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DOCKET NO. 080407-EG - Commission review of numeric conservation goals (Florida Power & Light Company)

DOCKET NO. 080408-EG - Commission review of numeric conservation goals (Progress Energy Florida)

DOCKET NO. 080409-EG - Commission review of numeric conservation goals (Tampa Electric Company)

DOCKET NO. 080410-EG - Commission review of numeric conservation goals (Gulf Power Company)

DOCKET NO. 080411-EG - Commission review of numeric conservation goals (Florida Public Utilities Company)

DOCKET NO. 080412-EG - Commission review of numeric conservation goals (Orlando Utilities Commission)

DOCKET NO. 080413-EG - Commission review of numeric conservation goals (JEA)

WITNESS: Direct Testimony Of Richard F. Spellman, President of GDS Associates, Inc. and Caroline Guidry, Engineer – Energy Efficiency & Demand-Side Management for GDS Associates, Inc., Appearing on Behalf of the Staff of the Florida Public Service Commission

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Index

1.0 QUALIFICATIONS

Q: Mr. Spellman, please state your name, position and business addresses.

A: My name is Richard F. Spellman and I am the President of GDS Associates, Inc. (GDS), an engineering and management consulting firm. My business address is Suite 800, 1850 Parkway Place, Marietta, Georgia 30067.

Q: Please describe GDS Associates, Inc.

A: GDS is an engineering and management consulting firm with over 170 employees in the United States (U.S.). GDS specializes in energy supply and energy efficiency planning and analysis issues with clients in the U.S. and Canada. Our services include:

(1) energy efficiency, renewable energy and demand response program design, implementation and evaluation;

(2) integrated resource planning;

(3) electric generation, transmission and distribution system planning;

(4) wholesale and retail rate studies; and

(5) other planning and implementation projects for electric and natural gas utilities and government agencies.

In addition to providing energy efficiency program planning and evaluation services, GDS is implementing energy efficiency and demand response programs for clients in several states.

Q: Are these government or utility clients?

A: Both. GDS provides engineering and energy consulting services to electric and natural gas utilities, government agencies, non-profit organizations, commercial organizations, other consulting firms, and homeowners.

Q: Please state your educational background and work experience.

A: My educational background and work experience are provided in my resume, which is attached as Exhibit RFS-1.

Q: Please summarize your work experience in the area of energy efficiency.

A: During my sixteen years at GDS, I have managed several large-scale consulting projects for GDS clients relating to the design, implementation and evaluation of energy efficiency and demand response programs. I have completed over thirty-six energy efficiency potential studies across the U.S., and I have completed numerous program evaluation and market assessment studies (including end-use metering studies, mail and phone surveys, internet-based surveys, in-depth interviews, focus groups, etc.). I have completed impact and process evaluations of energy efficiency, demand response and load management programs. I have testified on energy efficiency potential studies and other related planning issues before state regulatory commissions in Connecticut, Georgia, Maine, New Hampshire, New Mexico, North Carolina, Texas, Utah, and Vermont. My clients include electric and natural gas utilities, government agencies, non-profit organizations, and other commercial businesses.

Before joining GDS in 1993, I was the Manager of Marketing and Product Development at Central Maine Power Company (CMP) where I managed the design and implementation of CMP's energy efficiency and demand response programs (with a budget of over $26 million annually). I served as the chairman of the New England Power Pool DSM Planning Committee in 1991 and 1992, and I serve on the Board of Directors of the Association of Energy Services Professionals (AESP). My education includes a BA degree with distinction in Math/Economics from Dartmouth College (graduated cum laude and with distinction) and an MBA from the Thomas College Graduate School of Business. I am a graduate of the University of Michigan Graduate School of Business Administration Management II Program, the Electric Council of New England Skills of Utility Management Program, and I am a member of the Association of Energy Services Professionals.

Q. Mr. Spellman, please explain the portion of your panel's testimony for which you have responsibility.

A. I have the responsibility for all issues relating to the selection of cost effectiveness tests for Florida and for all issues relating to recommendations for energy efficiency goals for the seven FEECA utilities and other policy recommendations. In addition, Caroline Guidry and I are jointly responsible for the portion of the testimony relating to the review and analysis by GDS of the energy efficiency technical, economic, and achievable potential estimates developed by the seven FEECA utilities.[1]

[1] Utilities subject to FEECA include Florida Power & Light Company, Progress Energy Florida, Inc., Tampa Electric Company, Gulf Power Company, Florida Public Utilities Company, JEA, and OUC.

Q. Ms. Guidry, please state your name, title and business address.

A. My name is Caroline Guidry and I am employed by GDS as an Engineer. My business address is 1850 Parkway Place, Suite 800, Marietta, GA 30067.

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

A. As an Engineer in the Energy Efficiency/Renewable Energy department, I have assisted with data collection, analyses, report writing, and development of presentations all related to energy efficiency potential studies, demand-side management program planning, and DSM policies in general. I have worked with both utilities and public service commissions from both the potential assessment and program development perspectives.

Q: Please state your educational background and work experience.

A: My educational background and work experience are provided in my resume, which is attached as Exhibit RFS-2.

Q. Please explain the portion of your panel's testimony for which you are responsible.

A. Along with Mr. Spellman, I am responsible for the portion of the testimony addressing GDS' technical review and analysis of the energy efficiency technical, economic, and achievable potential estimates developed by the seven FEECA utilities. This portion of the testimony is contained in Part 5.0 of the testimony.

2.0 INTRODUCTION

Q. What is the purpose of your testimony?

A. The purpose of the testimony is to provide:

- the results of the GDS review and assessment of the technical, economic, and achievable potential studies performed by Itron for the seven FEECA utilities;
- recommendations on the energy efficiency cost-effectiveness tests that are consistent with the revised FEECA statute and should be utilized in this proceeding to establish new conservation goals for the FEECA utilities;
- recommendations for revisions to the energy efficiency goals proposed by each of the FEECA utilities; and
- policy recommendations pertaining to the implementation of the changes to the FEECA statutes made in the 2008 legislative session, including the need for utility performance incentives or penalties relating to demand-side management (DSM) goals, the treatment of efficiency investments across generation, transmission, and distribution systems, and an appropriate mechanism for increasing the development of demand-side renewable energy resources.

Q. Are you sponsoring any exhibits?

A. Yes, I am sponsoring Exhibits Nos. RFS-1 through RFS-23, which are attached to the testimony.

Q. Please summarize the recommendations contained in your testimony.

A. In the testimony, I recommend that the energy efficiency goals for each FEECA utility be based upon an estimate of the maximum achievable cost-effective potential determined

with the use of the E-TRC Test (an Enhanced Total Resource Cost Test) and the Participant Test as the primary cost-effectiveness tests. The E-TRC Test should include a monetary value for greenhouse gas (GHG) emissions based on the latest estimates of the future price of GHG allowances published by the U.S. Congressional Budget Office. The E-TRC Test is the correct primary test because it considers (a) costs and benefits to customers participating in conservation measures; (b) costs and benefits to the general body of ratepayers as a whole, including utility incentives and participant contributions; and (c) costs and benefits of avoided power plant emissions. The Participant Test is also needed because it determines whether an energy efficiency measure is cost-effective from the Participant's viewpoint.

With regard to the technical, economic and achievable potential studies submitted by the utilities in this proceeding, GDS concludes that the estimates of achievable energy efficiency potential developed in these studies are understated based on the following findings:

- The studies exclude several cost-effective energy efficiency measures.
- The utilities have eliminated many cost-effective measures within the residential and commercial sectors based on a two-year minimum payback requirement without considering the actual market barriers and low market saturations of many of these energy efficiency measures.
- The energy efficiency portfolio optimization program used by some of the FEECA utilities overly constrains the DSM program potential by limiting the application of energy efficiency measures to incremental increases in electric demand only.

- The baseline annual kilowatt-hour (kWh) sales estimates developed for the study are consistently low when compared to actual kWh sales, which also limits the savings potential in each utility and market sector.
- The market penetration projections developed for the 10-year planning period are conservative and do not adequately reflect aggressive marketing and successful program implementation plans.

GDS recommends specific numeric conservation goals for each of the seven FEECA utilities, which are summarized in the following table. The recommended goals are lower than those I calculated using the E-TRC Test and adjusted for deficiencies and errors in the potential studies. Recognizing that the higher goals represent a significant cultural and economic change for the FEECA utilities, I am recommending that for the first five years the conservation goals be set at 50 percent of my calculated goals. This five-year transition period affords the utilities time to plan, design and implement new, more comprehensive programs to support the much higher level of goals. The end of the transition period will coincide with the next five-year goal setting proceeding. In that proceeding, the Commission can assess whether there is a need to continue the transition period.

Table 1: GDS Proposed Energy Efficiency Goals for 2014						
Utility	Winter MW Savings (2014)	Summer MW Savings (2014)	Cumulative Annual GWh Savings (2014)	2014 Winter MW Savings Goal as Percent of 2014 Forecast System Peak	2014 Summer MW Savings Goal as Percent of 2014 Forecast System Peak	2014 GWh Savings Goal as Percent of 2014 Forecast Annual GWh Sales
FPL	680.5	1,233.5	3,128.0	3.4%	5.5%	2.9%
PEF	379.4	347.7	1147.8	3.5%	3.4%	2.7%
TECO	127.2	178.6	466.7	2.4%	3.7%	2.1%
Gulf	61.4	83.7	301.9	2.0%	2.6%	2.0%
JEA	8.9	77	264.9	0.3%	2.4%	1.8%
OUC	1.9	39.2	120.1	0.2%	2.9%	1.8%
FPUC	0.8	3.3	14.2	0.4%	1.8%	1.5%

In addition, we provide recommendations on a number of policy issues. Although we conclude that the development of more aggressive conservation goals will not have a significant rate impact, we describe a rate impact cap mechanism that the Commission may choose to implement. We also conclude in the testimony that while the Commission is authorized to develop a performance incentive mechanism for those utilities that exceed their annual targets, this should be developed in a separate proceeding with input from all interested stakeholders. The revised FEECA statute allows the Commission to consider efficiency investments in generation, transmission and distribution systems. However, since the utilities have not performed technical potential analyses of the specific efficiency improvements available, I recommend that this issue also be handled in a separate proceeding when the necessary analysis has been completed.

Finally, in order to further encourage the continued research and development of demand-side renewable systems in Florida, I recommend that the FEECA utilities be required to establish demand-side renewable programs that target solar thermal and solar photovoltaic measures that were not found to be cost-effective in this proceeding. I recommend that the Commission authorize annual recovery through the ECCR for these program equal to 10 percent of each IOU's five-year average of ECCR expenses for 2004-2008.

3.0 PURPOSE AND INTENT OF THE FEECA STATUTE

Q. Please describe the purpose of the Florida Energy Efficiency and Conservation Act (FEECA).

A. The Florida Legislature has directed the Florida Public Service Commission (Commission) to adopt appropriate goals for increasing the efficiency of energy consumption and increasing the development of demand-side renewable energy systems. Specifically, the FEECA legislation directs the Commission to establish energy efficiency goals for each FEECA utility to:

- Increase the conservation of expensive resources, such as petroleum fuels;
- Reduce and control the growth rates of electric consumption;
- Reduce the growth rates of weather-sensitive peak demand; and
- Encourage development of demand-side renewable energy resources.

Q. Is information on the legislative intent provided in the FEECA statute?

A. Yes. Section 366.81, Florida Statutes (F.S.), provides the intent of this legislation, as follows:

366.81 Legislative findings and intent.--The Legislature finds and declares that it is critical to utilize the most efficient and cost-effective demand-side renewable energy systems and conservation systems in order to protect the health, prosperity, and general welfare of the state and its citizens. Reduction in, and control of, the growth rates of electric consumption and of weather-sensitive peak demand are of particular importance. The Legislature further finds that the Florida Public Service Commission is the appropriate agency to adopt goals and approve plans related to the promotion of demand-side renewable energy systems and the conservation of electric energy and natural gas usage. The Legislature directs the commission to develop and adopt overall goals and authorizes the commission to require each utility to develop plans and implement programs for increasing energy efficiency and conservation and demand-side renewable energy systems within its service area, subject to the approval of the commission.

Q. What changes to the FEECA statute did the Florida Legislature make in the 2008 legislative session?

A. The 2008 Florida Legislature enacted several amendments to the FEECA statutes, the most significant of which are summarized as follows:

In developing the FEECA goals, the Commission is directed by Section 366.82, F.S., to:

- Consider costs and benefits to customers participating in conservation measures;
- Consider the costs and benefits to the general body of ratepayers as a whole,

including utility incentives and participant contributions;

- Consider the need for incentives to promote both customer-owned and utility-owned energy efficiency and demand-side renewable energy systems;
- Consider costs imposed by state and federal regulations on the emission of GHGs; and
- Evaluate the technical potential of all demand-side and supply-side energy conservation measures, including demand-side renewable energy systems.

In addition, the Commission is permitted by Section 366.82 F.S., to:

- Allow efficiency investments across generation, transmission, and distribution as well as efficiencies within the user base; and
- Authorize financial rewards or penalties for those utilities over which it has rate-setting authority for exceeding or failing to meet the goals, respectively.

Q. What impact do these changes have on the conservation goal-setting process which is the subject of this proceeding?

A. By amending Section 366.82, F.S., in 2008, the Florida Legislature has directed the Commission to place increased emphasis on the level of energy efficiency goals in order to reduce and control the growth rates of electric consumption. The changes give the Commission broader authority to maximize the achievement of energy efficiency in Florida.

4.0 CURRENT AND HISTORICAL FLORIDA ENERGY EFFICIENCY AND LOAD MANAGEMENT PROGRAMS

Q. Have the FEECA utilities' energy efficiency and load management programs been successful in the past?

A. Yes, however, in the past, more focus has been placed on kilowatt (kW) savings than on kilowatt-hour (kWh) savings.

Q. How have the FEECA utilities historically ranked in the nation in terms of absolute kW savings from load management programs in the past?

A. In 2007, based on incremental annual kW savings from load management programs reported by each utility in the U.S. Energy Information Administration (EIA) Form 861 Database, out of the 192 utilities reporting absolute savings of over zero kW, the FEECA utilities received the following ranks:

- Progress Energy Florida, Inc. (formerly Florida Power Corp.): 2
- Florida Power & Light Company: 5
- Gulf Power Company: 39
- Tampa Electric Company: 70
- Florida Public Utilities Company: Not Reported
- JEA: Not Reported
- OUC: Not Reported

A graphical representation of all of the reporting utilities and the rank of the FEECA utilities according to absolute kW savings reported for years 2005, 2006, and 2007 can be found in Exhibit RFS-3. This exhibit also contains a listing of the top 20 utilities for these three years.

Q. In the past, how have the FEECA utilities historically ranked in the nation in terms of relative load management kW savings as a percentage of summer peak loads?

A. In 2007, based on cumulative annual kW savings from load management programs as a percentage of summer peak loads reported by each utility in the U.S. EIA Form 861 Database, out of the 192 utilities reporting annual effects of over zero kW, the FEECA utilities received the following ranks:

- Progress Energy Florida, Inc. (Florida Power Corp.): 38
- Florida Power & Light Company: 124
- Gulf Power Company: 141
- Tampa Electric Company: 180
- Florida Public Utilities Company: Not Reported
- JEA: Not Reported
- OUC: Not Reported

A graphical representation of all of the reporting utilities and the rank of the FEECA utilities according to relative cumulative kW savings as a percentage of summer peak load reported for years 2005, 2006, and 2007 can be found in Exhibit RFS-4. This exhibit also contains a listing of the top 20 utilities for these three years. In ranking utilities on their energy efficiency and load management achievements, it is important to consider the magnitude of the kWh and kW savings in proportion to each utility's annual kWh sales and peak load, and not just on the level of kW savings alone.

Q. How have the FEECA utilities historically ranked in the nation in terms of energy efficiency program savings in the past?

A. In 2007, based on incremental annual kWh savings from energy efficiency programs

reported by each utility in the U.S. EIA Form 861 Database, out of the 279 utilities reporting incremental savings of over zero kWh, none of the FEECA utilities scored in the top 100 electric utilities. The FEECA utilities received the following ranks for 2007:

- Florida Power & Light Company: 107
- Progress Energy Florida, Inc. (Florida Power Corp.): 133
- Gulf Power Company: 146
- JEA: 154
- Tampa Electric Company: 158
- Florida Public Utilities Company: 177
- OUC: Not Reported

A graphical representation of all of the reporting utilities and the rank of the FEECA utilities according to annual incremental kWh savings reported as a percentage of total sales for years 2005, 2006, and 2007 can be found in Exhibit RFS-5. This exhibit also contains a listing of the top 20 utilities for these three years.

Q. Have other electric utilities in Florida implemented energy efficiency programs?

A. Yes. According to the U.S. EIA Form 861 Database, seven other Florida electric utilities, in addition to the FEECA utilities, have reported kWh savings from energy efficiency programs. Exhibit RFS-6 shows the reported incremental kWh savings as a percentage of total retail sales for years 2005, 2006, and 2007 for all of the Florida utilities that reported energy efficiency savings for those years.

Q. How do the energy efficiency program savings of the non-FEECA utilities in Florida compare to the Florida FEECA utility energy efficiency program savings?

A. The top three "non-FEECA" electric utilities in Florida reporting savings in 2007 – Reedy Creek Improvement District (Reedy Creek), Gainesville Regional Utilities (GRU), and City of Tallahassee (Tallahassee) – achieved annual kWh savings of 0.98 percent, 0.76 percent, and 0.34 percent, respectively, of total 2007 kWh sales. FPL, which is the highest ranking FEECA utility, achieved incremental annual kWh savings as a percent of retail kWh sales in 2007 of only 0.20 percent, which is significantly less that the savings achieved by Reedy Creek, GRU, and Tallahassee. As shown on Exhibit RFS-6, out of the total 13 utilities reporting energy efficiency programs savings in Florida for 2007, the FEECA utilities are ranked as follows:

- Florida Power & Light Company: 4
- Progress Energy Florida, Inc.(Florida Power Corp.): 6
- Gulf Power Company: 7
- JEA: 8
- Tampa Electric Company: 9
- Florida Public Utilities Company: 11
- OUC: Not Reported

This comparison of kWh savings data for Florida electric utilities raises the question of why the seven FEECA utilities do not achieve annual kWh savings as high as that achieved by Reedy Creek, GRU, or Tallahassee. Furthermore, the 0.76 percent of annual kWh sales saved in just one year (2007) by GRU is as high as what some of the FEECA utilities propose to save over a 10-year period.

Q. Why is it important for Florida's electric utilities to increase the level of energy efficiency and conservation?

A. The following factors make aggressive implementation of electric energy efficiency programs imperative for the State of Florida:

- According to the Florida Reliability Coordinating Council, Inc.'s (FRCC) 2009 Regional Load and Resource Plan,[2] consumption of electricity in Florida (as measured by growth in net energy for load) is expected to experience an average annual compound growth rate of 1.8 percent over the period from 2009 to 2018. Energy efficiency programs can help reduce the demand for electricity at a levelized cost per lifetime kWh saved that is much less expensive than building and operating a new nuclear power plant or power plant fueled with clean coal. A main objective of FEECA is to decrease the rate of growth in electricity consumption. Implementation of aggressive energy efficiency programs can help meet this objective.
- Having more energy efficiency resources in the utilities' energy resource plans provides a more diversified, less costly and less risky mix of energy resources.
- Investing more in cost-effective energy efficiency can help reduce Florida's consumption of fossil fuels. This is a key objective of the FEECA statute.
- Investing more in cost-effective energy efficiency can help Florida increase its energy independence and make the state less reliant on outside sources of energy supply.
- Investing more in cost-effective energy efficiency can help reduce emissions

[2] Florida Reliability Coordination Counsel, Inc.'s (FRCC) 2009 Regional Load and Resource Plan (July 2009), page 1. Available at: https://www.frcc.com/Planning/Shared%20Documents/Load%20and%20Resource%20Plans/2009%20LRP_Web.pdf

of SO_2, NO_X, CO_2, and particulates in Florida. Unlike coal and gas-fired plants, energy efficiency investments do not produce carbon dioxide, a major greenhouse gas.

- Investing more in cost-effective energy efficiency can help increase "green" jobs in the State of Florida.

5.0 EVALUATION OF POTENTIAL STUDIES

Q. Has GDS reviewed the potential studies completed by the seven FEECA utilities?

A. Yes. GDS has reviewed the technical potential studies for all seven FEECA utilities as well as the statewide technical potential report. GDS has also reviewed the methodology and results of the economic and achievable potential studies, which are described in the testimonies filed by witnesses for each utility.

Q. What methodological requirements should be utilized in the potential studies used as a basis to set goals for the FEECA utilities?

A. The potential studies should reflect the primary objectives of FEECA which are to: (1) reduce the growth rates of Florida's weather-sensitive peak demand, (2) reduce and control the overall growth in electricity consumption, and (3) reduce consumption of scarce fossil fuels. Additionally, pursuant to Section 366.82, F.S., the Commission, in developing the goals, should also evaluate the technical potential of all demand-side and supply-side energy conservation measures, including demand-side renewable energy systems. Because of the nature of the objectives and the audience, the potential studies should be thorough, reflect the environment and market of the service territory, be accurate in their approximations of technical potential savings and market potential, and be transparent so that technically oriented and non-technically oriented stakeholders may

see the assumptions, methodology, and supporting documentation behind the final numbers.

Q. Is it important for technical and achievable potential studies to include a comprehensive list of energy efficiency measures and technologies?

A. Yes. In order for these potential studies to provide meaningful and complete information on energy efficiency potential, the studies should contain detailed information on energy efficiency measures and the size of target markets. Specifically, the studies should include a comprehensive range of existing and emerging energy efficiency, demand response, and renewable measures and technologies. They should also provide evidence of and support for all assumptions relating to measure costs, measure savings and measure useful lives. The documentation and support for the underlying assumptions is just as important as those assumptions.

Q. Do the energy efficiency potential studies need to provide detailed information on the methodology used to develop the estimates and documentation of all assumptions, including measure costs, measure savings, measure useful lives, and measure penetration rates?

A. Yes. The studies should provide clear information on the methodology used to develop the energy efficiency potential estimates as well as detailed documentation of all underlying assumptions and data used to develop the energy efficiency potential estimates. Without proper documentation of methods and references, the validity of the data and assumptions used cannot be verified.

The studies should also be tailored to the users of the studies which includes: (1) the Commission, which has ultimate authority over the target setting; (2) the utilities, which will be proposing achievable goals based on these studies; (3) the public, which is indirectly involved both as customers of the utility and as prospective program participants; and (4) other interested stakeholders (public interest and environmental organizations).

Q. Do service area-specific factors impact potential studies?

A. Yes. Many factors can impact the savings results of energy efficiency programs; therefore, it is necessary to use Florida-specific data wherever possible so that the estimates reflect actual potential for service areas in Florida. The development of these energy efficiency potential estimates requires special attention in order to tailor the study to a specific service area.

Q. What service area-specific factors impacting potential studies should the Commission ensure are accounted for when setting targets based on the studies?

A. Service area specific factors include appliance saturation data, the mix of single-family versus multi-family housing units, heating and cooling degree days, avoided costs for electricity, retail electric rates, availability of alternative fuels, the degree to which energy efficient appliances are already installed and other economic and demographic characteristics of the service area including localized equipment and installation costs. These factors can affect a measure's savings potential and cost-effectiveness.

Q. In addition to the service area-specific factors mentioned above, what regulations should the Commission ensure are accounted for in the potential studies when setting targets based on those studies?

A. National, state and local building codes, national and state appliance efficiency standards, and other energy efficiency regulations all contribute to energy savings and greatly impact the calculated potential energy savings available through utility run energy efficiency programs. Higher appliance and building standards can lead to less calculated potential attributable to energy efficiency programs due to the smaller differences in energy consumption between minimum standard equipment codes (the baseline) and high efficiency equipment. Higher and more stringent standards lead to overall energy efficiency improvements and lower energy needs of customers. Such standards should carefully be accounted for in energy efficiency potential studies so that the potential for additional energy savings through energy efficiency programs is not overstated or double-counted.

Q. Should potential studies include federal and state incentive programs?

A. Yes. Studies of energy efficiency potential also should to take into account existing governmental incentives and programs as well as federal and state tax credits for energy efficiency measures in order to ensure that the proper utility and participant equipment costs are reflected in the cost-effectiveness tests.

Q. Have you reviewed the technical potential studies performed by Itron for the FEECA utilities?

A. Yes, we have reviewed the technical potential studies for all seven of the FEECA utilities

and we have reviewed the statewide energy efficiency potential study. Ms. Guidry had lead responsibility for this review.

Q. How did you approach the review of the technical potential studies?

A. The assessment process used by GDS included an examination of all aspects of the technical potential study from individual data points to the published electricity savings potential. The GDS assessment was designed to both verify and validate the equations, calculations, and methodology used to estimate the energy efficiency technical potential and the data and data sources used as inputs into the study. GDS examined the following five components of the studies:

(1) The equations and techniques used by Itron to determine the unadjusted and adjusted energy and peak demand savings were examined to verify that the equations produced the published results based upon the input assumptions and data provided in the technical potential studies.

(2) GDS assessed whether or not the objectives of the study could be met with the methodologies used by Itron to estimate the technical potential. This process included a review of the completeness of the sectors, subsectors, and energy efficiency measures studied.

(3) GDS tested whether the results could be reproduced with the given methodology and data points provided in each report and supporting appendices.

(4) GDS reviewed the data points and data sources used as inputs into the study to

determine the credibility of the source and the appropriateness of the data used given the assumptions and conditions of the source and its compatibility with the Florida electric service territory.

(5) Lastly, GDS assessed the final results of estimated technical potential in order to determine if the electricity savings estimates appropriately reflect the upper-limits of potential and if the utility-specific and statewide results were comparable with results of similar studies and assessments.

Q. What are your findings regarding the technical potential studies?

A. GDS has specific findings relating to additional cost-effective measures that should have been included in the technical potential studies. We also found calculations and data that need to be corrected, addressed, or documented. Below is a summary of our key findings pertaining to the technical potential studies:

- The technical potential studies exclude many important energy efficiency measures. Section 366.82, F.S., directs the Commission to evaluate the technical potential of <u>all</u> demand-side and supply-side energy conservation measures, including demand-side renewable energy systems. Thus, the technical potential studies fail to meet the requirements of the statute. The specific measures that were excluded are discussed later in this testimony;
- Documentation for weather normalization adjustment factors used in the technical potential studies was not provided in the studies;
- Documentation of sources for baseline saturation data was not provided in the technical potential studies;

- The technical potential studies did not include energy efficiency potential estimates for the new construction market for the residential and commercial market sectors;
- The latest market assessment data collected by KEMA in the 2009 FEECA utility commercial baseline studies was not integrated into the technical, economic, or achievable potential studies;
- GDS was not able to replicate the estimates of technical potential savings provided by the FEECA utilities based upon the documentation provided; and
- Market sector kWh baseline estimates for nearly all of the utility estimates fall short of actual historical kWh sales as compared to the utility specific 10 year site plans filed in 2009.[3]

Q. How do these technical potential study findings impact the economic and achievable studies?

A. The findings listed above can have a significant impact on the economic and achievable potential studies. Measures that are excluded from the technical potential study are also not considered in the economic or achievable studies, which limits the ultimate economic and achievable potential kWh savings estimates. Also, any uncertainties in the technical potential estimates resulting from lack of documentation regarding weather normalization factors or baselines saturations lead to uncertainties in the economic and achievable studies as well. Additionally, if the latest market assessment data is not incorporated into the technical potential study, then the economic and achievable estimates are also

[3] Note: FPUC is not required to file 10 year site plans; therefore, the baselines for FPUC could not be verified against historical sales data.

hindered by the use of older data. Finally, the fact that the baselines in the technical potential studies underestimate actual kWh sales limits the estimated energy available for saving through energy efficiency efforts.

Q. Based on your review, what additional issues have you found in the economic and achievable potential studies filed by the FEECA utilities?

A. GDS also conducted a thorough review of the methodology and calculations used by the FEECA utilities to estimate the achievable cost-effective potential. Based on this detailed review, we have determined that there are several factors that have caused the utilities' estimates of achievable energy efficiency potential to be understated, including the following:

- Market penetration projections for many measures appear to be too low;
- The list of energy efficiency measures considered is incomplete;
- Some utilities limit the amount of DSM savings potential to supplanting incremental growth in electric demand only;
- Some utilities used an incorrect optimization methodology to select a cost effective portfolio of energy efficiency measures;
- Minimum measure payback requirements were inappropriately applied to the residential and small commercial market sectors, resulting in the elimination of many cost effective energy efficiency measures; and
- Neither the Rate Impact Measure (RIM) nor the E-RIM Tests should have been used to determine if energy efficiency measures are cost effective.

These issues will be addressed individually in the following testimony.

Q. What are your concerns regarding the market penetration estimates?

A. In the early years of the forecast, the models that produce the projections of future market penetration of energy efficiency measures are constrained to what Florida utilities have been able to achieve in the past when the RIM Test was used to determine cost-effectiveness. It is not appropriate to constrain future estimates of market penetration to the achievements made in the past in Florida when the RIM Test prevented many energy efficiency programs from being implemented. This constraint underestimates the actual potential achievable in a particular market. In addition, because the list of energy efficiency measures is incomplete, the technical and achievable potential studies do not adequately address all of the customer market segments, and thus, do not ensure that every customer is provided an opportunity to lower electric consumption through utility sponsored energy efficiency programs.

Q. Why do you conclude that the list of energy efficiency measures considered in the Technical Potential Study is incomplete?

A. In our assessment of the Florida Technical Potential Study, we compared the list of residential and commercial measures contained in the study with those found in other recent technical potential studies. The following measures applicable to the residential sector were not included in the Florida study:

- Smart strips/phantom load switch
- Second refrigerator turn-in
- Light emitting diode (LED) lighting
- Programmable thermostats
- Second freezer turn-in

- Tree shading

The above six items could contribute to a rather large percentage of the technical potential. For example, as shown in Exhibit RFS-7, these listed measures account for 19.6 percent of the residential maximum achievable cost-effective potential according to a 2009 study conducted in New Hampshire. These are common, commercially available measures that are minimally affected by climate and could be applicable to the Florida residential energy market. We believe that these measures should have been included in the Florida technical potential study in order to meet the FEECA statute requirements to consider all energy efficiency measures.

The list of commercial measures found in other technical potential studies, but not assessed in the Florida study, is extensive. The measures contained in Exhibit RFS-7 may not break into the current list of top twenty energy saving measures. However, their cumulative potential savings could be substantial and merit consideration. We believe the missing commercial energy efficiency measures are applicable in many types of commercial buildings and should have been included in the Florida Technical Potential Study. There are four building types that consume 60 percent of the electricity sold to the commercial sector in Florida. The following table provides a list of energy efficiency measures that are likely to be applicable in these building types and that were not included in the studies conducted by the seven FEECA utilities:

Table 2: Recommend List of Additional Commercial Measures

Building Type	Percentage of Total Annual Energy Consumption[4]	Measures Likely to be Applicable in Building Type & Not Considered in Current FL Study -
Office	21%	Energy Star Compliant Single-Door Refrigerator Vending Miser for Non-Refrigerated Machines Specialty Lighting Integrated Building Design Energy Efficient Windows
Restaurant	18%	Specialty Lighting High Efficiency Steamer High Efficiency Holding Cabinet Demand Ventilation Control Induction Cook-tops Refrigeration Economizer Commercial Reach-In Cooler Commercial Reach-In Freezer Commercial Ice-Maker Zero-Energy Doors – Coolers Zero-Energy Doors – Freezers Door Heater Controls Discuss Compressor Scroll Compressor Floating Heat Pressure Control
Retail	12%	Vending Miser for Non-Refrigerated Machines Specialty Lighting
Lodging	9%	Pools – pumps, temperature controls, etc. High Efficiency Hot Tubs/Spas

Q. Do the current achievable studies place any unnecessary constraints on the amount of DSM savings potential?

A. Yes. Some of the utilities have limited the application of energy efficiency measures only to incremental new electric loads and have not allowed energy efficiency measures to displace current electric load. This also understates the DSM achievable potential.

Q. What are your concerns regarding the resource optimization model used to select cost-effective DSM measures for inclusion in the achievable estimate?

A. Some of the FEECA utilities have used a linear programming model approach to determine the optimal level of investments in energy efficiency. In these instances, the

[4] Technical Potential for Electric Energy and Peak Demand Savings in Florida – Final Report. Figure 3-12 on Pg. 3-21.

objective function should be to develop a least cost energy resource plan that minimizes the sum of utility and participant costs for supply-side and demand-side resources. However, some of the FEECA utilities minimized the costs of demand-side investments only (according to testimony provided by the utilities), which does not result in a least cost energy resource plan for customers.

Q. Do you believe it is necessary that a two-year minimum payback requirement be implemented for all customer sectors?

A. No. The utilities eliminated all energy efficiency measures that have a payback to the participant (before incentives) of two years or less for all customer sectors. According to the testimony of several utility witnesses, the purpose of the minimum measure payback requirement of two years is to avoid "free ridership." A free rider is an energy program participant who would have implemented the program measure or practice in the absence of the program.

We do not believe it is appropriate to impose this constraint in the residential sector or small commercial customer market segment where customers are typically not energy efficiency or financial experts. Customers in these residential and small commercial markets face multiple market barriers relating to adoption of energy efficiency measures, such as (but not limited to):

- Transaction costs;
- Lack of program funding;
- Lack of information about energy efficient technologies;
- Lack of time to install energy efficiency measures;

- Lack of time to learn about energy efficiency measures; and
- Concern about the performance of energy efficient technologies.

There are many energy efficiency measures with a payback less than two years that have low market penetration in Florida in residential and small commercial market segments. According to appendices attached to the utility-specific technical potential study reports, for the measures with a payback of less than two years, the average commercial market saturation is 37 percent. For residential measures with a payback of two years of less, the average market saturation is only 25 percent.[5] Thus, it is clear that even using the FEECA utilities-specific data, many energy efficiency measures in the residential and small commercial markets having a payback of less than two years have relatively low market penetration to date in Florida.

In addition to the FEECA utilities-specific data, GDS reviewed other recent U.S. studies for information on this topic. These studies demonstrated that residential and small commercial customers will not install many of these measures in the absence of a well-designed energy efficiency program.[6] Furthermore, the FEECA statute requires that "[i]n developing the goals, the commission shall evaluate the full technical potential of all available demand-side and supply-side conservation and efficiency measures, including demand-side renewable energy systems." Section 366.82(3), F.S. The removal of cost

[5] The average market saturations were estimated by averaging 1 minus the "Incomplete Factor" for all measures within a market sector that have a payback period of two years or less. Incomplete Factors are defined as 1-Measure Saturation. All of the data was obtained from the utility-specific technical potential study reports Appendices B and C. Appendix C was used to determine the measures with a payback period of two years or less, and Appendix B was used to obtain the "Incomplete Factors" for the desired measures.

[6] See "National Action Plan for Energy Efficiency" report published in July 2006. This plan was developed by more than 50 leading organizations in pursuit of energy savings and environmental benefits through electric and natural gas energy efficiency. This report notes that current underinvestment in energy efficiency is due to a number of well-recognized barriers, including some of the regulatory policies that govern electric and natural gas utilities.

effective measures for the residential and small commercial customer classes is not consistent with the requirement in the FEECA statute for the Commission to evaluate the full technical potential of all available energy efficiency measures.

Q. Please provide an example of a measure with a payback period of less than two years that has a low market penetration rate.

A. A good example of a measure having low penetration in the U.S. is the compact fluorescent light bulb (CFL) that has a payback to the customer of less than two years. According to data from the Consortium for Energy Efficiency, "[a]bout 85 percent of residential lighting energy is used by incandescent light sources" in the United States.[7]

Q. Have residential CFL lighting programs experienced high free-ridership rates across the U.S.?

A. No. GDS has conducted a survey of utilities and organizations across the United States to determine the impact of free-ridership with respect to CFL lighting. The results of the survey are provided in Exhibit RFS-8. As shown in this exhibit, all of the residential lighting programs examined by GDS experienced very low free-ridership rates.

Q. Can you provide examples of residential measures that were omitted from the estimates of achievable potential because they had a payback of two years of less?

A. Yes. PEF, for example, screened out the following residential sector measures that have a payback of two years or less:

[7] Data provided on the Consortium for Energy Efficiency Residential Lighting Fact Sheet, available at www.cee1.org/resrc/facts/res-lt-fx.pdf.

- Air conditioner maintenance
- Electronically commutated motors (ECM's)
- Testing of proper refrigerant charging and airflow for central air conditioning systems
- Proper sizing of HVAC systems
- Compact fluorescent lightbulbs
- T-8 lighting
- Low flow showerheads, faucet aerators, water heater blankets
- Heat traps
- High efficiency pool pumps
- High efficiency clothes washers
- Energy Star TV's, DVD players, VCR's, cable set-top boxes, desk-top PC's, lap top PC's,
- High efficiency windows with sunscreens

Q. Can you provide examples of commercial sector measures that were omitted from the estimates of achievable potential because they had a payback of two years of less?

A. Yes. FPL, for example, screened out such measures as premium T-8 lighting, high-bay T-five lighting, metal halide lighting, hard-wired 18 watt CFLs, aerosol duct sealing, variable speed drives for chiller pumps and towers, air handler optimization, and heat traps to name just a few measures. All of these energy efficiency measures have incomplete factors of over 60 percent and have payback periods of two years or less. FPL screened out several hundred energy efficiency measures (across all 11 commercial market segments), most of which have very high incomplete factors.

For the reasons stated above for the residential and small commercial markets, we conclude that the FEECA utilities' achievable potential studies currently underestimate the actual achievable potential because of the unnecessary constraint imposed by the two-year minimum payback requirement. However, we believe the two-year payback constraint makes sense for the large commercial/industrial market because these customers often possess the knowledge and expertise to identify and implement cost-effective energy savings measures without incentives.

Q. Why do you conclude that neither the RIM Test nor the E-RIM Test should be used to determine cost-effectiveness in the economic and achievable studies?

A. Both the RIM and the E-RIM cost-effectiveness tests screen out many measures that demonstrate energy savings potential and that cost far less than new power supply resources on a cost per lifetime kWh saved basis. Screening out measures using the RIM or E-RIM Tests significantly reduces both the economic and achievable kWh savings estimates. This issue is discussed in greater detail later in this testimony.

Q. How do the FEECA utilities estimates of technical, economic, and achievable potential compare to studies conducted by states other than Florida, non-profits, and other utilities across the country?

A. GDS collected the results from 20 potential studies ranging from an assessment of the entire Unites States, states in other regions of the U.S., and other states in the Southeast. Most of these studies have estimated the potential savings over a planning horizon of 10 years. Comparatively, the FEECA utilities studies project savings as a percentage of annual kWh sales that are much lower than other recent studies. On average, the

technical potential estimated by the FEECA utilities is 19 percent of annual kWh sales in 2019, which is seven percent lower than the other studies reported. The FEECA utilities project that the achievable cost-effective potential is only 0.62 percent of annual kWh sales in 2019, which is nearly 12 percent below other recent studies in both the southeast region and the U.S., and almost 0.4 percent below what other electric utilities in Florida have saved in the year 2008 alone. The achievable cost effective potential savings of 0.62 percent by 2019 estimated by the FEECA utilities is by far the lowest estimate of achievable potential of any of the recent studies examined by GDS. A table comparing all of the studies to the FEECA utilities potential estimates is presented in Exhibit RFS-9.

Q. What are your final remarks on the technical, economic, and achievable potential studies?

A. The studies of technical, economic and achievable potential completed for the seven FEECA utilities are voluminous and complex. It takes days to read all of the studies, technical appendices, and the supporting testimony by utilities' witnesses. It takes additional days to review the underlying calculations of kWh and kW potential savings, and to review all of the supporting references that provide detailed information on energy efficiency measure costs, measure electricity savings and measure useful lives. The modeling effort completed by Itron and the FEECA utilities provides the Commission with a starting point from which to develop new energy efficiency goals that are based upon the revised FEECA statute, goals that will consider all energy efficiency measures, and will utilize the most efficient and cost-effective demand-side renewable energy systems and conservation systems. However, because of the problems and deficiencies noted in the above discussion, these studies fall short of the requirements of the FEECA statute and The estimates of achievable cost effective potential exclude many cost-

effective and proven energy efficiency measures -- measures that have a levelized cost per lifetime kWh saved less than 2.5 cents per kWh saved.[8] As explained later in the testimony, GDS has developed energy efficiency goals for the FEECA utilities that address the deficiencies listed above for the technical, economic, and achievable studies.

