Forecasts of
Summer Peak Demand
Including DSM



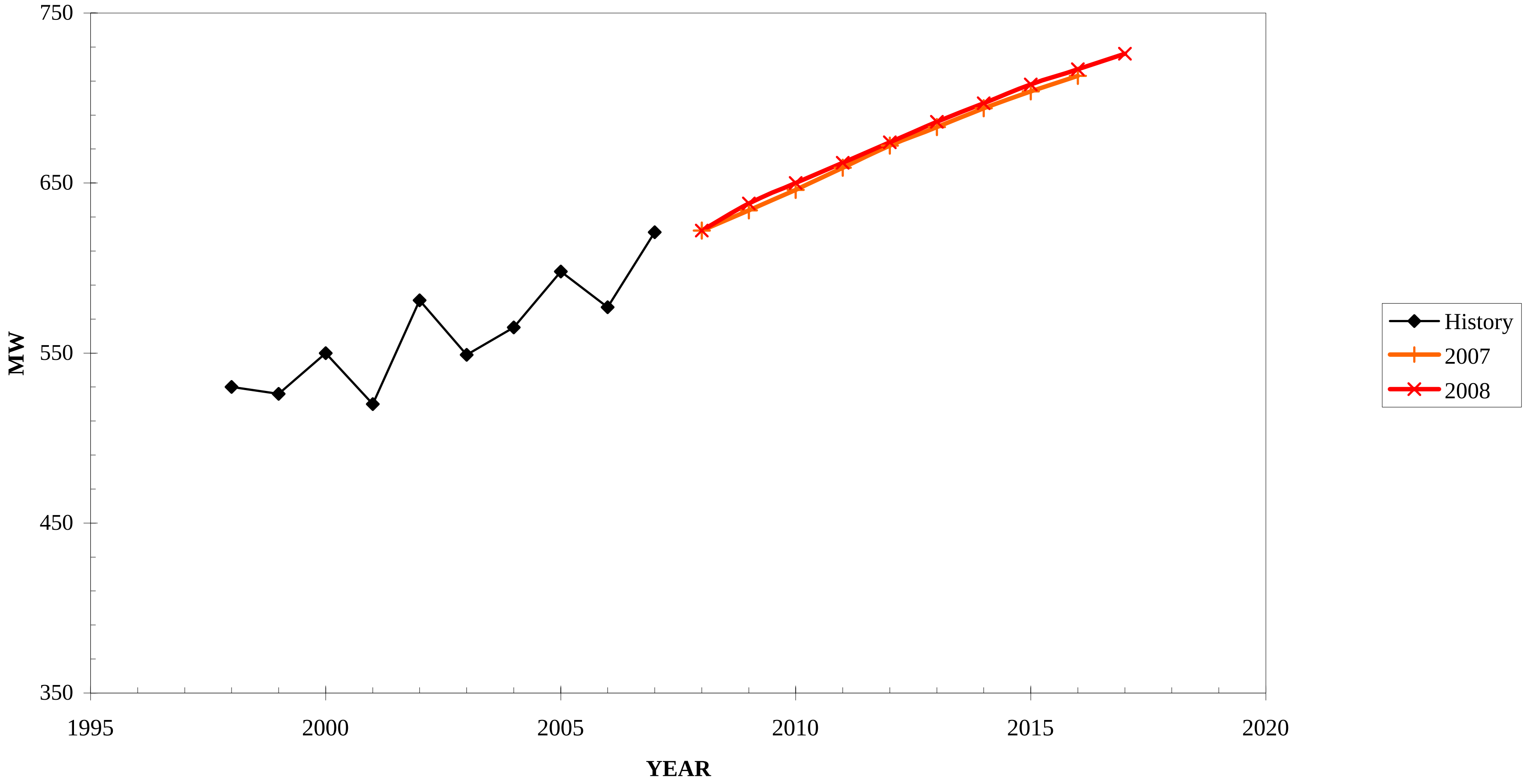
CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Comparison of 2004-2008 Forecasts of
Winter Peak Demand
Including DSM



