BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 080407-EG
FLORIDA POWER & LIGHT COMPANY

IN RE: FLORIDA POWER & LIGHT COMPANY'S PETITION FOR APPROVAL OF NUMERIC CONSERVATION GOALS

DIRECT TESTIMONY & EXHIBITS OF:

STEVE R. SIM

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

FLORIDA POWER & LIGHT COMPANY

DIRECT TESTIMONY OF DR. STEVEN R. SIM

DOCKET NO. 080407 - EG

JUNE 1, 2009

Q. Please state your name and business address.

A. My name is Steven R. Sim, and my business address is 9250 West Flagler Street, Miami, Florida 33174.

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

A. I am employed by Florida Power & Light Company (FPL) as Senior Manager of Integrated Resource Planning in the Resource Assessment & Planning Department.

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

A. I supervise and coordinate analyses that are designed to determine the magnitude and timing of FPL's resource needs and then develop the integrated resource plan with which FPL will meet those resource needs.

Q. Please describe your education and professional experience.

A. I graduated from the University of Miami (Florida) with a Bachelor's degree in Mathematics in 1973. I subsequently earned a Master's degree in Mathematics from the University of Miami (Florida) in 1975 and a Doctorate in Environmental Science and Engineering from the University of California at Los Angeles (UCLA) in 1979.

While completing my degree program at UCLA, I was also employed full-time as a Research Associate at the Florida Solar Energy Center during 1977 - 1979. My responsibilities at the Florida Solar Energy Center included an evaluation of Florida consumers' experiences with solar water heaters and an analysis of potential renewable resources including photovoltaics, biomass, wind power, etc., applicable in the Southeastern United States.

In 1979 I joined FPL. From 1979 until 1991, I worked in various departments including Marketing, Energy Management Research, and Load Management, where my responsibilities concerned the development, monitoring, and cost-effectiveness of demand side management (DSM) programs. In 1991 I joined my current department, then named the System Planning Department, where I held different supervisory positions dealing with integrated resource planning. In late 2007 I assumed my present position.

Q. Are you sponsoring any exhibits in this case?

A. Yes. I am sponsoring Exhibits SRS-1 through SRS-12, which are attached to my testimony:

Exhibit SRS-1	Projection of FPL's Resource Needs for 2010-2019 with No Incremental DSM Signups After 2009;
Exhibit SRS-2	Economic Elements Included in the DSM Cost-Effectiveness Tests: Benefits Only;
Exhibit SRS-3	Economic Elements Included in the DSM Cost-Effectiveness Tests: Benefits and Costs;

Exhibit SRS-4	Summary Results of the DSM Cost-Effectiveness Screenings;
Exhibit SRS-5	Results of Sensitivity Case Analyses of DSM Cost-Effectiveness Screening: Economic Potential Screening Analysis Only;
Exhibit SRS-6	Fuel Cost Forecast Values Utilized in the Analyses;
Exhibit SRS-7	The Environmental Compliance Cost Forecasts Utilized in the Analyses;
Exhibit SRS-8	Comparison of the Five Resource Plans: Economic Analysis Results and Consequences;
Exhibit SRS-9	Example of Levelized System Average Electric Rate for One Resource Plan: E-RIM 664 MW;
Exhibit SRS-10	Projection of Average Customer Bill and Bill Differentials Assuming 1,200 kWh Usage;
Exhibit SRS-11	Comparison of the Five Resource Plans: Projection of System Emissions; and,
Exhibit SRS-12	Comparison of the Five Resource Plans: Projection of System Oil and Natural Gas Usage.

Q. What is the scope of your testimony?

A. My testimony addresses ten main points.

(1) I briefly discuss FPL's resource planning process.

(2) I discuss how FPL determines what its future resource needs are projected to be. I also discuss FPL's projection of additional resource needs for the 2010-2019 time period assuming no incremental DSM signups after 2009.

(3) An overview of FPL's general approach to evaluating DSM resource options is provided.

(4) I briefly discuss the various cost-effectiveness tests that FPL used to analyze DSM options versus a competing Supply option and describe enhancements that FPL has made to its DSM cost-effectiveness analyses. I also discuss these cost-effectiveness tests in regard to the cost-effectiveness analysis language in HB 7135.

(5) An overview of FPL's DSM Goals analytical process that was used to first develop four DSM portfolios, and was then used to develop five resource plans with which the DSM portfolios were analyzed, is provided.

(6) I provide details of the DSM cost-effectiveness screenings that led to the development of the DSM portfolios, and I discuss the results of a number of DSM cost-effectiveness sensitivity case analyses that were performed at the request of the Florida Public Service Commission ("Commission" or "FPSC") Staff.

(7) I discuss the development of the four DSM portfolios and the creation of four DSM-based resource plans that included these DSM portfolios. I also discuss a fifth resource plan - a Supply Only resource plan that contained no incremental DSM.

(8) The results of the economic analyses of the five resource plans are presented.

(9) The results of the non-economic analyses of these resource plans are presented.

(10) I summarize the results of the economic and non-economic analyses of the resource plans and draw a conclusion as to what DSM-based resource plan, and accompanying DSM portfolio, is the best overall choice for FPL's customers as the basis for FPL's DSM Goals for 2010 – 2019.

Q. Please summarize your testimony.

A. In FPL's resource planning work in 2009, FPL evaluated how much incremental DSM was cost-effective and feasible for the 2010 through 2019 time period; i.e., the time period to be addressed in this DSM Goals docket.