6.0 DETERMINATION OF COSTS AND BENEFITS OF CONSERVATION

Q. What approach should the Commission consider in determining the costs and benefits of the conservation goals that is consistent with the revised FEECA statute?

A. The FEECA statutes provide the Commission with much flexibility when setting DSM goals. In declaring its intent, the Florida Legislature stated in Section 366.81, F.S.:

> The Legislature further finds and declares that ss. 366.80-366.85 and 403.519 are to be liberally construed in order to meet the complex problems of reducing and controlling the growth rates of electric consumption and reducing the growth rates of weather sensitive peak demand; increasing the overall efficiency and cost-effectiveness of electricity and natural gas production and use; encouraging further development of demand-side renewable energy systems; and conserving expensive resources, particularly petroleum fuels.

Because the Legislature requires these FEECA statutes to be liberally construed, the Commission is authorized to set aggressive yet achievable energy efficiency goals and to

[8] Using the levelized cost per kWh saved provided in the appendices of the utility specific technical potential reports and averaging only those measures with a two-year payback period or less, the commercial measure average levelized cost is 2.4 cents per kWh saved and the residential measure average levelized cost is 2.4 cents per kWh saved.

ensure that customers will see real savings on their electric bills.

Q. Does the revised FEECA statute require that the Commission consider the cost and benefits of energy efficiency to participants and to utility customers?

A. Yes. The Legislature found and declared that it is critical to utilize the most efficient and cost-effective demand-side renewable energy systems and conservation systems in order to protect the health, prosperity, and general welfare of the state and its citizens. Amendments to the FEECA statutes made during the 2008 legislative session provide guidance on what is to be considered cost-effective. The 2008 amendments clearly outline the costs and benefits that must be considered when determining cost-effectiveness and setting conservation goals. These costs and benefits include those incurred by all participating customers and the costs and benefits to the general body of ratepayers, including utility incentives and participant contributions. The Commission must also consider the need for incentives to promote both customer-owned and utility-owned energy efficiency and demand-side renewable energy systems. Finally, the Commission must consider costs imposed by state and federal regulations on the emission of greenhouse gases.

7.0 NATIONAL ACTION PLAN FOR ENERGY EFFICIENCY

Q. Are there any regional or national efforts underway that could provide useful information to the Commission as it develops updated energy efficiency goals for the FEECA utilities?

A. Yes. The National Action Plan for Energy Efficiency (NAPEE) is a private-public initiative begun in the fall of 2005 to create a sustainable, aggressive national commitment to energy efficiency through the collaborative efforts of gas and electric

utilities, utility regulators, and other partner organizations. According to the U.S. Environmental Protection Agency (EPA) web site, such a national commitment to energy efficiency can take advantage of large opportunities in U.S. homes, buildings, and schools to reduce energy use, save billions on customer energy bills, and reduce the need for new power supplies. The first NAPEE report was released in July 2006 and served as a call to action to bring diverse stakeholders in the U.S. together at the national, regional, state, or utility level, as appropriate, and foster the discussions, decision-making, and commitments necessary to take investment in energy efficiency to a new level.

Q. Has the NAPEE produced any reports that contain information on cost-effectiveness tests for energy efficiency programs that would be useful to the Commission as it develops new goals for the FEECA utilities?

A. Yes. In November of 2008, the NAPEE released its report on cost-effectiveness tests for energy efficiency measures and programs.[9] According to this report, "the most common primary measurement of energy efficiency cost-effectiveness used by state public utility commissions is the Total Resource Cost Test (TRC), followed closely by the Societal Cost Test (SC)." A positive TRC result indicates that the program will produce a net reduction in energy costs in the utility service territory over the lifetime of the program.

[9] National Action Plan for Energy Efficiency, "Understanding the Cost-effectiveness of Energy Efficiency Programs: Best Practices, Technical Methods and Emerging Issues for Policy Makers", November 2008. This paper, *Understanding Cost-Effectiveness of Energy Efficiency Programs,* is provided to assist utility regulators, gas and electric utilities, and others in meeting the 10 implementation goals of the National Action Plan for Energy Efficiency's Vision to achieve all cost-effective energy efficiency by 2025. This report reviews the issues and approaches involved in considering and adopting cost-effectiveness tests for energy efficiency, including discussing each perspective represented by the five standard cost-effectiveness tests and clarifying key terms. The intended audience for the report is any stakeholder interested in learning more about how to evaluate energy efficiency through the use of cost-effectiveness tests. All stakeholders, including public utility commissions, city councils, and utilities, can use this report to understand the key issues and terminology, as well as the various perspectives each cost-effectiveness test provides, and how the cost-effectiveness tests can be implemented to capture additional energy efficiency. Page ES-2.

A summary of results on the cost-effectiveness tests used in each state is provided in Exhibit RFS-10.

Q. Out of the 15 states that report a primary cost-effectiveness test, how many states use the Total Resource Cost or Societal Cost Test as a primary cost-effectiveness test?

A. As shown in Exhibit RFS-10, the NAPEE report identifies that 11 out of the 15 reporting states utilize/rely upon either the TRC or SC Test as a primary cost-effectiveness test.

Q. How many states use the RIM Test as a primary cost-effectiveness test?

A. According to the NAPEE study, Florida is the only state to use the Rate Impact Measure (RIM) Test as a primary cost-effectiveness screening test.[10]

Q. Does the National Action Plan's November 2008 cost-effectiveness report provide information on the impacts of using the RIM Test as a primary cost-effectiveness test?

A. Yes, the report states that, "reliance on the RIM Test has limited energy efficiency investment, as it is the most restrictive of the five cost-effectiveness tests."[11]

8.0 MAJOR COST-EFFECTIVENESS TESTS

Q. What are the major cost-effectiveness tests typically used to quantify the costs and benefits of energy efficiency programs or measures?

A. There are five major cost-effectiveness tests that quantify the benefits and costs of energy efficiency programs or measures from various perspectives. These five cost-

[10] *Ibid*
[11] *Ibid.*

effectiveness tests are: the Participant Test, the Program Administrator Cost (PAC) Test, the Total Resource Cost (TRC) Test, the Societal Cost (SC) Test, and the Ratepayer Impact Measures (RIM) Test.

Q. Please describe the Participant Test.

A. The Participant Test is used to measure the quantifiable benefits and costs to the customer as a result of participating in a program. It does not account for any unquantifiable benefits which may result from improved energy efficient behaviors. It is limited to customer cash flows only in the context of participation incentives, bill reductions, and direct costs incurred. In the past, the Participant Test has been used in Florida to ensure that a program is cost-effective to the participating customer; otherwise, the participant would not participate. The Florida utilities also use the Participant Test to identify and eliminate energy efficiency measures with a short payback period that consumers likely could be doing anyway. These customers are called "free riders." There is also no consideration for costs associated with imposed state and federal environmental regulations.

Q. Please describe the Program Administrator Cost Test.

A. The PAC Test is designed to calculate the costs and benefits of a demand-side management program as a resource option based on only the costs and benefits incurred by the utility. This test excludes any net costs incurred by the participant. The PAC Test has not historically been part of the FEECA goal setting process, and I do not recommend that it be included now as a criterion for determining cost-effectiveness.

Q. Please describe the Total Resource Cost Test.

A. The TRC Test measures the overall economic efficiency of a DSM program. It measures the net costs of a DSM program based on total program costs – utility costs and customer incurred costs. This test provides an "apples to apples" comparison of the costs of demand-side and supply-side resources on a level playing field. This test is applicable to all types of DSM programs – conservation as well as load management and other demand response programs. Regardless of the type of DSM program, the TRC Test measures the net direct economic impacts that the program has over the entire service area of the utility. It is essentially a test to determine the net costs that program participants and the utility would incur in order to implement a specific DSM program.

Q. Please describe the Societal Cost Test.

A. The SC Test follows the same structure as the TRC Test except that it is the only test that attempts to quantify the societal costs and benefits of a DSM program. In general, the SC Test assesses the changes in total resource costs and benefits – direct and indirect – to society as a whole as opposed to limiting the impacts to the service territory alone. The SC Test is similar to the TRC Test with the addition of consideration of the costs and benefits of externalities. States using the SC Test have typically attempted to include the costs and benefits associated with such social concerns as air quality, health, etc. These costs and benefits of externalities can be extremely difficult to quantify.

The SC Test has not historically been part of the FEECA goal setting process. While I do not recommend that it be included now as a criterion for determining cost-effectiveness, as discussed later in my testimony, I am recommending that an estimate of the likely

costs of greenhouse gases (GHG) based on pending legislation be included as part of an Enhanced TRC (E-TRC) Test. This concept has been proposed by several of the FEECA utilities, including FPL, TECO, Gulf, and PEF, which have included the avoided cost of GHG emissions as part of an Enhanced TRC (E-TRC) and an Enhanced RIM (E-RIM) cost-effectiveness testing in their base case of achievable potential. The cost of compliance with SO_2 and NO_X emissions are already included in the standard TRC and RIM Tests, since there are existing regulations associated with these GHGs. The utilities have also added a cost for CO_2 emissions even though there are no current CO_2 emissions regulations in effect.

Q. Please describe the Rate Impact Measure Test.

A. The Rate Impact Measure (RIM) Test provides information on whether rates will increase or decrease due to the implementation of an energy efficiency program. This test does not determine if a demand-side energy efficiency measure is less expensive than a supply-side measure. The RIM Test only indicates the direction and magnitude of the expected change in customer rate levels. This test is a measure of equity or fairness and is not a measure of economic efficiency. Furthermore, the RIM Test does not consider participant costs. For these reasons, this test cannot be used to determine if an energy efficiency measure or program is less expensive than a supply-side resource. As a result, I do not believe it is appropriate to use the RIM Test to screen energy efficiency programs because this test is not consistent with the requirements of the revised FEECA statute regarding cost-effectiveness.

The benefit and cost components accounted for in each of the five cost-effectiveness tests

are summarized in a table provided as Exhibit RFS-11.

Q. What cost-effectiveness test or tests have been relied on by this Commission in the past in approving DSM goals?

A. In the past, the Commission required the FEECA utilities to provide the results of three tests, the RIM, TRC, and Participant Tests, as part of the cost-effectiveness methodology. Utilities have also been allowed to provide information on externalities in a SC Test but have not done so in previous goal setting dockets. In practice, the Commission has relied on the RIM and the Participant Tests as the primary tests in approving DSM goals for the FEECA utilities. However, the Commission has not mandated the exclusive use of the RIM Test. In fact, the Commission has encouraged utilities to evaluate implementation of energy efficiency measures that pass the TRC Test when it is found that the savings are large and the rate impacts are small.[12]

Q. Have you conducted a survey to assess the benefit/cost tests currently being used by other public service commissions to determine cost-effectiveness?

A. Yes, GDS conducted a survey of all state utility regulatory agencies, including Washington, D.C., between November 2008 and January 2009. The results of the GDS survey can be found in Exhibit RFS-12.

Q. How is the GDS Survey different from the survey presented in the NAPEE report

[12] Order No. PSC-94-1313-FOF-EG, issued October 25, 1994 in Docket Nos. 93-0548-EG, 93-0549-EG, 93-0550-EG, and 93-0551-EG, In re: Adoption of Numeric Conservation Goals and Consideration of National Energy Policy Act Standards (Section III)

(Exhibit RFS–10)?

A. The NAPEE report was published in November 2008 with the research on the cost-effectiveness tests used in each state originally gathered throughout 2007 and compiled by the Regulatory Assistance Project (RAP) in early 2008. The information in the spreadsheet that RAP provided for NAPEE was considered up-to-date as of early May 2008.

According to the RAP, the focus of their study was to report the tests codified or memorialized in statutes, regulations, and commission rules/orders with some clarification requested in telephone interviews with a few state commissions. The RAP study did not go into any depth regarding the cost-effectiveness tests used in practice regardless of, or in the absence of, codified rules, regulations and statutes.

The GDS survey was initiated in 2007 and is updated periodically, with the most recent comprehensive update occurring in June 2009. For purposes of the survey, we determined a test to be 'required' if there is a statute, law, regulation, rule or commission order indicating a particular test that must be met before a DSM measure or program would be considered.

The GDS survey also went further to determine which tests were given the most weight in final evaluations by each state's commission regardless of the state's regulations, laws, commission orders and rules (or lack thereof). This particular piece of information was gathered in lengthy telephone interviews and through mail and email surveys. This gives rise to the two tables in Exhibit RFS–12. The first table displays the required tests

considered in each state based on regulations, orders, and rules. The second table displays all the tests reported to be used in practice, regardless of whether rules exist. This is important as it illustrates actual practice and future trends in the usage of cost-effectiveness tests to evaluate DSM measures and programs.

Q. What are the findings of the GDS survey?

A. The GDS survey found that the TRC Test or the SC Test, a TRC Test derivative, are the most commonly prescribed tests. For the purpose of this survey, "primary" test as used in Table 2 of Exhibit RFS-12, means that programs or measures absolutely must pass this test in order to be considered a cost-effective demand-side resource. As shown in Table 2 of Exhibit RFS-12, the TRC Test is accepted as the primary test, in practice, by 12 states (including Rhode Island)[13] and is codified into Commission rules in nine of these states (including Rhode Island). Twenty-seven states (including Rhode Island) report or consider the TRC Test in practice when evaluating the costs and benefits of demand-side measures and programs. The TRC Test is implemented as a required test, by commission rules and orders in California, Colorado, Illinois, Massachusetts, Missouri, New Hampshire, New Mexico, New York, and Rhode Island. The states of Delaware, Pennsylvania, and Washington use the TRC Test as a primary test in practice despite it not being specified in their respective commission's rules and orders.

The SC Test is established in commission regulations and orders as the primary benefit-cost test in Arizona, Iowa, Maine, Minnesota, Montana, Oregon, Vermont, and

[13] The Rhode Island RICET cost-effectiveness test is similar to the TRC test as defined by the California Standard Practice Manual, except that it only includes electric resource savings.

Wisconsin. The SC Test is used as the primary test in practice in New Jersey, despite it not being specified in any commission rules or orders. In summary, of 28 states that have indicated a primary test used in practice, 20 (including Rhode Island) rely on the TRC Test or the SC Test.

Only Florida and the District of Columbia (DC) use the RIM Test as a primary screening test in their commission rules and orders. Both the NAPEE and GDS surveys show this to be the case.

There are a small number of states where the Program Administrator Cost (PAC) Test is mandated as the primary test – Connecticut, Oregon (alongside the Societal Test), Utah, and Texas. The PAC Test is considered or reported in practice in 18 states despite it not being specified in any commission rules or orders.

There are 22 states that do not mandate, by law, the use of any benefit-cost tests to evaluate the cost-effectiveness of energy efficiency programs. Of these 22 states, there are nine that do not consider, even in practice, any tests at all. These include Alabama, Alaska, Louisiana, Mississippi, Nebraska, Ohio, South Carolina, Tennessee, and West Virginia. Thirteen state agencies continue to carry out cost-effectiveness tests on their utilities' programs, despite the lack of any law or commission rule requiring them to do so. These states include Delaware, Idaho, Kentucky, Maryland, Michigan, New Jersey, North Carolina, North Dakota, Oklahoma, Pennsylvania, South Dakota, Washington, and Wyoming. Of these aforementioned states, North Dakota, Oklahoma, South Dakota, and

Wyoming consider the results of the RIM Test as the primary determinate of cost-effectiveness in practice, despite the absence of any Commission regulations.

There are 14 states that consider or report almost all of the cost-effectiveness tests (4 or 5 out of the tests listed in the California Standard Practice Manual). Of these 14, eight give nearly equal weight to all the tests in practice. These states include Arkansas, Georgia, Hawaii, Indiana, Kansas, Kentucky, North Carolina, and Virginia. The states of Kentucky and North Carolina consider all cost-effectiveness tests equally in practice despite not having a law or commission order to that effect.

9.0 BASIS FOR RECOMMENDATION OF COST-EFFECTIVENESS TESTS

Q. Do you believe that the tests currently used by the FEECA utilities to determine cost-effectiveness are consistent with the intent of the FEECA statutes?

A. No. All of the FEECA utilities have developed their energy efficiency goals based on the RIM or E-RIM Test and the Participant Test as the applicable cost-effectiveness tests. As my testimony discusses in detail, the RIM or E-RIM Tests are not appropriate as primary tests because they are not tests of economic efficiency. Neither RIM nor E-RIM utilize the most efficient and cost-effective demand-side renewable energy systems and conservation systems in order to protect the health, prosperity, and general welfare of the state and its citizens. In fact, the application of the RIM or E-RIM Test will result in : (1) utility energy resource plans where the total present value of participant and utility costs is greater than energy resource plans based upon the E-TRC Test; and (2) under-investment in numerous energy efficiency measures that are less expensive than supply-side alternatives. While energy resource plans based upon the RIM or E-RIM Test may result in lower average electric rates, the present value of the sum of participant and

utility costs for energy resource plans based upon the RIM or E-RIM Test are significantly higher than plans based upon the E-TRC Test.

According to the November 2008 National Action Plan for Energy Efficiency Report titled *Understanding the Cost-effectiveness of Energy Efficiency Programs: Best Practices, Technical Methods and Emerging Issues for Policy Makers*:

> the most common primary measurement of energy efficiency cost-effectiveness is the Total Resource Cost (TRC) test, followed closely by the Societal Cost Test (SCT). A positive TRC result indicates that the program will produce a net reduction in energy costs in the utility service territory over the lifetime of the program. The distributional tests (PCT, PACT, and RIM) are then used to indicate how different stakeholders are affected. Historically, reliance on the RIM Test has limited energy efficiency investment, as it is the most restrictive of the five cost-effectiveness tests.[14]

Since the RIM Test tends to limit investment in energy efficiency programs, the RIM Test is not consistent with the FEECA statute as amended by the Legislature in 2008.

[14] National Action Plan for Energy Efficiency, "Understanding the Cost-effectiveness of Energy Efficiency Programs: Best Practices, Technical Methods and Emerging Issues for Policy Makers", November 2008. This paper, *Understanding Cost-Effectiveness of Energy Efficiency Programs,* is provided to assist utility regulators, gas and electric utilities, and others in meeting the 10 implementation goals of the National Action Plan for Energy Efficiency's Vision to achieve all cost-effective energy efficiency by 2025.

Q. Which cost-effectiveness test or tests do you believe the Commission should consider in establishing conservation goals which are consistent with the revised statute?

A. The Commission should select a cost-effectiveness test or tests that will help address the FEECA objective of reducing the growth rate of electric consumption. Therefore, I recommend that the Commission adopt the E-TRC and Participant Tests as the tests that all energy efficiency and load management programs must pass. The E-TRC Test should explicitly include the avoided costs of greenhouse gas emissions as a utility benefit of energy savings. I also recommend that a two-year minimum payback be required for measures offered to the large commercial and industrial markets but not for residential or small commercial.

Q. Please explain the E-TRC Test and how it differs from the traditional TRC Test.

A. The enhanced Total Resource Cost (E-TRC) Test includes as a benefit the avoided costs of regulatory fines associated with the reduction in greenhouse gas emissions due to the energy savings. Traditionally, the TRC Test does not account for environmental externalities; however, the revised FEECA statute directs the Commission to consider the costs imposed by state and federal regulations on the emission of GHGs. The E-TRC Test satisfies this requirement.

Q. If Congress has not yet adopted GHG regulation, why do you recommend that the cost of GHG emissions be included in the cost-effectiveness screening?

A. According to Section 366.82(3)(d), F.S., the Commission must consider "the cost imposed by state and federal regulations on the emission of greenhouse gases" when establishing goals. This format for including the avoided costs of GHG emission as part

of the E-TRC Test addresses this requirement. Although the laws have not yet been enacted, proposed legislation is in place and one version has been passed by the U.S. House of Representatives as of July 1, 2009. Therefore, the goals established for the FEECA utilities should reflect the most current expectations of the federal regulatory legislative intent. This will allow the utilities to be prepared for future regulations by already accounting for and conducting programs aimed at conserving energy and reducing emissions.

Q. Have any other states or jurisdictions included GHG costs in a cost-effectiveness test screening process?

A. Yes. The report issued in November 2008 by the National Action Plan for Energy Efficiency, which I referenced earlier in my testimony, includes several examples of states that currently account for the benefits of avoided environmental emissions resulting from energy efficiency programs.

> California includes a forecast of GHG values in the avoided costs used to perform the cost-effectiveness tests and Oregon requires that future GHG compliance costs be explicitly considered in utility resource planning. Several utilities, including Idaho Power, PacifiCorp, and Public Service Company of Colorado, include GHG emissions and costs when evaluating supply- and demand-side options, including energy efficiency, in their IRP process.[15]

[15] National Action Plan for Energy Efficiency. "Understanding Cost-Effectiveness of Energy Efficiency Programs: Best Practices, Technical Methods, and Emerging Issues for Policy-Makers." November 2008, Page 4-12.

According to a literature search conducted by GDS in June 2009, 11 states address environmental externalities in their DSM cost-effectiveness testing. Exhibit RFS-13 presents a summary of the environmental externalities addressed by states in their cost-effectiveness analyses. Thus, precedence exists for including the benefits of avoided emissions in benefit/cost tests for energy efficiency programs.

Q. What dollar amount do you recommend to reflect the anticipated cost of GHG emissions?

A. The National Action Plan for Energy Efficiency in the report – "Understanding Cost-Effectiveness of Energy Efficiency Programs: Best Practices, Technical Methods, and Emerging Issues for Policy-Makers" – recommends that the quantity of avoided Carbon Dioxide (CO_2) emissions be assigned an economic value based on projected market value and added to the net benefits of the energy efficiency measures. For a formal cost-effectiveness evaluation, the marginal emission rates for the particular utility should be used to more accurately reflect the changes in emissions resulting from energy efficiency programs.[16] It is my recommendation that the Commission assign a monetary value (for example, on a dollars per metric ton emitted basis) for GHG emissions. This rate can then be included as a benefit (i.e., an avoided cost) in an E-TRC Test. The avoided cost values for power plant emission savings can be based on the load shape of the energy efficiency savings for the particular utility. This same methodology could be applied to a variety of pollutant emissions or environmental regulations.

[16] National Action Plan for Energy Efficiency. "Understanding Cost-Effectiveness of Energy Efficiency Programs: Best Practices, Technical Methods, and Emerging Issues for Policy-Makers." November 2008, Page 4-12.

I recommend that the FEECA utilities assign a price for GHG emissions based upon the latest estimates for the future price of GHG allowances per metric ton as published by the U.S. Congressional Budget Office (CBO). According to the CBO Cost Estimate for H.R. 2454 – American Clean Energy and Security Act of 2009,[17] the projected prices of GHG allowances are on the order of $15 per metric ton in 2011 and escalate to $26 per metric ton in 2019. These estimates are comparable to monetary values currently assigned to CO_2 emissions by several of the FEECA utilities.

Q. Why do you recommend that the Enhanced Total Resource Cost (E-TRC) Test and the Participant Test be used as the primary economic tests?

A. I recommend that the E-TRC Test be a primary cost-effectiveness test because it is a test of economic efficiency and it puts supply-side and demand-side resources on a level playing field. Its main strength is that it considers the total costs and benefits of energy efficiency measures, including utility and participant costs and benefits. It also includes state and federal regulatory fines as avoided costs, and, unlike the RIM Test, the E-TRC Test is a test of overall economic efficiency. Furthermore, in the 2004 FEECA Goals Dockets, the TRC Test was considered because the Commission ordered that energy savings programs that did not have significant impact on rates should be included in the goals of the FEECA utilities. In addition to the E-TRC Test, energy efficiency programs should also pass the Participant Test in order to ensure that program participants are better off economically when they implement energy efficiency measures.

[17] Congressional Budget Office Cost Estimate for H.R. 2454, Pg. 13. <http://www.cbo.gov/ftpdocs/102xx/doc10262/hr2454.pdf>

Q. Will the use of the E-TRC Test and Participant Test as primary cost-effectiveness tests allow Florida utilities to implement aggressive energy efficiency programs?

A. Yes. GDS recommends that the Commission set goals to implement energy efficiency programs that pass the E-TRC and Participant Tests and that have minimal long-term rate impacts that fall within a range acceptable to the Commission. Additionally, GDS recommends that programs be made available to all customers so that every customer is provided with an opportunity to lower electric consumption through utility-sponsored energy efficiency programs. Finally, following this recommendation would ensure that aggressive, yet attainable, cost-effective energy savings are being achieved.

Q. Specifically, what aspects of the E-TRC Test are consistent with the revised FEECA statute?

A. According to Section 366.81, F.S., it is the intent that "The Legislature finds and declares that it is critical to utilize the most efficient and cost-effective demand-side renewable energy systems and conservation systems ...." In this context, the E-TRC Test can be used as a general resource portfolio planning tool, comparing DSM programs against supply-side resources in order to assess the cost-effectives of various planning options. As mentioned previously, the E-TRC Test can be amended to include the impacts of costs imposed by state and federal regulations on GHG, which is consistent with Section 366.82(3)(d) F.S. If energy efficiency programs can help avoid GHG regulatory costs, these savings can be reflected as avoided costs by the utility for using energy efficiency as a resource for meeting regulatory rules, thus avoiding penalties for non-compliance. The E-TRC Test also allows for the assessment of costs and benefits to participants and

ratepayers as a whole which is a requirement as stated in Sections 366.82(3)(a) and (b), F.S.

Q. Why is it your recommendation that the RIM or E-RIM Test not be used as the primary economic assessment tool?

A. The RIM Test is not an appropriate "primary" cost-effectiveness test for Florida. It is an "extreme" test for a first screen because, as noted by the November 2008 report of the National Action Plan for Energy Efficiency. It will prematurely screen out energy efficiency measures that can save significant amounts of electricity and can lower customer electric bills. The RIM Test is not a test of economic efficiency. It only indicates whether electric rates may go up if an energy efficiency measure or program is implemented. Unlike the E-TRC Test, the RIM Test fails to consider the impact on participants' electric bills. Additionally, the inclusion of lost revenues as an actual "cost" in the RIM Test is not a common accounting practice for any other electric investment and thus places an unfair penalty on energy efficiency. Further, policies and mechanisms exist that allow utilities to recover some or all of their actual and/or perceived costs of conducting energy efficiency programs. Last, load building programs pass the RIM Test. Since a key objective of FEECA is to reduce the growth rate of electric consumption (not increase the growth rate), selection of the RIM Test is inconsistent with the goals of FEECA.

Q. Do the FEECA utilities apply the Rate Impact Measure test to supply side investments?

A. No. The RIM Test is uniquely applied to DSM measures and is not considered for any supply-side investments, providing an unfair playing field for comparing utility investments. As noted above, load building programs pass the RIM Test, but energy efficiency programs typically do not, which sends the wrong message regarding the economics of energy efficiency.

10.0 LONG TERM RATE IMPACTS OF ENERGY EFFICIENCY PROGRAMS AND RECOMMENDATIONS CONCERNING RATE IMPACTS

Q. Do you think that the long term rate impacts of conservation are important?

A. Yes. It is important to be mindful of the rate impact on each customer's ultimate bill to ensure that the utility is not imposing any unnecessary burden on their customers. It is important that the customer continues to receive quality and reliable service at a reasonable and manageable price.

Q. What elements of conducting energy efficiency programs contribute to rate impacts and how are they transferred to the rate payers?

A. There are two particular components of energy efficiency programs that tend to impact rates: (1) utility-incurred program costs, including financial incentives paid to participants and administrative program costs for energy efficiency programs; and (2) lost revenues. In Florida, incentives paid to the customers and other utility-incurred program costs ultimately flow through the Energy Conservation Cost Recovery (ECCR) clause and are passed on to all ratepayers following an annual evaluation. Lost revenues, on the other hand, are evaluated during a rate case proceeding and may lead to adjustments to base rates.

Lost revenues should be considered separately from other direct program costs recouped in the cost-recovery clause. This is because there are a myriad of possible causes affecting total sales, which may or may not be under the control of the utility. These causes can include everything from the utility-sponsored efficiency programs in question to the weather or the economy. All of these causes can contribute to actual sales diverging from forecasted sales. The aggregated effect of these causes can fall in either direction, over or under the forecast, without knowing specifically which cause affected sales in a particular direction and by what magnitude. These perceived losses or finds are assessed with each rate case and used to adjust the future customer rates in order to minimize further over- or under-recoveries resulting from unanticipated revenue adjustments in both directions.

Q. In establishing new conservation goals under the revised statute, how can the Commission increase the level of conservation while, at the same time, mitigate the rate impact on customers of the utilities?

A. The ultimate goal of the FEECA statutes is to implement successful energy efficiency programs that can reduce the growth rate of electric consumption. The utilities have the responsibility to their customers and investors to comply with the FEECA statutes. This can be accomplished by selecting energy efficiency measures that pass the E-TRC and Participant Tests. The Commission could limit the rate impacts of energy efficiency by placing a rate impact cap on a utility's portfolio of proposed energy efficiency programs. For example, the Commission could direct utilities in Florida to achieve 100 percent of the maximum achievable E-TRC cost-effective potential for energy efficiency in their service territories, so long as the long term impact on overall electric rates remains within

a range that is acceptable to the Commission over the period that energy efficiency goals are set.

Q. Can you explain how a rate impact cap mechanism could be developed if the Commission decides that one is warranted in order to limit the rate impact of DSM programs?

A. If implemented, the rate impact cap would apply to the DSM portfolio for the period for which goals are set. The selection of the appropriate rate impact cap would, of course, be a policy decision for the Commission. Such a cap could be set at a level of one to two percent over current rates. This level should allow the FEECA utilities to set aggressive savings goals to attain an average annual level of energy efficiency savings on par with those achieved by the top 20 electric energy efficient utilities in the United States. According to the U.S. EIA Form 861 database, these top twenty electric utilities saved on average over one percent of their annual retail kWh sales in 2007 (See Exhibit RFS-14). However, for the reasons discussed below in my testimony, I do not find that a rate impact cap is necessary at this time.

Q. Have you examined the long term rate impacts due to aggressive implementation of energy efficiency programs in other states?

A. Yes. I have examined reports from the National Action Plan for Energy Efficiency (NAPEE),[18] Lawrence Berkeley Laboratory (LBNL),[19] and other technical reports

[18] See "National Action Plan for Energy Efficiency" report published in July 2006.

[19] Cappers, Peters. *Financial Analysis of Incentive Mechanisms to Promote Energy Efficiency: Case Study of Prototypical Southwest Utility*. Lawrence Berkeley National Laboratories: 2009. Paper : LBNL, 1598E. <http://www.repositories.cdlib.org/lgnl-1599E.>

relating to the impacts on electric rates due to decreased sales and increased program costs. According to the NAPEE, increases in overall bills resulting from energy efficiency are unlikely. In fact, the NAPEE estimates that bills, on average, will be reduced by 2.9 percent over a 10-year period due to energy efficiency programs even if there is a slight rate increase. This assessment was conducted under several different forecasts and utility operational scenarios. This report, which was issued in July 2006, can be found on the website of the U.S. Environmental Protection Agency.[20]

In addition, the LBNL published a report in March 2009 which estimates the long term rate impacts of implementing moderate, significant, and aggressive energy efficiency programs. This LBNL study found that the long-term rate impacts from implementation of energy efficiency programs are less than one percent for programs that would reduce annual kWh sales by 10 percent over 10 years. The study definitions of these scenarios and their levelized cost rate impacts as compared to a base case with no energy efficiency are described below.

- Moderate Energy Efficiency scenario (which is defined as saving 0.5 percent per year of the incremental annual retail electric sales) demonstrates a levelized rate impact of 0.14 percent over a 20-year planning period.
- Significant Energy Efficiency scenario (which is defined as saving 1.0 percent per year of the incremental annual retail electric sales) demonstrates a levelized rate impact of 0.83 percent over a 20-year planning period.

[20] (http://www.epa.gov/solar/documents/Business_case_for_EE_final.pdf)

- Aggressive Energy Efficiency scenario (which is defined as saving 2.0 percent per year of the incremental annual retail electric sales) demonstrates a levelized rate impact of 3.28 percent over a 20-year planning period.

Exhibit RFS-15 contains an excerpt from the LBNL study graphically representing the impact on electric rates from various levels of aggressiveness of energy efficiency programming.[21]

Q. What are the estimated rate impacts of moving from the use of the RIM/Participant Tests to the E-TRC/Participant Tests as the primary tests in Florida?

A. I do not know specifically for each of the seven FEECA utilities. However, based on the information I have, I do not believe the rate impacts would be significant. First, the national studies I have examined from the NAPEE and the LBNL indicate that the long-term rate impacts from energy efficiency programs are less than one percent over the long-term due to aggressive implementation of energy efficiency programs. Second, according to information provided in the testimony of FPL Witness Sim, the long-term rate impact on FPL ratepayers of moving from the E-RIM scenario to the E-TRC scenario produces electric rates that are only 0.4 percent higher over the period for which energy efficiency goals are being established. In my professional judgment, these long-term rate impacts are negligible. There is no particular need for the Commission to set a rate impact cap given these reported minimal energy efficiency rate impacts.

[21] LBNL Report, Technical Appendix B and Technical Appendix E.

Q. Would you please explain how the rate impacts of new generation facilities and electric grid operations compare to the rate impacts of investments in energy efficiency?

A. One way to examine the impact of energy efficiency programs on rates and customer bills is to compare the rate impacts resulting from energy efficiency programs to the rate impacts of supply-side alternatives. Supply-side investments can increase electric rates by 10 percent or more. Below are examples of rate increases that are expected in Florida and Georgia relating to electric utility operations:

1. In Georgia, the 2 new nuclear units proposed for the Vogtle site are projected to increase electric rates by more than 12 percent when these units come on line in 2016.[22]
2. In Florida, both PEF and FPL are constructing new nuclear units scheduled to be come on line during the period 2016 through 2020.[23] Pursuant to Section 366.93, F.S., these utilities are recovering certain costs on an annual basis during the pendency of the construction process through a nuclear cost recovery clause. The amounts approved to be recovered by these utilities in 2009 are $220,529,243 for FPL and $418,311,136 for PEF.[24]

[22] The Georgia Power Company web site states the following: "While the Georgia PSC will determine the final rate impacts, the company estimates the typical Georgia Power residential customer, using 1,000 kilowatt-hours a month, would see a base rate increase of approximately $12 per month in 2018, when both units are fully operational. The rate impact is expected to decline over time." The Georgia Public Service Commission web site indicates that the current electric bill for a customer using 1,000 kWh a month is $93.65.

[23] Order Nos. PSC-08-0518-FOF-EI, issued August 12, 2008 in Docket No. 080148-EI, In re: Petition for determination of need for Levy Units 1 and 2 nuclear power plants, by Progress Energy Florida, Inc., and PSC-08-0237-FOF-EI, issued on April 11, 2008 in Docket No. 070650-EI, In re: Petition to determine need for Turkey Point Nuclear Units 6 and 7 electrical power plant, by Florida Power & Light Company.

[24] Order No. PSC-08-0749-FOF-EI, issued November 12, 2008 in Docket No. 080009-EI, In re: Nuclear cost recovery clause.

3. In March 2009, FPL filed with the Commission to increase its base electric rates by 31 percent.[25]

Conversely, aggressive implementation of energy efficiency programs, which may result in a slight rate increase over the long term are accompanied by opportunities for all customers to partake in energy efficiency activities that can help to reduce their overall consumption and consequently reduce their electric bills.

Q. How do you ensure that all customers of the FEECA utilities have the opportunity to participate in energy efficiency or demand response programs?

A. Energy efficiency programs should be designed to include measures that will allow as many customers as possible to participate over the period that the FEECA goals are in effect. Measures such as high-efficiency lighting, high-efficiency residential appliances, insulation, air sealing and duct sealing are widely applicable across many market segments. Emerging energy efficiency technologies, such as LED lighting, will also be widely available to many market segments. While not every energy efficiency measure will be applicable to every electric customer, the broad array of technologies available

[25] According to a March 18, 2009 news release on FPL's web site, this general base rate increase will support capital investments for the following:

• Strengthening the transmission and distribution system to enhance its reliable operation day to day and during extreme weather conditions.

• Advanced meters and other "smart grid" technology that will give customers more information and control over their energy usage in the future while enhancing the company's ability to manage the system more efficiently and to predict and act on potential reliability issues before they occur.

• Existing fossil fuel power generation facilities to enhance their efficient and reliable operation and to lower fuel costs for customers.

• Existing nuclear power generation facilities to ensure reliable performance over their lifetimes, which have recently been extended by an additional 20 years.

makes it highly likely that as many customers as possible will have the opportunity to adopt some energy efficiency measures. The FEECA utilities can address these equity concerns by offering a comprehensive list of energy efficiency measures and educational materials available to all electric customers as part of their program plans. Designing programs to offer a broad array of energy efficiency measures across market segments will help to control the rate of growth of electric consumption, a key objective of the FEECA statute.

11.0 THE DETERMINATION OF NUMERIC kW AND kWh GOALS

Q. Does the FEECA statute provide the Commission with the flexibility to set aggressive but achievable energy efficiency goals?

A. Yes. Due to the flexibility inherent in the FEECA legislation, the Commission is authorized to set aggressive, achievable, energy efficiency goals, helping to ensure that customers will see real savings on their electric bills. The technical and achievable potential studies required by the FEECA statutes should have been conducted with the primary purpose of determining and implementing the maximum achievable cost-effective energy savings potential based on the cost-effective perspectives listed in the statute.

Q. Have any studies or surveys been conducted to assess best practice goal-setting methods in use?

A. Yes, in December of 2008 GDS conducted a survey of 12 state government organizations or utilities across the U.S. that oversee successful, cost-effective energy efficiency programs. The survey was designed to capture the methodology and inputs used by these

organizations to transform potential studies into concrete energy efficiency savings goals or targets.

Q. What were the conclusions of the GDS survey?

A. Out of the 10 survey responses, all organizations set some form of savings targets and six were set by a state government regulatory body. Based on the survey results, the following conclusions were made:

- Savings targets are based on the results of energy efficiency potential studies.
- Targets are generally expressed in terms of absolute peak demand (kW) and energy (kWh) savings.
- The theoretical basis for setting target values included targets based on a consensus of multiple stakeholders, targets based on past precedent, or targets determined as a percentage of economic or maximum achievable potential.
- None of the energy efficiency organizations included in the survey used the RIM Test as a cost-effectiveness test.

Q. Please provide examples of the savings targets set by other organizations as determined by the GDS survey.

A. A complete list of the targets set by the organizations surveyed is described in Exhibit RFS-16.

Q. According to their goals, what percentage of forecasted annual kWh sales are the FEECA utilities proposing to meet?

A. Based on the 10-year goals provided in each utility's testimony and on forecast projections of annual kWh sales contained in each utility's 2009 10-year site plan, the

energy efficiency savings targets (kWh savings as a percent of forecast 2019 kWh sales) are as follows:

- Florida Power & Light Company: 0.74 percent
- Gulf Power Company: 1.06 percent
- Progress Energy of Florida, Inc.: 1.50 percent
- Tampa Electric Company: 0.19 percent
- JEA: 0.00 percent
- Florida Public Utilities Company: 0.00 percent
- OUC: 0.00 percent

GDS notes that three of the FEECA utilities have set a goal of 0.0 percent for their target for savings from energy efficiency programs as a percent of forecast 2019 kWh sales.

Q. How do these proposed kWh savings goals compare to the actual kWh savings exhibited by the top 20 energy efficiency utilities in the U.S. and with the other electric utilities in Florida?

A. According to the EIA Form 861 Database, the top 20 utilities nationwide running the most successful energy efficiency programs are achieving average annual kWh savings as a percentage of sales of 1.79 percent per year (Exhibit RFS-17). The leading FEECA utility, PEF, is proposing cumulative annual savings as a percent of 2019 sales of 1.50 percent over the entire 10-year planning period. The proposed savings goals from the FEECA utilities fall far below the annual achievements of the top 20 electric utilities conducting successful energy efficiency programs and fall short of actual achievements in 2007 by other electric utilities in Florida. Even if the FEECA utilities were to realize their proposed goals, they would be saving less than 1/10 of the savings realized through

successful energy efficiency programs as reported by the top 20 electric utilities for the year 2007 in the EIA Form 861 Database.

Q. What kWh savings have other utilities in the Southeast achieved?

A. The following electric utilities in the Southeast have experienced incremental annual kWh savings much higher than the FEECA utilities are proposing. The following electric utilities located in the Southeast had significant kWh savings achievements in 2007 installations of energy efficiency equipment in 2007:

- Laurens Electric Cooperative, Inc. (South Carolina): 1.26 percent of annual 2007 kWh sales
- Austin Energy (Austin, Texas): 117,649,000 kWh saved or 1.02 percent of 2007 sales
- Gainesville Regional Utilities (Gainesville, Florida): 14, 327,000 kWh saved or 0.75 percent of 2007 sales
- City of Tallahassee, Florida: 9,465,000 kWh saved or 0.34 percent of 2007 sales

Their energy efficiency savings data, described as a percent of kWh sales or kW peak demand, are provided in Exhibit RFS-18 and Exhibit RFS-19. All data in these exhibits were provided in the U.S. EIA Form 861 Database. Additionally, listed in Exhibits RFS–18 and RFS-19 are data for 2005, 2006, and 2007 for the top 20 energy efficiency utilities. On average, these top 20 energy efficiency utilities save over one percent of their annual kWh sales every year, year after year.