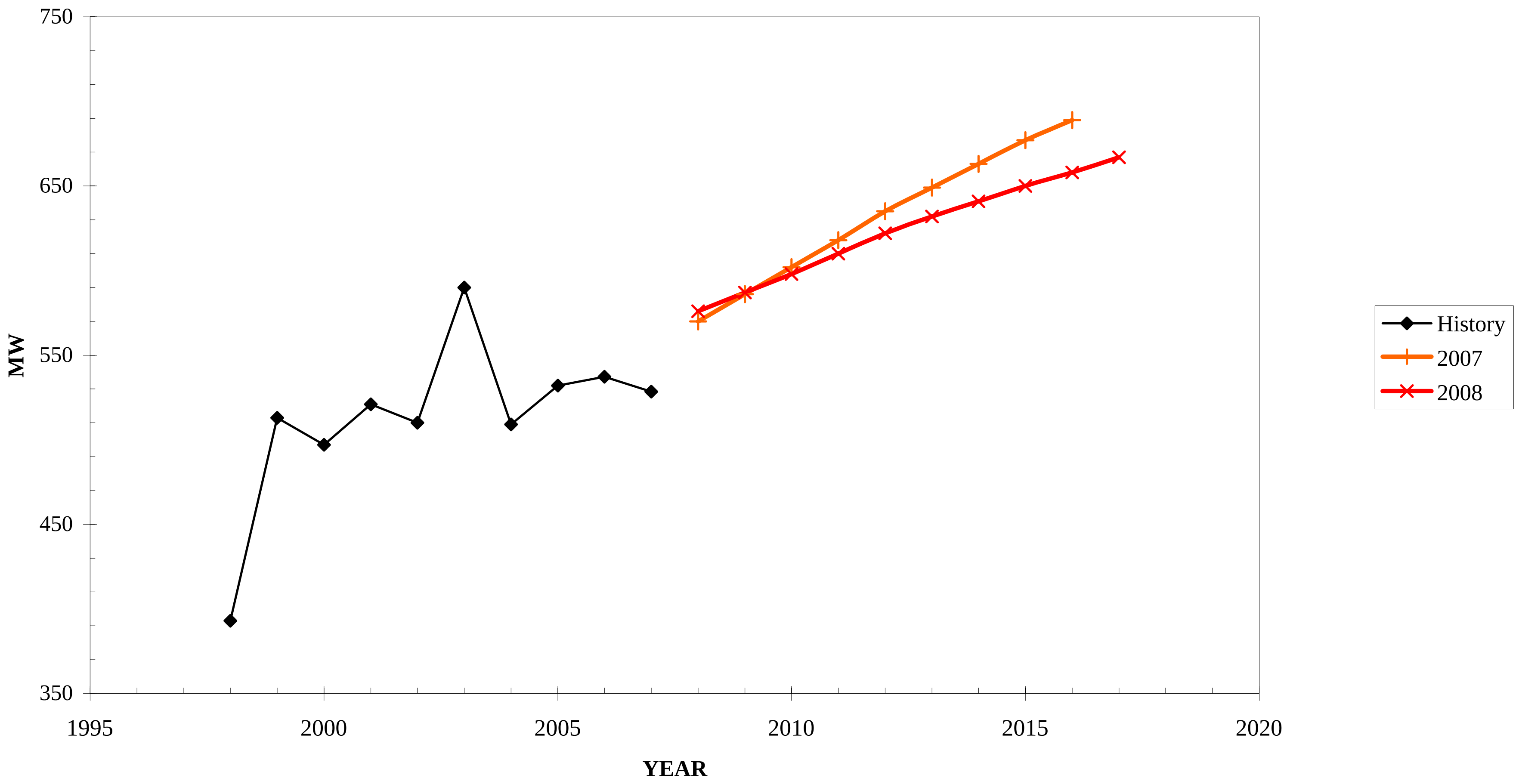
CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Comparison of 2007-2008 Forecasts of
Summer Peak Demand
Excluding DSM