This evaluation began with an assumption that FPL would add no incremental DSM signups beyond what is currently planned through the year 2009. Based on this assumption, two projections of FPL's incremental resource needs for the years 2010 through 2019 were made. One projection was made assuming that all of these incremental resource needs would be met only with Supply options (i.e., new generation and/or firm capacity purchases). The other projection was made assuming that all of these incremental resource needs would be met only with DSM options.

Using the results of the collaborative analysis of the technical potential for DSM that is addressed in FPL witness Haney's testimony, FPL first applied the Participant cost-effectiveness test, and enhanced versions of the Rate Impact Measure (RIM) and Total Resource Cost (TRC) cost-effectiveness tests, to the DSM measures identified in the technical potential work. (The enhanced versions of these tests are referred to as the E-RIM and E-TRC tests and these will be discussed later in my testimony.) In addition, FPL's two-year payback criterion that is designed to minimize potential "free riders" (i.e., customers who would have adopted a specific DSM measure without a utility DSM program and/or incentive payment from the utility) was applied to these DSM measures.

These analyses determined which DSM measures were potentially cost-effective on the FPL system and the incentive level that could be paid to potential participants under each of the two "utility perspective" cost-effectiveness tests, E-RIM and E-TRC. Using this information, FPL developed two different pairs of projections of the achievable potential for DSM measures; one pair of projections for the DSM measures identified in the E-RIM test as potentially cost-effective and one pair of projections for the DSM measures identified in the E-TRC test as potentially cost-effective. (The term "achievable potential" as used in my testimony refers to the maximum number of signups for each DSM measure without any adjustments.) Each of these projections provided, for each DSM measure that remained after the cost-effectiveness screening, the projected maximum numbers of annual participants, MW reductions, and GWh reductions.

This information was then utilized to develop four separate DSM portfolios of DSM measures:

- An E-RIM-based portfolio (i.e., a portfolio of measures passing both the E-RIM and Participant tests) that had sufficient DSM to at least meet FPL's projected resource needs through 2019;
- An E-TRC-based portfolio (a portfolio of measures passing both the E-TRC and Participant tests) that had sufficient DSM to at least meet FPL's projected resource needs through 2019;
- An E-RIM-based portfolio that utilized all of the achievable potential DSM based on the E-RIM test; and,
- An E-TRC-based portfolio that utilized all of the identified achievable potential DSM based on the E-TRC test.

These four DSM-based portfolios were developed after accounting for various criteria and/or constraints that will be addressed later in my testimony.

These four DSM portfolios were then used to develop four DSM-based resource plans: two E-RIM-based resource plans and two E-TRC-based resource plans. In order to both assist with the development of, and to provide a more meaningful analysis of, these four DSM-based resource plans, a fifth resource plan was also developed: the Supply Only resource plan that included no incremental DSM signups after 2009.

FPL then analyzed the five resource plans from both economic and non-economic perspectives. In the economic analysis, the levelized system average electric rate perspective was utilized to compare the five resource plans. In addition, the economic analysis evaluated the resource plans in regard to whether the incremental DSM included in each plan would result in cross-subsidization of one customer group by another customer group. In the non-economic analysis, two perspectives were taken. First, for each of the five resource plans, the projected FPL system emissions of sulfur dioxide (SO_2), nitrogen oxides (NO_x), and carbon dioxide (CO_2) were compared. Second, the five resource plans were compared in regard to projections of FPL system usage of oil and natural gas.

In regard to the economic analyses alone, the E-RIM 664 MW plan emerged as the clear winner. Regarding the non-economic analyses alone, no one plan emerged as the clear winner. However, all of the economic impacts of system fuel usage and emissions were fully accounted for in the economic analyses that identified the E-RIM 664 MW plan as the best plan for FPL's customers, i.e., the non-economic portion of the analysis has been effectively included in the economic portion.

FPL concludes that the E-RIM 664 MW portfolio should be the basis for FPL's DSM Goals for the 2010 – 2019 time period. This DSM portfolio fully meets FPL's projected resource needs through 2019, results in the lowest levelized average electric rates over the 34-year term of the analyses for all five plans, results in the lowest average rates and bills among the four DSM-based resource plans for the 2010 – 2019 time period, best avoids or minimizes cross-subsidization of one customer group by another, results in lower SO_2 and NO_x system emissions and system oil usage than the Supply Only plan for most years, and results in the lowest system SO_2 and NO_x emissions and system oil usage of any plan for at least one year.

Consequently, FPL's petition for approval of its DSM Goals for the 2010 – 2019 time period is a request for the Commission to approve the E-RIM 664 MW portfolio.

I. FPL'S RESOURCE PLANNING PROCESS

Q. What are the objectives of FPL's resource planning process?

A. FPL's basic integrated resource planning (IRP) process was developed in the early 1990s and, with numerous enhancements over the years, has been used since that time to determine: 1) the timing of when new resources are needed, 2) the magnitude (MW) of the needed resources, and 3) the types of resources that should be added. The determination of the types of resources that should be added is typically based primarily on what resources result in the lowest average electric rates for FPL's customers.

It should be noted that when only Supply options (i.e., power plants or power purchases) are the resources in question, the determination can be made on the basis of lowest total costs. In cases addressing only Supply options, the outcome when viewing results from the lowest total cost perspective is the same as when viewing results from the lowest average electric rate perspective, because the number of kilowatt-hours (kWh) over which the costs are distributed or recovered from customers does not change, as would be the case when DSM resources are being examined. Consequently, when only Supply options are being analyzed, the results of a total cost analysis indicate simultaneously both a total cost and an electric rate perspective.

Q. Please provide an overview of this resource planning process.

A. The IRP process has four main tasks. These four tasks are as follows:

- <u>Task 1:</u> Determine the magnitude and timing of FPL's new resource needs.
- <u>Task 2:</u> Identify the resource options and resource plans that are available to meet the determined magnitude and timing of FPL's resource needs (i.e., identify the available competing options and resource plans).
- <u>Task 3:</u> Evaluate the competing resource options and resource plans in regard to system economics and non-economic factors.