Q. Do you believe the energy efficiency savings goals proposed by the seven FEECA utilities are aggressive yet achievable goals for energy efficiency?

A. No, while achievable because the goals are overly conservative, they are not aggressive.

Q. What approach should the Commission consider in setting aggressive achievable savings goals consistent with the revised statute?

A. The goals should be based on the achievable potential as determined by the E-TRC and Participant Tests. It is correct to apply the two-year payback requirement to the selection of energy efficiency measures for large commercial and industrial sectors as outlined in my testimony, but not for the residential and small commercial sectors. GDS has developed revised energy efficiency goals that address the issues discussed in the testimony.

Q. How were these goals developed?

A. GDS developed revised kWh savings goals for each FEECA utility by making the following adjustments to the kWh savings goals proposed by these utilities:

- The starting point for the development of revised goals was the achievable cost effective potential based upon economic screening using the E-TRC and the Participant Tests as provided by the utilities and estimated by Itron.
- GDS made adjustments to add in energy efficiency measures for the residential and small commercial sectors that were eliminated due to the two-year payback constraint that was applied by the FEECA utilities. GDS utilized the measure data provided in the appendices of the utility specific technical potential reports to estimate the additional achievable savings potential of these measures.

- GDS made adjustments to allow for higher market penetrations due to implementation of more aggressive marketing and education strategies.
- GDS made adjustments to account for some of the energy efficiency measures that were excluded from the original technical potential analyses as identified earlier in this testimony.

Q. How were the revised energy efficiency goals developed by GDS for summer peak savings?

A. For each utility, GDS calculated a ratio of summer peak kW savings to the annual kWh savings for each market sector (residential, commercial and industrial, and all sectors) based on the E-TRC achievable potential estimates provided by each utility. GDS then applied these ratios to the annual kWh savings goals I developed for each of the next 10 years to obtain the energy efficiency goal for summer peak savings for each year from 2010 to 2019.

Q. How were the revised energy efficiency goals developed by GDS for winter peak savings?

A. For each utility, GDS calculated a ratio of winter peak kW savings to the annual kWh savings for each market sector (residential, commercial and industrial, and all sectors) based on the E-TRC achievable potential estimates provided by each utility. GDS then applied these ratios to the annual kWh savings goals I developed for each of the next ten years to obtain the energy efficiency goal for winter peak savings for each year from 2010 to 2019. Table 6 below provides the summer and winter peak to annual kWh savings ratios calculated by GDS and used to determine summer and winter peak savings

goals for the seven FEECA utilities.

Table 3: Peak Savings to Annual kWh Savings Ratios by FEECA Utility (Calculated Using TRC/E-TRC Maximum Achievable Potential as Identified in Utility Specific Testimony and Exhibits)

Summer Peak Savings-to-kWh Savings Ratios - TRC Test Calculated								
Utility	FPL	GULF	PROGRESS	TECO	JEA	ORLANDO	FPUC	TOTAL
Residential	0.0004469	0.0003375	0.0003265	0.0004704	0.0003628	0.0004063	0.0002432	0.0003770
Commercial and Insustrial	0.0002997	0.0001975	0.0002415	0.0002250	0.0002131	0.0002041	0.0002182	0.0002734
Total	0.0003531	0.0002830	0.0003063	0.0003309	0.0002830	0.0002778	0.0002282	0.0003276
Winter Peak Savings-to-Energy Ratios - TRC Test Calculated								
Utility	FPL	GULF	PROGRESS	TECO	JEA	ORLANDO**	FPUC	TOTAL
Residential	0.0003122	0.0003086	0.0004443	0.0004007	0.0000289	0.0000007	0.0000778	0.0003718
Commercial and Insustrial	0.0000472	0.0000647	0.0000337	0.0000425	0.0000387	0.0000397	0.0000321	0.0000447
Total	0.0001434	0.0002137	0.0003465	0.0001972	0.0000341	0.0000227	0.0000503	0.0002159
** Used TRC-M Scenario to Calculate Peak to Energy Ratio								

Q. Why are the goals recommended by GDS more appropriate in terms of the intent of the FEECA statutes than the goals proposed by the utilities?

A. The intent of the revised FEECA statutes is to set aggressive, achievable savings goals. The goals proposed by the utilities, while achievable, are not aggressive as discussed in this testimony. In fact, three of the seven FEECA utilities proposed goals of "zero" savings for energy efficiency over the next 10 years. The goals recommended by GDS are more aggressive than the utility proposed goals in that they strive for higher savings, which is still achievable for a variety of reasons. The GDS goals are also conservative estimates of the economic and achievable potential for each utility for the following reasons:

- The original maximum achievable (TRC or E-TRC Test) estimates upon which the revised goals were built are based on baselines sector annual kWh sales estimates that are lower than historical kWh sales data. Because the

annual kWh sales baselines used in the utility studies are lower than actual annual kWh sales, energy efficiency savings are under-estimated.

- For FPL maximum achievable (TRC or E-TRC Test) estimates upon which the revised goals were built were estimated using a linear programming model run with an incorrect optimization function that caused projections of energy efficiency savings to be too low.
- Not all of the measures that were identified as "missing" from the utility studies were added back by GDS into revised goals estimates.

Q. Do you recommend that the Commission adopt a transition period to phase in the conservation goals you have developed?

A. Yes. The goals developed using the procedure described above are substantially higher than the present or utility-proposed conservation goals and represent a significant cultural and economic change for the seven FEECA utilities. The utilities will need time to plan, design and implement new, more comprehensive energy efficiency programs in order to ramp up to a much higher level of energy efficiency program activity. This will include increased emphasis on program design and marketing in order to address the challenges of customer awareness and acceptance of the need for and benefit of energy conservation. Thus, I recommend that for the first five years (2010 to 2014) the conservation goals should be set at 50 percent of the achievable cost-effective potential based upon the E-TRC and Participant Tests and the adjustments made by GDS. This transition period will provide the FEECA utilities sufficient time to adapt to the requirements of the new FEECA statute and to develop the infrastructure to support the much higher level of program activity over the next five years. The end of the five-year transition period

coincides with the next FEECA goal setting proceeding, during which the Commission can assess whether there is a need to continue a transition adjustment.

While I believe a transition to the more aggressive goals of 50 percent over five years is adequate, the setting of a transition period and the level of magnitude of temporary reduction in the goals would be a policy decision for the Commission to make based on many factors that will be discussed during this proceeding.

Q. What specific goals are you recommending in this proceeding?

A. My recommended goals for 2014, which incorporate the transition period adjustment, are summarized in Table 4 below. The year 2014 represents the last year of the recommended transition period. Table 5 provides the utilities' proposed goals for 2014 for comparative purposes. I believe these goals represent aggressive, yet achievable savings targets for each FEECA utility.

Table 4: GDS Recommended Goals for 2014

Utility	Winter MW Savings (2014)	Summer MW Savings (2014)	Cumulative Annual GWh Savings (2014)
FPL	680.5	1,233.5	3,128.0
PEF	379.4	347.7	1147.8
TECO	127.2	178.6	466.7
Gulf	61.4	83.7	301.9
JEA	8.9	77	264.9
OUC	1.9	39.2	120.1
FPUC	0.8	3.3	14.2

Table 5: Utility Proposed Goals for 2014			
Utility	Winter MW Savings (2014)	Summer MW Savings (2014)	Cumulative Annual GWh Savings (2014)
FPL	166.3	300.0	390.1
PEF	254.15	225.88	288.49
TECO	17.6	35.3	84.3
Gulf	18.4	27.3	59.0
JEA	0	0	0
OUC	0	0	0
FPUC	0	0	0

Exhibit RFS-20 contains the goals I calculated without the transition period adjustment for the years 2010 through 2019. Exhibit RFS-21 provides my recommended goals for the years 2010-2019, which include the transition period adjustment through 2014. Exhibit RFS-21 also contains the FEECA utilities' proposed goals for the years 2010 through 2019 for comparative purposes.

12.0 RECOMMENDATIONS ON COST-RECOVERY AND INCENTIVES

Q. Do you believe the revisions to FEECA authorize the Commission to reward an investor-owned electric utility for exceeding its goals or to penalize a utility for failing to meet its goals?

A. Yes. Sections 366.82(8) and (9), F.S., explicitly authorize the Commission to reward or penalize an investor-owned utility. Taken together, I believe these sections allow the Commission to reward or penalize a company by either increasing or decreasing the

company's authorized return on equity up to 50 basis points. According to Section 366.82(9), F.S., such reward or penalty could only be applied after a limited proceeding.

Q. What kind of cost-recovery or incentive mechanisms is currently in practice under the Commission?

A. The Commission already has a partial revenue decoupling method in place whereby 53 percent - 69 percent of utility costs are recovered through an annually evaluated cost recovery clause. The costs recovered through this clause include fuel costs, purchased power costs, costs of complying with governmentally mandated environmental programs and standards, costs of new nuclear power plants, and costs associated with encouraging energy conservation.

Q. Are you recommending any additional incentive mechanisms at this time?

A. No. If the Commission believes that at some point incentives are necessary and appropriate, then the specific mechanism can be developed, in accordance with the FEECA statutes, in a separate proceeding, but not at this time.

The FEECA statutes state that the Commission may authorize performance incentives for those utilities that meet or exceed their annual targets and enforce penalties for those that do not. The proposed incentive structures are an additional return on investment of up to 50-basis points for saving over 20 percent of the annual load growth through energy efficiency and conservation measures. It is my recommendation that the Commission utilize its authority in this matter to further develop a performance-based incentive structure – comprised of both rewards and penalties – as a way to incite willing and successful utility participation in energy efficiency programs. However, the record in this

proceeding does not contain any discussion of the need for a performance incentive or penalty or any analysis of how it should be structured. At this time, I recommend that issues relating to this topic be addressed in a future proceeding when the necessary analysis has been done and all interested stakeholders can participate.

13.0 EFFICIENCY INVESTMENTS ACROSS GENERATION TRANSMISSION AND DISTRIBUTION

Q. Do you have any recommendations regarding how the Commission should address efficiency investments across generation, transmission, and distribution facilities as stated in Section 366.82(2), F.S.?

A. The final charge of Section 366.82(2), F.S., is a bit different from traditional conservation measures. Efficiency investments in generation, transmission, and distribution result in savings of fuel (BTUs), increased capability of facilities (kW), and savings of O&M expenditures, not reductions in kWs or kWhs. If the Commission were to consider investments in generation, transmission, or distribution efficiency improvements as part of the DSM goals proceeding, one would first have to establish kW and kWh equivalent values for each improvement. In the alternative, the Commission could set separate goals for say a percentage improvement to be obtained in each category. However, since the utilities have not performed a technical potential analysis of the generation, transmission, or distribution improvements available, such goals would be arbitrary. At this time, I recommend that all issues relating to efficiency investments across generation, transmission, and distribution facilities be handled in a separate, future proceeding.

14.0 ENERGY AUDITS AND GOALS

Q. Do you recommend that additional goals be set for energy audits?

A. No.

Q. Why are separate energy audit goals unnecessary at this time?

A. Currently, the seven FEECA utilities are mandated to offer free or nominal energy audits to all of their customers. As long as the FEECA utilities continue to actively market this service and fulfill all of the audit requests, there is no need to set additional goals for this service.

Q. What are your recommendations on counting the savings resulting from these energy audits?

A. I recommend that savings not be counted unless an action is taken either by the auditor/utility or the customer themselves. For example, if the auditor installs three CFLs while performing the audit, then the savings attributed to the installation of the CFLs may be counted towards the utility's energy saving efforts. Savings can also be counted if the customers take action. However, the savings associated with the customer-installed efficiency measures should be counted towards the savings of the particular program through which they obtained the measure. In other words, if the auditor recommends that a customer install a high-efficiency appliance, and the customer heeds the advice, the savings associated with the high-efficiency appliance should be counted as savings associated with the utility's high efficiency appliance program and not the energy audit service.

15.0 DEMAND-SIDE RENEWABLE ENERGY RESOURCES RECOMMENDATIONS

Q. What changes to the FEECA statute did the Florida Legislature make in the 2008 legislative session regarding the Commission's ability to encourage the development of demand-side renewable energy resources?

A. Section 366.82(2), F.S., was amended to allow the Commission authority over adopting

appropriate goals for increasing the development of demand-side renewable energy resources.

Q. How are demand-side renewable energy resources defined?

A. Section 366.82(1)(b), F.S., defines demand-side renewable energy as "a system located on a customer's premises generating thermal or electric energy using Florida renewable energy resources and primarily intended to offset all or a part of the customer's electricity requirements provided such system does not exceed 2 megawatts."

Q. Do you believe that the revisions to the FEECA statutes allow the Commission to set separate goals for demand-side renewable energy systems?

A. Yes, I think the legislation clearly requires the Commission to focus some specific attention on demand-side renewable energy resources as part of its goal setting process. Solar water heating and solar photovoltaic (PV) are the two principal demand-side renewable technologies with the most potential, although solar water heating appears to be a more established technology and is currently closer to becoming cost-effective for both individuals and utility programs. If the FEECA utilities' proposed kW and kWh goals include cost-effective demand-side renewable energy measures, such as solar water heaters and residential and commercial solar PV systems, then the goals would encourage the development of these types of facilities and separate goals for renewable energy systems may not be necessary

However, if the proposed kW and kWh goals do not include demand-side renewable energy resource measures because they are not cost-effective, then the Commission

should consider setting separate goals to encourage the development of these renewable resources utilizing a-cost cap.

Q. After reviewing the FEECA utilities' testimony with regard to demand-side renewable energy systems, what do you recommend?

A. The demand-side renewable measures such as solar water heating and solar PV did not pass the cost-effectiveness tests for any utility. However, Mr. John Masiello, witness for PEF, states in his direct testimony that PEF intends to file for Commission approval enhancements to an existing solar program and new solar programs for residential and commercial customers. The programs proposed by Mr. Masiello would have the effect of encouraging the installation of solar technologies by: (1) improving the financial viability of solar for potential participants; (2) complementing existing federal and state rebates and incentives; and (3) protecting PEF's ratepayers by limiting annual participation.

The Commission can satisfy the statutory requirement to encourage the development of demand-side renewable systems by requiring each FEECA IOU to establish demand-side renewable programs and recover a limited amount annually through the Energy Conservation Cost Recovery (ECCR) clause. These programs should target solar thermal and solar PV measures that were not found to be cost-effective at this time. The demand-side renewable programs should be designated as research and development programs (R&D) in order to allow for recovery through the ECCR clause. However, because the measures included in these programs were not found to be cost-effective and were excluded from the development of numeric goals, the energy and demand savings from

these R&D programs should not count towards FEECA IOUs' numeric goals.

Q. Why do you recommend ratepayer support for demand-side renewable systems that have not been found to be cost-effective?

A. It is important that research and development continue for solar thermal and solar PV systems because of their potential for more efficient energy production, the environmental benefits, and the conservation of non-renewable petroleum fuels. By continuing to provide some level of financial support for these emerging technologies, costs should decrease over time. If fiscal support for the development of solar technologies is restricted, then research and development of these technologies may be stymied.

Q. What amount of funding do you recommend that each IOU commit to the renewable R&D programs?

A. The Commission should authorize annual recovery through the ECCR clause for demand-side renewable programs equal to 10 percent of each IOU's five-year average of ECCR expenses for 2004-2008. Similar to the proposal of Mr. Masiello, 10 percent of each IOUs five-year average of ECCR expenses would provide the IOUs with flexibility to design programs that will complement existing incentives and rebates in order to maximize participation, and provide ratepayer protection by limiting annual expenditures. The following table illustrates the dollar amount that each IOU would dedicate to demand-side renewable programs under my proposal:

Table 6: Recommended Expenditures for Demand-Side Renewable R&D Programs

UTILITY	GDS Recommended Annual Expenditures
FPL	$15,536,870
PEF	$6,467,592
TECO	$1,531,018
Gulf	$900,338
FPUC	$47,233

I recommend that this dollar amount remain constant each year until new conservation goals are established in five years. At that time, the need for and the design of the overall program would be reevaluated. The Commission may, of course, wish to choose a different amount to dedicate each year to demand-side renewable programs. Exhibit RFS-22 provides the dollar amounts under the scenarios of two percent, five percent, and 10 percent of the five-year average of ECCR expenditures. Exhibit RFS-23 illustrates the impact of these scenarios on the five-year average ECCR factor for each IOU.

Q. How should the funds be used in the renewable R&D programs?

A. The funds should be used as one-time rebates for demand-side renewable energy system. The specific programs established by the utilities should be structured to supplement existing programs offered by the Florida Energy and Climate Commission (FECC) and the federal government through tax incentives. Currently, the FECC offers rebates for solar water heating installations of $500 for residential systems, and commercial

customers may receive $15 per 1,000 Btu up to a maximum of $5,000. Rebates for solar photovoltaic installations are offered at $4 per watt with a maximum rebate of $20,000 for residential customers and $100,000 for commercial customers. The FECC also offers $100 for solar swimming pool heating systems. The federal government offers a 30 percent tax credit for residential solar electric installations. The demand-side renewable utility programs would, in essence, be used to "sweeten the pot" for customers in order to further encourage the installation of demand-side renewable systems.

Q. What are you recommending for the FEECA municipal and cooperative utilities in terms of renewable R&D programs?

A. The Commission does not have ratemaking jurisdiction over the municipal and rural electric cooperative utilities; however, it does have authority to approve conservation goals pursuant to the FEECA statutes. Given this FEECA authority, the Commission should direct JEA and OUC to implement an R&D program to encourage demand-side renewable systems similar to the program outlined above for the IOUs. These utilities are subject to the same FEECA statutes as the IOUs and should be developing programs to encourage demand-side renewable system. Further, their customers are eligible for the same rebates from the FECC and federal tax incentives. They should, likewise, have the same additional incentive that would be applicable to the customers of the IOUs.

16.0 SUMMARY OF TESTIMONY

Q. Please summarize your testimony.

A. After an extensive review of the FEECA statutes and the methodologies used by the utilities to conduct the technical, economic, and potential studies used to develop their proposed goals, I have concluded that the proposed goals by each utility are overly

conservative and therefore do not satisfy the intent of the FEECA legislation which describes goals and "aggressive and achievable." My final conclusions regarding the process used by the FEECA utilities to develop their goals are summarized below:

- The technical potential basic methodology is sound in that there are no errors in the calculations developed by Itron.
- Several policy and methodology decisions made by the FEECA utilities have contributed to the overly conservative estimates of technical, economic, and achievable potential.
- The RIM Test should no longer be used as a cost-effectiveness test in Florida because it is not consistent with the intent of the amended FEECA statute. The use of the RIM Test has contributed to three FEECA utilities setting goals of "zero" savings from energy efficiency programs over the next decade. This clearly contrary to the amended FEECA statute.
- Estimates of achievable potential provided by the utilities are consistently lower than achievable potential estimates developed by other utilities and non-profit organizations in the Southeast (based on achievable potential as a percent of kWh sales).

For all the reasons set forth in this testimony, I recommend that the Commission adopt the goals that GDS developed and presented in the testimony and exhibits attached for each of the FEECA utilities.

Q. Does this conclude your testimony?

A. Yes, it does.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Commission review of numeric conservation goals (Florida Power & Light Company).	DOCKET NO. 080407-EG
In re: Commission review of numeric conservation goals (Progress Energy Florida, Inc.).	DOCKET NO.080408-EG
In re: Commission review of numeric conservation goals (Tampa Electric Company).	DOCKET NO.080409-EG
In re: Commission review of numeric conservation goals (Gulf Power Company).	DOCKET NO.080410-EG
In re: Commission review of numeric conservation goals (Florida Public Utilities Company).	DOCKET NO.080411-EG
In re: Commission review of numeric conservation goals (Orlando Utilities Commission).	DOCKET NO.080412-EG
In re: Commission review of numeric conservation goals (JEA).	DOCKET NO. 080413-EG DATED: JULY 17, 2009

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the DIRECT TESTIMONY OF RICHARD F. SPELLMAN and CAROLINE GUIDRY on behalf of the Florida Public Service Commission, has been served to the following by electronic and U. S. Mail this 17th day of July, 2009:

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List of Exhibits

EDUCATION: Management II Program, University of Michigan, Graduate School of Business, 1987
M.B.A., Thomas College, 1980
Amos Tuck Graduate School of Business, 1974-75
B.A., Math/Economics, Dartmouth College, 1974 (graduated with distinction)

PROFESSIONAL MEMBERSHIP: Association of Energy Service Professionals,
Board of Directors of AESP – 2005 to Present
Chair of AESP Policy Committee – 1997 & 1998,
Vice Chair AESP Policy Committee – 1995 & 1996

EXPERIENCE:

Mr. Spellman is the President of GDS Associates and the Chair of the GDS Board of Directors. He has over 30 years of energy industry experience. He has managed natural gas and electric energy efficiency, demand response and renewable energy consulting projects in such states as California, Connecticut, Georgia, Florida, Hawaii, Indiana, Louisiana, Maine, Massachusetts, Nebraska, New Hampshire, New Mexico, New York, North Carolina, North Dakota, Oregon, Pennsylvania, Rhode Island, South Carolina, Texas, Utah, Vermont, Virginia, and Wisconsin for GDS clients.

Mr. Spellman has also completed over three dozen electric and natural gas energy efficiency technical potential studies for clients across North America. He has also served in project management positions for energy efficiency and demand response implementation projects for electric utility clients, Wisconsin Focus on Energy and Efficiency Maine. From 1999 to December 2002, Mr. Spellman served as the Program Manager for the Wisconsin Focus on Energy Commercial and Industrial pilot energy efficiency programs (Systems Benefit Charge funded) implemented in a 23-county area in Northeast Wisconsin, and he served as the Deputy Project Director for the $60 million Wisconsin Focus on Energy Business Program from March of 2001 until June of 2003. He also served as the Deputy Program Manager for the Efficiency Maine Small Business Program from 2003 through 2007.

He has designed and implemented DSM bidding programs for such clients as Central Maine Power Company, the Business Program of Wisconsin Focus on Energy, and the East Texas Electric Cooperative. Mr. Spellman has also chaired several committees to review energy efficiency and demand response proposals received in response to DSM RFPs (for Central Maine Power Company, Wisconsin Focus on Energy, East Texas Electric Cooperative, etc.).

In addition to program implementation projects, Mr. Spellman has completed renewable energy and conservation program market assessments, technical potential studies, market research, program designs, and Integrated Resource Plans for a number of the firm's clients. He has served as the Chair of the Policy Topic Committee of the Association of Energy Services Professionals (AESP) and he is currently a member of the Board of Directors of AESP.

Before joining GDS in Atlanta, Mr. Spellman was the Manager of Marketing and Product Development at Central Maine Power Company, where he was employed from 1977 to 1993. He has extensive experience working with collaboratives and community organizations on conservation and renewable energy issues. While at CMP he managed CMP's $26 million portfolio of energy efficiency programs. He also worked on CMP's market transformation program efforts with appliance and building standards, energy efficient lighting and motors, new construction and renewable energy programs. He worked on national market transformation programs such as the Super Efficient Refrigerator Program, and the EPA's Green Lights and Energy Star Programs. Finally, he has a solid track record testifying for clients before Commissions and legislative

committees on energy issues. He was also the chairperson of the New England Power Pool DSM Planning Committee for several years, and worked on a wide range of regional DSM and renewable energy projects in New England during his sixteen years at CMP.

His education includes a BA degree with distinction in Math/Economics from Dartmouth College (graduated cum laude) and a Masters in Business from Thomas College Graduate School of Business. He is a graduate of the University of Michigan Graduate School of Business Administration Management II Program (1967), and the Electric Council of New England Skills of Utility Management Program (1986). In 1974 Mr. Spellman was awarded a research grant by the Richard King Mellon Foundation to study how colleges and universities in the Northeast were responding to the 1973-1974 U.S. energy crisis.

Specific Experience Includes:

1993-Present GDS Associates, Inc.

At GDS Associates, Mr. Spellman has directed and completed numerous management consulting, IRP, renewable energy, DSM planning and implementation, market research, load research and market planning assignments for the firm's clients, which include electric and natural gas utilities, municipal utilities, electric cooperatives, government agencies, and large commercial and industrial organizations.

Listed below are examples of consulting projects completed by Mr. Spellman relating to energy efficiency technical, economic and achievable potential studies:

1. Consolidated Edison of New York – Consolidated Edison Company of New York retained GDS to prepare an assessment of the natural gas energy efficiency potential in its service area and to develop a portfolio of natural gas energy efficiency programs. GDS developed this Gas Efficiency Plan for Con Ed, and the Plan was filed with the New York Public Service Commission in March 2009. The program plans included detailed benefit/cost calculations using the Total Resource Cost test. The plan also included a detailed plan for evaluation of each individual program, including details on the scope and method of measurement and verification activities pursuant to the Commission's rules and regulations.
2. District of Columbia Energy Office - In September 2007, GDS Associates and Ed Meyers Consulting completed a detailed assessment of energy use in the District of Columbia, and developed findings and recommendations for cost effective electric and natural gas energy efficiency programs for the District. The report included detailed information on residential energy measures recommend for consideration in the upcoming Comprehensive Energy Plan IV for DC (CEP-IV) as well as energy efficiency programs and measures for DC Government facilities. The report found that the effectiveness of the District's programs can be increased working with the Metropolitan Washington Council of Governments (MWCOG) to leverage resources with federal agencies and coordinate policies and programs throughout the region to produce mutually targeted results. Such regional cooperation also reduces administrative costs per program unit delivered, as costs are amortized over more clients served. One particularly promising opportunity may involve regional government purchasing of energy efficiency products, where each governmental unit would gain from regional quantity discounts. The report determined the successful energy conservation programs can yield about 6,000 new jobs in the District of Columbia over a fifteen year period. DC's job creation totals in energy efficiency can be boosted for DC residents through First Source Employment Agreements and LSDBE requirements, when businesses receive tangible benefits from the DC government (for example, low-interest loans or down payment assistance).

3. **New Hampshire Public Utilities Commission** - In 2008, GDS in partnership with RLW Analytics, Research Into Action and RKM Research and Communications was retained by the New Hampshire Public Utilities Commission to conduct a thorough assessment of the potential for electric and natural gas energy efficiency in the state of New Hampshire. To support the energy efficient potential analysis, the GDS Team conducted residential and small commercial telephone surveys and large C&I site visits. The data collected will help determine key study inputs such as equipment saturations and baseline efficiency levels. The GDS Team has identified hundreds of electric and natural gas energy efficiency measures which are being analyzed to identify cost-effective measures. Estimates of the technical, economic and achievable electric and natural gas savings potential over the next ten years and the cost necessary to achieve these savings will then be developed.
4. **Hoosier Energy** - GDS was retained by Hoosier Energy to conduct a thorough assessment of the cost effective achievable potential for electric energy efficiency and demand response measures in service area of Hoosier Energy in southern Indiana. GDS collected and analyzed extensive information on over 200 energy efficiency measures and 25 demand response measures, developed supply curves to show the achievable potential and completed a report by December 2008.
5. **Brazos Electric Cooperative** - GDS was retained by Brazos Electric Cooperative to conduct a thorough assessment of the cost effective achievable potential for electric energy efficiency and demand response measures in the service area of this large electric cooperative in Eastern Texas. GDS collected and analyzed extensive information on over 200 energy efficiency measures and 25 demand response measures, developed supply curves to show the achievable potential and completed a draft report by September 2008.
6. **Arkansas Electric Cooperative Corporation** - GDS was retained by Arkansas Electric Cooperative Corporation to conduct a thorough assessment of the cost effective achievable potential for electric energy efficiency and demand response measures in the service area of this large electric cooperative in Arkansas. GDS collected and analyzed extensive information on over 200 energy efficiency measures and 25 demand response measures, developed supply curves to show the achievable potential and completed a draft report by September 2008.
7. **Central Maine Power Company (CMP)** - As a subcontractor to La Capra Associates, GDS was retained by CMP to conduct an assessment of the potential for cost-effective electric energy efficiency and demand response as an alternative to transmission system expansion in 5 sub-areas of the CMP service area. GDS collected and analyzed extensive information on over 100 energy efficiency and conservation measures, developed supply curves to show the achievable potential and is in the process of developing a draft findings report.
8. **Bonneville Power Administration (BPA)** - GDS was retained by BPA to conduct an assessment of their Non-Wires Solutions initiative development process and the current state of the initiative. The BPA Non Wires Solutions Program assesses the feasibility of energy efficiency and demand response programs as an alternative to building new electric transmission lines in the BPA service area. GDS reviewed program materials and reports, designed an interview guide and conducted in-depth, interviews with key BPA staff. Our analysis identified program strengths, weaknesses and potential improvements in key program areas including design, implementation, planning, cost impact & allocation and resources. A final report was delivered on June 8, 2007.
9. **Reading Municipal Light Department (Reading, Massachusetts)** - GDS was retained by the RMLD to assess the technical, economic, and market potential for reducing (avoiding) electricity use and peak demand, and reducing fossil-fueled electricity use and peak demand, in RMLD's service territory by implementing a wide range of end-use efficiency

measures and renewable energy resource technologies. GDS collected and analyzed extensive information on over 100 energy efficiency, conservation and demand-response measures and renewable energy technologies, developed supply curves to show the achievable potential and is in the process of developing a draft report.

10. **Concord Municipal Light Department, Concord, Massachusetts** – GDS completed a detailed study for the potential for energy efficiency and renewable energy technologies for the Concord Municipal Light Department (CMLD). GDS's specific responsibilities for this project include identification and analysis of demand-side alternatives, including distributed generation and other demand response technologies (i.e., direct load control).
11. **North Carolina Electric Membership Corporation (NCEMC)** - GDS was retained by the NCEMC to conduct a thorough assessment of the cost effective achievable potential for electric energy efficiency and conservation resources in service area of the North Carolina Electric Membership Corporation (NCEMC). GDS collected and analyzed extensive information on over 200 energy efficiency and conservation measures, developed supply curves to show the achievable potential and completed a final report in 2007.
12. **Central Electric Power Cooperative Inc. (CEPCI)** - GDS was retained by the CEPCI to conduct a thorough assessment of the cost effective achievable potential for electric energy efficiency, conservation and demand response resources in the service area of CEPCI. GDS collected and analyzed extensive information on over 200 energy efficiency and conservation measures, developed supply curves to show the achievable potential and completed a final report in August 2007.
13. **Maine** – GDS recently completed a technical potential study for high efficiency residential lighting equipment for the Efficiency Maine Residential Lighting Program. GDS conducted this study for the Maine Public Utilities Commission.
14. **North Carolina Public Utilities Commission** -GDS was retained by the North Carolina PUC to conduct an assessment of the cost effective achievable potential for electric energy efficiency and conservation resources in the State of North Carolina. GDS collected and analyzed extensive information on over 100 energy efficiency and conservation measures, developed supply curves to show the achievable potential and completed a final report in December 2006.
15. **Vermont Department of Public Service** - GDS was retained by the Vermont Department of Public Service to conduct a thorough assessment of the cost effective achievable potential for electric energy efficiency and conservation resources in the State of Vermont. GDS collected and analyzed extensive information on over 100 energy efficiency and conservation measures, developed supply curves to show the achievable potential and completed a final report in January 2007. GDS also conducted market research with energy services providers in Vermont to collect information on baseline levels of energy efficiency in the State.
16. **Big Rivers Electric Corporation – 2005 Energy Efficiency Technical Potential Study - Kentucky** - During 2005, GDS completed a study of the technical and maximum achievable cost effective economic potential of energy efficiency measures and programs for the service area of the Big Rivers Electric Corporation, a large Generation and Transmission electric utility in Ohio. This technical and economic potential study was completed as part of the comprehensive analysis of supply-side and demand-side options for the latest BREC Integrated Resource Plan filing with the Kentucky Public Service Commission.
17. **Public Service of New Mexico** – GDS completed this natural gas DSM technical and achievable potential study in May 2005. This study presents estimates of the maximum achievable cost-effective potential for natural gas Demand-Side Management (DSM)

opportunities in the service area of Public Service of New Mexico. The main output of this study is a concise, fully documented report on the opportunities for achievable, cost effective natural gas energy efficiency programs in New Mexico.

18. **Utah Energy Office and Questar Gas Company** – GDS completed this natural gas DSM technical and achievable potential study in June 2004. This study presents estimates of the maximum achievable cost-effective potential for natural gas Demand-Side Management (DSM) opportunities in the State of Utah. The main output of this study is a concise, fully documented report on the opportunities for achievable, cost effective natural gas energy efficiency programs in Utah. This study assessed the impacts that gas DSM measures and programs can have on natural gas use, assesses the economic costs and benefits of DSM programs, and assesses the revenue impacts to Questar Gas Company. The final report also includes an assessment of the environmental impacts of the achievable DSM options identified in this study.
19. **Energy Efficiency Potential in Georgia – Study for the Alliance to Save Energy** – GDS completed this study for the Alliance to Save Energy in July 2004. This study provides estimates of the maximum achievable cost effective potential in the State of Georgia for several "top-ranked" energy efficiency programs. In addition, GDS presented expert witness testimony on behalf of the ASE before the Georgia Public Service Commission that covered the following issues:
    - the potential net present value dollar savings to ratepayers in Georgia due to the implementation of cost effective energy efficiency programs.
    - the cost effectiveness of these energy efficiency programs
    - energy efficiency tariffs that could be implemented in Georgia to save energy
    - up-to-date information on energy efficiency and DSM success stories and energy savings in other regions of North America and the technical potential for DSM in Georgia
    - improvements that could be made in the DSM measure screening process in Georgia.
    - recommendations for DSM cost recovery and shareholder incentive mechanisms.
20. **Energy Efficiency Potential in Florida – Study for the Alliance to Save Energy and the Southern Alliance for Clean Energy** – GDS completed this study for the Alliance to Save Energy in July 2004. This study provides estimates of the maximum achievable cost effective potential in the State of Florida for several "top-ranked" energy efficiency programs
21. **Connecticut Energy Conservation Management Board** – In March 2003, GDS was retained by the Connecticut Energy Conservation Management Board to conduct a thorough assessment of the cost effective maximum achievable technical potential for energy efficiency and conservation resources in the State of Connecticut and two sub-regions of the State. GDS collected and analyzed extensive information on over 250 energy efficiency and conservation, and developed supply curves to show the maximum achievable potential. GDS completed the final report in June 2004.
22. **Alliant Energy Corporate Services** - As an update to an assessment of potential customer-sited/distributed generation technology applications in all categories (residential, small/large commercial, industrial, and agricultural) conducted by GDS in 2001, Alliant requested that modeling assumptions be reviewed and revised, as necessary. In addition, the Distributed/Onsite Generation Screening (DOGS) tool was reviewed by MN Department of Commerce as part of a filing in 2001 and they requested expansion of applicable technologies and fuels, including: bio-diesel and methane from landfills and digesters to fuel reciprocating engines; methanol, ethanol, gasoline, and methane for electricity production from fuel cells. The revised model results will be used to estimate the market potential for

distributed/onsite generation within Alliant's Minnesota service territories.

23. **Massachusetts GasNetworks** – In January of 2004, GDS was hired by GasNetworks (a network of several natural gas utilities in Massachusetts) to develop benefit/cost analyses and energy savings potential estimates for GasNetworks' regional market transformation and demand-side management programs. Benefit/cost ratios and energy savings potential estimates were developed for several regional gas energy efficiency programs using a spreadsheet model, and similar data were developed for each program for each service area for each natural gas utility participating in this study.
24. **Northern Utilities (Gas Company)** – In 2002 GDS was hired by Northern Utilities to prepare benefit/cost analyses and energy savings potential estimates of a portfolio of energy efficiency programs proposed for implementation in their New Hampshire service area. This project was completed during September 2002 and a final report was filed with the New Hampshire PUC. A workshop was conducted at the NH Public Utilities Commission early in 2003 to review cost-effectiveness methodologies and key model input/output requirements.
25. **KeySpan Energy Delivery (Gas Company)** – In 2002 GDS was hired by KeySpan Energy Delivery – New Hampshire to prepare benefit/cost analyses and energy savings potential estimates of ten energy natural gas energy efficiency programs proposed for implementation in the KeySpan New Hampshire service area. This project was completed during September 2002 and a final report was filed with the New Hampshire PUC that month.
26. **Big Rivers Electric Corporation – 2002 Energy Efficiency Technical Potential Study - Kentucky** - During 2002, GDS completed a study of the technical and economic potential of energy efficiency and load management measures and programs for the service area of the Big Rivers Electric Corporation, a large Generation and Transmission electric utility in Ohio. This technical and economic potential study was completed as part of the comprehensive analysis of supply-side and demand-side options for the latest 8REC Integrated Resource Plan filing with the Kentucky Public Service Commission.
27. **City of Grand Island, Nebraska – Municipal Utility – Energy Efficiency Technical Potential Study** - GDS completed a study of the technical and economic potential for energy efficiency and load management measures and programs for the service area of this large municipal electric utility in Nebraska. This technical and economic potential study was completed as part of the comprehensive analysis of supply-side and demand-side options for an Integrated Resource Plan for this utility.
28. **City of Lafayette, Louisiana – Municipal Utility – Energy Efficiency Technical Potential Study** - GDS completed a study of the technical and economic potential for energy efficiency and load management measures and programs for the service area of this large municipal electric utility in Louisiana. This technical and economic potential study was completed as part of the comprehensive analysis of supply-side and demand-side options for an Integrated Resource Plan for this utility.
29. **New York State Energy Research and Development Authority (NYSERDA) - Energy $mart℠ Program Evaluation Services:** In the fall of 1999, GDS was retained by NYSERDA to be the prime evaluation contractor for the New York Energy $mart℠ program. During the years 2000, 2001, 2002, and 2003, GDS has been responsible for providing energy efficiency program and measure data collection, analysis, and report writing services to NYSERDA in support of their overall evaluation and market assessment efforts, and to determine actual savings of the programs. To date, GDS team evaluation activities have included development of a Gap Analysis for the purpose of setting priorities and allocating evaluation resources to the various New York Energy $mart℠ project areas; and numerous

evaluation activities leading to development of a draft and final Program Evaluation Status report which provided the New York Public Service Commission with sufficient information to determine the future of SBC-funded public benefits programs beyond its initial three-year transition period which ended July, 2001.

30. **Distributed Generation Technical Potential Assessment for Minnesota and Iowa:** During the fall of 2001, GDS assessed the technical potential of customer-sited distributed generation technology applications for Alliant, a major investor owned utility located in the MidWest. The analysis covered the residential, small/large commercial, industrial, and agricultural sectors. GDS developed a Distributed/Onsite Generation Screening spreadsheet model to determine the cost-effectiveness of various distributed generation options; used the model to assess the potential for various customer groups and then scaled results using customer profiles. Model results were also used to estimate the technical potential for distributed/onsite generation within Alliant's Minnesota and Iowa service territories.
31. **Renewable Electric Energy and Peak Demand Savings Methodology Reviews - Wind Power and Photovoltaics Programs:** GDS performed detailed reviews of NYSERDA's methodologies for estimating electric energy savings and peak demand reduction benefits associated with NYSERDA's Wind Power Research & Development Program and two Photovoltaic (PV) programs. These Savings Methodology reviews entailed three-components: 1) a review of the current method used by NYSERDA for estimating savings (including algorithms and inherent assumptions), 2) a review of the methods and assumptions used by other utilities and program administrators for estimating savings from similar programs being implemented elsewhere in the country, and 3) a presentation of key findings and recommendations.
32. **Evaluation Services for Commercial/Industrial Program Areas and Technical Assistance Reviewing Engineering Analyses- Efficiency Vermont:** GDS Associates is the lead contractor in a team that has been hired to assist the VT DPS in evaluating a statewide portfolio of energy efficiency programs targeted to the Commercial and Industrial market sectors. The GDS team is also providing technical engineering and review assistance, on an "on-call" basis, to the administrator of Vermont's energy efficiency programs.
33. **Development and Implementation of Five-Year Energy Efficiency Plan – Boston Edison:** GDS Associates was retained by Boston Edison to assist BECo staff with the development of program designs, evaluation plans, technical potential estimates and budgets for the Company's Five Year Energy Efficiency Plan. For this project GDS performed energy efficiency technology screenings to identify potentially viable measures for utility funding/support, and developed the program designs for a number of new initiatives, including over a dozen new market transformation programs. GDS also conducted cost effectiveness screening for all of the new DSM initiatives included in the plan.
34. **Energy Efficiency Technical and Market Potential Analysis:** This report presented the results of a technical and market potential study for energy efficiency options for the East Texas Electric Cooperative, Inc. (ETEC). The purpose of this report was to review energy efficiency options that comply with the Public Utility Commission of Texas (PUCT) orders issued in Northeast Texas Electric Cooperative (NTEC), Sam Rayburn Electric Cooperative (SRG&T) and Tex-La Electric Cooperative of Texas (Tex-La) rate cases. This study presented cost effectiveness findings and recommendations on energy efficiency options and programs for ETEC and its member generation and transmission electric cooperatives (NTEC, SRG&T, and Tex-La). In this study, GDS evaluated the cost effectiveness of over

90 energy efficiency options and found many of them to be cost effective according to the Total Resource Cost Test.