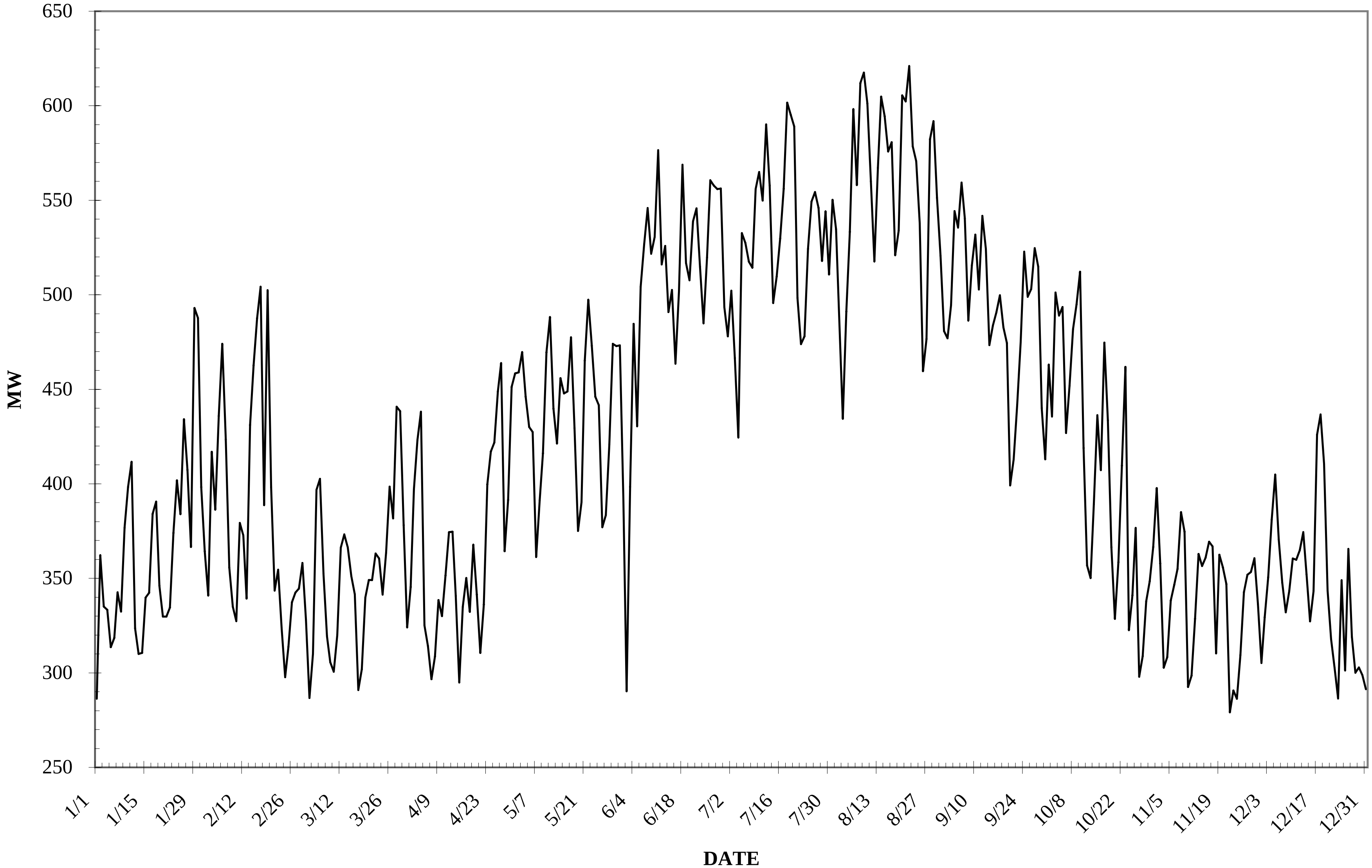
CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Comparison of 2004-2008 Forecasts of
Winter Peak Demand
Excluding DSM