- Task 4: Select a resource plan from which FPL management will commit, as needed, to the nearer-term options.

Q. Was this resource planning approach used to analyze the DSM resource options?

A. Yes. The IRP process outlined above describes the basic approach that FPL takes in its major resource planning efforts, including previous DSM Goals dockets, and which was taken in the analyses presented in this filing.

In regard to the analysis work conducted for this filing, each of the four tasks outlined above was performed. Once the timing and magnitude of FPL's resource needs were established, FPL then identified resource options that could meet those needs. These options included a wide range of DSM measures that were applicable to FPL and potentially cost-effective, plus Supply options with which the DSM options must compete. FPL then developed five resource plans that included these competing resource options. System economic and non-economic analyses were then conducted, and a decision was made as to the best resource plan and associated resource options for FPL's customers.

II. FPL'S PROJECTION OF RESOURCE NEEDS FOR 2010-2019

Q. How does FPL decide whether it needs additional future resources?

A. FPL uses two analytical approaches in its reliability analyses to determine the timing and magnitude of its future resource needs. The first approach is to make projections of reserve margins both for Winter and Summer peak hours for future years. A minimum reserve margin criterion of 20% is used to judge the projected reserve margins. The 20% reserve margin criterion is based on the reliability planning standard that FPL believes is the appropriate criterion, that FPL is committed to maintain, and that the Commission approved in Order No. PSC-99-2507-S-EU issued in Docket No. 981890-EU.

The second approach is a Loss-of-Load-Probability (LOLP) methodology. Simply stated, LOLP is an index of how well a generating system may be able to meet its demand (i.e., a measure of how often load may exceed available resources). In contrast to the reserve margin approach, the LOLP approach looks at the daily peak demands for each year, while taking into consideration the probability of individual generators being out-of-service due to scheduled maintenance or forced outages. LOLP is typically expressed in units of "numbers of times per year" that the system demand could not be served. FPL's LOLP criterion is a maximum of 0.1 days per year. This LOLP criterion is generally accepted throughout the electric utility industry.

For a number of years, FPL's projected need for additional resources has been driven by the Summer reserve margin criterion. This again was the case in FPL's reliability analysis that was the basis for FPL's projected resource needs for 2010-2019.

Q. In making its projection of FPL's future resource needs, what were the assumptions used?

A. The primary assumptions used in making the projection of resource needs include: FPL's January 2009 load forecast, FPSC-approved generating unit additions, a projection of new firm and non-firm capacity renewable additions, the temporary removal from active service of specific generating units as they are placed on Inactive Reserve status and their return to active service, and no incremental DSM signups after the end of 2009.

Q. What is the implication of assuming no incremental DSM signups after the end of 2009?

A. This assumption has two implications. First, it allows FPL to start its DSM Goals analyses for the 2010 – 2019 period with the proverbial "clean sheet of paper" in which previous decisions regarding DSM implementation for 2010 and beyond are discarded, allowing a fresh look at DSM in light of current load forecasts, fuel cost forecasts, etc. Second, the removal of the previously projected DSM signups after 2009 increases the magnitude (MW) of FPL's projected resource needs and moves those projected resource needs closer to the present. The resulting greater magnitude of, and earlier timing of, future resource needs will tend to increase the projected cost-effectiveness of DSM options by showing a greater resource need.

Q. What was the magnitude and timing of the projection of resource needs?

A. The incremental resource need projection for 2010-2019 is presented in Exhibit SRS-1. Column (9) of this exhibit shows what the projected resource needs are if the resource needs are met solely by Supply options while Column (10) shows what the projected resource needs are if the resource needs are met solely by DSM options.

These columns show that FPL's first resource need is in 2017. In 2017, the resource need is relatively small: 160 MW if the need is met solely by Supply options or 134 MW if met solely by DSM options. (The difference in the two values is caused by FPL's 20% reserve margin criterion. For example, if FPL's projected load grows by 100 MW, FPL can meet this need by either implementing 100 MW of new DSM or by adding 120 MW of new Supply options. Either option would result in an identical reserve margin value.)

There is no resource need in 2018, due to the projected addition of the Turkey Point Unit 6 nuclear unit, but there is an additional resource need in 2019. In 2019, the projected resource need is 796 MW if the need is met solely by Supply options or 664 MW if met solely by DSM options.

Exhibit SRS-1 also shows that, if these levels of Supply or DSM additions are added to meet the Summer resource needs, these additions will also satisfy the lower resource needs dictated by the Winter reserve margin criterion.

(Note: The MW values mentioned above, and which are presented in Exhibit SRS-1, are MW values "at the generator"; i.e., after line losses have been accounted for. FPL's resource planning work typically uses only MW values "at the generator". Therefore, unless otherwise noted in either my testimony or exhibits, all MW values will be "at the generator" values.)

Q. What was the impact of FPL's current load forecast on FPL's projected resource needs?

A. FPL's 2009 load forecast is lower than FPL's 2007 and early 2008 load forecasts, both in terms of peak demand and annual net energy for load. There are two basic impacts of the current peak demand forecast on FPL's projection of resource needs compared to previous resource need projections based on prior load forecasts.

First, FPL's projected next resource need is pushed out in time. As mentioned above, FPL's projected first resource need does not appear until 2017 and the first resource need of any significant size is projected to occur in 2019. Second, the magnitude of FPL's projected resource need is smaller. As discussed above, the total resource need through 2019 is approximately 664 MW if that resource need were to be solely met by incremental DSM signups starting in 2010. This projected resource need over ten years is significantly smaller than with previous load forecasts.