35. **Technical and Market Potential Analysis for Load Management and Energy Efficiency Options:** GDS was retained to update energy efficiency and load management technical and market potential analyses completed in the mid 1990's time period, and to develop recommendations relating to cost effective DSM programs for electric cooperatives in East Texas. This study identified energy efficiency and load management (DSM) options that were viable based on economic tests presented in the California Standard Practice Manual for Economic Analysis of Demand-Side Management Programs. DSM options that had a Total Resource Cost test benefit/cost ratio greater than 1.3 and a positive net present value for the participant were ones that were recommended by GDS for further program development.

8/90-5/93 Central Maine Power Company - Manager of Marketing Services/Marketing and Product Development

From 8/90 to 8/92 - Responsible for managing the design and implementation of CMP's residential, commercial, and industrial demand-side management programs. Also responsible for corporate market research, five-year DSM implementation plans, testifying on DSM topics before regulatory agencies, and for participating in integrated resource planning activities. Accountable for managing a $26 million DSM budget and a staff of 50 persons. Served on three person lead team from 1989 to 1992 to develop CMP's first integrated resource plan. During 1991 traveled to Czechoslovakia and Poland to provide consulting to foreign utilities on DSM issues.

From 8/92 to 5/93, responsible for identifying and developing marketing strategies for products and services which would improve the competitiveness of CMP's customers, increase the efficiency of energy use, increase CMP's profitability, and which would reduce the rate of growth of electricity prices for all customers. Directly responsible for the design of renewable energy and demand-side management programs, integrated resource planning, research on new technologies, and managing marketing and product development staff. Also provided consulting services to utilities in New Zealand, Australia, and Bulgaria relating to DSM program design and implementation.

6/86-8/90 Central Maine Power Company - Director of Market Research and Forecasting

Responsible for managing twenty-five professional employees. Duties included supervising DSM program evaluation activities, short and long range load forecast development, local area energy and peak load forecasts, market and load research, economic forecasting, and developing and updating DSM assumptions for use in the Company's long range planning models. Also participated in the development of the first Power Partners RFP, and in the evaluation and selection of proposals submitted in response to this RFP.

5/85-5/86 Central Maine Power Company - Corporate Economist

Responsible for monitoring and forecasting energy and economic trends in the CMP service area and in the New England Region. Duties included development of corporate short-term kWh sales and revenue forecasts, market research studies, and CMP's energy management strategy. Instrumental in promoting the use of state-of-the art PC-based computer models for integrated resource planning (UPLAN). Authored a second report on CMP's DSM strategy in April 1986. Also responsible for supervising several analysts.

5/77-5/85 Central Maine Power Company - Staff Economist

(5/77 to 5/78) Joined CMP in May 1977 and worked in the Customer Services Department. Responsibilities included short-term forecasting, annual appliance saturation surveys, and preparation of the 1977 and 1978 long-range energy and peak load forecasts.

(5/78 to 12/80) In May of 1978, selected to join a new group, the Corporate Financial Model Staff, to develop a new corporate financial model for CMP. Had major responsibility for development of a revenue forecasting model, and assisted with development of models to produce income statement, balance sheet, and sources and uses of funds forecasts. In addition to corporate model development, responsibilities included short-term forecasting and market research.

(12/80 to 5/85) In December of 1980, moved to CMP's Research Department and worked for Phil Hastings for five years. Responsible for all corporate market research, short-term kWh sales and revenue forecasts, economic analyses and forecasts, and forecasts of key corporate planning assumptions. Prepared and published CMP's first DSM strategy study in March 1985.

Other Professional Activities:

- Board of Directors, Association of Energy Services Professionals (AESP), 2005 to 2010
- Member of the Association of Energy Service Professionals (1993 to Present), Vice Chairman of the Policy Committee (1995-1996), Chair of Policy Committee (1997 and 1998)
- Panel Leader, 1992 American Council for an Energy Efficient Economy (ACEEE) Summer Study on Building Energy Efficiency.
- Chairman of the NEPOOL Demand-Side Management Planning Committee, September 1989 to September 1990, August 1991-July 1992.
- Vice Chairman of the NEPOOL Demand-Side Management Committee - January to August 1989, July 1990 - July 1991.
- Member of the NEPOOL Demand-Side Management Task Force (1986-1988).
- Member of the Load Research Committee of the Association of Edison Illuminating Companies (1988-1991).
- Alternate to the NEPOOL Governor's Liaison Committee (1986-1988).
- State Forecast Analyst for the NEPOOL Load Forecasting Model (1979-1986).
- Maine Model Manager of the New England Economic Project economic forecasting model, 1983-1986.
- Member of the Statistical Research Committee of the Electric Council of New England (Chairperson 1982-1983, member 1977-1986).
- Member of the Edison Electric Institute Economics Committee (1986-1991).
- Past member of the International Association of Energy Economists.

Publications:

1. Spellman, Richard F., *Modeling of Energy Management Strategies with the Utility Systems Analysis Model*, paper presented at the International Load Management Conference, November 1984, Chicago, Illinois

2. Spellman, Richard F., *Use of Computer Models and Load Research Data for Developing Energy Management Strategies*, paper presented at the Fifth Annual Northeast Load Research Conference, September 10-12, 1986, Farmington, Connecticut
3. Spellman, Richard F., *Potential Market Penetration of DSM Programs at Central Maine Power*, paper presented at Third National Conference on Utility DSM Programs, June 16-18, 1987, Houston, Texas
4. Spellman, Richard F., *Demand-Side Management Market Penetration: Modeling and Resource Planning Perspectives from Central Maine Power Company*, paper presented at the Fourth National Conference on Utility DSM Programs, May 2-4, 1989, Cincinnati, Ohio
5. Spellman, Richard F., *Using Program Evaluation Data for Long-Range Resource Planning at Central Maine Power Company*, paper presented at the Canadian Electrical Association's Conference on Enhancing Electricity's Value to Society, October 22-24, 1990, Toronto, Canada
6. Spellman, Richard F., *Demand-Side Management from a North American Perspective*, Keynote Address to the International Energy Agency Conference on Advanced Technologies for Electric Demand-Side Management, written for Joe C. Collier, Jr., President and Chief Executive Officer of Central Maine Power Company, paper presented in Sorrento, Italy on April 3, 1991
7. Leamon, Ann K., and Spellman, Richard F., *From the Bottom Up: T&D and DSM*, paper presented at the 5th National Demand-Side Management conference, July 30 - August 1, 1991, Boston, Massachusetts
8. Haeri, M. Hossein, and Spellman, Richard F., *Integration of Evaluation Results into the Resource Planning Process*, paper presented at the 5th National Demand-Side Management Conference, July 30 - August 1, 1991, Boston, Massachusetts
9. Spellman, Richard F., *Does Fuel Switching Make Sense for an Electric Utility?*, paper presented at the 1992 International Energy Efficiency and DSM Conference, October 22, 1992, Toronto, Ontario
10. Spellman, Richard F., and Brunette, Marguerite, *Market Research for the Design, Implementation, and Evaluation of a Compact Fluorescent Lighting Program*, paper presented at the EPRI/EUMRC Market Research Symposium, November 17-20, 1992, Dallas, Texas
11. Spellman, Richard F., Forum For Applied Research and Public Policy/Fall 1992, *Energy Management: A View from Maine* (Journal Article)
12. Spellman, Richard F., *DSM Incentives Plus Electric Rate Adjustment Mechanisms Equal Bottom Line Impact*, paper presented at the 6th National Demand-Side Management Conference, March 24-26, 1993, Miami Beach, Florida
13. Spellman, Richard F., Van Wie, David A., Peaco, Daniel E., Lawrence, and Dennis R., *Optimizing Demand-Side and Supply Resources Using Linear Programming*
14. Spellman, Richard F., Utility Experience With Load Management in Texas, EPRI/Houston Lighting and Power Co. Load Management Conference, May 3, 1994, Houston, Texas.
15. Spellman, Richard, F., The Role of DSM in the Privatized Electricity Sector in England and Wales, and New Zealand, Paper Presented at the Association of Demand-Side Management Professionals Annual Meeting, Orlando, Florida, December 1994.
16. Spellman, Richard, F., Energy Services in A Global Environment, Paper Presented at the Association of Energy Services Professionals Annual Meeting, Phoenix, Arizona, December 1995.

17. Spellman, Richard, F., Value Added Services as Profit Centers in Texas, Paper Presented at the Association of Energy Services Professionals Annual Meeting, Beverly Hills, California, December 1996.
18. Spellman, Richard, F., "Preparing for Competition by Updating Corporate Marketing Strategies", Paper Presented at the Association of Energy Services Professionals Annual Meeting, Boca Raton, Florida, December 1997.
19. Megdal, Lori, Spellman, Richard, F., Johnson, Bruce "Methods and Measurement Issues for a DSM Evaluation versus a Market Transformation Market Assessment and Baseline Study", Paper Presented at the 1999 Energy Program Evaluation Conference, Denver, Colorado, August 1999.
20. Spellman, Richard F., Shel Feldman, Bruce Johnson, Lori Megdal, "Measuring Market Transformation Progress & the Binomial Test: Recent Experience at Boston Gas Company", Paper presented at the ACEEE Summer Study on Building Energy Efficiency, August 2000.
21. Spellman, Richard F., Giffin, Thomas M., Sheil, Jolene A., Nicol, John, "Experience and Lessons from the Wisconsin Industrial Focus on Energy Program: Transformation in Industrial Energy Efficiency Markets", presented at American Council for and Energy Efficient Economy Summer Study on Energy Efficiency in Buildings, Tarrytown, New York. July 25-27, 2001
22. Spellman, Richard F., Shel Feldman, Bruce Johnson, Lori Megdal, "Transition Strategies for Market Transformation Programs: Recent Experience at KeySpan Energy Delivery", Paper presented at the December 2001 12th National Energy Services Conference.
23. Rooney, Thomas; Spellman, Richard; Rufo, Michael; Schlegel, Jeff; "Estimating the Potential for Cost Effective Electric Energy and Peak Demand Savings in Connecticut", Paper presented at the 2004 American Council for an Energy Efficient Economy Summer Study in Pacific Grove, California, August 2004.
24. Spellman, Richard F., Goldfarb, Lynn K., Barnes, Harley, "Using Market Research to Improve Program Design and Delivery of Residential Lighting Programs in the US Northeast Region", Paper presented at the 15th National Energy Services Conference, December 7, 2004, Clearwater Beach, Florida.
25. Spellman, Richard F.; Goldfarb, Lynn K.; Huber, Jeffrey; "IS THERE A POTENTIAL NATIONAL MARKET FOR TRADING ENVIRONMENTAL CREDITS BASED ON THE ENVIRONMENTAL SAVINGS ACHIEVED THROUGH ENERGY EFFICIENCY SAVINGS?", Paper presented at the 16th National Energy Services Conference, December 2005.
26. Spellman, Richard F.; Rooney, Thomas; Burks, Jeffrey; Bean, Stephen; "Potential for Natural Gas Savings in the Southwest", Paper presented at the 2006 ACEEE Summer Study on Building Energy Efficiency, held at Pacific Grove, California.

Direct Testimony of Richard F. Spellman:

1. On Behalf of Central Maine Power Company, Before the State of Maine Public Utilities Commission, Docket Nos. 85-48, 85-82, 85-83, filed July 7, 1986. Subject Matter: Economics of Commercial and Industrial Conservation Programs in the CMP Service Area
2. On Behalf of Central Maine Power Company, Before the State of Maine Public Utilities Commission, Docket Nos. 86-111 and 87-261, filed November 6, 1987. Subject Matter: DSM Assumptions for Central Maine Power Company in Long Term Avoided Cost Filing.
3. On Behalf of Central Maine Power Company, Before the State of Maine Public Utilities Commission, Docket Nos. 86-111 and 87-261, filed June 22, 1988. Subject Matter: DSM Potential and Cost Effectiveness in the CMP Service Area.
4. On Behalf of Central Maine Power Company, Before the State of Maine Public Utilities

Commission, Docket No. 89-68, filed May 19, 1989. Subject Matter: Review and explain the basis for the updated short-term kWh sales forecast on which CMP's revised Attrition Study is based.

5. On Behalf of Central Maine Power Company, Before the State of Maine Public Utilities Commission, Docket No. 89-68, filed October 24, 1989. Subject Matter: Review and explain the basis for the short-term kWh sales forecast on which CMP's Attrition Study is based.
6. On Behalf of Central Maine Power Company, Before the State of Maine Public Utilities Commission, Docket No. 91-213, filed November 15, 1991. Subject Matter: Present CMP's conclusions regarding the advisability of inaugurating a residential space heat conversion program in the Company's service territory.
7. On Behalf of Central Maine Power Company, Before the State of Maine Public Utilities Commission, Docket No. 91-213, filed July 31, 1992. Subject Matter: Present updated information regarding the advisability of inaugurating a residential space heat conversion program in the Company's service territory.
8. On Behalf of Tex-La Electric Cooperative of Texas, Inc. Before the Public Utilities Commission of Texas, Docket No. 12289, filed July 1993. Subject Matter: Tex-La's DSM activities and updating of TEX-LA Energy Efficiency Plan.
9. On Behalf of Tex-La Electric Cooperative of Texas, Inc. Before the Public Utilities Commission of Texas, Docket No. 12289, filed July 1993. Subject Matter: Rebuttal testimony relating to TEX-LA's DSM activities.
10. On Behalf of H.E. Butt Grocery Company. Before the Public Utilities Commission of Texas, Docket No. 12820, Filed October 17, 1994. Subject Matter: Proposed modifications to Central Power and Light DSM Programs.
11. On Behalf of The Coalition of Cities and The City of Houston, Before the Public Utilities Commission of Texas, Docket No. 12065, filed November 15, 1994. Subject Matter: Proposed changes to Houston Lighting and Power Company's DSM programs.
12. On Behalf of the Georgia Public Service Commission Staff IRP Adversary Team, Before the Georgia Public Service Commission, Docket NO. 5602-U, filed May 8, 1995. Subject Matter: Proposed modifications to DSM programs proposed by Georgia Power Company in Integrated Resource Plan filed by the Company in January 1995.
13. On Behalf of the Georgia Public Service Commission Staff IRP Adversary Team, Before the Georgia Public Service Commission, Docket NO. 5601-U, filed May 8, 1995. Subject Matter: Proposed modifications to DSM programs proposed by Savannah Electric and Power Company in Integrated Resource Plan filed by the Company in January 1995.
14. On Behalf of the Sam Rayburn G&T Electric Cooperative, Inc., Before the Public Utilities Commission of Texas, Docket No. 14893, filed September 1995. Subject Matter: Description of SRG&T Compliance with prior Commission orders relating to SRG&Ts DSM activities.
15. On Behalf of the Sam Rayburn G&T Electric Cooperative, Inc., Before the Public Utilities Commission of Texas, Docket No. 14893, filed January 1996. Subject Matter: Rebuttal testimony relating to SRG&Ts DSM activities.
16. On Behalf of the Sam Rayburn G&T Electric Cooperative, Inc., Before the Public Utilities Commission of Texas, Docket No. 14893, filed March 1996. Subject Matter: Surrebuttal testimony relating to SRG&Ts DSM activities.
17. On Behalf of the Georgia Public Service Commission Staff IRP Adversary Team, Before the Georgia Public Service Commission, Docket Nos. 6315-U and 6325-U, filed April 5, 1996. Subject Matter: Evaluation of Benefits and Costs of Residential Load Management Program

Proposed by Georgia Power Company.

18. On Behalf of Green Mountain Power Company, Before the Vermont Public Service Board, Docket No. 5983, filed December 8, 1997. Subject Matter: Rebuttal Testimony relating to the effectiveness of the Company's historical DSM activities.
19. On Behalf of the Georgia Public Service Commission Staff IRP Adversary Team, Before the Georgia Public Service Commission, Docket NO. 8708-U, filed May 29, 1998. Subject Matter: DSM programs proposed by Georgia Power Company in Integrated Resource Plan filed by the Company in 1998.
20. On Behalf of the Georgia Public Service Commission Staff IRP Adversary Team, Before the Georgia Public Service Commission, Docket NO. 8709-U, filed May 29, 1998. Subject Matter: Proposed modifications to DSM programs proposed by Savannah Electric and Power Company in Integrated Resource Plan filed by the Company in January 1995.
21. On Behalf of the Georgia Public Service Commission Staff IRP Adversary Team, Before the Georgia Public Service Commission, Docket No. 8709-U, filed May 29, 1998. Subject Matter: Proposed modifications to DSM programs proposed by Savannah Electric and Power Company in Integrated Resource Plan filed by the Company in January 1998.
22. On Behalf of the Georgia Public Service Commission Staff IRP Adversary Team, Before the Georgia Public Service Commission, Docket No. 13305-U, filed May 11, 2001. Subject Matter: DSM programs proposed by Georgia Power Company in Integrated Resource Plan filed by the Company in January 2001.
23. On Behalf of the Georgia Public Service Commission Staff IRP Adversary Team, Before the Georgia Public Service Commission, Docket No. 13306-U, filed May 11, 2001. Subject Matter: Proposed modifications to DSM programs proposed by Savannah Electric and Power Company in Integrated Resource Plan filed by the Company in January 2001.
24. On Behalf of the Alliance to Save Energy, Before the Georgia Public Service Commission, Docket Nos. 17687 & 17688-U, filed May 14, 2004. Subject Matter: Proposal for new energy efficiency programs to be paid for and implemented by Savannah Electric and Power Company and Georgia Power Company (this was intervener testimony filed in the Integrated Resource Plan dockets heard before the Georgia Commission during 2004).
25. On Behalf of the Southern Alliance for Clean Energy, Before the Georgia Public Service Commission, Docket Nos. 4822-U & 19279-U, filed November 12, 2004. Subject Matter: Provided comments on the rules of the Georgia Commission relating to the methodology for the calculation of electric energy and capacity avoided costs that would apply to renewable energy producers in the State of Georgia.
26. On behalf of the Public Staff of the North Carolina Utilities Commission, Before the North Carolina Public Service Commission, Docket No. E-7, Sub 831, June 26, 2008, Subject Matter: The purposes of this testimony were the following: (1) to determine whether the SAVE-A-WATT (SAW) approach was in the public interest of the ratepayers of Duke Energy Carolinas, LLC (Duke or the Company); (2) to determine whether the SAW program administrator costs per lifetime kWh saved were reasonable and whether projected utility margins for energy efficiency and demand response resources under the proposed SAVE-A-WATT approach were reasonably based; (3) to determine whether the SAW approach would achieve the maximum achievable cost-effective potential for kilowatt-hour (kWh) and kilowatt (kW) savings in the Company's service area in North Carolina.; (4) to determine whether any additional cost-effective energy efficiency and demand response programs should be included in the Company's Energy Efficiency Plan; (5) to determine whether an alternative to SAW exists that provides superior electricity and dollar savings to the Company's ratepayers at a

much lower cost to them.

27. On behalf of Communities Against Regional Interconnect, Before the State of New York Public Service Commission, Case No. 06-T-0650, Filed January 9, 2009, Subject Matter: The purpose of this testimony were the following: to present the achievable, cost effective non-route alternatives to construction of the New York Regional Interconnect (NYRI) project and to demonstrate that with the implementation of the proposed non-route alternatives there is no real need for the NYRI project.

28. On behalf of Connecticut Natural Gas Corporation, Before the State of Connecticut Department of Public Utility Control, Docket No. 08-12-06, Filed January 16, 2009, Subject Matter: The purposes of this testimony were the following: (1) describe how the new Connecticut Natural Gas (CNG) energy efficiency programs will strengthen the partnership with customers through expanded communication and outreach, consistent with the state's policy encouraging energy efficiency; (2) present an overview of existing CNG energy efficiency programs; (3) present information on best practice natural gas energy efficiency programs in other States; (4) describe CNG's proposal to expand energy efficiency program offerings; (5) provide a summary of proposed budgets, energy savings and cost effectiveness of proposed program offerings; (6) describe staffing needs to support the proposed programs; (7) present information on the impact of proposed programs on natural gas use per customer; (8) describe the regulatory mechanism for recovery of program costs.

29. On behalf of the Southern Connecticut Gas Company, Before the State of Connecticut Department of Public Utility Control, Docket No. 08-08-17, Filed January 20, 2009, Subject Matter: The purposes of this testimony were the following: (1) describe how the new Southern Connecticut Gas Company (SCG) energy efficiency programs will strengthen the partnership with customers through expanded communication and outreach, consistent with the state's policy encouraging energy efficiency; (2) present an overview of existing SCG energy efficiency programs; (3) present information on best practice natural gas energy efficiency programs in other States; (4) describe SCG's proposal to expand energy efficiency program offerings; (5) provide a summary of proposed budgets, energy savings and cost effectiveness of proposed program offerings; (6) describe staffing needs to support the proposed programs; (7) present information on the impact of proposed programs on natural gas use per customer; (8) describe the regulatory mechanism for recovery of program costs.

Caroline L. Guidry
GDS Associates, Inc.
Engineer - Energy Efficiency & Demand-Side Management

Education

Georgia Institute of Technology, Woodruff School of Mechanical Engineering		Atlanta, GA
M.S. Mechanical Engineering:	GPA – 3.71/4.0	August 2008
Master's Thesis:	*Modified Comparative Life Cycle Assessment of End-of-Life Options for Post-Consumer Carpet in Urban Regions*	
Relevant Coursework:	Engineering Design, Designing Open Engineering Systems, Optimization in Engineering Design, Design and Analysis of Experiments, Simulation, Business and the Environment, Rapid Prototyping	
Columbia University, Fu Foundation School of Engineering and Applied Science		New York, NY
B.S. Mechanical Engineering:	Overall GPA – 3.57/4.00 Major GPA – 3.63/4.00	May 2006
Relevant Coursework:	Computer Graphics and Design, Computer Aided Design, Manufacturing Processes, Industrial Economics, Industrial Forecasting, Probability and Statistics, Math Programming	

Certifications

Engineer in Training:	Certified by the New York State Education Department	December 2006

Technical Skills

Applications:	REM/Rate: Home Energy Rating Tool, MatLab, IDEAS, INVENTOR, ProEngineer, Excel, MS Word, PowerPoint

Work Experience

GDS Associates, Inc. September 2008 - present

- **Florida Public Service Commission**
  - **Technical Consulting Assistance**
    - **Concept Paper:** Compiled a paper for the Florida Public Service Commission on topics related to energy efficiency potential and setting targets for demand-side management energy efficiency programs. Subjects included: strengths and weaknesses of benefit-cost tests, techniques for the development of energy efficiency goals, methodological best practices for conducting energy efficiency potential studies, revenue- and cost-recovery and performance incentives, potential supply-side efficiency improvements and regulations effecting energy efficiency not under control of the utilities of the public service commission. Regarding all of these issues, connections where made where appropriate to tailor discussions in terms of current the current Florida Energy Efficiency and Conservation Act (FEECA), which sets the regulations and parameters for energy efficiency and conservation in Florida. Based on this content, recommendations were made to the FPSC regarding appropriate benefits-costs test used to determine measure/program cost-effectiveness, methodologies for conducting potential studies, performance incentives (rewards and repercussions), and methods for translating studies into goals. This work also required the creation and implementation of a survey designed

to ascertain methods for setting savings targets used by organization overseeing best-practice energy efficiency programs.

- **Technical Potential Study – Review:** This work in progress involves an assessment of the Statewide Technical Potential Study and the seven FEECA utilities' individual technical potential reports conducted by Itron. The recommendations and conclusions drawn from this assessment where incorporated into a report to be submitted to the FPSC. The review covers all methodologies, assumptions, sources, and models used to determine the technical potential available within the seven FEECA utility service areas. The project includes an assessment of the residential, commercial, and industrial sector energy efficiency, demand response, and customer-PV potential.

- **Georgia Public Service Commission**
  – Consulting Assistance with the DSM Working Group
  - For this ongoing project, Ms. Guidry has attended all of the 2008/2009 Georgia Power Company Demand-Side Management Working Group meetings as an advisor to the commission staff. Contributions to the group have included (1) a review of the proposed technical manual for energy efficient measure completeness; (2) a set straw-man proposals for residential energy efficiency programs, based on best-practice program plans, that included descriptions of measure bundles, implementation strategies, marketing strategies, potential trader allies, and verification and evaluations plans; and (3) a summary of current CFL incentives/rebates offered throughout the country as a percent of incremental measure costs in order to determine a best-practice incentive level for achieving high market penetration rates at rebate levels under 100% of the full incremental costs.

- **Communities Against Regional Interconnect**
  - Energy Efficiency and Demand Response Technical Consulting Assistance
  - This work included a Residential Technical Potential Study for the downstate region of New York, which involved research, compilation and documentation of all measure data and assumptions. Ms. Guidry incorporated the data into the GDS residential technical potential model to determine the savings potential. Ms. Guidry also assisted in the assessment of typical residential energy efficiency program packages in order to determine savings potential and economic and impacts. Additionally, she drafted the residential sector technical potential section of technical witness Spellman's exhibit. The results of the residential technical potential study and program potentials developed supported Mr. Spellman's claim that the construction of the NYRI proposed Transmission Line could be avoided if aggressive energy efficiency were implemented instead.

- **Hoosier Energy Rural Electric Cooperative**
  – Energy Efficiency and Demand Response Technical Potential Study
  - Ms. Guidry assisted in the development and review of the technical, economic and achievable potential energy efficiency estimates for the commercial and industrial sectors of Hoosier Energy's service territory.

- **Buckeye Power, Inc.**
  – "Lite" Technical Potential Study
  - Ms. Guidry assisted in the "Lite" Technical Potential Study for Buckeye Power, Inc. This study involved "lite" assessments of both residential energy efficiency and demand response programs. Work included research, compilation, and documentation of all measure data assumptions; the data input and model update of the GDS residential technical potential model; and the data input and updating of the GDS cost-effectiveness model.

- **Consolidated Edison Company**

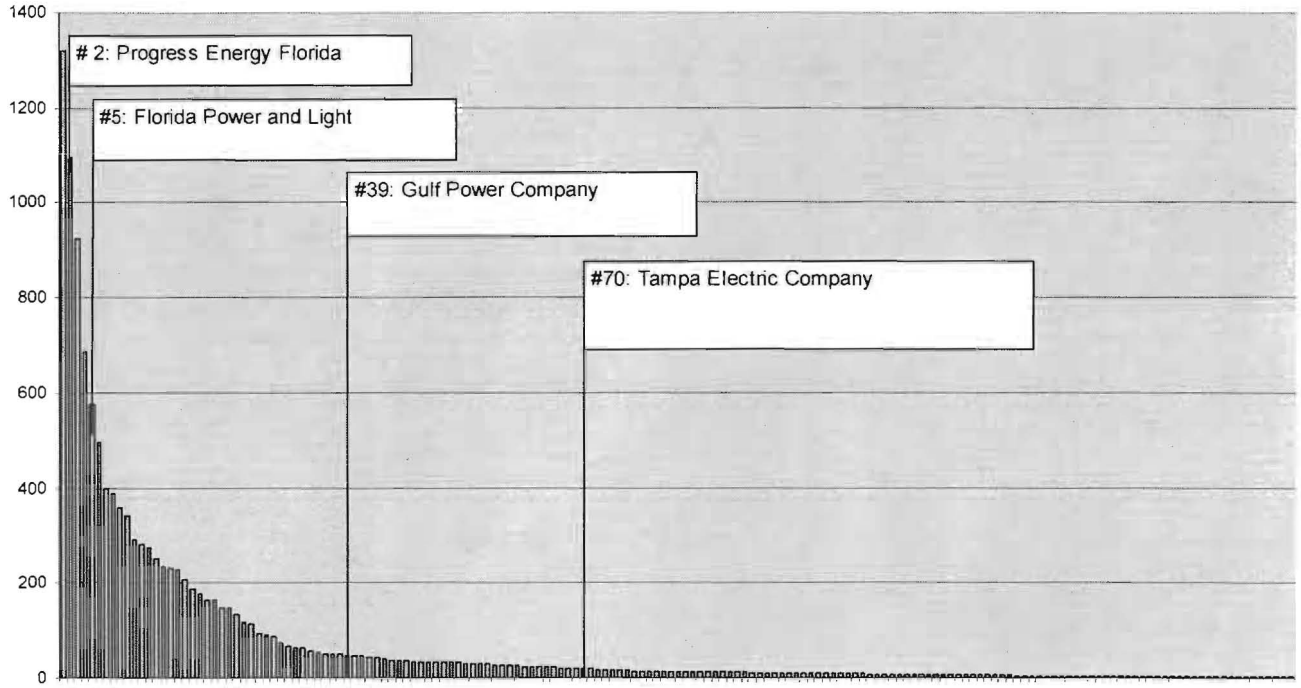
- **Technical Consulting Assistance**
  - This work included a review of the Technical Reference Manual for gas appliances, specifically those related to winter sensitive temperatures. The investigation included filtering through national standards for calculating heating load hours and equivalent full load heating hours for residential heating equipment (boilers and furnaces) as well as determining the national standard for calculating regionally specific heating degree days. The culmination of the work included a memo sent out to involved parties addressing the discrepancies between the method used in the Technical Reference Manual and the national standards for calculating heating load hours and well as the proposed alternative estimates for the New York City region.

Graduate Research Assistant Fall 2006 – August 2008

- **Project:** *Modeling Material Flows for Sustainable Industrial Systems for Urban Regions*
  - Material Use: Science, Engineering and Society (MUSES) project - National Science Foundation Award No. 0628190
  - collaborative project focused on the sustainability of recycling post-consumer products in urban regions based on social, economic and environmental viability with contributions from City and Regional Planning, Chemical Engineering and Mechanical Engineering at Georgia Institute of Technology; Mechanical Engineering at University of Washington; and the Regional Research Institute at West Virginia University
- **Thesis:** *Modified Comparative Life Cycle Assessment of End-of-Life Options for Post-Consumer Carpet in Urban Regions*
  - modular process and facility modeling
  - study of material reclamation, secondary material reclamation, and waste disposal end-of-life options for post-consumer carpet
  - modified LCA concentrating on social (employment opportunities), economic (investments and savings) and environmental (global warming potential, criteria pollutants, solid wastes) impacts
  - sensitivity of model explored to determine tipping points, enablers and inhibitors
- **Conference Presentation** - The Institute for Operations Research and the Management Sciences
  - INFORMS Annual Meeting: November 4-7, 2007; Seattle, Washington
  - Presentation: *A Triple Bottom Line Comparison of Carpet Reclamation Strategies for Urban Regions* - By Caroline Guidry and Dr. Bert Bras; Presented by: Dr. Bert Bras

Exhibit RFS - 3: Ranking of FEECA Utilities by Absolute Cumulative kW Savings from Load Management Programs

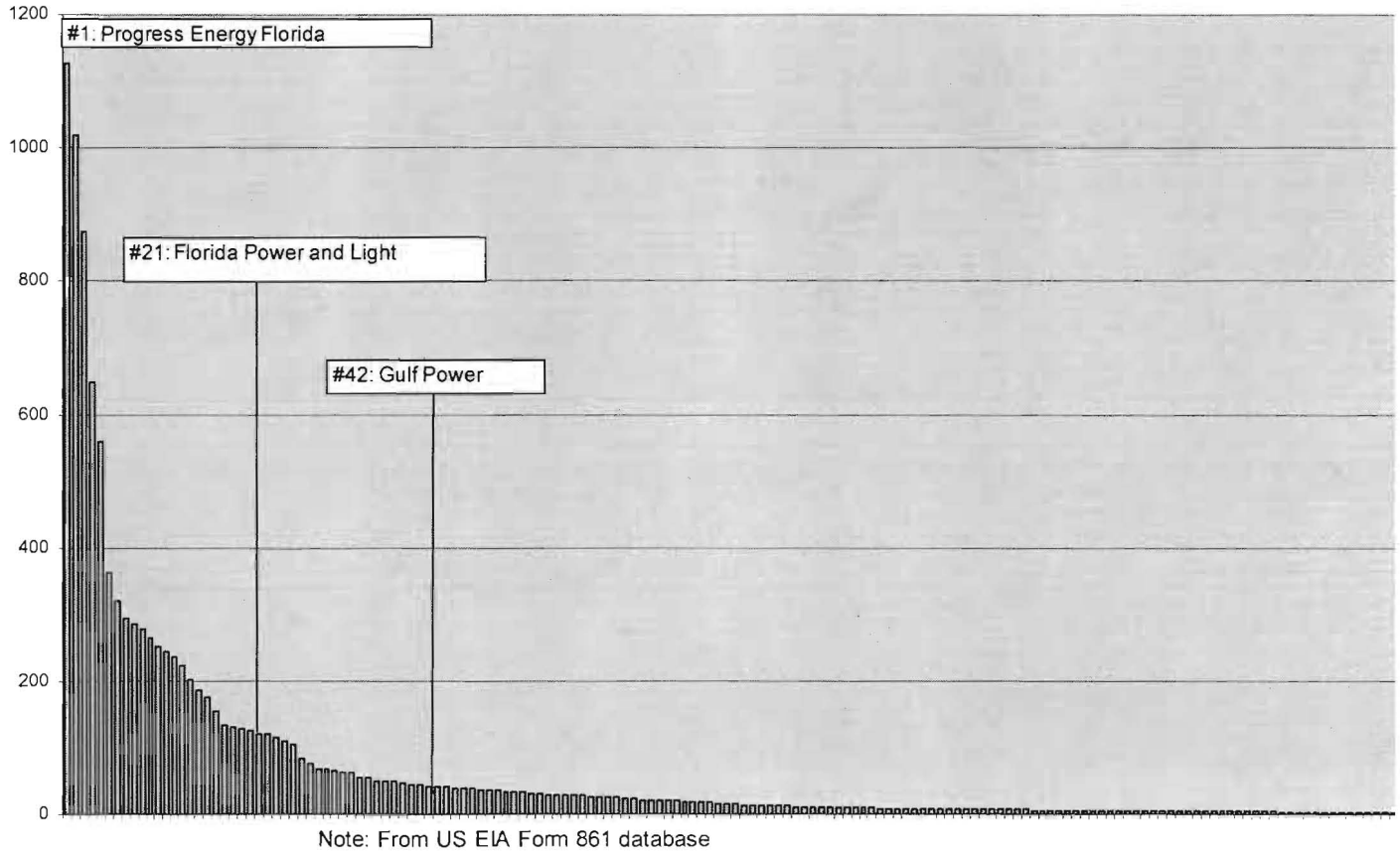
Figure 1: Rankings of US Electric Utilities by their total amount of kW saved by Load Management Programs in 2007



Note: From US EIA Form 861 database

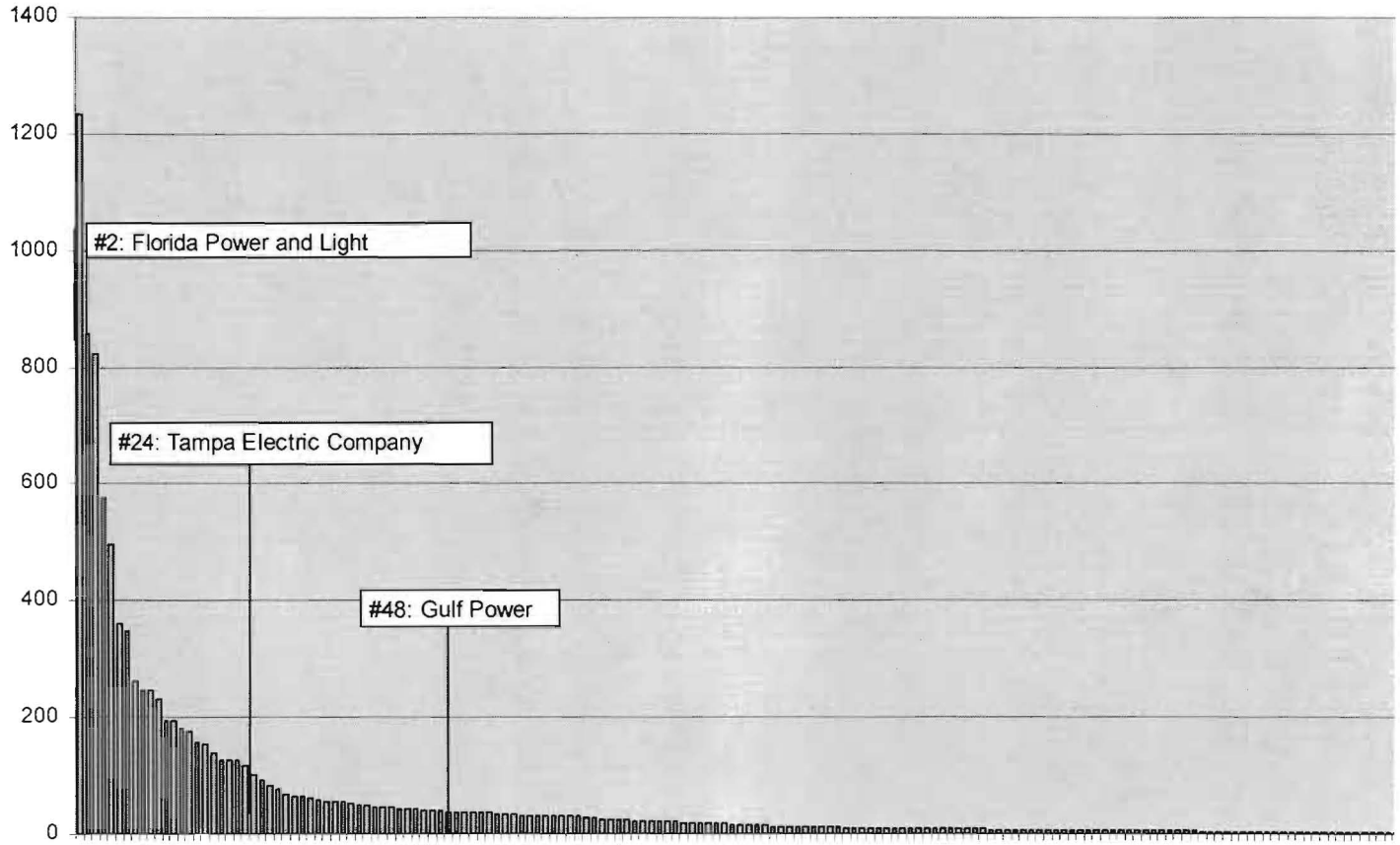
Note: Orlando Utility Company, Florida Public Utilities Company and JEA did not report savings for 2007.

Figure 2: Rankings of US Electric Utilities by their total amount of kW saved by Load Management Programs in 2006



Note: Tampa Electric Company, Orlando Utility Company, Florida Public Utilities Company and JEA, did not report savings for 2006.

Figure 3: Rankings of US Electric Utilities by their total amount of kW saved by Load Management Programs in 2005



Note: From US EIA Form 861 database

Note: Orlando Utility Company, Florida Public Utilities Company, Progress Energy Florida and JEA did not report savings for 2005.