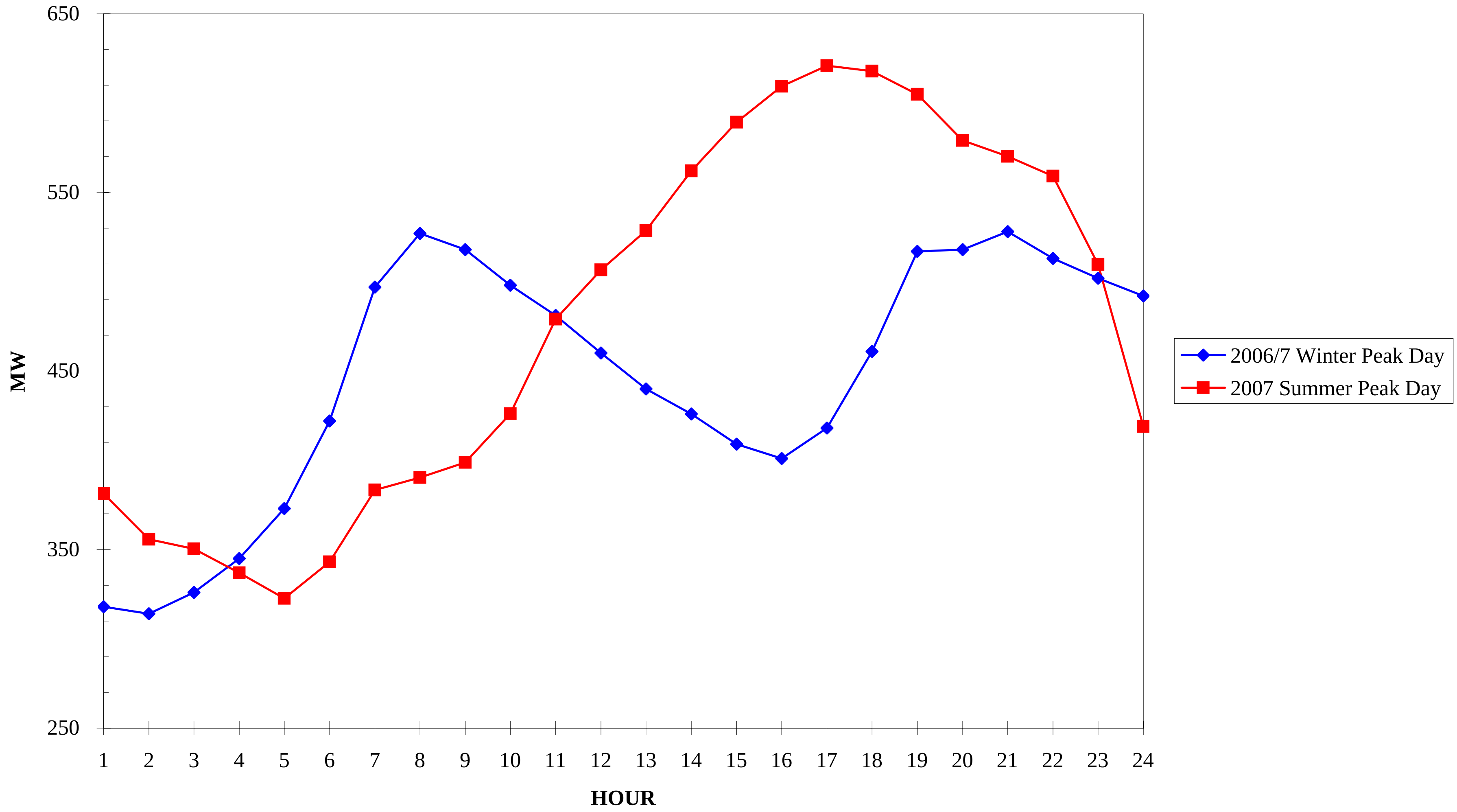
CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Calendar Year 2007 Daily Peak Demands