Consequently, the impact of FPL's new, lower load forecast is that FPL's need for new resource additions – whether Supply or DSM resources – is later and smaller than previously projected.

Q. **What does this lower load forecast and projection of lower resource needs mean in regard to energy efficiency for FPL's customers?**

A. It means that energy efficiency and/or DSM will continue to play a growing role for FPL's customers, but that the relative amounts of energy efficiency that are delivered to FPL's customers through two different "paths" will likely change compared to what has occurred in previous years.

One of the two paths to providing energy efficiency/DSM to FPL's customers is through cost-effective FPL DSM programs and the other is through federally mandated appliance efficiency and lighting standards. The impacts of the latter, appliance efficiency and lighting standards based on the 2005 National Energy Policy Act (NEPACT) and the 2007 Energy Independence and Security Act (EISA), are already reflected in FPL's lower load forecast.

These updated appliance efficiency and lighting standards are one of several significant "drivers" of the new lower load forecast. FPL's 2009 load forecast reflects a projection of approximately 895 MW of Summer peak load reduction, and a projection of approximately 8,925 GWh of annual energy reduction, by 2019 due to these updated standards, over and above the projected impact of federal standards in FPL's previous load forecast. This large amount of additional energy efficiency projected to be realized from the updated federal standards lowers FPL's forecasted load which, in turn, significantly lowers FPL's future resource needs through 2019. As a consequence, there is less need for any new resource, whether DSM or Supply options, through 2019.

There is another impact from these updated federal standards beyond a lowering of FPL's projected needs. Prior to these updated federal standards, the large amount of energy efficiency projected to be realized from the standards would have been available for utility DSM programs to address. Thus, the potential for energy efficiency delivered through utility DSM programs is diminished by the updated federal standards.

FPL's IRP process recognizes the reality of the growing impact of appliance efficiency and lighting standards through the incorporation of the energy efficiency impacts of these standards in FPL's load forecast, resulting in projections of lower resource needs through 2019. The analyses conducted for this DSM Goals docket uses this projection of lower resource needs as the starting point to determine the appropriate role for FPL's DSM programs to meet those lower resource needs.

In summary, the updated federal appliance efficiency and lighting standards result in two impacts to DSM cost-effectiveness analysis. The first impact is a lower projection of need for additional resources, regardless of whether the resources are Supply or DSM options. The second impact is that higher appliance efficiency and lighting standards lower the potential efficiency gains that utility DSM programs can deliver.

Q. Are you suggesting that one should consider both the updated federal appliance efficiency standards and utility DSM programs when viewing how much energy efficiency/DSM will be ultimately delivered to FPL's customers over the next 10 years?

A. Yes. As described above, FPL's customers are projected to receive approximately 895 MW and 8,925 GWh of additional energy efficiency through these federally mandated standards by 2019. FPL's January 2009 load forecast reflects these reductions and the forecast is the starting point for FPL's analyses of how much utility-sponsored DSM is cost-effective for its customers. Therefore, this amount of utility-sponsored DSM, which will be discussed later in my testimony, should be added to the approximately 895 MW from the federal standards to obtain a full and complete picture of how much total energy efficiency/DSM FPL's customers will receive in the 2010 – 2019 time frame.

III. FPL'S GENERAL APPROACH FOR EVALUATING DSM OPTIONS

Q. Earlier you provided an overview of FPL's integrated resource planning (IRP) process. How does FPL approach the analysis of DSM resource options within this IRP process?

A. A fundamental guiding principle of integrated resource planning is that all resource options, Supply and DSM options, are competing options and that analyses should evaluate all resource options on a level playing field in order to determine which of these competing options is (are) the best choice(s) for a utility's customers. FPL agrees with this guiding principle and seeks to incorporate it in its IRP process.

FPL's view is that, to the extent practical, a Supply option must compete both with other Supply options and with DSM options to earn a place in FPL's resource plan. Similarly, a DSM option must compete both with other DSM options and with Supply options to earn a place in FPL's resource plan. In addition, FPL's IRP process is designed to evaluate all resource options, both Supply and DSM options, on a level playing field.

Q. How do FPL's IRP analyses seek to achieve a level playing field for Supply and DSM options?

A. FPL's analyses are designed to achieve a level playing field through two approaches. First, FPL's IRP analyses typically compare each resource option's impacts on the FPL system from both economic and non-economic perspectives. The economic perspective considers the impact on electric rates and also examines the question of "cross-subsidization"; i.e., whether one group of customers is subsidizing another group due to the selection of a resource option. The non-economic perspective considers the impacts on system emissions and system fuel usage.

Both emissions and fuel usage have economic impacts, and these impacts are fully captured in the economic analyses. However, emissions and fuel usage are frequently discussed in non-economic terms such as tons of emissions and mmBTU of fuel usage. I will discuss them in similar terms in this testimony. The use of these different perspectives in examining the various impacts of the competing resource options on the FPL system ensures that resource decisions are made with broad knowledge of the variety of impacts resource options will have on the FPL system and FPL's customers.

FPL's IRP process also seeks to evaluate resource options on a level playing field in another very important way. For each resource option, FPL's analyses attempt to include a complete set of costs and benefits that will directly impact FPL's customers for each of the perspectives discussed above. This ensures that the analyses are as complete as possible and that a level playing field is maintained throughout the analyses.

Q. Did FPL incorporate these two approaches to achieve a level playing field in its analyses presented in this docket?

A. Yes. Later in my testimony I will present the results of the analyses of resource plans based on DSM and Supply options from each of these four system perspectives: electric rates, cross-subsidization of one customer group by another group, system emissions, and system fuel usage. I will also discuss the aspect of using a complete set of costs and benefits in DSM analyses when discussing the different DSM cost-effectiveness tests.