Figure 4: Top Twenty Utilities Ranked by Total Load Management Savings in 2007

Utility Code	Rank	Utility Name	State	2007 Total Peak Reduction (KW)
17609	1	Southern California Edison Co	CA	1,321,000
6455	2	Florida Power Corp	FL	1,096,000
13781	3	Northern States Power Co	MN	923,000
14328	4	Pacific Gas & Electric Co	CA	686,000
6452	5	Florida Power & Light Company	FL	575,000
13337	6	Nebraska Public Power District	NE	497,000
13374	7	Constellation NewEnergy, Inc	MD	398,000
12658	8	Minnkota Power Coop, Inc	ND	387,000
7570	9	Great River Energy	MN	360,000
7140	10	Georgia Power Co	GA	341,000
13687	11	North Carolina Eastern M P A	NC	292,000
15466	12	Public Service Co of Colorado	CO	283,000
9417	13	Interstate Power and Light Co	IA	274,000
15470	14	PSI Energy Inc	IN	251,000
1167	15	Baltimore Gas & Electric Co	MD	234,000
9324	16	Indiana Michigan Power Co	OH	232,000
12341	17	MidAmerican Energy Co	IA	229,000
13780	18	Northern States Power Co	WI	207,000
16572	19	Salt River Project	AZ	188,000
14940	20	PECO Energy Co	PA	179,000

Figure 5: Top Twenty Utilities Ranked by Total Load Management Savings in 2006

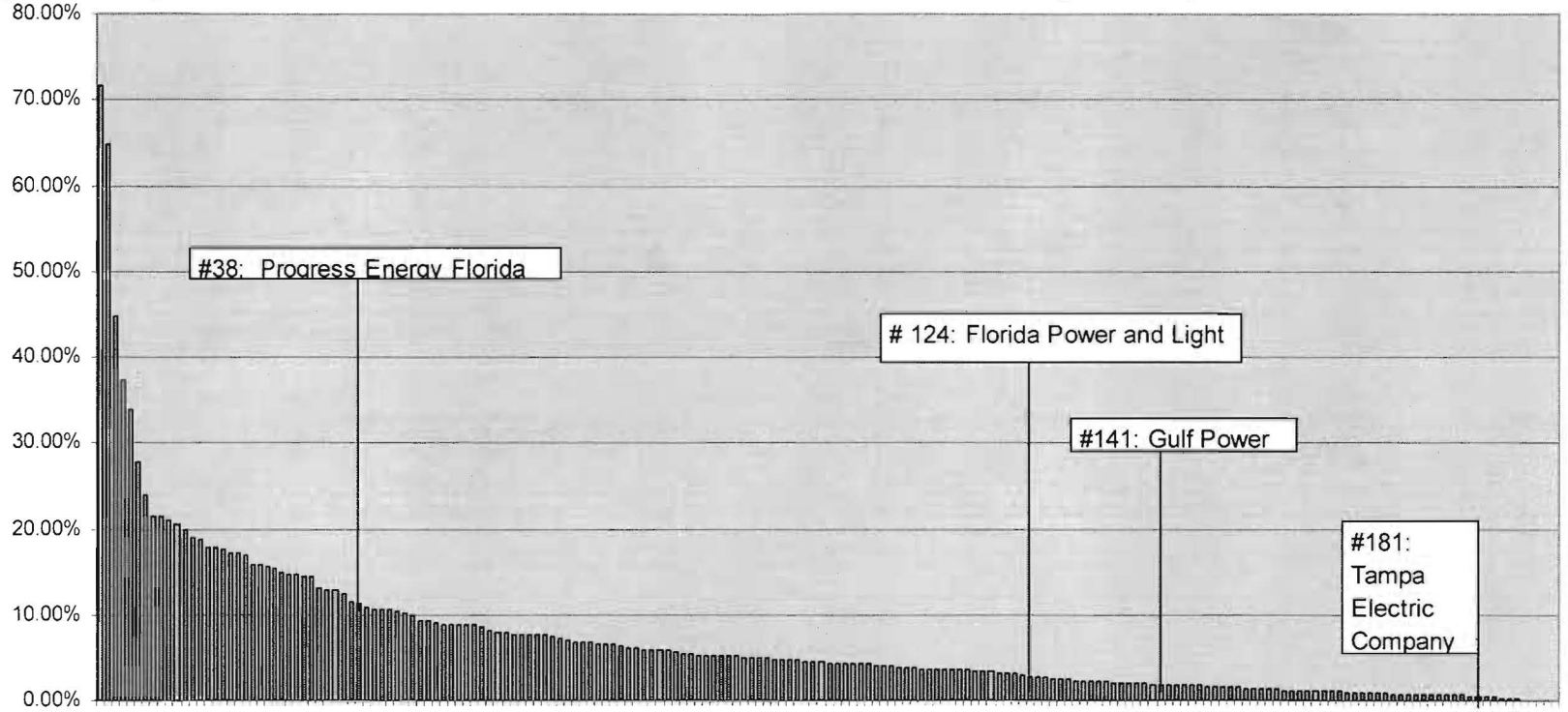
Utility Code	Rank	Utility Name	State	2006 Total Peak Reduction (KW)
6455	1	Progress Energy Florida Inc	FL	1,126,000
17609	2	Southern California Edison Co	CA	1,018,000
13781	3	Northern States Power Co	MN	874,000
14328	4	Pacific Gas & Electric Co	CA	648,000
13337	5	Nebraska Public Power District	NE	560,000
7140	6	Georgia Power Co	GA	362,000
12658	7	Minnkota Power Coop, Inc	ND	320,000
195	8	Alabama Power Co	AL	294,000
13687	9	North Carolina Eastern M P A	NC	285,000
9417	10	Interstate Power and Light Co	IA	279,000
15466	11	Public Service Co of Colorado	CO	266,000
20847	12	Wisconsin Electric Power Co	WI	252,000
16572	13	Salt River Project	AZ	244,000
14006	14	Ohio Power Co	OH	237,000
12341	15	MidAmerican Energy Co	IA	222,000
13780	16	Northern States Power Co	WI	202,000
9324	17	Indiana Michigan Power Co	OH	187,000
14940	18	PECO Energy Co	PA	175,000
14063	19	Oklahoma Gas & Electric Co	OK	156,000
16534	20	Sacramento Municipal Util Dist	CA	135,000

Figure 6: Top Twenty Utilities Ranked by Total Load Management Savings in 2005

Utility Code	Rank	Utility Name	State	2005 Total Peak Reduction (KW)
17609	1	Southern California Edison Co	CA	1,234,000
6452	2	Florida Power & Light Company	FL	858,000
13781	3	Northern States Power Co	MN	822,000
14328	4	Pacific Gas & Electric Co	CA	577,000
13337	5	Nebraska Public Power District	NE	495,000
7140	6	Georgia Power Co	GA	360,000
9417	7	Interstate Power and Light Co	IA	350,000
13687	8	North Carolina Eastern M P A	NC	261,000
15466	9	Public Service Co of Colorado	CO	248,000
15470	10	PSI Energy Inc	IN	247,000
12341	11	MidAmerican Energy Co	IA	232,000
807	12	Arkansas Electric Coop Corp	AR	195,000
20847	13	Wisconsin Electric Power Co	WI	193,000
13780	14	Northern States Power Co	WI	183,000
14940	15	PECO Energy Co	PA	175,000
16534	16	Sacramento Municipal Util Dist	CA	156,000
9324	17	Indiana Michigan Power Co	OH	155,000
20856	18	Wisconsin Power & Light Co	WI	138,000
7004	19	Buckeye Power, Inc	OH	127,000
14006	20	Ohio Power Co	OH	126,000

Exhibit RFS - 4: Ranking of FEECA Utilities by Cumulative kW Savings as Percent of Summer Peak Load

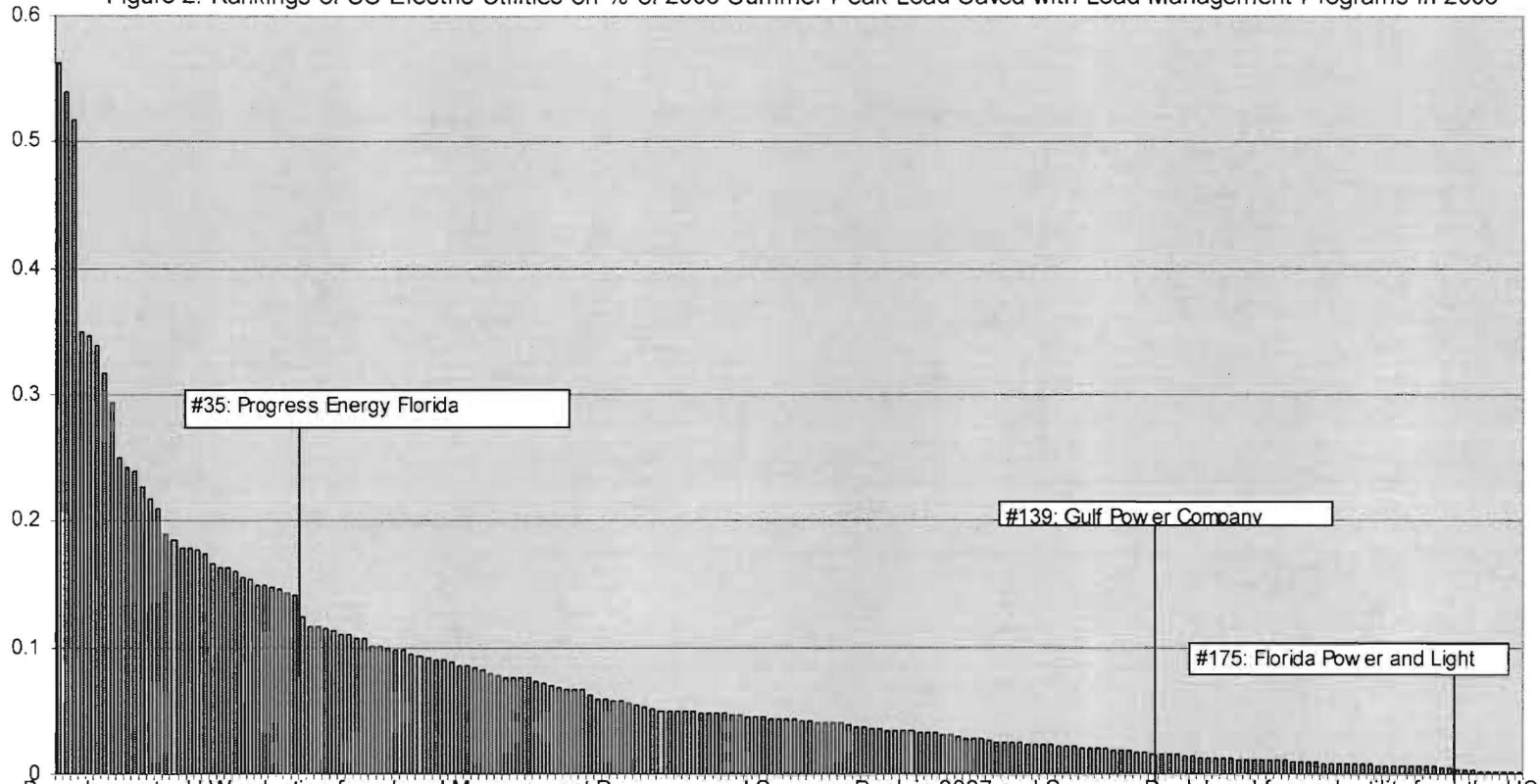
Figure 1:Rankings of US Electric Utilities on % of 2007 Summer Peak Load Saved with Load Management Programs in 2007



Note: Based on actual kW reduction from Load Management Programs and Summer Peak in 2007 and Summer Peak Load for each utility from the US EIA Form 861 Database

Note: Orlando Utility Company, Florida Public Utilities Company and JEA did not report savings for 2007.

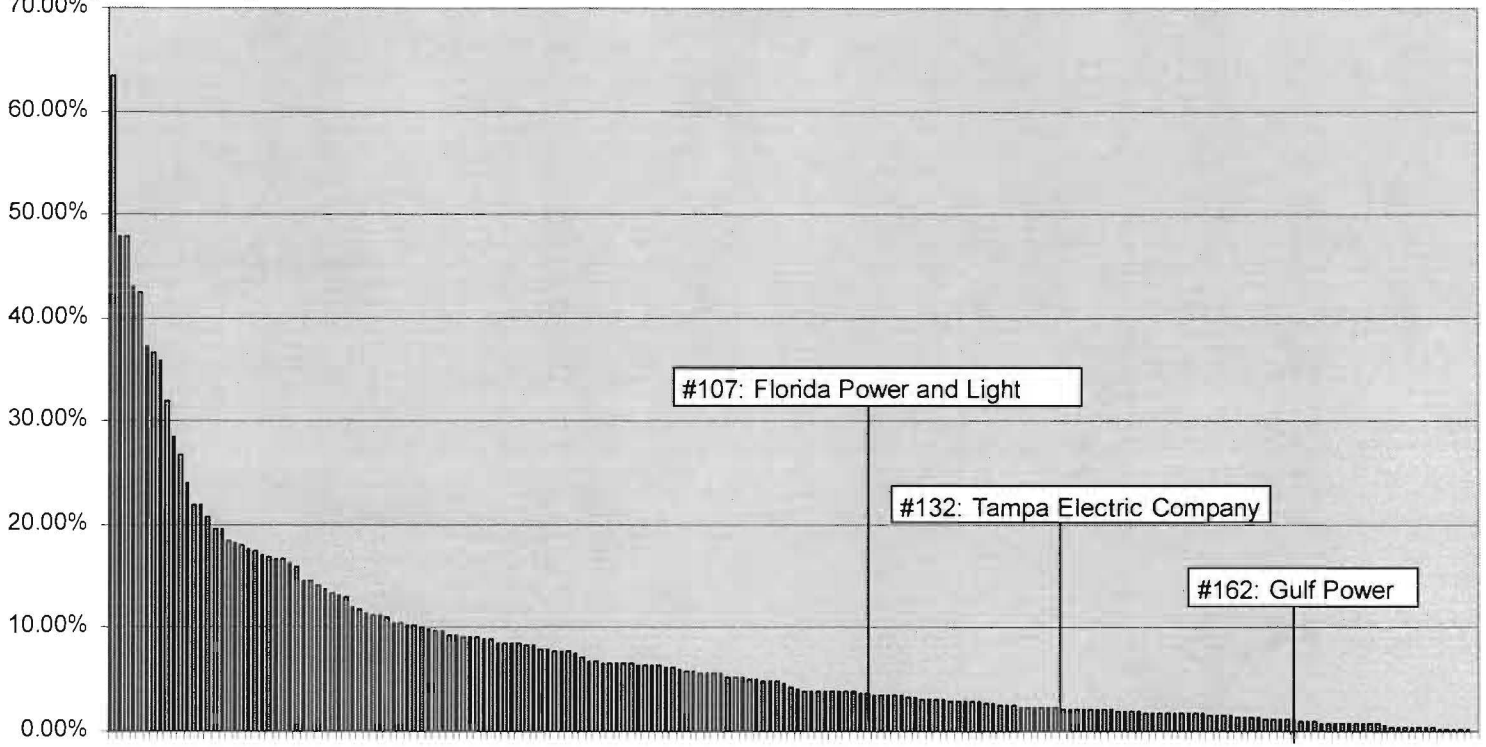
Figure 2: Rankings of US Electric Utilities on % of 2006 Summer Peak Load Saved with Load Management Programs in 2006



Note: Based on actual kW reduction from Load Management Programs and Summer Peak in 2007 and Summer Peak Load for each utility from the US EIA

Note: Tampa Electric Company, Orlando Utility Company, Florida Public Utilities Company and JEA did not report savings for 2006.

Figure 3:Rankings of US Electric Utilities as a % of 2005 Summer Peak Load Saved with Load Management Programs in 2005



Note: Based on actual kW reduction from Load Management Programs in 2007 and Summer Peak Load for each utility from the US EIA Form 861

Note: Orlando Utility Company, Progress Energy Florida, Florida Public Utilities Company and JEA did not report savings for 2005.

Figure 4: Top Twenty Utilities Ranked as a % of 2007 Summer Peak Load Saved with Load Management Programs in 2007

Utility Code	Rank	Utility Name	State	2007 Total Peak Reduction (KW)	2007 Summer Peak (KW)	Annual 2007 Peak Reduction as Percentage of 2007 Summer Peak
12658	1	Minnkota Power Coop, Inc	ND	387,000	540,000	71.67%
12301	2	Nodak Electric Coop Inc	ND	94,000	145,000	64.83%
5780	3	Elkhorn Rural Public Pwr Dist	NE	38,000	85,000	44.71%
13050	4	Mountain Parks Electric, Inc	CO	19,000	51,000	37.25%
213	5	Alaska Electric Light&Power Co	AK	21,000	62,000	33.87%
2890	6	City of Camden	SC	15,000	54,000	27.78%
17040	7	Shelby Electric Coop, Inc	IL	12,000	50,000	24.00%
5552	8	East River Elec Pwr Coop, Inc	SD	88,000	408,000	21.57%
13523	9	City of Newberry	FL	9,000	42,000	21.43%
108	10	Adams-Columbia Electric Coop	WI	26,000	124,000	20.97%
21111	11	Perennial Public Power Dist	NE	14,000	68,000	20.59%
13337	12	Nebraska Public Power District	NE	497,000	2,510,000	19.80%
17868	13	St Croix Electric Coop	WI	7,000	37,000	18.92%
19790	14	Verendrye Electric Coop Inc	ND	13,000	69,000	18.84%
20472	15	Wharton County Elec Coop, Inc	TX	7,000	39,000	17.95%
1251	16	Barron Electric Coop	WI	10,000	56,000	17.86%
5417	17	Wharton County Elec Coop, Inc	WI	6,000	34,000	17.65%
13687	18	North Carolina Eastern M P A	NC	292,000	1,692,000	17.26%
8319	19	Heartland Power Coop	IA	6,000	35,000	17.14%
20997	20	Yellowstone Valley Elec Co-op	MT	10,000	59,000	16.95%
Weighted Average Annual Peak Reduction as a Percent of Annual Summer Peak				1,571,000	6,160,000	25.50%

Figure 5: Top Twenty Utilities Ranked as a % of 2006 Summer Peak Load Saved with Load Management Programs in 2006

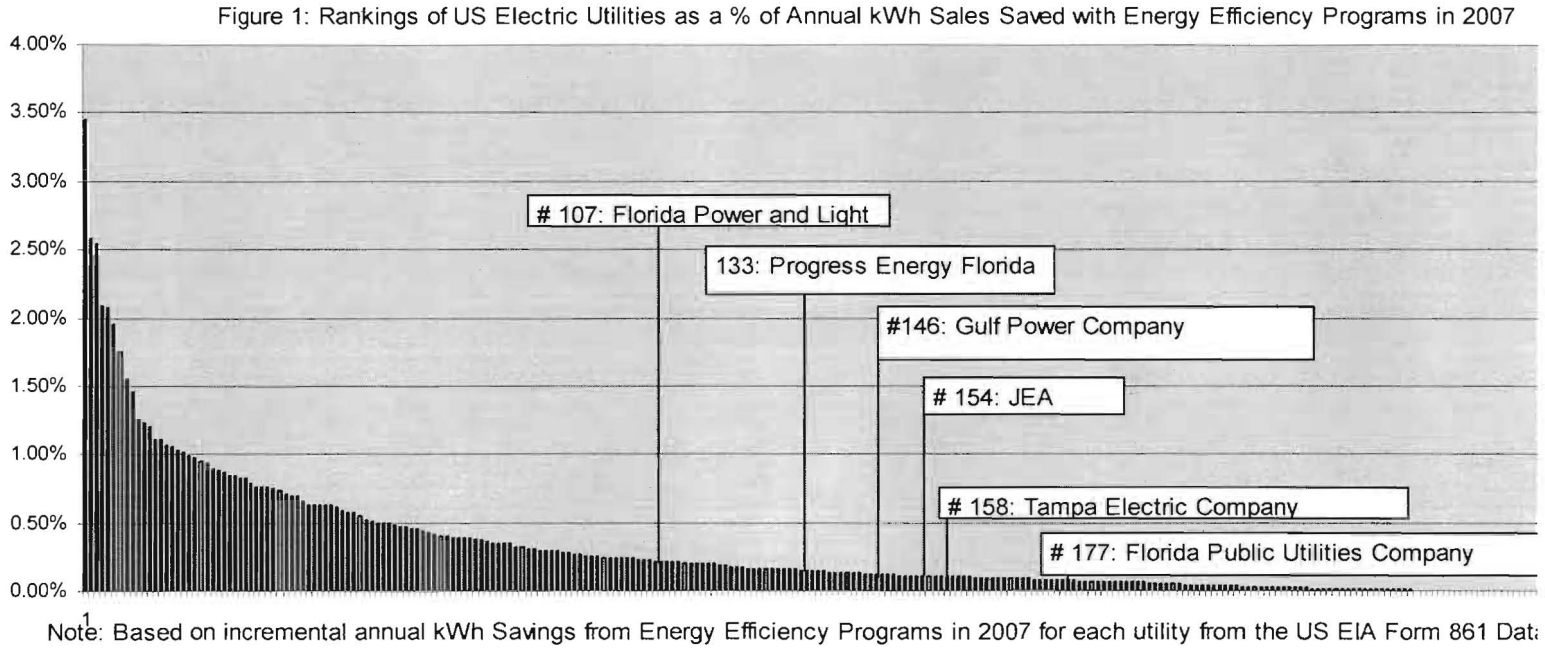
Utility Code	Rank	Utility Name	State	2006 Total Peak Reduction (KW)	2006 Summer Peak (KW)	Annual 2006 Peak Reduction as Percentage of 2006 Summer Peak
12301	1	Nodak Electric Coop Inc	ND	76,000	135,000	56.296%
12658	2	Minnkota Power Coop, Inc	ND	320,000	594,000	53.872%
5780	3	Elkhorn Rural Public Pwr Dist	NE	44,000	85,000	51.765%
407	4	Altamaha Electric Member Corp	GA	55,000	157,000	35.032%
13050	5	Mountain Parks Electric, Inc	CO	18,000	52,000	34.615%
20963	6	Woodruff Electric Coop Corp	AR	42,000	124,000	33.871%
12395	7	Menard Electric Coop	IL	19,000	60,000	31.667%
2890	8	City of Camden	SC	15,000	51,000	29.412%
1233	9	City of Barnesville	MN	1,000	4,000	25.000%
8319	10	Heartland Power Coop	IA	8,000	33,000	24.242%
17040	11	Shelby Electric Coop, Inc	IL	12,000	50,000	24.000%
5552	12	East River Elec Pwr Coop, Inc	SD	84,000	369,000	22.764%
108	13	Adams-Columbia Electric Coop	WI	27,000	124,000	21.774%
13337	14	Nebraska Public Power District	NE	560,000	2,671,000	20.966%
10539	15	La Plata Electric Assn, Inc	CO	25,000	132,000	18.939%
19157	16	Tri-County Electric Coop	MN	12,000	65,000	18.462%
20472	17	Wharton County Elec Coop, Inc	TX	7,000	39,000	17.949%
20997	18	Yellowstone Valley Elec Co-op	MT	10,000	56,000	17.857%
14216	19	City of Osceola	AR	6,000	34,000	17.647%
13687	20	North Carolina Eastern M P A	NC	285,000	1,633,000	17.453%
Weighted Average Annual Peak Reduction as a Percent of Annual Summer Peak				1,626,000	6,468,000	25.14%

Figure 6: Top Twenty Utilities Ranked as a % of 2005 Summer Peak Load Saved with Load Management Programs in 2005

Utility Code	Rank		State	2005 Total Peak Reduction (KW)	2005 Summer Peak (KW)	Annual 2005 Peak Reduction as Percentage of 2005 Summer Peak
12301	1	Nodak Electric Coop Inc	ND	76,000	120,000	63.33%
16971	2	Shakopee Public Utilities Comm	MN	34,000	71,000	47.89%
24949	3	Cass County Electric Coop Inc	ND	66,000	138,000	47.83%
2890	4	City of Camden	SC	22,000	51,000	43.14%
5780	5	Elkhorn Rural Public Pwr Dist	NE	34,000	80,000	42.50%
20963	6	Woodruff Electric Coop Corp	AR	42,000	113,000	37.17%
19157	7	Tri-County Electric Coop	MN	22,000	60,000	36.67%
407	8	Altamaha Electric Member Corp	GA	55,000	153,000	35.95%
108	9	Adams-Columbia Electric Coop	WI	30,000	94,000	31.91%
13050	10	Mountain Parks Electric, Inc	CO	18,000	63,000	28.57%
12395	11	Menard Electric Coop	IL	16,000	60,000	26.67%
17040	12	Shelby Electric Coop, Inc	IL	12,000	50,000	24.00%
5552	13	East River Elec Pwr Coop, Inc	SD	82,000	373,000	21.98%
10539	14	La Plata Electric Assn, Inc	CO	30,000	137,000	21.90%
12894	15	City of Moorhead	MN	15,000	72,000	20.83%
13739	16	Northeast Nebraska P P D	NE	8,000	41,000	19.51%
13337	17	Nebraska Public Power District	NE	495,000	2,539,000	19.50%
20472	18	Wharton County Elec Coop, Inc	TX	7,000	38,000	18.42%
19790	19	Verendrye Electric Coop Inc	ND	10,000	55,000	18.18%
3279	20	Central Power Elec Coop, Inc	ND	32,000	177,000	18.08%
				1,106,000	4,485,000	24.66%

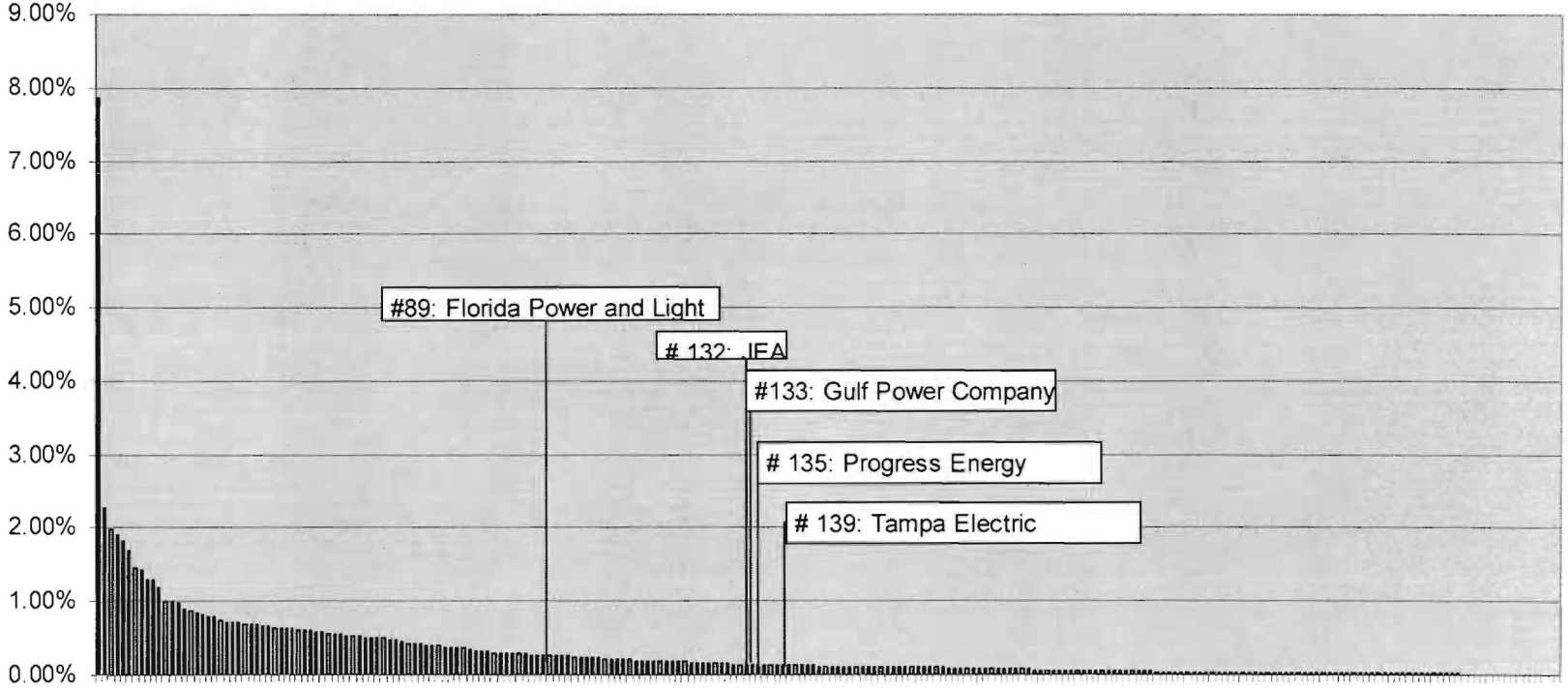
Ranking of FEECA Utilities by Cumulative kW Savings as Percent of Summer Peak Load

Exhibit RFS - 5: Ranking of FEECA Utilities by Incremental Annual kWh Savings as Percent of Sales



Note: Orlando Utility Company did not report savings for 2007.

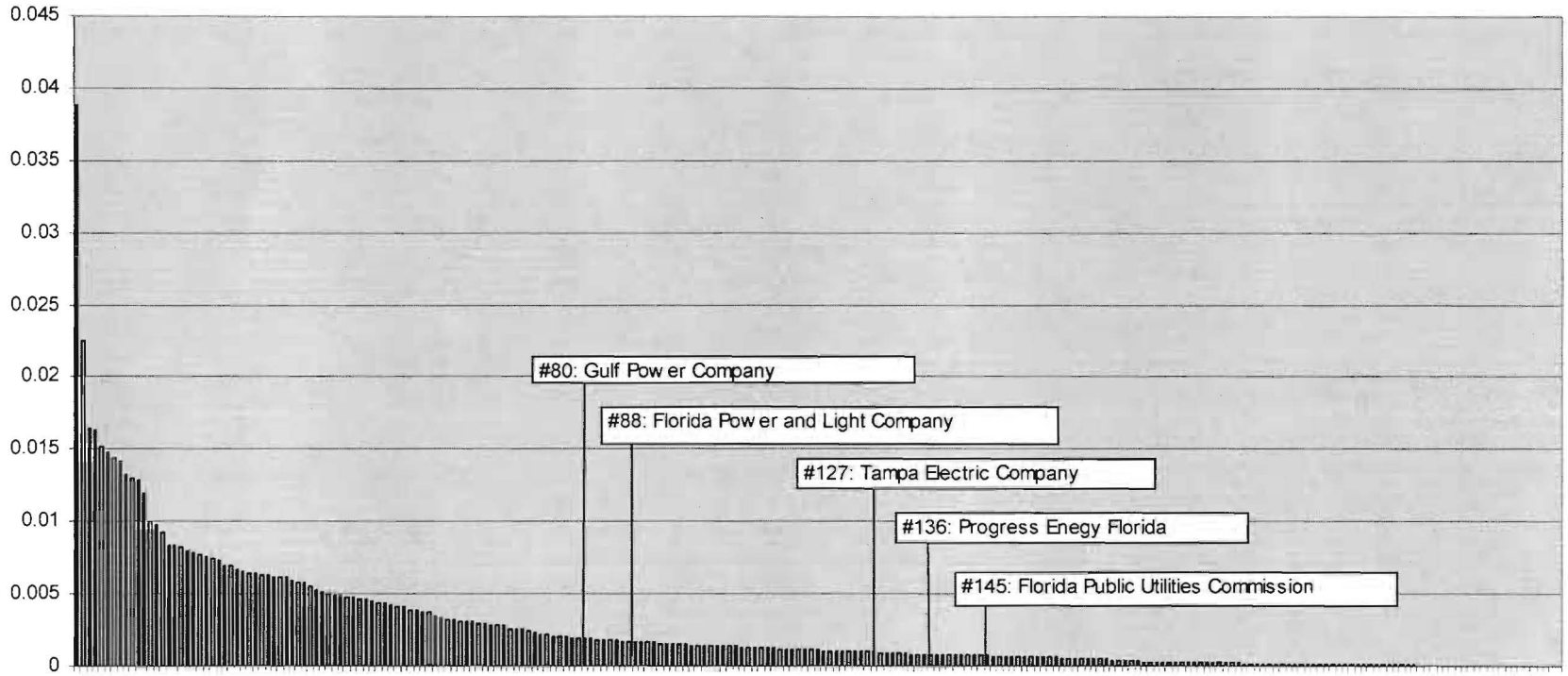
Figure 2: Rankings of US Electric Utilities as a % of Annual kWh Sales Saved with Energy Efficiency Programs in 2006



1 Note: Based on incremental annual kWh Savings from Energy Efficiency Programs in 2006 for each utility from the US EIA Form 861 Database

Note: Orlando Utility Company and Florida Public Utilities Company did not report savings for 2006.

Figure 3: Rankings of US Electric Utilities as a % ofAnnual kWh Sales Saved w ith Energy Efficiency Programs in 2005



Note: Based on incremental annual kWh Savings from Energy Efficiency Programs in 2005 for each utility from the US EIA Form 861

Note: Orlando Utility Company and JEA did not report savings for 2005.

Figure 4: Top Twenty Utilities Ranked by Annual 2007 Energy Savings as a Percentage of Annual kWh Sales

Utility Code	Rank	Utility Name	State	2007 Energy Efficiency Savings (kWh) Incremental	2007 Annual Retail kWh Sales	Annual 2007 Energy Efficiency Savings as a % of Annual kWh Sales
2182	1	City of Breckenridge	CO	1,462,000	42,336,000	3.45%
7303	2	Glidden Rural Electric Coop	IA	2,606,000	101,177,000	2.58%
2548	3	Burlington City of	VT	9,276,000	364,586,000	2.54%
14328	4	Pacific Gas & Electric Co	CA	1,662,875,000	79,450,903,000	2.09%
20806	5	City of Windom	MN	1,480,000	71,208,000	2.08%
17609	6	Southern California Edison Co	CA	1,551,503,000	79,505,231,000	1.95%
4176	7	Connecticut Light & Power Co	CT	281,367,000	16,054,317,000	1.75%
11804	8	Massachusetts Electric Co	MA	195,357,000	12,543,637,000	1.56%
19497	9	United Illuminating Co	CT	86,011,000	5,917,448,000	1.45%
10768	10	Laurens Electric Coop, Inc	SC	12,519,000	996,410,000	1.26%
20455	11	Western Massachusetts Elec Co	MA	25,873,000	2,098,952,000	1.23%
16181	12	Rochester Public Utilities	NY	15,815,000	1,307,897,000	1.21%
12312	13	Merced Irrigation District	CA	4,709,000	422,674,000	1.11%
6374	14	Fitchburg Gas & Elec Light Co	NH	3,049,000	276,004,000	1.10%
405	15	City of Alta	IA	166,000	15,587,000	1.06%
24590	16	Unitil Energy Systems	CT	9,983,000	941,779,000	1.06%
15500	17	Puget Sound Energy Inc	WA	222,310,000	21,626,537,000	1.03%
1015	18	Austin Energy	TX	117,649,000	11,546,977,000	1.02%
6022	19	Eugene City of	OR	26,914,000	2,728,684,000	0.99%
15776	20	Reedy Creek Improvement Dist	FL	11,607,000	1,183,620,000	0.98%
Weighted Average Annual kWh Savings as a Percent of Annual Retail kWh Sales				4,230,924,000	236,012,344,000	1.79%

Figure 5: Top Twenty Utilities Ranked by Annual 2006 Energy Savings as a Percentage of Annual kWh Sales

Utility Code	Rank	Utility Name	State	2006 Energy Effciency Savings (kWh) Incremental	2006 Annual Retail kWh Sales	Annual 2006 Energy Efficiency Savings as a % of Annual kWh Sales
14534	1	City of Pasadena	CA	96,632,000	1,229,963,000	7.86%
7303	2	Glidden Rural Electric Coop	IA	2,243,000	98,493,000	2.28%
11804	3	Massachusetts Electric Co	MA	256,956,000	12,990,328,000	1.98%
20455	4	Western Massachusetts Elec Co	MA	43,298,000	2,276,376,000	1.90%
2548	5	Burlington City of	VT	6,604,000	359,268,000	1.84%
2182	6	City of Breckenridge	CO	682,000	40,123,000	1.70%
12312	7	Merced Irrigation District	CA	5,451,000	375,279,000	1.45%
13214	8	Narragansett Electric Co	RI	96,048,000	6,707,930,000	1.43%
10768	9	Laurens Electric Coop, Inc	SC	12,433,000	951,468,000	1.31%
19497	10	United Illuminating Co	CT	76,242,000	5,919,000,000	1.29%
4176	11	Connecticut Light & Power Co	CT	264,916,000	22,109,070,000	1.20%
14328	12	Pacific Gas & Electric Co	CA	779,603,000	76,817,131,000	1.01%
17609	13	Southern California Edison Co	CA	787,563,000	78,863,143,000	1.00%
3477	14	Chicopee City of	MA	4,438,000	458,566,000	0.97%
6374	15	Fitchburg Gas & Elec Light Co	NH	2,548,000	283,887,000	0.90%
24590	16	Unitil Energy Systems	NH	9,210,000	1,048,943,000	0.88%
9417	17	Interstate Power and Light Co	IA	134,177,000	16,026,131,000	0.84%
16181	18	Rochester Public Utilities	MN	10,417,000	1,266,716,000	0.82%
17166	19	Sierra Pacific Power Co	NV	69,404,000	8,726,238,000	0.80%
15500	20	Puget Sound Energy Inc	WA	166,254,000	21,091,533,000	0.79%
Weighted Average Annual kWh Savings as a Percent of Annual Retail kWh Sales				2,562,817,000	236,548,053,000	1.08%

Figure 6: Top Twenty Utilities Ranked by Annual 2005 Energy Savings as a Percentage of Annual kWh Sales

Utility Code	Rank	Utility Name	State	2005 Energy Efficiency Savings (kWh) Incremental	2005 Annual retail kWh Sales	Annual 2005 Energy Efficiency Savings as a % of Annual kWh Sales
10768	1	Laurens Electric Coop, Inc	SC	35,951,000	924,781,000	3.89%
7303	2	Glidden Rural Electric Coop	IA	2,008,000	89,156,000	2.25%
17609	3	Southern California Edison Co	CA	1,239,175,000	75,301,581,000	1.65%
14328	4	Pacific Gas & Electric Co	CA	1,191,221,000	72,727,705,000	1.64%
12647	5	Minnesota Power Inc	MN	137,033,000	9,051,942,000	1.51%
1998	6	Boston Edison Co	MA	160,406,000	10,888,695,000	1.47%
4089	7	Commonwealth Electric Co	MA	31,760,000	2,210,570,000	1.44%
21013	8	City of Worthington	MN	2,634,000	186,896,000	1.41%
19497	9	United Illuminating Co	CT	80,931,000	6,106,000,000	1.33%
20455	10	Western Massachusetts Elec Co	MA	40,238,000	3,113,996,000	1.29%
11804	11	Massachusetts Electric Co	MA	199,421,000	15,491,461,000	1.29%
6374	12	Fitchburg Gas & Elec Light Co	NH	3,986,000	332,612,000	1.20%
1015	13	Austin Energy	TX	111,000,000	10,997,914,000	1.01%
4176	14	Connecticut Light & Power Co	CT	236,818,000	24,125,638,000	0.98%
13214	15	Narragansett Electric Co	RI	66,093,000	7,115,094,000	0.93%
12312	16	Merced Irrigation District	CA	2,905,000	345,224,000	0.84%
15500	17	Puget Sound Energy Inc	WA	171,390,000	20,465,557,000	0.84%
6022	18	Eugene City of	OR	22,030,000	2,663,174,000	0.83%
2886	19	Cambridge Electric Light Co	MA	8,845,000	1,117,811,000	0.79%
13441	20	New Hampshire Elec Coop Inc	NH	5,878,000	747,260,000	0.79%
Weighted Average Annual kWh Savings as a Percent of Annual Retail kWh Sales				3,749,723,000	264,003,067,000	1.42%

Exhibit RFS - 6: Ranking of Florida Utilities by Incremental Annual and Cumulative kWh Savings as a Percentage of Total Sales

Table 1: 2007 Incremental Annual kWh Energy Savings by Florida Utilities as Reported in the EIA Form 861 Database

Rank:	Utility Name	Incremental Savings	Total Retail Sales	%
1	Reedy Creek Improvement Dist	11,607	1,183,620	0.9806%
2	Gainesville Regional Utilities	14,327	1,876,933	0.7633%
3	City of Tallahassee	9,465	2,755,874	0.3434%
4	Florida Power & Light Company	208,608	105,274,631	0.1982%
5	Lee County Electric Coop, Inc	5,769	3,621,892	0.1593%
6	Florida Power Corp	51,413	39,281,638	0.1309%
7	Gulf Power Co	12,353	11,520,888	0.1072%
8	JEA	13,000	12,844,424	0.1012%
9	Tampa Electric Co	18,581	19,532,753	0.0951%
10	Sumter Electric Coop, Inc	1,918	2,677,554	0.0716%
11	Florida Public Utilities Co	574	812,897	0.0706%
12	Clay Electric Cooperative, Inc	584	3,195,230	0.0183%
13	City of Lakeland	9	2,928,568	0.0003%

Note: Orlando Utility Company did not report savings in EIA Form 861 for 2007.