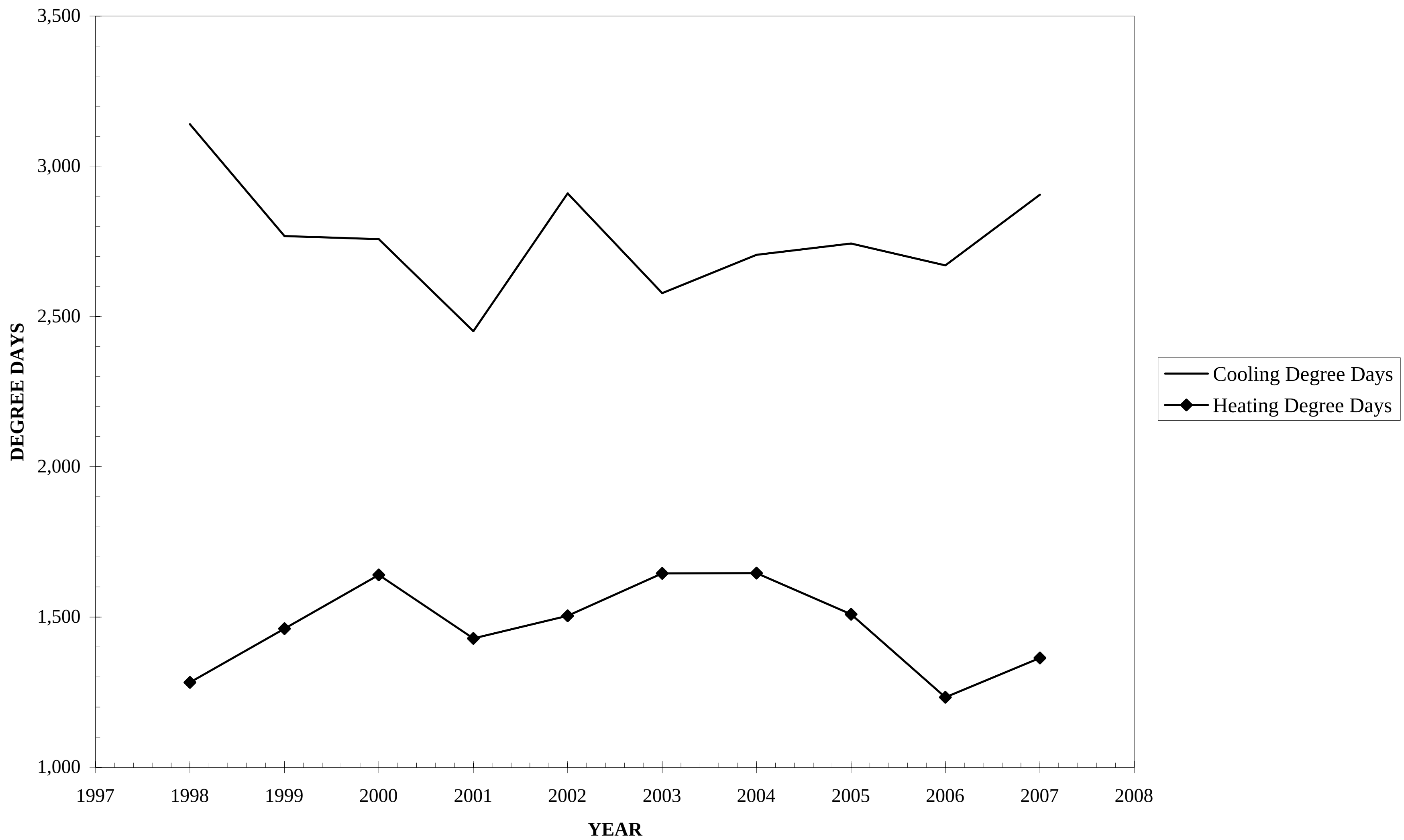
CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Comparison of 2006/7 Winter and
2007 Summer Peak Day Hourly Loads



CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

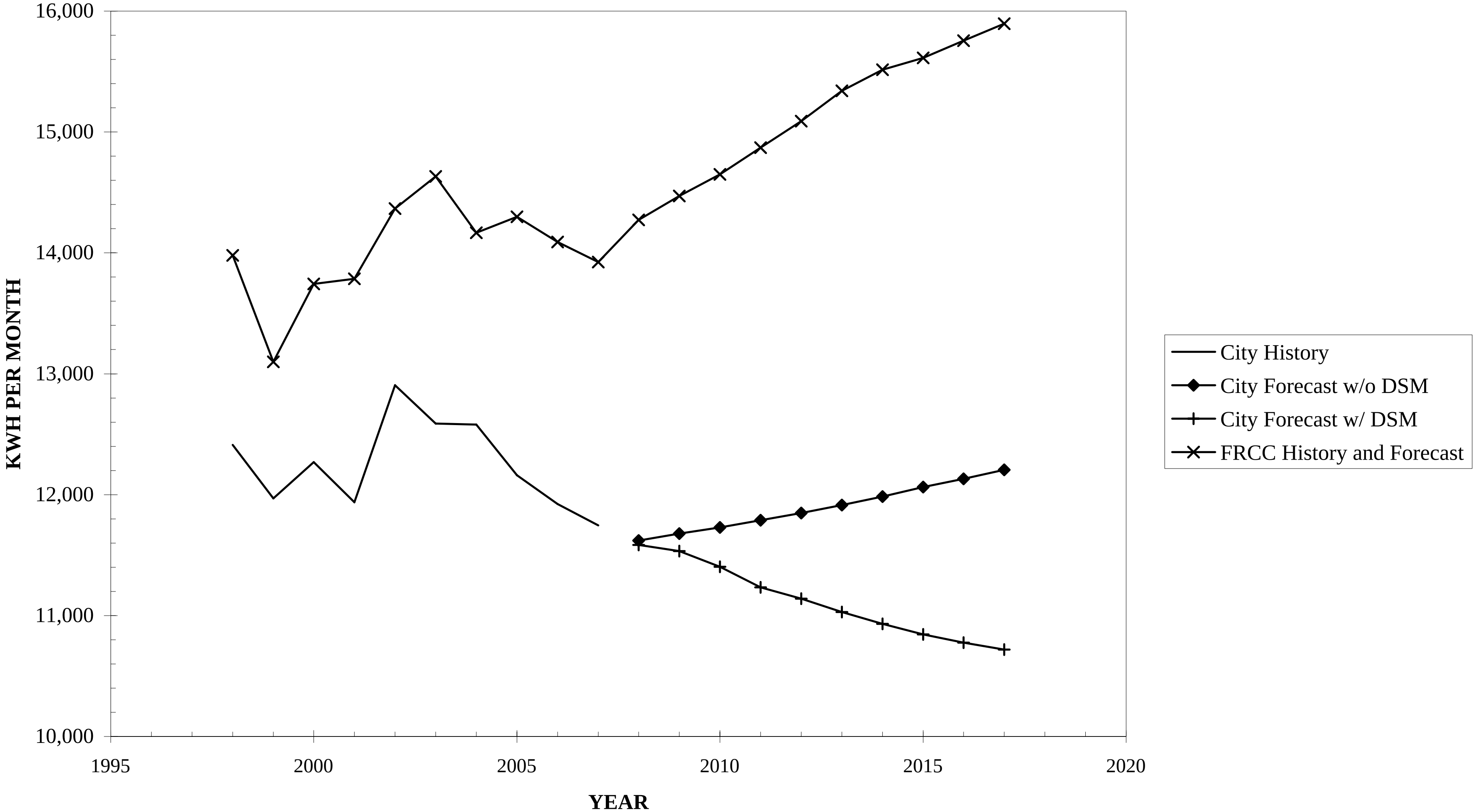
Historical Degree Day Summary



GRAPH 4.14

CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Residential Energy Use per Meter*