IV. VARIOUS COST-EFFECTIVENESS TESTS USED TO ANALYZE DSM OPTIONS

Q. Which DSM cost-effectiveness tests were used in FPL's analyses that are presented in this docket, and what information are the tests intended to convey?

A. FPL utilized three basic DSM cost-effectiveness tests in these analyses: the Participant test, the RIM test, and the TRC test. All three tests are designed to provide economic information regarding the DSM option being evaluated. The intent of the Participant test is to determine if it makes economic sense for a potential participant to participate in a specific FPL DSM program. The purported intent of the other two tests is to determine if it makes economic sense for the utility system as a whole; i.e., for non-participants as well as for participants, for FPL to offer the DSM option. However, as will be discussed in my testimony, only one of these two tests really addresses the issue of whether it makes sense for a utility to offer a DSM option when considering all customers on a utility system.

Q. Are all three cost-effectiveness tests currently required by the Florida Public Service Commission?

A. Yes. All three tests, the Participant test, the RIM test, and the TRC test, are currently required by the Commission as part of the Commission-approved cost-effectiveness methodology.

Q. Please discuss the primary differences in these three tests.

A. The differences in the three tests can best be described by comparing the specific economic elements that are included in each test. Exhibit SRS-2 presents a comparison of the economic elements that are included in the calculation of the benefits for each test.

A listing of the types of DSM-related economic benefits that DSM program participants obtain, and that utility systems obtain, from DSM measures appears in the two shaded columns. Adjacent to the shaded columns are columns that indicate whether a specific cost-effectiveness test actually incorporates those economic benefits in the test.

Two main conclusions can be drawn from this exhibit. First, all three tests include all of the relevant economic impacts that represent <u>benefits</u> from either participating in, or from implementing, a DSM measure. This is obviously a desirable characteristic for these tests to have. Second, in regard to the RIM and TRC tests, the tests are identical in regard to the calculations of benefits that can be derived from DSM measures. In other words, these two tests will provide an identical calculation of benefits for a specific DSM measure.

Q. **Do the three tests also include all relevant DSM-related costs, and do the RIM and TRC tests provide an identical calculation of costs for a specific DSM option?**

A. No, not all of the tests include all of the relevant DSM-related costs. Exhibit SRS-3 expands the benefits-only perspective presented in Exhibit SRS-2 to also include DSM-related costs. Several additional conclusions can be drawn from this exhibit that presents a complete perspective of these cost-effectiveness tests.

First, the Participant test includes all of the relevant DSM-related costs that will be incurred by a customer who may participate in a DSM program. Therefore, the Participant test fully accounts for all benefits and costs that are received and/or incurred by a potential participant in a DSM program. This is obviously a good thing.

Second, the RIM test also includes all of the relevant DSM-related costs that will be incurred by the utility and its customers, both DSM participants and non-participants. Therefore, the RIM test fully accounts for all benefits and costs that are received and/or incurred by all of a utility's customers if the utility decides to offer a DSM program. This is obviously a good thing as well.

Third, the TRC test does not include all of the DSM-related costs that will be incurred by the utility and all of its customers. This so-called "total resource cost" test omits the incentive payments made to DSM program participants, costs that are recovered from all of the utility's customers. The TRC test also omits the economic impact of unrecovered revenue requirements on the utility's electric rates. In addition, the TRC test includes the participant's out-of-pocket costs for participating in the DSM program. These participant's out-of-pocket costs are not recovered from all of a utility's customers, and these costs are already captured in the Participant test.

Therefore, only the combination of the Participant and RIM tests correctly include all of the economic impacts, benefits and costs, which are incurred by all of a utility's customers when DSM options are implemented. The TRC test omits two important costs/economic impacts and "double counts" the participant's costs which are already captured in the Participant test.

The use of the combination of both the RIM and Participant tests achieves the objective of creating and maintaining a level playing field for IRP analyses because all of the relevant DSM-based benefits and costs are included. On the other hand, because the TRC test does not include all of the relevant DSM costs and economic impacts when comparing DSM to Supply options, the TRC test, whether alone or paired with the Participant test, does not allow DSM options to be compared on a level playing field to Supply options.

In summary, the Participant test includes all of the relevant benefits and costs that a customer who is considering participating in a DSM measure would consider. Similarly, the RIM test includes all of the relevant benefits and costs that all of the utility's customers would incur if the utility implements a DSM measure. Conversely, although the TRC test includes all of the relevant DSM-based benefits that a utility's customers would realize, this test does not include all of the DSM-related costs. This is a fundamental flaw in the TRC test.

Q. What is the practical result of the TRC test omitting some significant DSM-related costs?

A. Because the TRC test only recognizes a subset of DSM-related costs, more DSM options, either in the form of the number of measures or the amount of MW or GWh, will "pass" the TRC test than will pass the RIM test, which correctly includes all of the relevant costs and economic impacts of DSM options.

All relevant costs and benefits are included in FPL's analyses of Supply options. The inclusion of all relevant costs and benefits of DSM options that is accomplished by using the RIM test allows FPL to evaluate Supply and DSM options on a level playing field; i.e., a principle of IRP analyses.

Conversely, comparing resource options on a level playing field is simply not possible with the TRC test, because this test omits significant DSM-related costs, thus giving an erroneous advantage to DSM options when they are compared to Supply options. As a result, a resource plan developed based on the TRC test would not be the most cost-effective resource plan for the utility's customers.