Table 2: 2006 Incremental Annual kWh Energy Savings by Florida Utilities as Reported in the EIA Form 861 Database

Rank:	Utility Name	Incremental Savings	Total Retail Sales	%
1	Reedy Creek Improvement Dist	11,607	1,172,862	0.990%
2	Gainesville Regional Utilities	14,327	1,849,368	0.775%
3	City of Tallahassee	9,465	2,713,901	0.349%
4	Florida Power & Light Co	208,608	103,652,914	0.201%
5	Lee County Electric Coop, Inc	5,769	3,505,338	0.165%
6	Progress Energy Florida Inc	51,413	39,431,837	0.130%
7	Gulf Power Co	12,353	11,428,880	0.108%
8	JEA	13,000	12,799,959	0.102%
9	Tampa Electric Co	18,581	19,025,064	0.098%
10	Sumter Electric Coop, Inc	1,918	2,570,910	0.075%
11	Florida Public Utilities Co	574	848,718	0.068%
12	Clay Electric Cooperative, Inc	584	3,154,987	0.019%

Note: Orlando Utility Company did not report savings in EIA Form 861 for 2006.

Table 3: 2005 Incremental Annual kWh Energy Savings by Florida Utilities as Reported in the EIA Form 861 Database

Rank:	Utility Name	Incremental Savings	Total Retail Sales	%
1	City of Tallahassee	11,160	2,723,848	0.410%
2	Gulf Power Co	22,657	11,238,896	0.202%
3	Gainesville Regional Utilities	3,566	1,853,587	0.192%
4	Florida Power & Light Company	183,925	101,979,583	0.180%
5	Sumter Electric Coop, Inc	3,436	2,425,467	0.142%
6	Lee County Electric Coop, Inc	3,771	3,339,388	0.113%
7	Tampa Electric Co	18,550	18,911,837	0.098%
8	Progress Energy Florida Inc	32,583	39,176,586	0.083%
9	Florida Public Utilities Co	610	824,645	0.074%
10	Reedy Creek Improvement Dist	749	1,219,849	0.061%
11	City of Lakeland	9	2,808,851	0.000%

Note: Orlando Utility Company and JEA did not report savings in EIA Form 861 for 2005.

Exhibit RFS - 7: Recommended Measures to be Added to the Potential Studies

1.0: Residential Measures

The list of residential measures assessed in the Florida Technical Potential Study was compared to measure lists of comparable studies. The following measures, found in other technical potential studies, were not included in the Florida study.

The six items in Table 1 could contribute to a rather large percentage of the technical potential. For example, these listed measures account for 19.6% of the residential maximum achievable cost-effective potential according to a New Hampshire study (2009). These measures are common, commercially available measures that are minimally affected by climate and could be applicable to the Florida residential energy market.

Table 1: Recommended List of Residential Measures to be Added to Technical Potential Studies

Measure	Percent of Maximum Achievable Cost-Effective potential in NH Study
Smart Strips/Phantom Load Switch	9.2%
Second refrigerator turn-in	7.8%
Light Emitting Diode (LED) lighting	0.9%
Programmable thermostats	0.8%
Second freezer turn-in	0.7%
Tree shading	0.2%
TOTAL	**19.6%**

The following measures listed below are not featured in the list of potential energy savings measures in Itron's Florida study and, based on their inclusion in other state or utility potential studies, may also be worthy of consideration.

- Zero-energy homes
- T-5 lighting
- Daylighting/Solar tubes
- Dimmable CFLs
- LED Holiday Lighting

2.0: Commercial Measures

The list of commercial measures assessed in the Florida technical potential study was compared to measure lists of comparable studies. The following measures, found in other technical potential studies, were not included in the Florida study:

Appliances

- Energy Star Compliant Single-Door Refrigerator
- Computers/Office Equipment
- TVs – Energy Star over Standard
- Energy Efficiency "Smart" Power Strip for PC/Monitor/Printer

Water Heating

- Commercial Dishwashers
- Commercial Clothes Washers
- Booster Water Heater
- Point of Use Water Heater
- Low Flow Faucet/Shower Adaptors

Pools

- Energy Efficient Pool Pumps
- High Efficiency Spas/Hot Tubs
- Solar Pool Heater
- Heat Pump Pool Heater
- Temperature Control
- Pool Cover
- Liquid Pool Cover

Building Envelop

- Integrated Building Design
- Energy Efficient Windows

Ventilation

- Dual Enthalpy Economizer (from Fixed Damper and Dry Bulb)

Space Cooling

- Variable Refrigerant Volume/Flow
- Dedicated Outdoor Air System
- Radiant Ceiling Cooling
- HVAC Controls
- Programmable Thermostat
- LEED Enhanced Commissioning

Cooking

- High Efficiency Steamer
- High Efficiency Holding Cabinet
- Demand Ventilation Control
- Induction Cook-tops

Lighting

- Specialty Fixture – Halogen Infra Red Bulb
- Specialty Fixture – Integrated Ballast 25W MH
- Specialty Fixture – Induction Fluorescent 23W
- Specialty Fixture – Metal Halide Track
- Cold Cathode Screw-in
- LED Screw-in
- LED Christmas type – decorative lighting
- Efficient Lighting Design

Refrigeration

- Vending Miser for Non-Refrigerated Machines
- Refrigeration Economizer
- Commercial Reach-In Cooler
- Commercial Reach-In Freezer
- Commercial Ice-Maker
- Zero-Energy Doors – Coolers
- Zero-Energy Doors – Freezers
- Door Heater Controls
- Discuss Compressor
- Scroll Compressor
- Floating Heat Pressure Control

Compressed Air

- Compressed Air – Non-Controls
- Compressed Air – Controls
- Transformers
- Energy Efficiency Transformers

Space Heating

- Water Source Heat Pump

Non-HVAC Motors

- Efficient Motors
- Variable Frequency Drives (VFD)

Exhibit RFS - 8: Free Ridership Estimates – GDS Study

A free rider is a "program participant who would have implemented the program measure or practice in the absence of the program."[1] Free-ridership rates are difficult to determine, greatly due to the tendency of consumers to falsely agree that they would have selected energy efficient products regardless of the current program in place. This misinformation is intensified when more than one lighting program is active in one area. Consumers who consider themselves free-riders in one program might have learned about measures, such as compact fluorescent light bulbs, through a different program. Thus they would not be free-riders after all.

Although difficult to determine, free-ridership rates give insight into the overall effectiveness of an energy efficiency program. Low rates show that the population is not familiar with the promoted product, suggesting that high sales of that product are a result of the program rather than pure consumer preference. Higher rates can be indicative of a biased free-ridership survey, or they can suggest that the program is paying out unneeded incentives.

Of the nine organizations surveyed in addition to Efficiency Maine, six reported current free-ridership rates. The average rate of these six is just under 6%. Instead of a direct free-ridership rate, Pacific Gas and Electric reported a net-to-gross ratio of 0.8. Below, Table 1 summarizes these results.

Table 1: Free Ridership Rates

Programs	Free-Ridership Rates
Connecticut Light and Power	8% for bulbs, 3% for fixtures and portables
Efficiency Maine	Will be available in Feburary, 2007
Efficiency Vermont	10%
National Grid/Mass. Electric*	10%
Northwest Energy Efficiency Alliance	N/A
NSTAR*	6%
NYSERDA	6.50%
Pacific Gas and Electric	Net-to-gross ratio: 0.8
Public Service Company of New Hampshire	N/A
Wisconsin Focus on Energy	0.60%

[1] The California Evaluation Framework, Prepared for the California Public Utilities Commission and the Project Advisory Group, Tech Market Works, June 2004.

Exhibit RFS - 8:

Exhibit RFS - 9: Potential Study Results Comparison

		Technical Potential				Max Acheivable Potential				Achievable Cost Effective Potential			
	Year for which results are reported	Res	Comm	Ind	Total	Res	Comm	Ind	Total	Res	Comm	Ind	Total
FL	**2019** [19]	**33.60%**	**11.25%**		**19.22%**	**2.19%**	**1.11%**		**1.49%**	**0.89%**	**0.47%**		**0.62%**
U.S.	2020 [20]								**10.14%**	4.09%	5.67%	4.42%	**4.78%**
U.S.	2030 [20]								**11.20%**	7.81%	8.84%	7.59%	**8.54%**
Downstate NY (Load Zones H, I, J, K)	2018 [16]									16%	19%	19%	**19%**
CT (2004)	2012 [1]	21%	25%	20%	**24%**	17%	17%	17%	**17%**	13%	14%	13%	**13%**
CA (2006)	2016 [2]	39%	27%	18%	**30%**					13%	6%	10%	**10%**
FL	2017 [3]					22%	30%	24%	**26%**				
GA	2015 [4]	33%	33%	17%	**29%**	21%	22%	15%	**20%**	9%	10%	7%	**9%**
Big Rivers (KY)	2015 [5]	26%		11%		18%		9%		16%	10%	9%	**12%**
Mass.	2007 [6]									31%	21%	21%	**24%**
North Carolina (2006)	2016 [7]	40%	32%	24%	**33%**	20%	22%	18%	**20%**	17%	12%	12%	**14%**
North Carolina (2007)	2026 [17]				**31%**								**19%**
State of New York	2012 [8]	37%	41%	22%	**37%**	26%	38%	16%	**30%**				
NY/NJ/ PA	2011 [9]					35%		41%					
RI	2018 [18]	34%	32%	14%	**28%**	28%	28%	14%	**24%**	9%	10%	11%	**9%**
OR	2013 [10]	28%	32%	35%	**31%**								
Puget Sound (WA)	2023 [11]					17%	7%	0%	**12%**	7%	6%	0%	**6%**
Southwest	2020 [12]	26%	37%	33%	**33%**								
TX	2017 [13]					32%	39%	26%	**33%**				
VT	2015 [14]	40%	40%	21%	**35%**	26%	24%	15%	**22%**	21%	21%	15%	**19%**
WI	2015 [15]									4.9%	4.8%		**9.2%**
		Technical Potential				**Max Acheivable Potential**				**Proposed Goals**			
FPL	2019	36.6%	18.3%		**26.8%**	1.43%	2.2%		**1.8%**	0.59%	0.87%		**0.74%**
TECO	2019	23.8%	2.9%		**5.4%**	1.06%	0.2%		**0.3%**	0.47%	0.15%		**0.19%**
OUC	2019	29.8%	18.9%		**23.0%**	0.98%	1.0%		**1.0%**	0.00%	0.00%		**0.00%**
FPU	2019	39.5%	26.1%		**31.8%**	1.54%	1.7%		**1.6%**	0.00%	0.00%		**0.00%**
Progress	2019	35.2%	23.4%		**30.1%**	5.16%	2.2%		**3.9%**	2.08%	0.72%		**1.50%**
GULF	2019	25.8%	18.6%		**22.3%**	2.02%	1.3%		**1.7%**	1.14%	0.98%		**1.06%**
JEA	2019	32.3%	14.1%		**21.9%**	1.03%	0.9%		**1.0%**	0.00%	0.00%		**0.00%**

Notes:

1. GDS Associates, "Independent Assessment of Conservation and Energy Efficiency Potential for Connecticut and the Southwest Connecticut Region, Appendix B," June 2004.

2. Itron et al., "California Energy Efficiency Potential Study," vol. 1, May 2006. Achievable cost effective potential is defined as a market potential scenario where incentives are the average between 2004 incentive levels and full measure cost.

3. R. Neal Elliott et al., "Potential for Energy Efficiency and Renewable Energy to Meet Florida's Growing Electricity Needs," ACEEE report E072, February 2007.

4. Georgia Environmental Facilities Authority, "Assessment of Energy Efficiency Potential in Georgia - Final Report," prepared by ICF Consulting, May 5, 2005.

5. "The Maximum Achievable Cost Effective Potential for Electric Energy Efficiency In the Service Territory of the Big Rivers Electric Corporation," prepared for Big Rivers Electric Cooperative by GDS Associates, November 2005.

6. "Remaining Electric Energy Efficiency Opportunities in Massachusetts: Final Report," prepared for program administrators and Massachusetts Division of Energy Resources by RLW Analytics, Inc. and Shel Feldman Management Consulting, June 7, 2001.

7. GDS Associates, "A Study of the Feasibility of Energy Efficiency as an Eligible Resource as Part of a Renewable Portfolio Standard for the State of North Carolina," December 2006.

8. New York State Energy Research and Development Authority, "Energy Efficiency and Renewable Energy Resource Development Potential in New York State - Final Report," prepared by Optimal Energy, Inc., August, 2003.

9. ACEEE, "Energy Efficiency and Economic Development in New York, New Jersey, and Pennsylvania," 1997.

10. "Energy Efficiency and Conservation Measure Resource Assessment for the Residential, Commercial, Industrial, and Agricultural Sectors," prepared for the Energy Trust of Oregon by Ecotope, Inc., ACEEE, and the Tellus Institute, January 2003.

11. "Assessment of Long-Term Electricity and Natural Gas Conservation Potential in Puget Sound Energy Service Area 2003--2024," prepared for Puget Sound Energy by KEMA-XENERGY/Quantec, August 2003.

12. "The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest," prepared for Hewlett Foundation Energy Series by Southwest Energy Efficiency Project, November 2002.

13. ACEEE, "Potential for Energy Efficiency, Demand Response, and Onsite Renewable Energy to Meet Texas' Growing Electricity Needs," ACEEE report E073, March 2007.

14. Vermont Department of Public Service, "Vermont Electric Energy Efficiency Potential Study, Final Report," prepared and submitted by GDS Associates, Inc., January 2007. This study includes fuel shifting programs to shift residential customers away fr

15. Energy Center of Wisconsin, "Energy Efficiency & Customer-Sited Renewable Energy: Achievable Potential in Wisconsin: 2006–2015," November 2005. Wisconsin reported combined results for commercial and industrial sectors as C&I.

16. GDS Associates, "Energy Efficiency Potential in the Downstate Region of New York", prepared for New York Communities Againts Regional Interconnect", January 2006, filed in New York Public Service Commission Case No. 06-T-0650.

17. Forefront Economics, "Duke Energy Carolinas, DSM Action Plan: North Carolina Report", August 31, 2007.

18. KEMA, Inc., "Rhode Island Energy Efficiency and Resource Management Council: Opportunity Report - Phase 1"; submitted to the Rhode Island Public Utilities Commission, July 15, 2008.

19. Itron, "Technical Potential for Electric Energy and Peak Demand Savings in Florida." - DRAFT FINAL REPORT: March 4, 2009. NOTE: Represents savings as percent of 2019 forecasted baseline sales.

20. EPRI, "Assessment of Achievable Potential from Energy Efficiency and Demand Response Programs in the U.S. (2010-2030)." January, 2009. - Reporting Realistic Achievable Potential & Maximum Achievable Potential.

Exhibit RFS - 10: National Action Plan for Energy Efficiency – *Understanding Cost-Effectiveness of Energy Efficiency Programs* – Use of Cost-Effectiveness Tests by States

State	Requires All	Primary Test	TRC	SCT	PCT	PACT	RIM	Other	Non-Specific
AK									•
AL									•
AR			•		•	•	•		
AZ*		SCT		•					
CA		TRC	•			•			
CO			•	•					
CT		PACT	•			•			
DC							•	•	
DE*			•						
FL		RIM	•		•		•		
GA			•	•	•		•		
HI	•		•	•	•	•	•		
IA				•	•	•	•		
ID†			•	•	•	•			
IL			•						
IN	•		•	•	•	•	•		
KS*			•				•		
KY									•
LA									•
MA		TRC	•						
MD*									•
ME		SCT		•					
MI									•
MN	•	SCT	•	•	•	•	•		
MO		TRC	•			•			
MS									•
MT			•	•					
NC									•
ND									•
NE									•
NH		TRC	•				•		
NJ								•	
NM		TRC	•						
NV				•		•		•	
NY		TRC	•						
OH									•
OK									•
OR*				•		•			
PA									•
RI								•	
SC									•
SD									•
UT		PACT	•			•			
VA	•		•	•	•	•	•		
VT		SCT		•					
TN									•
TX		PACT				•			
WA								•	
WI		SCT		•					
WV									•
WY									•

* Proposed or not yet codified in statute/Commission Order.
† Allows any or all tests, though the RIM may not be used as primary or limiting cost-effectiveness test.

Source: Regulatory Assistance Project (RAP) analysis.

Exhibit RFS - 11: Summary of Benefits and Costs Included in Each Cost-Effectiveness Test

Table 1: National Action Plan for Energy Efficiency – *Understanding Cost-Effectiveness of Energy Efficiency Programs* - Summary of Benefits and Costs Included in Each Cost-Effectiveness Test

Test	Benefits	Costs
PCT	*Benefits and costs from the perspective of the customer installing the measure*	
	▪ Incentive payments ▪ Bill savings ▪ Applicable tax credits or incentives	▪ Incremental equipment costs ▪ Incremental installation costs
PACT	*Perspective of utility, government agency, or third party implementing the program*	
	▪ Energy-related costs avoided by the utility ▪ Capacity-related costs avoided by the utility, including generation, transmission, and distribution	▪ Program overhead costs ▪ Utility/program administrator incentive costs ▪ Utility/program administrator installation costs
RIM	*Impact of efficiency measure on non-participating ratepayers overall*	
	▪ Energy-related costs avoided by the utility ▪ Capacity-related costs avoided by the utility, including generation, transmission, and distribution	▪ Program overhead costs ▪ Utility/program administrator incentive costs ▪ Utility/program administrator installation costs ▪ Lost revenue due to reduced energy bills
TRC	*Benefits and costs from the perspective of all utility customers (participants and non-participants) in the utility service territory*	
	▪ Energy-related costs avoided by the utility ▪ Capacity-related costs avoided by the utility, including generation, transmission, and distribution ▪ Additional resource savings (i.e., gas and water if utility is electric) ▪ Monetized environmental and non-energy benefits (see Section 4.9) ▪ Applicable tax credits (see Section 6.4)	▪ Program overhead costs ▪ Program installation costs ▪ Incremental measure costs (whether paid by the customer or utility)
SCT	*Benefits and costs to all in the utility service territory, state, or nation as a whole*	
	▪ Energy-related costs avoided by the utility ▪ Capacity-related costs avoided by the utility, including generation, transmission, and distribution ▪ Additional resource savings (i.e., gas and water if utility is electric) ▪ Non-monetized benefits (and costs) such as cleaner air or health impacts	▪ Program overhead costs ▪ Program installation costs ▪ Incremental measure costs (whether paid by the customer or utility)

Source: Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects.

Table 2: Components of DSM Benefit/Cost Tests

	PARTICIPANT TEST	RATE IMPACT MEASURE TEST	TOTAL RESOURCE COST TEST	UTILITY COST TEST	SOCIETAL TEST
BENEFITS:					
Reduction in Customer's Utility Bill	X				
Incentive Paid By Utility	X				
Any Tax Credit Received	X		X		
Avoided Supply Costs		X	X	X	X
Avoided Participant Costs	X		X		X
Participant Payment to Utility (if any)		X		X	
External Benefits					X
COSTS:					
Utility Costs (Including utility incentives)		X	X	X	X
Participant Costs	X		X		X
External Costs					X
Lost Revenues		X			

Exhibit RFS - 12:

Exhibit RFS - 12: GDS Survey - Summary of the Primary Benefit-Cost Tests Used in Each State

Table 1: Cost-Effectiveness Test Required[2] (by law or regulation)

State	TRC	SCT	PCT	PAC	RIM	OTHER	ALL	N/A
Alabama								x
Alaska								x
Arizona		x						
Arkansas							x	
California	x							
Colorado	x							
Connecticut				x				
DC					x			
Delaware								x
Florida			x		x			
Georgia							x	
Hawaii							x	
Idaho								x
Illinois	X							
Indiana							x	
Iowa		x						
Kansas							x	
Kentucky								x
Louisiana								x
Maine		x						
Maryland								x
Massachusetts	x							
Michigan								x
Minnesota		x						
Mississippi								x
Missouri	X							
Montana		x						
Nebraska								x
Nevada							x	
New Hampshire	x							
New Jersey								x
New Mexico	x							
New York	x							

[2] The study determined a test to be a 'required' if there is a statute, law, regulation, rule or commission order indicating a particular test that must be met before DSM measures or programs would be considered a resource, either explicit or implied through a list of cost-effectiveness test elements or commission precedent.

State	TRC	SCT	PCT	PACT	RIM	OTHER	ALL	N/A
North Carolina								x
North Dakota								x
Ohio								x
Oklahoma								x
Oregon		x		x				
Pennsylvania								x
Rhode Island						x		
South Carolina								x
South Dakota								x
Tennessee								x
Texas				x				
Utah				x				
Vermont		x						
Virginia							x	
Washington								x
West Virginia								x
Wisconsin		x						
Wyoming								x

Table 2: Cost-Effectiveness Tests Reported (in practice)

State	TRC	SCT	PCT	PAC	RIM	OTHER	NONE	Primary
Alabama							x	N/A
Alaska							x	N/A
Arizona		x						SCT
Arkansas	x		x	x	x			NONE
California	x	x	x	x	x			TRC
Colorado	x							TRC
Connecticut	x			x				PACT
DC					x			RIM
Delaware	x							TRC
Florida	x		x		x			NONE
Georgia	x	x	x	x	x			NONE
Hawaii	x	x	x	x	x			NONE
Idaho	x		x	x				NONE
Illinois	x							TRC
Indiana	x	x	x	x	x			NONE
Iowa		x	x	x	x			SCT
Kansas	x	x	x	x	x			NONE
Kentucky	x	x	x	x	x			NONE

State	TRC	SCT	PCT	PACT	RIM	OTHER	NONE	Primary
Louisiana							x	N/A
Maine		x						SCT
Maryland		x	x		x			NONE
Massachusetts	x							TRC
Michigan			x	x				NONE
Minnesota	x	x	x	x	x			SCT
Mississippi							x	N/A
Missouri	x			x				TRC
Montana	x	x		x				SCT
Nebraska							x	N/A
Nevada		x		x		x		NONE
New Hampshire	x				x			TRC
New Jersey	x	x	x	x	x	x		SCT
New Mexico	x							TRC
New York	x			x				TRC
North Carolina	x	x	x	x	x			NONE
North Dakota					x			RIM
Ohio							x	N/A
Oklahoma					x			RIM
Oregon		x		x				NONE
Pennsylvania	x							TRC
Rhode Island						x		RICET*
South Carolina							x	N/A
South Dakota					x			RIM
Tennessee							x	N/A
Texas					x			PACT
Utah	x	x	x	x	x			PACT
Vermont		x						SCT
Virginia	x	x	x	x	x			NONE
Washington	x	x	x	x	x			TRC
West Virginia							x	N/A
Wisconsin		x						SCT
Wyoming					x			RIM

Note:

*RICET: Rhode Island Cost Effectiveness Test, similar to the TRC test as described in the California Standard Practice Manual, except that it only includes electric resource savings.

NONE: Refers to situations (de jure and de facto) where the state uses multiple tests with no one primary test.

N/A: Refers to situations where there are no legal guidelines for testing and there is no primary test in practice.

Exhibit RFS - 13: Environmental Externalities Considered in Cost-Effectiveness Calculations of Various States

State	
Arizona	Environmental costs or the value of environmental improvements shall be quantified when possible, reasonable, and cost-efficient. At a minimum, utilities shall make a good faith effort to quantify water consumption savings and air emission reductions. Other environmental impacts may be considered qualitatively.
Arkansas	
California	In the Societal Test variant of the TRC test, the effects of certain externalities are included, such as the benefit of avoided environmental damages, and a societal discount rate is used to calculate net present value of costs and benefits. The TRC-Societal Test attempts to quantify the change in the total resource costs to society as a whole, rather than only to the service territory (the utility and its ratepayers). ....We also clarify that both the TRC and PAC tests should utilize the non-price components of avoided costs (e.g., environmental adders) being developed for the evaluation of energy efficiency programs in our avoided cost rulemaking, R 04-04-025
Colorado	Modified Total Resource Cost test" or "modified TRC test" means an economic cost-effectiveness test used to compare the net present value of the benefits of a DSM program or measure over its useful life, to the net present value of costs of a DSM measure or program for the participant and the utility, consistent with § 40-1-102(5), C.R.S. In performing the modified TRC test, **the benefits shall include, but are not limited to**, as applicable: the utility's avoided production, distribution and energy costs; the participant's avoided operating and maintenance costs; **the valuation of avoided emissions**; and non-energy benefits as set forth in rule 4753. Costs shall include utility and participant costs. The utility costs shall include the net present value of costs incurred in accordance with the budget set forth in rule 4753. **If the commission considers environmental effects when comparing the costs and benefits of potential utility resources, it shall also make findings and give due consideration to the effect that acquiring such resources will have on the state's economy and employment, including, but not limited to, the effect on the mining, electric, natural gas, energy efficiency, and renewable resource industries.**
Connecticut	cited on page 3 of GDS's Connecticut Energy Conservation Programs Study, February, 2008.
DC	
Delaware	
Florida	no information on environmental effects in rule
Georgia	
Hawaii	no information on environmental effects in rule
Idaho	no information on environmental effects in rule
Illinois	In calculating avoided costs of power and energy that an electric utility would otherwise have had to acquire, reasonable estimates shall be included of **financial costs likely to be imposed by future regulations and legislation on emissions of greenhouse gases.**
Indiana	no information on environmental effects in rule
Iowa	no information on environmental effects in rule
Kansas	
Kentucky	
Louisiana	
Maine	no information on environmental effects in rule
Maryland	
Massachusetts	Consistent with the use of the Total Resource Test, the **Proposed Guidelines allow for the inclusion of those environmental benefits that are related to environmental compliance costs that are reasonably projected to be incurred in the future** because of rules and/or regulatory requirements that are not currently in effect, but which are projected to take effect in the foreseeable future.
Michigan	In determining whether the substitution of advanced cleaner energy credits is cost-effective, the commission shall include as part of the costs of the system **the environmental costs attributed to the advanced cleaner energy system, including the costs of environmental control equipment or greenhouse gas constraints or taxes**. The commission's determinations shall be made after a contested case hearing that includes consultation with the department of environmental quality on the issue of carbon dioxide emissions benefits, if relevant, and environmental costs.
Minnesota	
Mississippi	
Missouri	The probable environmental costs of each supply-side resource option shall be quantified by estimating the cost to the utility to comply with additional environmental laws or regulations that may be imposed at some point within the planning horizon.

Montana	no information on environmental effects in rule
Nebraska	no information on environmental effects in rule
Nevada	**The environmental costs to the State associated with operating and maintaining a supply plan or demand side plan must be quantified for air emissions, water and land use.** Environmental costs are those costs, wherever they may occur, that result from harm or risks of harm to the environment after the application of all mitigation measures required by existing environmental regulation or otherwise included in the resource plan. **(THE PUCN DOES NOT CURRENTLY PLACE ANY MONETARY VALUE ON CARBON OR OTHER GREENHOUSE GASES REDUCTION.)**
New Hampshire	Yes there is an analysis done and includes greenhouse gases. Separate analysis than TRC test as the TRC doesn't include the greenhouse gas component. Estimate of the potential Cap and Trade value is used. Eventually, will estimate a statewide average value to use. The Statewide Potential study also has some assumptions on the value...Oscar thinks that they used $30 per ton for CO2. See PSCW website for study or someone in Marietta asked me for a link a while ago. (Rich Hackner)
New Jersey	no information on environmental effects in rule
New Mexico	no information on environmental effects in rule
New York	**Consensus was not reached on whether the following elements should be included in the total resource cost test**: energy market price effects, avoided transmission and distribution costs, distributed generation costs and benefits, load curtailment program impacts, **environmental externalities**, and the value of reductions in avoided variability and risk. **NYSERDA further recommends that unquantifiable environmental externalities and avoided variability and risk**, as well as difficult to measure and monetize customer benefits associated with distributed generation projects such as improved power quality and reliability to the host customer, and the additional distributed generation costs associated with enhanced customer benefits, **not be included.**
North Carolina	
North Dakota	Environmental externalities are not explicitly considered. North Dakota has a statute that forbids the use of environmental cost adders. Externalities affecting the environment, jobs, or other situations might become a factor if two plans were similar in cost, but one plan offered clear advantages or disadvantages, either environmentally or in terms of job creation.
Ohio	
Oklahoma	For Asset Purchase Proposals, the Company **prefers Proposals that address the ability to meet potential future emission compliance requirements for CO2.** Recognizing the increasing role that coa l will play in meeting future electricity supply needs, advanced technologies that utilize coal for power generation in a clean and efficient manner comprise a key element of a portfolio of technology options . International, national an d state policy activities all indicate the high likelihood of future legal requirement s to reduce greenhouse gas emissions, including CO2 . While the prospects for enactment of greenhouse gas control legislation in the United States are not imminent in the near term, there is growing evidence that emission control requirements will be mandated within the next several years .
Oregon	The societal perspective includes a credit for carbon dioxide reduction.
Pennsylvania	no information on environmental effects in rule
Rhode Island	Are externalities considered? If so, which ones and how are they considered? This topic has been brought up by different public groups, and the **Commission has directed the Company to include a consideration of the financial risks associated with environmental externalities** (see above); i.e., the financial risks associated with potential future environmental regulation compliance.
South Carolina	no information on environmental effects in rule
South Dakota	no information on environmental effects in rule
Tennessee	no information on environmental effects in rule
Texas	no information on environmental effects in rule
Utah	no information on environmental effects in rule
Vermont	For purposes of the analysis, a value of 0.7 cents per kWh (2000 dollars) was used to account for the externality benefits. These externality benefits are always the subject of controversy. The 0.7 cents per kWh value (2000 dollars) used here is the product of a settlement in a Vermont Public Service Board investigation in Docket 5980. For purposes of the analysis, the 0.7 cents per kWh is broad and encompasses the benefits for all externality values, especially those associated with categories of pollutants that remain uncapped..
Virginia	no information on environmental effects in rule
Washington	no information on environmental effects in rule
West Virginia	no information on environmental effects in rule
Wisconsin	no information on environmental effects in rule
Wyoming	no information on environmental effects in rule

Exhibit RFS - 14: LBNL Study – Base Case and Utility Build Moratorium

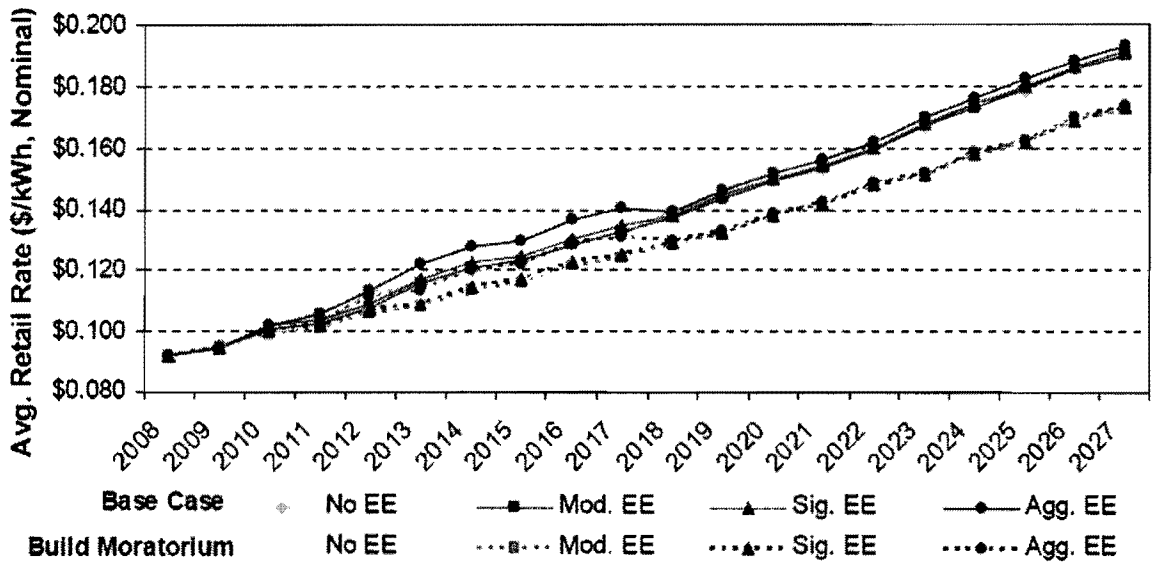


Figure E- 11. Base Case and Utility Build Moratorium annual average retail rates

Exhibit RFS - 15: Top 20 Electric Utilities Based on Annual kWh Savings as Reported in EIA Form 861 Database

Table 1: Data on the Top Twenty Energy Efficiency Utilities in the United States as Reported by the EIA for 2007

Utility Code	Rank	Utility Name	State	kWh Saved per $ Spent in 2007	2007 Energy Effciency Savings (kWh) Incremental	2007 Energy Efficiency Savings (kWh) Cumulative Annual Base	2007 Annual Retail kWh Sales	2007 Energy Efficiency Spending	2007 Retail Revenue	Annual 2007 Energy Efficiency Savings as a % of Annual kWh Sales	Cumulative Annual Energy Effciency Savings as a % of Annual kWh Sales
2182	1	City of Breckenridge	CO	50.4138	1,462,000	not reported	42,336,000	29,000	$2,649,000	3.45%	not reported
7303	2	Glidden Rural Electric Coop	IA	not reported	2,606,000	not reported	101,177,000	not reported	$7,149,000	2.58%	not reported
2548	3	Burlington City of	VT	9.2024	9,276,000	not reported	364,586,000	1,008,000	$46,118,000	2.54%	not reported
14328	4	Pacific Gas & Electric Co	CA	5.6465	1,662,875,000	8,523,069,000	79,450,903,000	294,496,000	$10,902,816,000	2.09%	10.73%
20806	5	City of Windom	MN	not reported	1,480,000	not reported	71,208,000	not reported	$5,408,000	2.08%	0.00%
17609	6	Southern California Edison Co	CA	5.1838	1,551,503,000	9,613,063,000	79,505,231,000	299,301,000	$11,217,201,000	1.95%	12.09%
4176	7	Connecticut Light & Pow er Co	CT	4.1500	281,367,000	2,424,378,000	16,054,317,000	67,800,000	$2,955,597,000	1.75%	15.10%
11804	8	Massachusetts Electric Co	MA	3.6985	195,357,000	2,246,977,000	12,543,637,000	52,820,000	$1,950,608,000	1.56%	17 91%
19497	9	United Illuminating Co	CT	4.0121	86,011,000	492,743,000	5,917,448,000	21,438,000	$900,448,000	1.45%	8 33%
10768	10	Laurens Electric Coop, Inc	SC	521.6250	12,519,000	not reported	996,410,000	24,000	$81,671,000	1.26%	not reported
20455	11	Western Massachusetts Elec Co	MA	3.8582	25,873,000	487,041,000	2,098,952,000	6,706,000	$348,993,000	1.23%	23.20%
16181	12	Rochester Public Utilities	NY	23.6398	15,815,000	69,466,000	1,307,897,000	669,000	$116,320,000	1.21%	5.31%
12312	13	Merced Irrigation District	CA	11 1324	4,709,000	29,458,000	422,674,000	423,000	$44,966,000	1.11%	6 97%
6374	14	Fitchburg Gas & Elec Light Co	NH	2.6375	3,049,000	38,833,000	276,004,000	1,156,000	$50,307,000	1.10%	14.07%
405	15	City of Alta	IA	not reported	166,000	not reported	15,587,000	not reported	$1,168,000	1.06%	not reported
24590	16	Unitil Energy Systems	CT	4.1133	9,983,000	47,098,000	941,779,000	2,427,000	$89,923,000	1.06%	5.00%
15500	17	Puget Sound Energy Inc	WA	13.8563	222,310,000	1,943,716,000	21,626,537,000	16,044,000	$1,836,471,000	1.03%	8.99%
1015	18	Austin Energy	TX	10 0580	117,649,000	1,024,162,000	11,546,977,000	11,697,000	$933,640,000	1 02%	8.87%
6022	19	Eugene City of	OR	4 6929	26,914,000	471,387,000	2,728,684,000	5,735,000	$173,907,000	0 99%	17.28%
15776	20	Reedy Creek Improvement Dist	FL	48.1618	11,607,000	23,214,000	1,183,620,000	241,000	$119,060,000	0.98%	1 96%
Weighted Average Annual kWh Savings as a Percent of Annual Retail kWh Sales					4,230,924,000	27,434,605,000	236,012,344,000	782,014,000		1.79%	11.62%

Exhibit RFS - 16: Savings Targets Set by the Organizations Surveyed by GDS

Table 1: Summary Types of Goals Set by Organizations Surveyed

	Goal Policy:	**Organizations:**
1.	Annual Goals	PUCT, PUCO
2.	Program Lifetime Goals	CPUC, VT-PSB, Efficiency VT, NGRID
3.	Renewable Energy Goals	NCUC
4.	Goals Based on Annual Load Growth	PUCT
5.	Goals Based on Forecasted Sales (kWh)	PUCO
6.	Goals Based on Forecasted Demand (kW)	PUCO
7.	Goals Based on Per Capita Usage	CPUC
8.	Goals Based on Historical Sales/Demand	PUCO
9.	Goals Based on Forecasted Sales/Demand	CPUC
10.	Goals Set by Program	PUCN (NV)
11.	Savings Goals as Percentage	CPUC, PUCT, PUCO, NCUC
12.	Absolute Savings Goals	VT-PSB, Efficiency VT, PUCN (NV), NGRID
13.	Monetary Expenditure Requirements	VT-PSB
14.	Participation No. Requirements	VT-PSB
15.	Alliance/Partnership Requirements	VT-PSB

California Public Utility Commission: minimum 0.3% reduction to per capita usage relative to base year (2003) data

PG&E: 0.6% reduction to per capita usage relative to forecasted data
SCE: 0.8% reduction to per capita usage relative to forecasted data
SDG&E: 0.93% reduction to per capita usage relative to forecasted data

Public Utility Commission of Texas:

2007 Goals: 10% reduction in annual growth
2008 Goals: 15% reduction in annual growth
2009 Goals: 30% reduction in annual growth
2009+ Goals: 50% reduction in annual growth

Public Utility Commission of Ohio:

2009 Goals:

(1) 1% reduction in forecasted peak demand based on average of 3 years of historical peak demand data
(2) 0.3% reduction in forecasted energy demand based on normalized and average 3 years of historical sales data

2010 Goals:

(1) 1.75% reduction in forecasted peak demand based on average of 3 years of historical peak demand data
(2) 0.5% reduction in forecasted energy demand based on normalized and average 3 years of historical sales data

2011 Goals:

(1) 2.5% reduction in forecasted peak demand based on average of 3 years of historical peak demand data

(2) 0.7% reduction in forecasted energy demand based on normalized and average 3 years of historical sales data

2012 Goals:

(1) 3.25% reduction in forecasted peak demand based on average of 3 years of historical peak demand data

(2) 0.8% reduction in forecasted energy demand based on normalized and average 3 years of historical sales data

2012-2018 Goals:

(1) 4% (additional 0.75% added annually) reduction in forecasted peak demand based on average of 3 years of historical peak demand data

(2) 2% annual reduction in forecasted energy demand based on normalized and average 3 years of historical sales data

Vermont Public Service Board: [targets applicable for 2006-2008]

Note: (*) 3-year timeframe; (**) < 3-year time frame

Electricity*: 261,700 MWh

Peak Demand*:

Summer: 37,570 kW

Winter: 41,480 kW

Geographic Peak Demand**:

Summer: 7,200 kW

Winter: 7,740 kW

Total Resource Benefit*: $198 million

CFL Stocking*:

Partnerships with 40 stores

1 partnership with each of 3 grocery store chains

Community Awareness: 2 communities with 35% participation, at least one of which demonstrates a 3% reduction in community-side electrical energy use

Vermont – Efficiency Vermont: [targets set for 2007-2008 program years]

Residential Sector:

Annual Savings: 99,452 MWh

Winter Peak Demand Savings: 14.36 MW

Summer Peak Demand Savings: 13.89 MW

Business Sector:

Annual Savings: 114,168 MWh

Winter Peak Demand Savings: 16.49 MW

Summer Peak Demand Savings: 15.95 MW

Totals:

Annual Savings: 213,620 MWh

Winter Peak Demand Savings: 30.85 MW
Summer Peak Demand Savings: 29.84 MW

North Carolina Utilities Commission: [applicable to all major utilities] – Goals Set for 2020

Energy Sales: 12.5% of 2012 retail sales met with Renewable Energy and/or DSM Programs; maximum of 25% to be met with DSM Programs

By 2012: Intermediate goal of 3% of sales met with Renewable Energy and/or DSM Programs

New York Sate Energy Research and Development Authority [general public policy goals]
[Refer to latest annual report on the New York $mart Program, March 2008, for concrete program targets based on the following general public policy goals.
<http://www.nyserda.org/pdf/Combined%20Report.pdf>]

(1) Improve New York's energy system reliability and security by reducing energy demand and increasing energy efficiency, supporting innovative transmission and distribution technologies that have broad application, and enabling fuel diversity.