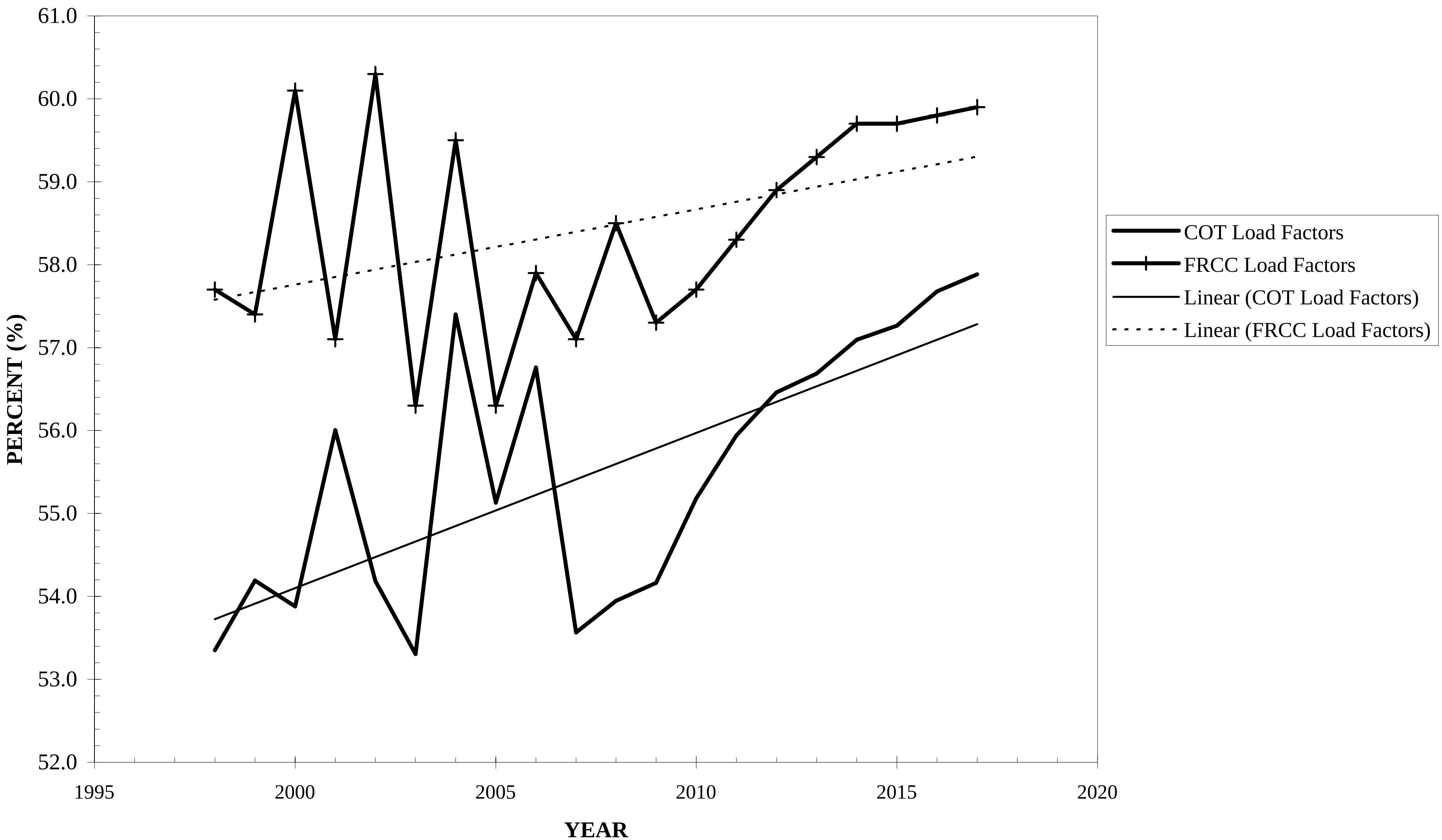


*Starting with 2005 forecast, meters rather than customers are forecast.

GRAPH 4.15

CITY OF TALLAHASSEE, FLORIDA
2008 LOAD FORECAST

Load Factor



Appendix A

NERC Modeling, Data and Analysis (MOD) Document Reference

NERC MOD Document Reference

Standard MOD-016-1 — Actual and Forecast Demands, Net Energy for Load, Controllable DSM	**Section/Page**	**Paragraph**
B. Requirements		
R1. The Planning Authority and Regional Reliability Organization shall have documentation identifying the scope and details of the actual and forecast (a) Demand data, (b) Net Energy for Load data, and (c) controllable DSM data to be reported for system modeling and reliability analyses.	Entire Document	
R1.1. The aggregated and dispersed data submittal requirements shall ensure that consistent data is supplied for Reliability Standards TPL-005, TPL-006, MOD-010, MOD-011, MOD-012, MOD-013, MOD-014, MOD-015, MOD-016, MOD-017, MOD-018, MOD-019, MOD-020, and MOD-021. The data submittal requirements shall stipulate that each Load-Serving Entity count its customer Demand once and only once, on an aggregated and dispersed basis, in developing its actual and forecast customer Demand values.	Section 3.0, Page 21	2nd paragraph
R2. The Regional Reliability Organization shall distribute its documentation required in Requirement 1 and any changes to that documentation, to all Planning Authorities that work within its Region.	NA	NA
R2.1. The Regional Reliability Organization shall make this distribution within 30 calendar days of approval.	NA	NA
R3. The Planning Authority shall distribute its documentation required in R1 for reporting customer data and any changes to that documentation, to its Transmission Planners and Load-Serving Entities that work within its Planning Authority Area.	Section 3.5, Page 25	1st paragraph
R3.1. The Planning Authority shall make this distribution within 30 calendar days of approval.	Section 3.5, Page 25	1st paragraph
Standard MOD-017-0 — Aggregated Actual and Forecast Demands and Net Energy for Load	**Section/Page**	**Paragraph**
B. Requirements		
R1. The Load-Serving Entity, Planning Authority and Resource Planner shall each provide the following information annually on an aggregated Regional, subregional, Power Pool, individual system, or Load-Serving Entity basis to NERC, the Regional Reliability Organizations, and any other entities specified by the documentation in Standard MOD-016-1_R1.	Section 3.5, Page 25	1st paragraph
R1.1. Integrated hourly demands in megawatts (MW) for the prior year.	Section 3.5, Page 25	2nd paragraph
R1.2. Monthly and annual peak hour actual demands in MW and Net Energy for Load in gigawatthours (GWh) for the prior year.	Section 3.5, Page 25	2nd paragraph
R1.3. Monthly peak hour forecast demands in MW and Net Energy for Load in GWh for the next two years.	Section 3.5, Page 25	2nd paragraph
R1.4. Annual Peak hour forecast demands (summer and winter) in MW and annual Net Energy for load in GWh for at least five years and up to ten years into the future, as requested.	Section 3.5, Page 25	2nd paragraph