Q. If one were to overlook the fact that the TRC test gives an erroneous advantage to DSM options over Supply options, would there be other undesirable consequences?

A. Yes. There are a number of serious and undesirable consequences. First, the use of the TRC test would violate the fundamental principle of integrated resource planning: evaluating competing resource options on a level playing field.

Second, the use of the TRC test rather than the RIM test would tend to lead to the selection of more DSM than is truly cost-effective if all DSM-related costs were accounted for. Such an occurrence would, in turn, lead to a sub-optimal resource plan.

Third, the inclusion in a resource plan of DSM measures that "passed" the TRC test, but did not pass the RIM test, would result in higher electric rates than if either the competing Supply option or RIM-based DSM measure had been chosen.

Fourth, the inclusion in a resource plan of DSM measures that "passed" the TRC test, but did not pass the RIM test, would result in customer cross-subsidization with non-participants in those DSM measures paying higher bills due to the higher electric rates than if either the competing Supply option or RIM-based DSM had been chosen. Therefore, the use of TRC-based DSM measures results in "winners" (participants in TRC-based DSM measures) and "losers" (all other customers) among a utility's customers. I'll return to the issue of cross-subsidization later in my testimony as I discuss the economic analysis results.

Fifth, from the Commission's perspective, the use of the TRC test would prevent the Commission from having a complete picture of all of the costs of the DSM options being compared to a competing Supply option. From my experience in a variety of need determinations and prior DSM Goals filings, I believe that the Commission always seeks to have a full accounting of costs associated with both Supply and DSM options. The use of the TRC test would not provide the Commission with a full accounting of DSM-related costs for their deliberations.

Q. Has FPL made any enhancements to its analytical approach regarding these cost-effectiveness tests?

A. Yes. FPL's analyses in support of its recent determination of need filings, including the filings for the supercritical coal units, the nuclear uprates, the Turkey Point Units 6 & 7 new nuclear units, the West County Energy Center Unit 3, and the conversions/modernizations of FPL's existing Cape Canaveral and Riviera units, have each included the economic impact of environmental compliance costs for specific emissions including sulfur dioxide (SO_2), nitrogen oxides (NO_x), and carbon dioxide (CO_2). These analyses first determined the projected system net emissions (after accounting for any allowances that FPL is projected to have) for resource plans that each included a specific competing resource option. Then projected environmental compliance costs (generally in terms of $/ton of a given emission) were applied to the projected system emissions for each resource plan to ensure that the costs of these system emissions are captured in the economic analyses.

In order to maintain a level playing field for all resource options, FPL has enhanced its DSM analyses to include these environmental compliance costs. This accounting for projected environmental compliance costs is included in all of the analyses of Supply and DSM options that are presented in FPL's filing in this docket. In this way, FPL is able to economically quantify the impacts that DSM options have on a utility's system emissions in the same way they are quantified when analyzing Supply options. This helps ensure that all resource options are analyzed on a level playing field in FPL's IRP process.

Q. Therefore, is it correct to assume that the RIM and TRC test methodologies that FPL now utilizes are not the same as FPL has utilized in the past?

A. Yes. FPL's inclusion of environmental compliance costs in both the RIM and TRC cost-effectiveness methodologies results in both cost-effectiveness calculation approaches being significantly different from those used by FPL in the past. Taking the RIM test methodology for example, one could correctly view the new RIM calculation methodology as an Environmental RIM (E-RIM) methodology. The new E-RIM methodology allows DSM options to continue to be analyzed on a level playing field with Supply options for which environmental compliance costs are included.

Therefore, the two cost-effectiveness tests will generally be referred to as the E-RIM and E-TRC tests in the remainder of my testimony.

Q. Because this same improvement was made to the previously used version of the TRC test, does this change overcome the previously discussed problems with the TRC test?

A. No. The correct way to interpret FPL's changes to the TRC test to now include environmental compliance costs, thus resulting in an E-TRC test, is that these changes prevent the still fundamentally flawed E-TRC test from falling even further behind the E-RIM test in its ability to allow comparison of

DSM and Supply options on a level playing field. The fundamental flaws in the TRC test, its failure to account for the significant DSM costs and economic impacts of incentive payments to participants and unrecovered revenue requirements, and its "double counting" of participant costs already accounted for by the Participant test, still remain in the E-TRC test. These flaws are as detrimental as ever when trying to analyze competing resource options on a level playing field.

Q. In practical terms, what is the impact of incorporating environmental compliance costs in the cost-effectiveness screening of DSM options?

A. The basic outcome of incorporating environmental compliance costs in DSM cost-effectiveness screening is two-fold when compared to DSM screening results in which these environmental compliance costs are not included. First, DSM programs with higher kWh reduction to kW reduction ratios (such as certain energy efficiency programs) will generally have higher total benefit values than they otherwise would have. Second, DSM programs with lower kWh reduction to kW reduction ratios (such as load management programs) will generally have lower total benefit values than they would have had otherwise.

This does not mean that all energy efficiency programs will now pass both the E-RIM and E-TRC tests, nor does it mean that all load management programs will now fail both the E-RIM and E-TRC tests. What it means is that the benefit-to-cost ratios under both tests will move in the directions described above: assuming all else remains the same, the benefit-to-cost ratios for energy efficiency programs will be higher and the benefit-to-cost ratios for load management programs will be lower.

Q. In your opinion, does the enhanced E-RIM test fully account for the costs and benefits of DSM programs with higher kWh reduction to kW reduction ratios?