(2) Reduce the energy cost burden of New Yorkers by offering energy users, particularly the State's lowest income households, services that moderate the effects of energy price increases and volatility and provide access to cost-effective energy saving measures.

(3) Mitigate the environmental and health impacts of energy use by increasing energy efficiency, encouraging the development of support services for renewable energy resources, and optimizing the energy performance of buildings and products.

(4) Create economic opportunity and promote economic well-being by supporting emerging energy technologies, fostering competition, improving productivity, stimulating the growth of New York energy businesses, and helping to meet future energy needs through efficiency and innovation.

Public Utility Commission of Nevada:
[Nevada Renewable Energy & Energy Conservation Task Force. "Energy Efficiency." Accessed February 2, 2009. <http://www.nevadarenewables.org/?section=energy>]

A/C Load Management Programs: 100 MW (2007-2009)
Cool Controls Plus: 4,900 MWh (2007); 5,900 MWh (2008)
EnergyStar Lighting and Appliances: 73,000 MWh (2007); 76,000 MWh (2008); 80,000 MWh (2009)
EnergyStar Manufactured Homes: 700 MWh (2007); 900 MWh (2008); 1,150 MWh (2009)
High Efficiency A/C Incentive: 14,000 MWh Annually
Commercial Incentives: 62,000 MWh (2007 & 2008); 52,000 MWh (2009)
School Programs: 3,600 MWh Annually
New Construction Programs: 9,000 MWh Annually
Pool Pump Programs: 3,600 MWh (2007); 4,500 MWh (2008); 5,400 MWh (2009)
Low-Income Programs:

Homes: 500 (2007); 1,000 (2008); 1,000 (2009)
Savings: 1,500 MWh (2007); 3,000 MWh (2008); 3,000 MWh (2009)

National Grid:

Program Lifetime MWh: 2,626,172 MWh
Program Lifetime kW: 417,991 kW

Oregon Public Utility Commission:

Suggested Minimum for 2008-2009 Energy Trust of Oregon Contrac: 31 MW saved based on three year rolling average

Exhibit RFS - 17: EIA For 861 Database – Top 20 Energy Efficiency Utilities in the US

Table 1: Data on the Top 20 Energy Efficiency Utilities in the United States as Reported by the EIA for 2007

Utility Code	Rank	Utility Name	State	kWh Saved per $ Spent in 2007	2007 Energy Effciency Savings (kWh) Incremental	2007 Energy Efficiency Savings (kWh) Cumulative Annual Base	2007 Annual Retail kWh Sales	2007 Energy Efficiency Spending	2007 Retail Revenue	Annual 2007 Energy Efficiency Savings as a % of Annual kWh Sales	Cumulative Annual Energy Effciency Savings as a % of Annual kWh Sales
2182	1	City of Breckenridge	CO	50.4138	1,462,000	not reported	42,336,000	29,000	$2,649,000	3.45%	not reported
7303	2	Glidden Rural Electric Coop	IA	not reported	2,606,000	not reported	101,177,000	not reported	$7,149,000	2.58%	not reported
2548	3	Burlington City of	VT	9.2024	9,276,000	not reported	364,586,000	1,008,000	$46,118,000	2.54%	not reported
14328	4	Pacific Gas & Electric Co	CA	5.6465	1,662,875,000	8,523,069,000	79,450,903,000	294,496,000	$10,902,816,000	2.09%	10.73%
20806	5	City of Windom	MN	not reported	1,480,000	not reported	71,208,000	not reported	$5,408,000	2.08%	0.00%
17609	6	Southern California Edison Co	CA	5.1838	1,551,503,000	9,613,063,000	79,505,231,000	299,301,000	$11,217,201,000	1.95%	12.09%
4176	7	Connecticut Light & Power Co	CT	4.1500	281,367,000	2,424,378,000	16,054,317,000	67,800,000	$2,955,597,000	1.75%	15.10%
11804	8	Massachusetts Electric Co	MA	3.6985	195,357,000	2,246,977,000	12,543,637,000	52,820,000	$1,950,608,000	1.56%	17.91%
19497	9	United Illuminating Co	CT	4.0121	86,011,000	492,743,000	5,917,448,000	21,438,000	$900,448,000	1.45%	8.33%
10768	10	Laurens Electric Coop, Inc	SC	521.6250	12,519,000	not reported	996,410,000	24,000	$81,671,000	1.26%	not reported
20455	11	Western Massachusetts Elec Co	MA	3.8582	25,873,000	487,041,000	2,098,952,000	6,706,000	$348,993,000	1.23%	23.20%
16181	12	Rochester Public Utilities	NY	23.6398	15,815,000	69,466,000	1,307,897,000	669,000	$116,320,000	1.21%	5.31%
12312	13	Merced Irrigation District	CA	11.1324	4,709,000	29,458,000	422,674,000	423,000	$44,966,000	1 11%	6.97%
6374	14	Fitchburg Gas & Elec Light Co	NH	2.6375	3,049,000	38,833,000	276,004,000	1,156,000	$50,307,000	1.10%	14.07%
405	15	City of Alta	IA	not reported	166,000	not reported	15,587,000	not reported	$1,168,000	1.06%	not reported
24590	16	Unitil Energy Systems	CT	4.1133	9,983,000	47,098,000	941,779,000	2,427,000	$89,923,000	1.06%	5.00%
15500	17	Puget Sound Energy Inc	WA	13.8563	222,310,000	1,943,716,000	21,626,537,000	16,044,000	$1,836,471,000	1.03%	8.99%
1015	18	Austin Energy	TX	10.0580	117,649,000	1,024,162,000	11,546,977,000	11,697,000	$933,640,000	1 02%	8 87%
6022	19	Eugene City of	OR	4.6929	26,914,000	471,387,000	2,728,684,000	5,735,000	$173,907,000	0.99%	17.28%
15776	20	Reedy Creek Improvement Dist	FL	48.1618	11,607,000	23,214,000	1,183,620,000	241,000	$119,060,000	0.98%	1.96%
Weighted Average Annual kWh Savings as a Percent of Annual Retail kWh Sales					4,230,924,000	27,434,605,000	236,012,344,000	782,014,000		1.79%	11.62%

Table 2: Data on the Top 20 Energy Efficiency Utilities in the United States as Reported by the EIA for 2006

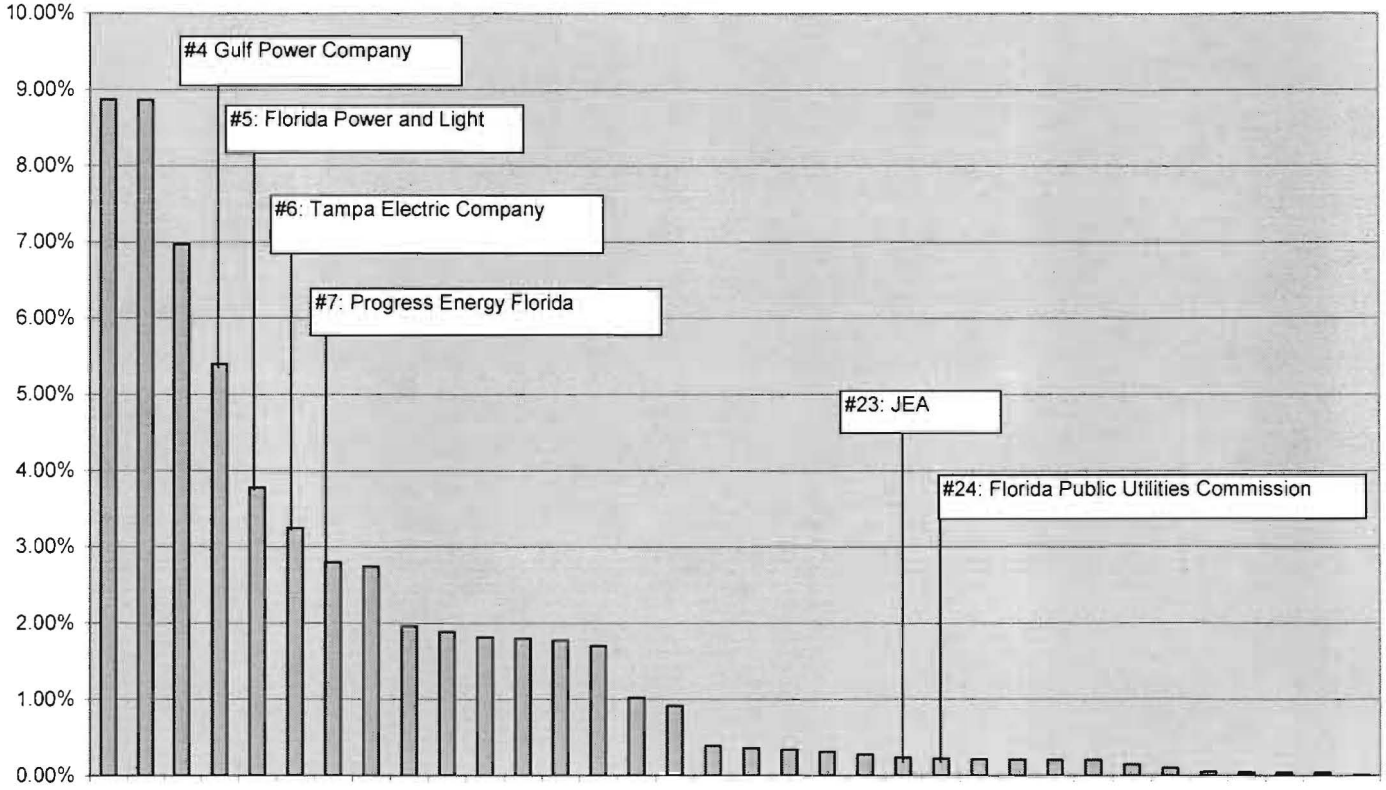
Utility Code	Rank on Cumulative % Savings	Utility Name	State	kWh saved per $ spent in 2006	2006 Energy Efficiency Savings (kWh) Incremental	2006 Energy Efficiency Savings (kWh) Cumulative Annual Basis	2006 Annual Retail kWh Sales	2006 Energy Efficiency Spending	2006 Retail Revenue	Annual 2006 Energy Efficiency Savings as a % of Annual kWh Sales	Cumulative Annual Energy Efficiency Savings as % of Annual kWh Sales
20458	1	Western Massachusetts Elec Co	MA	4.3975	43,295,000	489,152,000	2,276,376,000	$9,846,000	$355,419,000	1.90%	21.49%
2548	2	Burlington City of	VT	6.9079	6,604,000	86,503,000	359,269,000	$956,000	$42,928,000	1.84%	18.23%
16783	3	City of Redding	CA	2.7178	3,900,000	133,300,000	799,214,000	$1,435,000	$75,380,000	0.49%	16.68%
11804	4	Massachusetts Electric Co	MA	5.1081	256,956,000	2,163,812,000	12,990,329,000	$50,304,000	$2,032,981,000	1.98%	16.66%
6022	5	Eugene City of	OR	2.3955	18,966,000	444,500,000	2,689,623,000	$7,914,000	$173,277,000	0.70%	16.52%
6374	6	Fitchburg Gas & Elec Light Co	NH	2.2351	2,648,000	37,509,000	293,887,000	$1,140,000	$53,523,000	0.90%	13.21%
19497	7	United Illuminating Co	CT	4.2622	76,242,000	769,397,000	5,919,000,000	$17,868,000	$771,000,000	1.29%	13.00%
15270	8	Potomac Electric Power Co	DC		0	1,789,598,000	15,462,295,000	$0	$1,903,263,000	0.00%	11.57%
17609	9	Southern California Edison Co	CA	8.4707	787,563,000	9,031,178,000	78,863,143,000	$121,713,000	$11,577,730,000	1.00%	11.45%
13781	10	Northern States Power Co	MN	8.1180	253,684,000	4,040,946,000	35,923,013,000	$31,247,000	$2,591,785,000	0.71%	11.25%
16534	11	Sacramento Municipal Util Dist	CA	4.7173	79,283,000	1,197,783,000	10,799,230,000	$16,807,000	$1,083,877,000	0.73%	11.09%
20169	12	Avista Corp	WA	5.6364	46,316,000	935,086,000	8,787,002,000	$8,213,000	$554,988,000	0.53%	10.64%
16968	13	Seattle City of	WA	2.9642	52,271,000	974,022,000	9,454,606,000	$18,250,000	$569,114,000	0.55%	10.30%
12647	14	Minnesota Power Inc	MN	4.0249	15,271,000	930,416,000	9,077,994,000	$3,795,000	$432,793,000	0.17%	10.25%
4176	15	Connecticut Light & Power Co	CT	5.7656	264,916,000	2,226,304,000	22,109,070,000	$46,026,000	$3,460,557,000	1.20%	10.07%
26510	16	Granite State Electric Co	NH	3.2679	5,111,000	72,234,000	749,207,000	$1,564,000	$86,081,000	0.68%	9.64%
16520	17	Puget Sound Energy Inc	WA	5.7492	166,264,000	2,032,762,000	21,091,533,000	$28,916,000	$1,629,072,000	0.79%	9.64%
17470	18	Snohomish County PUD No 1	WA	4.3720	42,946,000	622,899,000	6,483,487,000	$9,800,000	$475,139,000	0.66%	9.60%
2098	19	City of Boulder	NV	4.5399	967,000	15,061,000	156,868,000	$213,000	$9,459,000	0.61%	9.49%
13214	20	Narragansett Electric Co	RI	5.5913	96,048,000	636,000,000	6,707,930,000	$17,178,000	$952,801,000	1.43%	9.48%
Average % Savings										0.91%	12.51%

Table 3: Data on the Top 20 Energy Efficiency Utilities in the United States as Reported by the EIA for 2005

Utility Code	Rank on % Savings	Utility Name	State	kWh saved per $ spent in 2005	2005 Energy Efficiency Savings (kWh) Incremental	2005 Energy Efficiency Savings (kWh) Cumulative Annual Basis	2005 Annual Retail kWh Sales	2005 Energy Efficiency Spending	2005 Retail Revenue	Annual 2005 Energy Efficiency Savings as % of Annual kWh Sales	Cumulative Annual Energy Efficiency Savings as % of Annual kWh Sales
2548	1	Burlington City of	VT	NA	Not available	65,016,000	368,279,000	$897,000	$37,718,000	Not available	17.7%
15763	2	City of Redding	CA	3.6523	5,000,000	129,400,000	769,947,000	$1,369,000	$72,552,000	0.6%	16.8%
6022	3	Eugene City of	OR	4.4923	22,050,000	424,451,000	2,663,174,000	$4,904,000	$169,452,000	0.8%	15.9%
20455	4	Western Massachusetts Elec Co	MA	3.9051	40,238,000	464,208,000	3,113,996,000	$10,304,000	$353,749,000	1.3%	14.9%
11804	5	Massachusetts Electric Co	MA	4.4066	199,421,000	1,990,984,000	15,491,461,000	$45,255,000	$1,932,300,000	1.3%	12.9%
1998	6	Boston Edison Co	MA	4.8827	160,406,000	1,346,101,000	10,888,695,000	$32,852,000	$1,539,977,000	1.5%	12.4%
15270	7	Potomac Electric Power Co	DC	NA	0	1,789,608,000	14,670,325,000	$0	$1,374,057,000	0.0%	12.2%
17609	8	Southern California Edison Co	CA	7.8740	1,239,175,000	8,901,686,000	75,301,581,000	$157,375,000	$9,445,101,000	1.6%	11.8%
19497	9	United Illuminating Co	CT	3.9787	80,931,000	693,154,000	6,106,000,000	$20,341,000	$767,000,000	1.3%	11.4%
4089	10	Commonwealth Electric Co	MA	5.8902	31,760,000	241,539,000	2,210,570,000	$5,392,000	$321,085,000	1.4%	10.9%
6374	11	Fitchburg Gas & Elec Light Co	NH	2.1430	3,986,000	36,150,000	332,612,000	$1,860,000	$50,385,000	1.2%	10.9%
16534	12	Sacramento Municipal Util Dist	CA	5.8219	81,163,000	1,118,500,000	10,483,042,000	$13,941,000	$1,027,440,000	0.8%	10.7%
13781	13	Northern States Power Co	MN	8.1285	259,422,000	3,787,182,000	35,646,728,000	$31,915,000	$2,423,494,000	0.7%	10.6%
16868	14	Seattle City of	WA	2.9775	52,555,000	970,249,000	9,161,466,000	$17,651,000	$562,548,000	0.6%	10.6%
20169	15	Avista Corp	WA	12.5713	56,571,000	888,770,000	8,542,674,000	$4,500,000	$512,689,000	0.7%	10.4%
15500	16	Puget Sound Energy Inc	WA	6.7883	171,390,000	2,086,208,000	20,465,557,000	$25,248,000	$1,436,075,000	0.8%	10.2%
2886	17	Cambridge Electric Light Co	MA	4.3983	8,845,000	113,565,000	1,117,811,000	$2,011,000	$127,749,000	0.8%	10.2%
12647	18	Minnesota Power Inc	MN	38.0014	137,033,000	892,802,000	9,051,942,000	$3,606,000	$414,810,000	1.5%	9.9%
13214	19	Narragansett Electric Co	RI	4.1844	66,093,000	679,204,000	7,115,094,000	$15,795,000	$859,772,000	0.9%	9.5%
20856	20	Wisconsin Power & Light Co	WI	6.6651	60,526,000	964,714,000	10,539,095,000	$9,081,000	$849,733,000	0.6%	9.2%
Average % Savings				6.0790	2,676,545,000		244,040,049,000			1.0%	11.9%

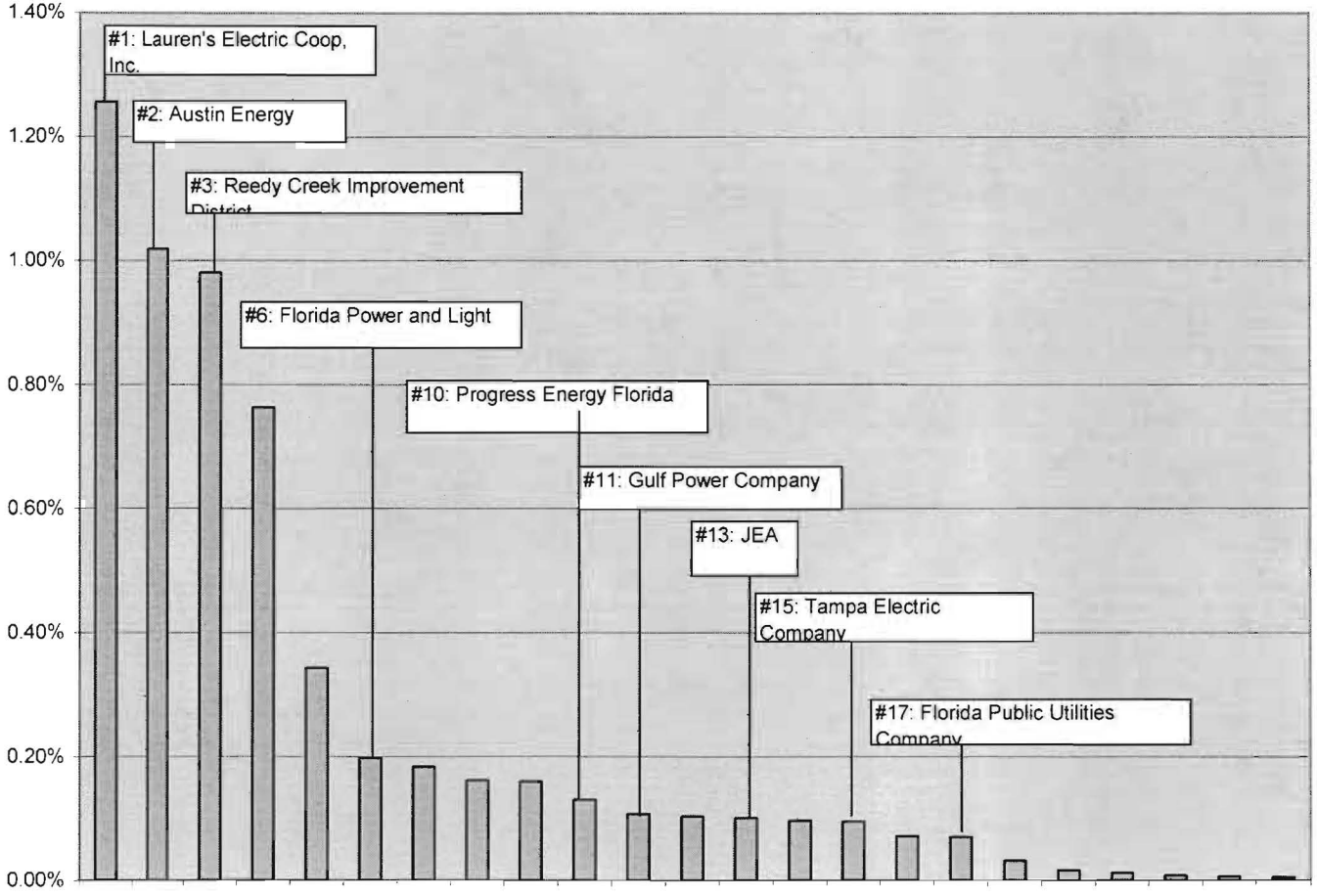
Exhibit RFS - 18: Southeastern Electric Utilities Energy Efficiency kWh Savings

Figure 1: All Utilities from Alabama, Georgia, Florida, Louisiana, Mississisippi, North Carolina, South Carolina, Tennessee and Texas that reported Cumulative kWh Savings in 2007. Graph shows utilites ranked by Cumulative kWh Savings as a percentage of total retail sales for 2007



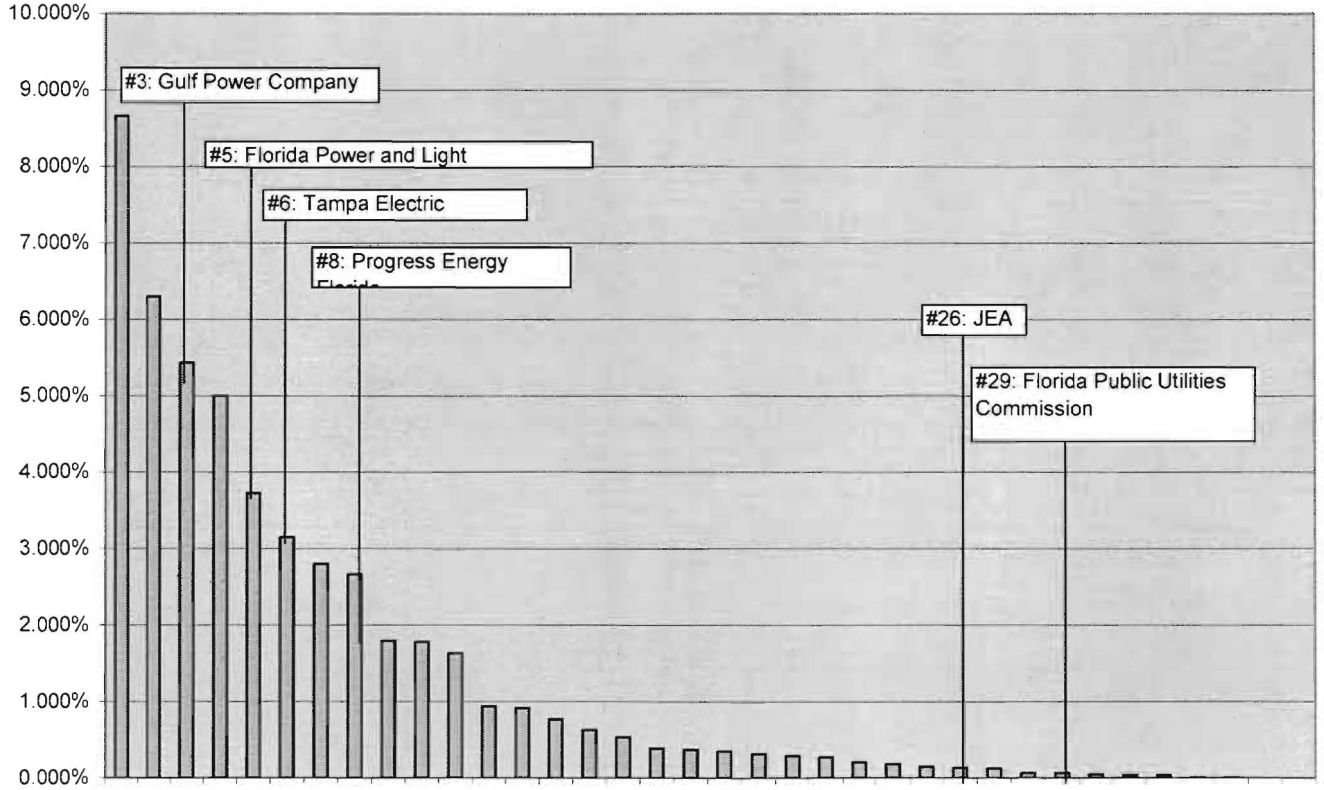
Note: Orlando Utility Company did not report savings for 2007.

Figure 2: All Utilities from Alabama, Georgia, Florida, Louisiana, Mississisippi, North Carolina, South Carolina, Tennessee and Texas that reported Incremental kWh Savings in 2007. Graph shows utilites ranked by Incremental kWh Savings as a percentage of total retail sales for



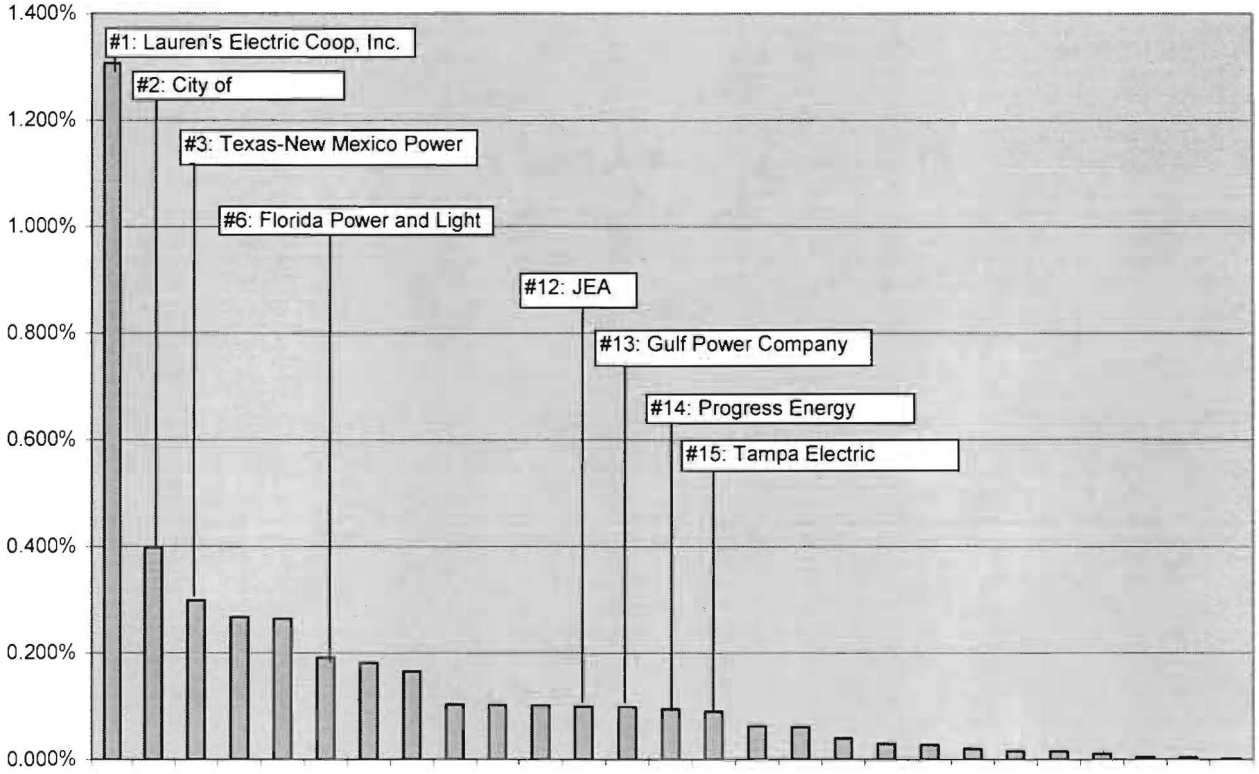
Note: Orlando Utility Company did not report savings for 2007.

Figure 3: All Utilities from Alabama, Georgia, Florida, Louisiana, Mississisippi, North Carolina, South Carolina, Tennessee and Texas that reported Cumulative kWh Savings in 2006. Graph shows utilites ranked by Cumulative kWh Savings as a percentage of total retail sales for 2006



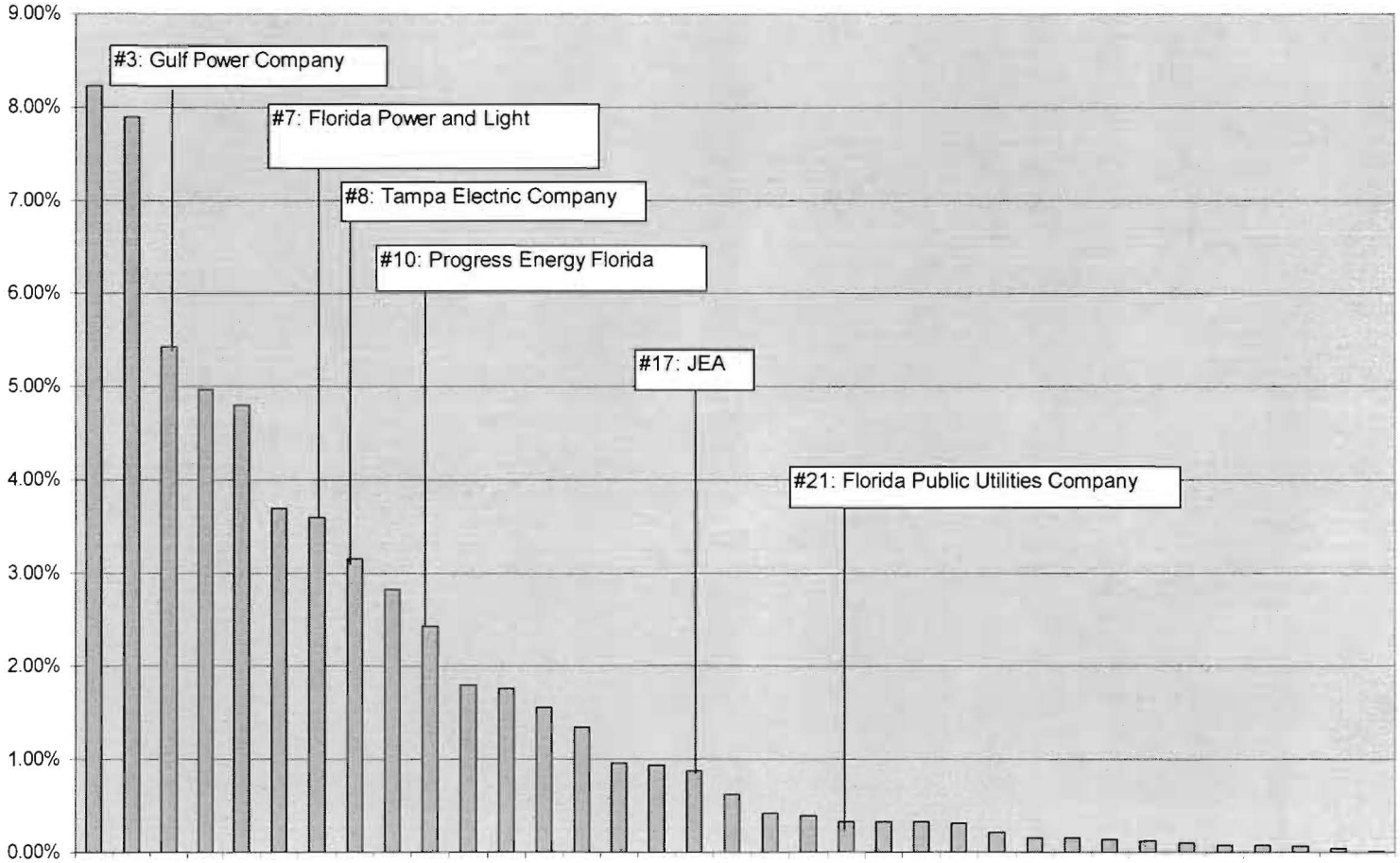
Note: Orlando Utility Company did not report savings for 2007.

Figure 4: All Utilities from Alabama, Georgia, Florida, Louisiana, Mississisippi, North Carolina, South Carolina, Tennessee and Texas that reported Incremental kWh Savings in 2006. Graph shows utilites ranked by Incremental kWh Savings as a percentage of total retail sales for 2006



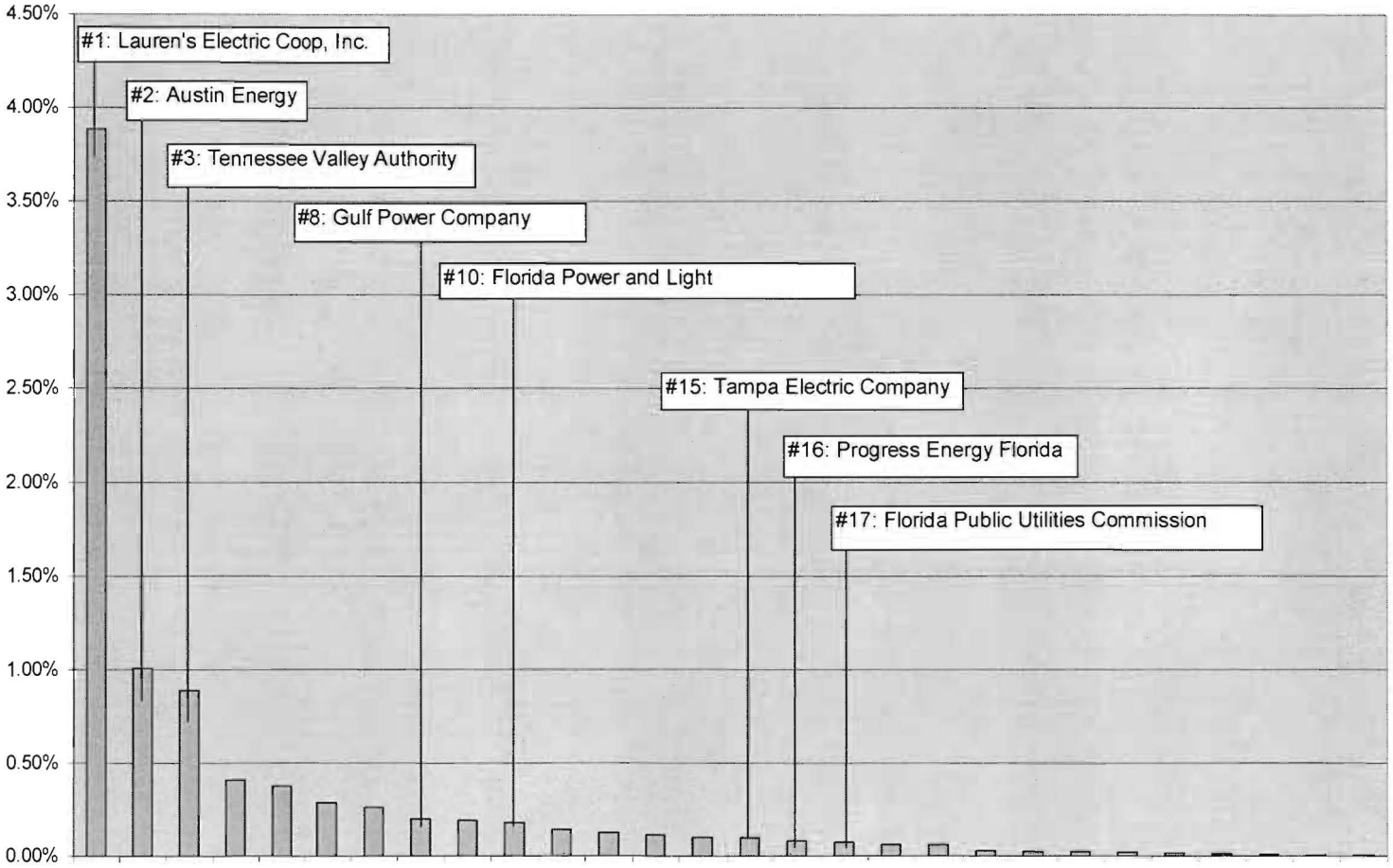
Note: Orlando Utility Company and Florida Public Utilities Company did not report savings for 2006.

Figure 5: All Utilities from Alabama, Georgia, Florida, Louisiana, Mississisippi, North Carolina, South Carolina, Tennessee and Texas that reported Cumulative kWh Savings in 2005. Graph shows utilites ranked by Cumulative kWh Savings as a percentage of total retail sales for 2005



Note: Orlando Utility Company did not report savings for 2005.

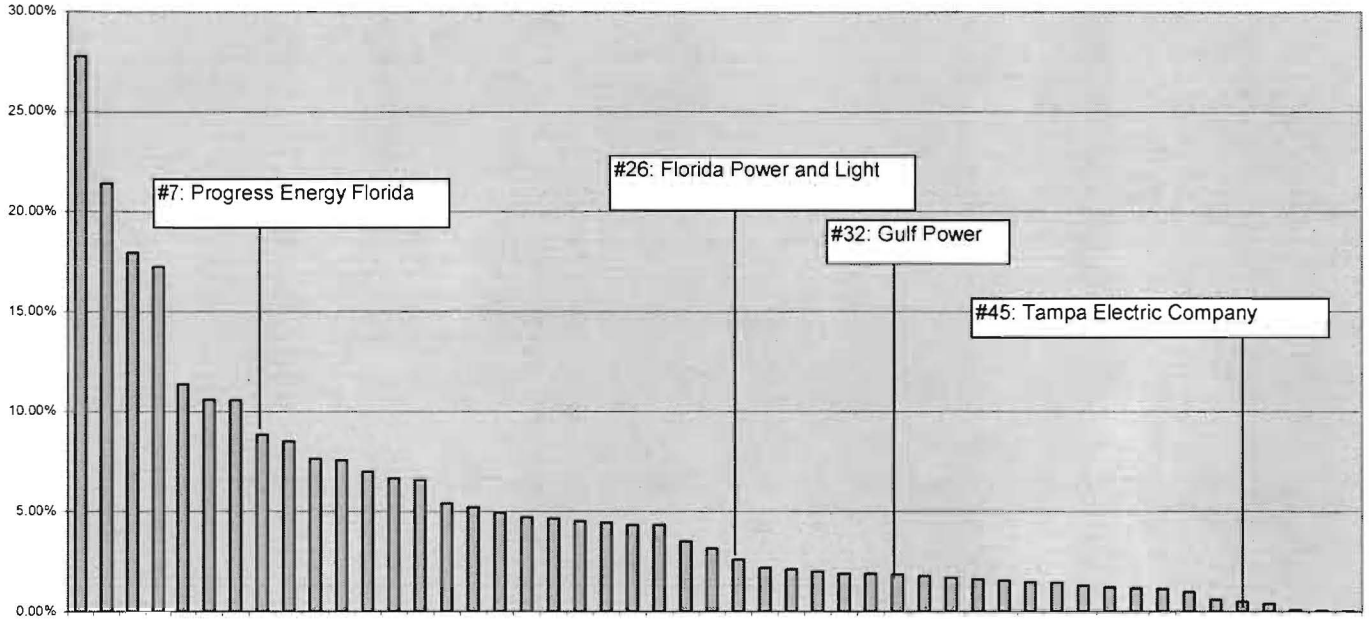
Figure 6: All Utilities from Alabama, Georgia, Florida, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee and Texas that reported Incremental kWh Savings in 2005. Graph shows utilites ranked by Incremental kWh Savings as a percentage of total retail sales for 2005



Note: Orlando Utility Company and JEA did not report savings for 2005.