NERC MOD Document Reference

Standard MOD-018-0 — Reports of Actual and Forecast Demand Data	Section/Page	Paragraph
B. Requirements		
R1. The Load-Serving Entity, Planning Authority, Transmission Planner and Resource Planner's report of actual and forecast demand data (reported on either an aggregated or dispersed basis) shall:		
R1.1. Indicate whether the demand data of nonmember entities within an area or Regional Reliability Organization are included, and	Section 3.0, Page 21	2nd paragraph
R1.2. Address assumptions, methods, and the manner in which uncertainties are treated in the forecasts of aggregated peak demands and Net Energy for Load.	Section 3.1, Pages 22-23	
R1.3. Items (MOD-018-0_R1.1) and (MOD-018-0_R1.2) shall be addressed as described in the reporting procedures developed for Standard MOD-016-0_R1.	Section 3.0, Page 21	2nd paragraph
R2. The Load-Serving Entity, Planning Authority, Transmission Planner and Resource Planner shall each report data associated with Reliability Standard MOD-018-0_R1 to NERC, the Regional Reliability Organization, Load-Serving Entity, Planning Authority, and Resource Planner on request (within 30 calendar days).	Section 3.5, Page 24	1st paragraph

Standard MOD 019-0 — Forecasts of Interruptible Demands and DCLM Data	Section/Page	Paragraph
B. Requirements		
R1. The Load-Serving Entity, Planning Authority, Transmission Planner, and Resource Planner shall each provide annually its forecasts of interruptible demands and Direct Control Load Management (DCLM) data for at least five years and up to ten years into the future, as requested, for summer and winter peak system conditions to NERC, the Regional Reliability Organizations, and other entities (Load-Serving Entities, Planning Authorities, and Resource Planners) as specified by the documentation in Reliability Standard MOD-016-1_R1.	Section 3.4, Page 24	3rd paragraph

Standard MOD-020-0 — Providing Interruptible Demands and DCLM Data	Section/Page	Paragraph
B. Requirements		
R1. The Load-Serving Entity, Transmission Planner, and Resource Planner shall each make known its amount of interruptible demands and Direct Control Load Management (DCLM) to Transmission Operators, Balancing Authorities, and Reliability Coordinators on request within 30 calendar days.	Section 3.4, Page 24	3rd paragraph

Standard MOD-021-0 — Accounting Methodology for Effects of Controllable DSM in Forecasts	Section/Page	Paragraph
B. Requirements		
R1. The Load-Serving Entity Transmission Planner and Resource Planner's forecasts shall each clearly document how the Demand and energy effects of DSM programs (such as conservation, time-of-use rates, interruptible Demands, and Direct Control Load Management) are addressed.	Section 3.4, Pages 23-24	
R2. The Load-Serving Entity, Transmission Planner and Resource Planner shall each include information detailing how Demand-Side Management measures are addressed in the forecasts of its Peak Demand and annual Net Energy for Load in the data reporting procedures of Standard MOD-016-0_R1.	Section 3.4, Pages 23-24	
R3. The Load-Serving Entity, Transmission Planner and Resource Planner shall each make documentation on the treatment of its DSM programs available to NERC on request (within 30 calendar days).	Section 3.4, Page 24	3rd paragraph