A. Yes. Historically, the TRC test – despite its obvious fundamental flaws – has been favored by some in large part because it tended to favor DSM programs with larger kWh reductions which might fail the RIM test. These proponents of the TRC test willingly overlooked the obvious flaws in the TRC test because this flawed test generally "passed" more DSM measures and/or DSM MW or GWh. Passing more DSM, particularly DSM measures with high kWh-to-kW reduction ratios, was seen as inherently "good", because it was believed these measures would reduce a utility system's emissions, even though these emission "benefits" were often not quantified.

However, the enhanced E-RIM test not only incorporates the emission impacts of these (and all other) DSM measures, but also places a monetary value on the emission impacts in the same way monetary values are calculated for the emission impacts of Supply options.

Therefore, the E-RIM test is a significant advancement in regard to continuing to analyze DSM programs and Supply options on a level playing field. The E-

RIM test retains the fundamental concept found in the previously used version of the RIM test - the incorporation of all DSM-related costs that allow a comparison of options on a level playing field. In addition, the E-RIM test now incorporates environmental compliance costs, using the same bases for these costs as are used when analyzing Supply options, thus accurately quantifying the monetary impact of system emission impacts from all DSM programs.

Now one no longer needs to settle for – and there is no logical rationale for using - a fundamentally flawed test such as TRC based on the notion that it favors higher kWh reduction DSM programs. The E-RIM test gives full economic value to emission reductions for all DSM programs and does so while retaining the IRP objective of a level playing field for both DSM and Supply options which is necessary to arrive at an optimal resource plan for a utility's customers.

Q. Do the DSM cost-effectiveness tests used by FPL in the analyses presented in this docket meet all of the items listed in HB 7135 that the Commission, according to HB 7135, "shall take into consideration"?

A. The answer is "yes" for the E-RIM and Participant tests and "no" for the E-TRC test.

HB 7135 lists the following four items that the "commission shall take into consideration" in regard to cost-effectiveness tests used in DSM evaluation:

a) "The costs and benefits to customers participating in the measure."

b) "The costs and benefits to the general body of ratepayers as a whole, including utility incentive and participant contributions."

c) "The need for incentives to promote both customer-owned and utility-owned energy efficiency and demand-side renewable energy systems."

d) "The costs imposed by state and federal regulations on the emission of greenhouse gases."

In regard to item (a), "The costs and benefits to customers participating in the measure," FPL's analyses use two pairs of cost-effectiveness tests: the E-RIM and Participant tests, and the E-TRC and Participant tests. The Participant test is specifically designed to account for all DSM-related costs incurred by, and all DSM-related benefits provided to, DSM program participants. Therefore, the pairing of either the E-RIM or E-TRC test with the Participant test ensures that all of the costs and benefits to customers participating in a DSM measure are accounted for.

Regarding item (b), "The costs and benefits to the general body of ratepayers as a whole including utility incentives and participant contributions", the use of the E-RIM and Participant tests allow this requirement to be met. As previously explained, although both the E-RIM and E-TRC tests account for all DSM-related benefits that are realized by all ratepayers, only the E-RIM test accounts for all DSM-related costs, including utility incentive payments made to program participants, that are passed on to all of FPL's ratepayers, and the negative impacts of unrecovered revenue requirements on customers' electric rates. Furthermore, the pairing of the E-RIM test with the Participant test ensures that all participant contributions are fully accounted for because of the inclusion of the Participant test.

Conversely, the E-TRC test, even when paired with the Participant test, does not comply with item (b) because it omits the two DSM-related costs/economic impacts described above.

Item (c), "The need for incentives to promote both customer-owned and utility-owned energy efficiency and demand-side renewable energy systems," is a moot point in regard to the cost-effectiveness tests that FPL is utilizing in the analyses presented in this docket. At this time, FPL is neither receiving nor requesting such incentives.

Item (d), "The costs imposed by state and federal regulations on the emission of greenhouse gases" s fully addressed in the E-RIM and E-TRC tests that FPL used for the analyses in this docket. Although there are currently no state or federal regulations regarding the emission of greenhouse gases, FPL's analyses in this docket utilized a projected set of compliance costs for carbon dioxide (CO_2) in both its E-RIM and E-TRC analyses.

In summary, the analyses based on the use of the E-RIM and Participant tests fully address all of these four items listed in HB 7135. Conversely, the analyses based on the use of the E-TRC and Participant tests fail to address item (b) of HB 7135 because the E-TRC test does not account for all DSM-related costs that are incurred by all of FPL's ratepayers.

V. AN OVERVIEW OF FPL'S DSM GOALS ANALYTICAL PROCESS

Q. Please provide a brief description of FPL's DSM Goals analytical process?

A. The analytical process that FPL utilizes in its DSM Goals work consists of seven main steps. These analytical steps are typically performed sequentially over a number of months by two FPL departments - the Resource Assessment & Planning (RAP) department and the Demand Side Management (DSM) department. For the 2009 DSM Goals analyses, an outside consultant, Itron, was utilized for some of the steps.

Q. Please provide a brief summary of these seven steps in the analytical process.

A. These seven analytical steps can be summarized as follows:

Step 1: Determine DSM Technical Potential:

In this first step, a wide variety of DSM measures is examined to determine which measures are technically feasible for application in FPL's service territory. This step results in a large number of DSM measures being identified as technically feasible. In 2009, these efforts utilized a collaborative approach and an outside consultant, Itron. FPL witness Haney discusses the Step 1 activities in more detail in his testimony. All of the DSM measures identified in this step as technically feasible for FPL are carried forward to the second step in the process.

Step 2: Initial Cost-Effectiveness Screening of DSM Measures:

In this step, the DSM measures identified as being technically feasible for application in FPL's service territory undergo initial economic screening to judge the potential cost-effectiveness of the measures if implemented on FPL's system. Both the E-RIM and E-TRC cost-effectiveness tests are used in a pairing with the Participant test in this step. In addition, a two-year payback criterion is used to minimize the potential for free riders.