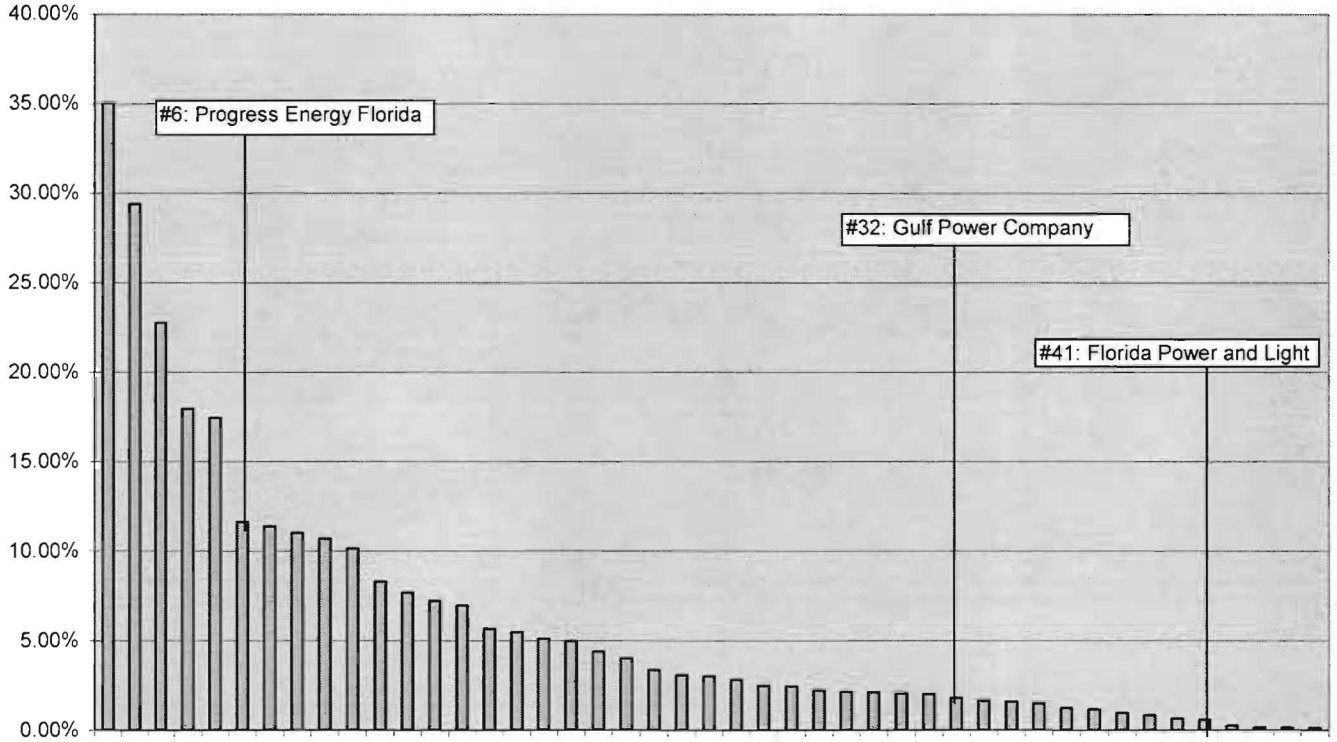
Exhibit RFS - 19: Southeastern Electric Utilities Energy Efficiency kW Savings

Figure 1: All Utilities from Alabama, Georgia, Florida, Louisiana, Mississisippi, North Carolina, South Carolina, Tennessee and Texas that reported kW in 2007. Graph shows utilites ranked by kW Load Reduction as a percentage of the Summer Peak for 2007



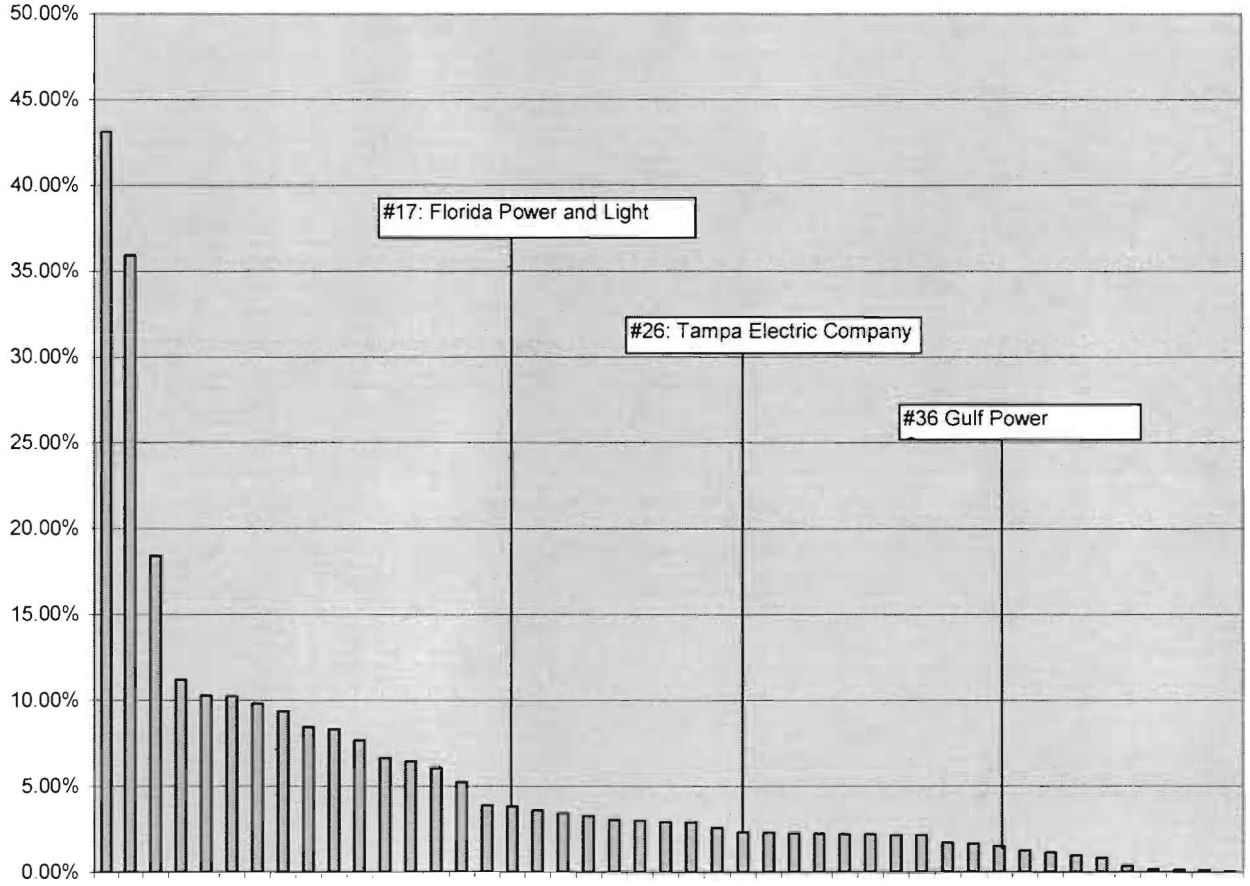
Note: Orlando Utility Company, Florida Public Utilities Company and JEA did not report savings for 2007.

Figure 2: All Utilities from Alabama, Georgia, Florida, Louisiana, Mississisippi, North Carolina, South Carolina, Tennessee and Texas that reported kW in 2006. Graph shows utilites ranked by kW Load Reduction as a percentage of the Summer Peak for 2006



Note: Orlando Utility Company, Florida Public Utilities Company, Tampa Electric Company and JEA did not report savings for 2006.

Figure 3: All Utilities from Alabama, Georgia, Florida, Louisiana, Mississisippi, North Carolina, South Carolina, Tennessee and Texas that reported kW in 2005. Graph shows utilites ranked by kW Load Reduction as a percentage of the Summer Peak for 2005



Note: Orlando Utility Company, Florida Public Utilities Company, Progress Energy Florida and JEA did not report savings for 2005.

Florida Power and Light - Cumulative Revised Goals (without Transition Period Adjustment)

	TOTAL			RESIDENTIAL			COMMERCIAL/INDUSTRIAL		
Year	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh
2010	258.5	468.6	1,188.3	238.5	341.4	764.0	20.0	127.2	424.4
2011	518.5	939.7	2,383.1	478.3	684.7	1532.0	40.2	255.0	851.0
2012	786.8	1,426.0	3,616.3	725.8	1039.1	2324.9	60.9	387.0	1291.4
2013	1,058.9	1,919.3	4,867.2	976.9	1398.5	3129.0	82.0	520.8	1738.1
2014	1,361.1	2,466.9	6,256.0	1255.7	1797.5	4021.9	105.4	669.5	2234.1
2015	1,665.7	3,019.0	7,656.0	1536.7	2199.8	4921.9	129.0	819.3	2734.1
2016	1,988.4	3,604.0	9,139.4	1834.4	2626.0	5875.6	154.0	978.0	3263.8
2017	2,323.4	4,211.1	10,678.9	2143.4	3068.3	6865.3	180.0	1142.8	3813.6
2018	2,685.9	4,868.1	12,345.1	2477.8	3547.1	7936.5	208.0	1321.1	4408.6
2019	3,064.1	5,553.6	14,083.5	2826.7	4046.6	9054.1	237.3	1507.1	5029.4

Florida Power & Light:

				Steps:	(1)	(2)	(3)	(4)		
	2007 GWh Sales	2019 GWh Forecast	Proposed GWh Goals by FPL	Max. Achievable - E-RIM (GWh)	Max. Achievable - E-TRC (GWh)	Max. Achievable - E-TRC + 2-yr. Screened Measures (GWh)	Market Penetration Corrections - +10% (GWh)	Measures Originally Omitted (GWh)	GDS Revised GWh Goals Before Transition Period Adjustment	GDS Revised GWh Goals After Transition Period Adjustment
GWh - Totals	105,414	118,628	878.2	1,700.3	2,999.1	12,889.0	13,018.9	14,083.5	14,083.5	10,955.6
GWh Added - Residential			328.3	26.3	462.0	8,033.2	46.2	158.1	9,054.1	7043.173
GWh Added - Commercial/Industrial			549.9	795.7	836.8	1,856.7	83.7	906.6	5,029.4	3,912.4
Residential Cumulative as % of 2007 Sales				0.34%	0.77%	8.40%	8.44%	8.59%	8.59%	6.68%
Commercial/Industrial Cumulative as % of 2007 Sales				1.28%	2.07%	3.83%	3.91%	4.77%	4.77%	3.71%
All Sectors Cumulative Savings as % of 2007 Sales			0.83%	1.61%	2.85%	12.23%	12.35%	13.36%	13.36%	10.39%
All Sectors Cumulative as % of 2019 Forecast			0.74%	1.43%	2.53%	10.87%	10.97%	11.87%	11.87%	9.24%

Progress Energy Florida - Cumulative Revised Goals (without Transition Period Adjustment)

	TOTAL			RESIDENTIAL			COMMERCIAL/INDUSTRIAL		
Year	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh
2010	144.1	132.1	436.0	140.1	102.9	315.3	4.1	29.2	120.8
2011	289.0	264.9	874.5	280.9	206.4	632.2	8.2	58.5	242.2
2012	438.6	402.0	1,327.0	426.2	313.3	959.4	12.4	88.8	367.6
2013	590.3	541.1	1,786.0	573.7	421.6	1291.2	16.6	119.5	494.7
2014	758.8	695.5	2,295.6	737.4	541.9	1659.7	21.4	153.6	635.9
2015	928.6	851.1	2,809.3	902.4	663.2	2031.1	26.2	188.0	778.2
2016	1,108.5	1,016.1	3,353.6	1077.2	791.7	2424.6	31.3	224.4	929.0
2017	1,295.2	1,187.2	3,918.6	1258.7	925.0	2833.1	36.5	262.2	1085.5
2018	1,497.3	1,372.4	4,530.0	1455.1	1069.4	3275.1	42.2	303.1	1254.9
2019	1,708.2	1,565.7	5,167.9	1660.0	1220.0	3736.3	48.2	345.8	1431.6

Progress Energy Florida:

				Steps:	(1)	(2)	(3)	(4)		
	2007 Sales	2019 Forecast	Proposed GWh Goals by PEF	Max. Achievable - E-RIM	Max. Achievable - E-TRC	Max. Achievable - E-TRC + 2-yr. Screened Measures	Market Penetration Corrections - +10%	Measures Originally Omitted	GDS Revised Goals	GDS Revised GWh Goals After Transition Period Adjustment
GWh - Totals	39,282	40,997	613.8	613.8	1,584.5	4,689.8	4,786.8	5,167.9	5,167.9	4020.0728
GWh Added - Residential			487.5	0.0	719.6	2,241.2	72.0	216.1	3,736.3	2906.454
GWh Added - Commercial/Industrial			126.3	0.0	251.1	864.1	25.1	165.0	1,431.6	1113.6188
Residential Cumulative as % of 2007 Sales				1.24%	3.07%	8.78%	8.96%	9.51%	9.51%	7.40%
Commercial/Industrial Cumulative as % of 2007 Sales				0.32%	0.96%	3.16%	3.22%	3.64%	3.64%	2.83%
All Sectors Cumulative Savings as % of 2007 Sales			0.58%	0.58%	1.50%	4.45%	4.54%	4.90%	13.16%	10.23%
All Sectors Cumulative as % of 2019 Forecast			0.52%	0.52%	1.34%	3.95%	4.04%	4.36%	12.61%	9.81%

Tampa Electric Company - Cumulative Revised Goals (without Transition Period Adjustment)

	TOTAL			RESIDENTIAL			COMMERCIAL/INDUSTRIAL		
Year	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh
2010	48.3	67.8	177.3	45.6	53.6	113.9	2.7	14.3	63.4
2011	96.9	136.0	355.5	91.5	107.4	228.4	5.4	28.6	127.1
2012	147.1	206.4	539.5	138.9	163.0	346.6	8.2	43.4	192.9
2013	198.0	277.9	726.1	186.9	219.4	466.5	11.0	58.4	259.6
2014	254.5	357.1	933.3	240.3	282.0	599.6	14.2	75.1	333.7
2015	311.4	437.1	1,142.2	294.0	345.2	733.8	17.4	91.9	408.4
2016	371.8	521.7	1,363.5	351.0	412.0	876.0	20.7	109.7	487.5
2017	434.4	609.6	1,593.2	410.2	481.5	1023.6	24.2	128.2	569.6
2018	502.2	704.8	1,841.8	474.1	556.6	1183.3	28.0	148.2	658.5
2019	572.9	804.0	2,101.1	540.9	634.9	1349.9	32.0	169.0	751.2

Tampa Electric Company:

				Steps:	(1)	(2)	(3)	(4)		
	2007 Sales	2019 Forecast	Proposed GWh Goals by TECO	Max. Achievable - E-RIM	Max. Achievable - E-TRC	Max. Achievable - E-TRC + 2-yr. Screened Measures	Market Penetration Corrections - +10%	Measures Originally Omitted	GDS Revised Goals	GDS Revised GWh Goals After Transition Period Adjustment
GWh - Totals	19,533	22,532	201.7	201.8	310.3	1,939.9	1,950.7	2,101.1	2,101.1	1634.4703
GWh Added - Residential			59.0	0.0	74.9	1,161.6	7.5	46.9	1,349.9	1050.1025
GWh Added - Commercial/Industrial			142.7	0.0	33.6	468.0	3.4	103.5	751.2	584.36777
Residential Cumulative as % of 2007 Sales				0.30%	0.69%	6.63%	6.67%	6.91%	6.91%	5.38%
Commercial/Industrial Cumulative as % of 2007 Sales				0.73%	0.90%	3.30%	3.32%	3.85%	3.85%	2.99%
All Sectors Cumulative Savings as % of 2007 Sales			0.19%	0.19%	0.29%	1.84%	1.85%	1.99%	10.76%	8.37%
All Sectors Cumulative as % of 2019 Forecast			0.17%	0.17%	0.26%	1.64%	1.64%	1.77%	9.33%	7.25%

Gulf Power Company - Cumulative Revised Goals (without Transition Period Adjustment)

	TOTAL			RESIDENTIAL			COMMERCIAL/INDUSTRIAL		
Year	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh
2010	23.3	31.8	114.7	20.1	22.0	65.2	3.2	9.8	49.5
2011	46.8	63.7	230.0	40.4	44.1	130.8	6.4	19.6	99.2
2012	71.0	96.7	349.1	61.3	67.0	198.5	9.7	29.7	150.6
2013	95.6	130.2	469.8	82.4	90.1	267.1	13.1	40.0	202.7
2014	122.8	167.3	603.8	106.0	115.9	343.4	16.9	51.4	260.5
2015	150.3	204.8	739.0	129.7	141.8	420.2	20.6	62.9	318.8
2016	179.4	244.4	882.2	154.8	169.3	501.6	24.6	75.1	380.5
2017	209.7	285.6	1,030.8	180.9	197.8	586.1	28.8	87.8	444.6
2018	242.4	330.2	1,191.6	209.1	228.7	677.6	33.3	101.5	514.0
2019	271.8	362.4	1,359.4	238.6	260.9	773.0	33.3	101.5	586.4

Gulf Power:

				Steps:	(1)	(2)	(3)	(4)		
	2007 Sales	2019 Forecast	Proposed GWh Goals by Gulf	Max. Achievable - E-RIM	Max. Achievable - E-TRC	Max. Achievable - E-TRC + 2-yr. Screened Measures	Market Penetration Corrections - +10%	Measures Originally Omitted	GDS Revised Goals	GDS Revised GWh Goals After Transition Period Adjustment
GWh - Totals	11,521	15,008	159.0	159.0	251.4	1,279.9	1,289.1	1,359.4	1,359.4	1057.4544
GWh Added - Residential			86.8	0.0	67.1	579.0	6.7	33.4	773.0	601.29327
GWh Added - Commercial/Industrial			72.2	0.0	25.3	449.6	2.5	36.9	586.4	456.16108
Residential Cumulative as % of 2007 Sales				0.75%	1.34%	6.36%	6.42%	6.71%	6.71%	5.22%
Commercial/Industrial Cumulative as % of 2007 Sales				0.63%	0.85%	4.75%	4.77%	5.09%	5.09%	3.96%
All Sectors Cumulative Savings as % of 2007 Sales			0.15%	0.15%	0.24%	1.21%	1.22%	1.29%	11.80%	9.18%
All Sectors Cumulative as % of 2019 Forecast			0.13%	0.13%	0.21%	1.08%	1.09%	1.15%	9.06%	7.05%

JEA - Cumulative Revised Goals (without Transition Period Adjustment)

	TOTAL			RESIDENTIAL			COMMERCIAL/INDUSTRIAL		
Year	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh
2010	3.4	29.3	100.7	1.5	18.9	52.1	1.9	10.3	48.6
2011	6.8	58.7	201.8	3.0	37.9	104.5	3.8	20.8	97.4
2012	10.3	89.0	306.3	4.6	57.5	158.5	5.7	31.5	147.8
2013	13.9	119.8	412.3	6.2	77.4	213.4	7.7	42.4	198.9
2014	17.8	154.0	529.9	7.9	99.5	274.3	9.9	54.5	255.6
2015	21.8	188.5	648.5	9.7	121.8	335.7	12.1	66.7	312.8
2016	26.0	225.0	774.1	11.6	145.4	400.7	14.5	79.6	373.4
2017	30.4	262.9	904.5	13.5	169.9	468.2	16.9	93.0	436.3
2018	35.2	303.9	1,045.7	15.7	196.4	541.2	19.5	107.5	504.4
2019	40.1	346.7	1,192.9	17.9	224.0	617.5	22.3	122.6	575.4

JEA:

			Steps:	(1)	(2)	(3)	(4)		
	2007 Sales	2019 Forecast	Proposed GWh Goals by JEA	Max. Achievable - E-RIM	Max. Achievable - E-TRC	Max. Achievable - E-TRC + 2-yr. Screened Measures	Market Penetration Corrections - +10%	Measures Originally Omitted	GDS Revised Goals	GDS Revised GWh Goals After Transition Period Adjustment
GWh - Totals	12,751	14,642	0.0	0.0	138.5	1,070.7	1,084.5	1,192.9	1,192.9	927.95021
GWh Added - Residential			0.0	0.0	64.7	514.5	6.5	31.9	617.5	480.31583
GWh Added - Commercial/Industrial			0.0	0.0	73.9	417.7	7.4	76.5	575.4	447.63439
Residential Cumulative as % of 2007 Sales				0.00%	0.51%	4.54%	4.59%	4.84%	4.84%	3.77%
Commercial/Industrial Cumulative as % of 2007 Sales				0.00%	0.58%	3.85%	3.91%	4.51%	4.51%	3.51%
All Sectors Cumulative Savings as % of 2007 Sales			0.00%	0.00%	0.13%	1.02%	1.03%	1.13%	9.36%	7.28%
All Sectors Cumulative as % of 2019 Forecast			0.00%	0.00%	0.12%	0.90%	0.91%	1.01%	8.15%	6.34%

Orlando Utility Commission - Cumulative Revised Goals (without Transition Period Adjustment)

	TOTAL			RESIDENTIAL			COMMERCIAL/INDUSTRIAL		
Year	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh
2010	0.7	14.9	45.6	0.02	11.20	27.56	0.7	3.7	18.1
2011	1.5	29.9	91.5	0.04	22.45	55.26	1.4	7.4	36.3
2012	2.2	45.3	138.9	0.06	34.07	83.86	2.2	11.2	55.0
2013	3.0	61.0	187.0	0.08	45.85	112.87	2.9	15.1	74.1
2014	3.9	78.4	240.3	0.11	58.94	145.08	3.8	19.4	95.2
2015	4.8	95.9	294.1	0.13	72.13	177.54	4.6	23.8	116.5
2016	5.7	114.5	351.1	0.16	86.10	211.94	5.5	28.4	139.1
2017	6.6	133.8	410.2	0.18	100.61	247.65	6.5	33.2	162.5
2018	7.7	154.7	474.2	0.21	116.31	286.29	7.5	38.4	187.9
2019	8.8	176.4	541.0	0.24	132.68	326.60	8.5	43.8	214.4

Orlando Utility Commission:

				Steps:	(1)	(2)	(3)	(4)		
	2007 Sales	2019 Forecast	Proposed GWh Goals by OUC	Max. Achievable - E-RIM	Max. Achievable - E-TRC	Max. Achievable - E-TRC + 2-yr. Screened Measures	Market Penetration Corrections - +10%	Measures Originally Omitted	GDS Revised Goals	GDS Revised GWh Goals After Transition Period Adjustment
GWh - Totals	6,079	7,874	0.0	0.0	78.8	511.2	519.1	541.0	541.0	420.81667
GWh Added - Residential			0.0	0.0	28.8	287.7	2.9	7.3	326.6	254.06132
GWh Added - Commercial/Industrial			0.0	0.0	50.1	144.7	5.0	14.6	214.4	166.75534
Residential Cumulative as % of 2007 Sales				0.00%	0.47%	5.21%	5.25%	5.37%	5.37%	4.18%
Commercial/Industrial Cumulative as % of 2007 Sales				0.00%	0.82%	3.20%	3.29%	3.53%	3.53%	2.74%
All Sectors Cumulative Savings as % of 2007 Sales			0.00%	0.00%	0.07%	0.48%	0.49%	0.51%	8.90%	6.92%
All Sectors Cumulative as % of 2019 Forecast			0.00%	0.00%	0.07%	0.43%	0.44%	0.46%	6.87%	5.34%

Florida Public Utility Company - Cumulative Revised Goals (without Transition Period Adjustment)									
	TOTAL			RESIDENTIAL			COMMERCIAL/INDUSTRIAL		
Year	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh
2010	0.3	1.3	5.4	0.2	0.7	3.0	0.1	0.5	2.4
2011	0.6	2.5	10.8	0.5	1.5	6.0	0.2	1.1	4.8
2012	0.9	3.8	16.4	0.7	2.2	9.1	0.2	1.6	7.3
2013	1.3	5.1	22.1	1.0	3.0	12.3	0.3	2.1	9.8
2014	1.6	6.6	28.4	1.2	3.8	15.8	0.4	2.8	12.6
2015	2.0	8.1	34.8	1.5	4.7	19.3	0.5	3.4	15.5
2016	2.4	9.6	41.6	1.8	5.6	23.1	0.6	4.0	18.5
2017	2.8	11.3	48.6	2.1	6.6	27.0	0.7	4.7	21.6
2018	3.2	13.0	56.1	2.4	7.6	31.2	0.8	5.4	24.9
2019	3.7	14.9	64.0	2.8	8.7	35.6	0.9	6.2	28.4

Florida Public Utilities Company:

				Steps:	(1)	(2)	(3)	(4)		
	2007 Sales	2019 Forecast	Proposed GWh Goals by FPUC	Max. Achievable - E-RIM	Max. Achievable - E-TRC	Max. Achievable - E-TRC + 2-yr. Screened Measures	Market Penetration Corrections - +10%	Measures Originally Omitted	GDS Revised Goals	GDS Revised GWh Goals After Transition Period Adjustment
GWh - Totals	793	793	0.0	0.0	12.9	59.2	60.5	64.0	64.0	49.817753
GWh Added - Residential			0.0	0.0	5.1	28.8	0.5	1.2	35.6	27.688112
GWh Added - Commercial/Industrial			0.0	0.0	7.8	17.5	0.8	2.4	28.4	22.129642
Residential Cumulative as % of 2007 Sales				0.00%	0.65%	4.27%	4.34%	4.49%	4.49%	3.49%
Commercial/Industrial Cumulative as % of 2007 Sales				0.00%	0.98%	3.19%	3.29%	3.59%	3.59%	2.79%
All Sectors Cumulative Savings as % of 2007 Sales			0.00%	0.00%	0.01%	0.06%	0.06%	0.06%	8.08%	6.28%
All Sectors Cumulative as % of 2019 Forecast			0.00%	0.00%	0.01%	0.05%	0.05%	0.05%	8.08%	6.28%

Florida Power and Light - GDS Recommended Cumulative Goals (Including Transition Period)									
	TOTAL			RESIDENTIAL			COMMERCIAL/INDUSTRIAL		
Year	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh
2010	129.3	234.3	594.2	119.3	170.7	382.0	10.0	63.6	212.2
2011	259.2	469.9	1,191.5	239.2	342.4	766.0	20.1	127.5	425.5
2012	393.4	713.0	1,808.2	362.9	519.5	1,162.4	30.5	193.5	645.7
2013	529.5	959.6	2,433.6	488.5	699.2	1,564.5	41.0	260.4	869.1
2014	680.5	1,233.5	3,128.0	627.8	898.7	2,010.9	52.7	334.7	1,117.0
2015	985.1	1,785.5	4,528.0	908.8	1,301.0	2,911.0	76.3	484.5	1,617.0
2016	1,307.9	2,370.5	6,011.4	1,206.6	1,727.2	3,864.6	101.3	643.3	2,146.8
2017	1,642.8	2,977.6	7,550.9	1,515.6	2,169.6	4,854.4	127.2	808.0	2,696.5
2018	2,005.3	3,634.7	9,217.2	1,850.0	2,648.3	5,925.6	155.3	986.3	3,291.6
2019	2,383.5	4,320.2	10,955.6	2,198.9	3,147.8	7,043.2	184.6	1,172.4	3,912.4

Florida Power and Light - Proposed Cumulative Goals									
	TOTAL			RESIDENTIAL			COMMERCIAL/INDUSTRIAL		
Year	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh
2010	33.1	60.0	74.1	24.6	26.6	33.1	8.5	33.4	41.0
2011	66.2	120.0	148.6	49.2	53.2	66.2	17.0	66.8	82.4
2012	99.4	180.0	225.6	73.9	79.5	99.0	25.5	100.5	126.6
2013	132.7	240.0	303.5	98.6	105.7	131.7	34.1	134.3	171.8
2014	166.3	300.0	390.1	123.3	131.9	164.4	43.0	168.1	225.7
2015	200.0	360.0	477.4	148.0	158.1	197.1	52.0	201.9	280.3
2016	233.9	420.5	569.9	172.7	184.3	229.8	61.2	236.2	340.1
2017	268.2	481.4	665.9	197.4	210.5	262.5	70.8	270.9	403.4
2018	303.0	543.4	769.8	222.1	236.7	295.2	80.9	306.7	474.6
2019	337.8	606.6	878.2	246.7	263.3	328.3	91.1	343.3	549.9

Progress Energy Florida - GDS Recommended Cumulative Goals (Including Transition Period)									
	TOTAL			RESIDENTIAL			COMMERCIAL/INDUSTRIAL		
Year	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh
2010	72.1	66.1	218.0	70.0	51.5	157.6	2.0	14.6	60.4
2011	144.5	132.5	437.2	140.4	103.2	316.1	4.1	29.3	121.1
2012	219.3	201.0	663.5	213.1	156.6	479.7	6.2	44.4	183.8
2013	295.2	270.5	893.0	286.8	210.8	645.6	8.3	59.7	247.4
2014	379.4	347.7	1,147.8	368.7	271.0	829.8	10.7	76.8	318.0
2015	549.2	503.4	1,661.5	533.7	392.2	1,201.3	15.5	111.2	460.3
2016	729.1	668.3	2,205.8	708.5	520.7	1,594.8	20.6	147.6	611.1
2017	915.8	839.5	2,770.8	890.0	654.1	2,003.2	25.8	185.4	767.5
2018	1,117.9	1,024.7	3,382.2	1,086.4	798.4	2,445.3	31.5	226.3	936.9
2019	1,328.8	1,218.0	4,020.1	1,291.3	949.0	2,906.5	37.5	269.0	1,113.6

Progress Energy Florida - Proposed Cumulative Goals									
	TOTAL			RESIDENTIAL			COMMERCIAL/INDUSTRIAL		
Year	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh
2010	42.42	33.34	50.64	37.68	24.57	40.22	4.74	8.77	10.42
2011	88.74	70.79	104.35	79.23	50.45	82.88	9.51	20.34	21.47
2012	142.74	120.15	162.66	122.43	78.35	129.19	20.31	41.8	33.47
2013	197.88	171.97	224.04	166.73	107.68	177.94	31.15	64.29	46.1
2014	254.15	225.88	288.49	212.13	138.32	229.13	42.02	87.56	59.36
2015	310.99	282.66	361.22	258.01	171.58	286.9	52.98	111.08	74.32
2016	380.44	349.98	430.28	316.54	214.86	341.75	63.9	135.12	88.53
2017	449.66	415.57	498.72	374.85	257.44	396.11	74.81	158.13	102.61
2018	515.71	476.26	558.56	430.08	296.67	443.64	85.63	179.59	114.92
2019	559.54	520.59	613.81	463.14	322.76	487.52	96.4	197.83	126.29

Tampa Electric Company - GDS Recommended Cumulative Goals (Including Transition Period)									
	TOTAL			RESIDENTIAL			COMMERCIAL/INDUSTRIAL		
Year	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh
2010	24.2	33.9	88.6	22.8	26.8	57.0	1.3	7.1	31.7
2011	48.5	68.0	177.8	45.8	53.7	114.2	2.7	14.3	63.6
2012	73.6	103.2	269.8	69.4	81.5	173.3	4.1	21.7	96.4
2013	99.0	138.9	363.1	93.5	109.7	233.3	5.5	29.2	129.8
2014	127.2	178.6	466.7	120.1	141.0	299.8	7.1	37.5	166.8
2015	184.2	258.5	675.5	173.9	204.1	434.0	10.3	54.3	241.5
2016	244.5	343.2	896.8	230.9	271.0	576.2	13.6	72.2	320.6
2017	307.1	431.1	1,126.5	290.0	340.4	723.8	17.1	90.6	402.8
2018	374.9	526.2	1,375.1	354.0	415.6	883.5	20.9	110.6	491.6
2019	445.6	625.4	1,634.5	420.8	493.9	1,050.1	24.9	131.5	584.4

Tampa Electric Company - Proposed Cumulative Goals									
	TOTAL			RESIDENTIAL			COMMERCIAL/INDUSTRIAL		
Year	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh
2010	2.1	4.1	8.2	1.2	1.4	1.9	0.9	2.7	6.3
2011	5.0	10.1	21.6	3.1	3.5	5.5	1.9	6.6	16.1
2012	8.6	17.3	39.6	5.5	6.4	10.5	3.1	10.9	29.1
2013	12.9	26.0	60.9	8.5	9.9	16.8	4.4	16.1	44.1
2014	17.6	35.3	84.3	12.0	13.9	24.0	5.6	21.4	60.3
2015	22.4	45.1	108.9	15.5	18.2	31.7	6.9	26.9	77.2
2016	27.5	55.1	133.8	19.2	22.5	39.6	8.3	32.6	94.2
2017	32.3	64.3	157.7	22.6	26.4	46.8	9.7	37.9	110.9
2018	36.8	73.5	180.4	25.7	30.1	53.3	11.1	43.4	127.1
2019	40.9	81.8	201.7	28.5	33.3	59.0	12.4	48.5	142.7

Gulf Power Company - GDS Recommended Cumulative Goals (Including Transition Period)

	TOTAL			RESIDENTIAL			COMMERCIAL/INDUSTRIAL		
Year	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh
2010	11.7	15.9	57.4	10.1	11.0	32.6	1.6	4.9	24.7
2011	23.4	31.9	115.0	20.2	22.1	65.4	3.2	9.8	49.6
2012	35.5	48.4	174.5	30.6	33.5	99.2	4.9	14.9	75.3
2013	47.8	65.1	234.9	41.2	45.1	133.6	6.6	20.0	101.3
2014	61.4	83.7	301.9	53.0	57.9	171.7	8.4	25.7	130.2
2015	88.9	121.1	437.1	76.7	83.9	248.5	12.2	37.2	188.5
2016	118.0	160.8	580.2	101.8	111.3	329.9	16.2	49.4	250.3
2017	148.3	201.9	728.8	127.9	139.9	414.4	20.4	62.1	314.4
2018	181.0	246.5	889.7	156.1	170.7	505.9	24.8	75.8	383.8
2019	210.4	278.7	1,057.5	185.6	202.9	601.3	24.8	75.8	456.2

Gulf Power Company - Proposed Cumulative Goals

	TOTAL			RESIDENTIAL			COMMERCIAL/INDUSTRIAL		
Year	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh
2010	2.3	3.1	4.7	1.8	1.9	2.0	0.5	1.2	2.7
2011	5.3	7.5	13.3	4.3	4.7	6.0	1.0	2.8	7.3
2012	9.0	13.1	25.7	7.4	8.4	12.3	1.6	4.7	13.4
2013	13.4	19.8	41.2	11.1	12.9	20.5	2.3	6.9	20.7
2014	18.4	27.3	59.0	15.4	18.0	30.3	3.0	9.3	28.7
2015	23.8	35.5	78.5	20.0	23.7	41.3	3.8	11.8	37.2
2016	29.6	44.2	99.3	25.0	29.8	53.2	4.6	14.4	46.1
2017	35.4	52.9	120.4	30.0	35.9	65.3	5.4	17.0	55.1
2018	40.9	61.1	140.4	34.7	41.6	76.5	6.2	19.5	63.9
2019	46.2	68.9	159.0	39.2	47.0	86.8	7.0	21.9	72.2

JEA - GDS Recommended Cumulative Goals (Including Transition Period)

	TOTAL			RESIDENTIAL			COMMERCIAL/INDUSTRIAL		
Year	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh
2010	1.7	14.6	50.3	0.8	9.5	26.0	0.9	5.2	24.3
2011	3.4	29.3	100.9	1.5	19.0	52.2	1.9	10.4	48.7
2012	5.2	44.5	153.2	2.3	28.8	79.3	2.9	15.7	73.9
2013	6.9	59.9	206.1	3.1	38.7	106.7	3.9	21.2	99.4
2014	8.9	77.0	264.9	4.0	49.8	137.1	4.9	27.2	127.8
2015	12.9	111.5	383.5	5.7	72.0	198.5	7.2	39.4	185.0
2016	17.1	148.0	509.2	7.6	95.6	263.6	9.5	52.4	245.6
2017	21.5	185.9	639.6	9.6	120.1	331.0	11.9	65.8	308.5
2018	26.3	226.9	780.7	11.7	146.6	404.1	14.6	80.3	376.6
2019	31.2	269.7	928.0	13.9	174.3	480.3	17.3	95.4	447.6

JEA - Proposed Cumulative Goals

	TOTAL			RESIDENTIAL			COMMERCIAL/INDUSTRIAL		
Year	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh
2010	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2011	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2012	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2013	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2016	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2017	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2018	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Orlando Utility Commission - GDS Recommended Cumulative Goals (Including Transition Period)

	TOTAL			RESIDENTIAL			COMMERCIAL/INDUSTRIAL		
Year	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh
2010	0.4	7.4	22.8	0.0	5.6	13.8	0.4	1.8	9.0
2011	0.7	14.9	45.8	0.0	11.2	27.6	0.7	3.7	18.1
2012	1.1	22.7	69.5	0.0	17.0	41.9	1.1	5.6	27.5
2013	1.5	30.5	93.5	0.0	22.9	56.4	1.5	7.6	37.0
2014	1.9	39.2	120.1	0.1	29.5	72.5	1.9	9.7	47.6
2015	2.8	56.7	173.9	0.1	42.7	105.0	2.7	14.1	68.9
2016	3.7	75.3	230.9	0.1	56.6	139.4	3.6	18.7	91.5
2017	4.7	94.6	290.0	0.1	71.1	175.1	4.6	23.5	114.9
2018	5.7	115.5	354.0	0.2	86.8	213.7	5.6	28.6	140.3
2019	6.8	137.3	420.8	0.2	103.2	254.1	6.6	34.0	166.8

Orlando Utility Commission - Proposed Cumulative Goals

	TOTAL			RESIDENTIAL			COMMERCIAL/INDUSTRIAL		
Year	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh
2010	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2011	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2012	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2013	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2016	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2017	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2018	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Florida Public Utility Company - GDS Recommended Cumulative Goals (Including Transition Period)									
	TOTAL			RESIDENTIAL			COMMERCIAL/INDUSTRIAL		
Year	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh
2010	0.2	0.6	2.7	0.1	0.4	1.5	0.0	0.3	1.2
2011	0.3	1.3	5.4	0.2	0.7	3.0	0.1	0.5	2.4
2012	0.5	1.9	8.2	0.4	1.1	4.6	0.1	0.8	3.7
2013	0.6	2.6	11.1	0.5	1.5	6.2	0.2	1.1	4.9
2014	0.8	3.3	14.2	0.6	1.9	7.9	0.2	1.4	6.3
2015	1.2	4.8	20.6	0.9	2.8	11.4	0.3	2.0	9.1
2016	1.6	6.3	27.3	1.2	3.7	15.2	0.4	2.6	12.1
2017	2.0	8.0	34.3	1.5	4.6	19.1	0.5	3.3	15.3
2018	2.4	9.7	41.9	1.8	5.7	23.3	0.6	4.1	18.6
2019	2.9	11.6	49.8	2.2	6.7	27.7	0.7	4.8	22.1

Florida Public Utilities Company - Proposed Cumulative Goals									
	TOTAL			RESIDENTIAL			COMMERCIAL/INDUSTRIAL		
Year	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh	Winter MW	Summer MW	Energy GWh
2010	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2011	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2012	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2013	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2016	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2017	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2018	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exhibit RFS – 22: Proposed Expenditures on Renewable R&D Programs

Table 1: Proposed Expenditures on Renewable P&D Programs Based on 5-Yr. Average Funding Recovery as Determined through the Energy Cost Recovery Clause

Year	Florida Power & Light Company	Progress Energy Florida, Inc.	Tampa Electric Company	Gulf Power Company	Florida Public Utility Company
2004	$145,679,192	$60,072,362	$16,357,137	$7,619,637	$382,504
2005	$144,192,696	$59,143,076	$15,583,727	$8,826,754	$473,610
2006	$146,204,978	$59,460,367	$14,099,638	$10,205,567	$456,161
2007	$160,749,639	$67,109,815	$13,652,585	$9,107,192	$515,022
2008	$180,016,994	$77,593,960	$16,857,795	$9,257,740	$534,350
5-yr Average	$155,368,700	$64,675,916	$15,310,176	$9,003,378	$472,329
2% of 5-yr. Avg.	$3,107,374	$1,293,518	$306,204	$180,068	$9,447
5% of 5-yr. Avg.	$7,768,435	$3,233,796	$765,509	$450,169	$23,616
10% of 5-yr. Avg.	$15,536,870	$6,467,592	$1,531,018	$900,338	$47,233

ECCR Factors with Additional Amount Dedicated to Demand-Side Renewable Programs

Utility	Five-Year Average Conservation Costs (2004-2008) ($)	2009 Projected Sales at Meter (kWh)	Five-Year Average Conservation Recovery Factor (¢kWh)	2% Increase to Five-Year Average Conservation Costs (¢/kWh)	5% Increase to Five-Year Average Conservation Costs (¢/kWh)	10% Increase to Five-Year Average Conservation Costs (¢/kWh)
FPL	$155,368,700	105,989,914,000	0.147	0.150	0.154	0.161
Gulf	$9,003,378	11,936,559,000	0.075	0.077	0.079	0.083
FPUC	$472,329	771,656,238	0.061	0.062	0.064	0.067
TECO	$15,310,176	18,598,571,000	0.082	0.084	0.086	0.091
PEF	$64,675,916	40,687,466,000	0.159	0.162	0.167	0.175