For those measures that pass this cost-effectiveness screening step, a maximum incentive amount for each measure that results in at least a "breakeven" result (benefits equal costs; i.e., a 1.00 benefits-to-cost ratio) for each of the cost-effectiveness test pairs is identified. These measures and their associated maximum possible incentive levels are carried forward to Step 3 to finalize the cost-effectiveness screening analyses and determine the final incentive amount. Those measures that do not pass this initial cost-effectiveness screening in Step 2 are not evaluated further.

Step 3: Determine Maximum Incentive Levels for DSM Measures and Finalize Cost-Effectiveness Screening:

In Step 3, this maximum possible incentive amount identified in Step 2 for each remaining DSM measure is further evaluated and may be adjusted. Using this value as a starting point, FPL may adjust the incentive amount for a particular DSM measure downward for one or two reasons.

First, in regard to the analyses conducted with the E-RIM and Participant tests, FPL wants each DSM measure to result in positive net benefits under the E-RIM test. It may not be able to do this if the previously calculated maximum possible incentive value is used without an adjustment.

For example, suppose that the maximum possible incentive level results in total costs equaling total benefits in the E-RIM test results; i.e., a net benefits value of zero. In such a case, FPL may lower the incentive by an amount which will result in positive net benefits for the measure and which allows some cushion for the measure to remain cost-effective if other costs and/or benefits change over time as they frequently do.

Second, an adjustment in the incentive payment level may occur when FPL determines the years-to-payback period for a potential participant in the DSM measure. If this projected period is less than two years, FPL would typically lower the incentive amount to a point where the projected payback period is at least two years. This "two-year payback" criterion is designed to minimize the occurrence of free riders. The two-year payback criterion is applied to DSM measures when using either the E-RIM and Participant tests approach or the E-TRC and Participant tests approach. FPL witness Haney discusses the concept of free riders and the two-year payback criterion in his testimony.

If, after the previously identified maximum possible incentive value has been appropriately lowered as described above, and a non-zero incentive amount remains, the DSM measure is judged to have survived Step 3 of the analysis process.

At the end of Step 3, an incentive amount for each surviving DSM measure under both pairs of cost-effectiveness tests has been identified. These surviving or remaining DSM measures under both pairs of cost-effectiveness tests, and their associated incentive amounts, are carried forward to Step 4.

Step 4: Determine DSM Achievable Potential:

In this step, the remaining DSM measures and their associated incentive amounts under each of the cost-effectiveness tests are used to develop projections of the maximum number of participants that can reasonably be signed up for each DSM measure annually over the 10-year period of 2010 through 2019.

The resulting projection of the maximum number of participants that can be reasonably signed up annually for each DSM measure over the 10-year period without any adjustments, and the corresponding projected MW reductions, are referred to in my testimony as the achievable potential of DSM. Three sets of achievable potential values for both pairs of cost-effectiveness tests were developed. I will return to these three sets of achievable potential values later in my testimony. FPL witness Haney and Itron witness Rufo also discuss this concept and related work in their testimonies.

<u>Step 5: Develop DSM Portfolios:</u>

Four DSM portfolios are developed in this step, two associated with each of the pairs of cost-effectiveness tests. (Note: in my remaining testimony, I will refer solely to the E-RIM and E-TRC portfolios with the understanding that the results of the Participant test have been accounted for in all portfolios.)

For each specific cost-effectiveness test, a list of all DSM measures that survived the economic screening, the associated incentive amount for each DSM measure and the corresponding achievable potential projections (annual participants and MW reductions) serve as inputs to the work. This information is used to develop specific DSM portfolios that at least meet FPL's projected resource needs with the lowest total DSM-related costs that are applicable to the specific cost-effectiveness test being used. Each portfolio must also meet certain practical program implementation constraints.

The four DSM-based portfolios can be described as follows:

1) E-RIM 664 MW portfolio;
2) E-TRC 664/1,093 MW portfolio;
3) E-RIM 949 MW portfolio; and,
4) E-TRC 1,153 MW portfolio.

The first two portfolios are designed to meet at least all of FPL's resource needs through the 2019 time period. The third and fourth portfolios are based on the maximum achievable potential MW projections. These projections, 949 MW for E-RIM and 1,153 MW for E-TRC, are for DSM amounts that are clearly greater than what is called for (664 MW) to meet FPL's projected resource needs by 2019.

Each DSM portfolio will have specific characteristics that include its annual MW reduction capability, annual GWh reduction capability, and associated costs. Once the four DSM portfolios are completed, these portfolios are carried forward to Step 6.

Step 6: Develop Resource Plans:

The four DSM portfolios are then used to create four DSM-based resource plans that will be referred to by the same names as the portfolios. These four resource plans are created by examining FPL's projected remaining resource needs once the DSM portfolio has been accounted for, then adding Supply options "after" the DSM portfolio to address years beyond 2019 in the analyses. This ensures that each resource plan meets FPL's reliability criteria and that the resource plans are comparable. These four DSM-based resource plans, plus a Supply Only resource plan that includes no additional DSM signups beyond 2009, are then analyzed in Step 7.

Step 7: Analysis of Resource Plans:

As previously discussed, these five resource plans are then evaluated in a system analyses that determine the levelized system average electric rates, the ability to avoid or minimize cross-subsidization of one customer group by another, system emission levels for SO_2, NO_x, and CO_2, and system usage levels of oil and natural gas for each resource plan. These results for each resource plan are then compared to each other.

VII. DETAILS OF THE DSM COST-EFFECTIVENESS SCREENINGS AND THE RESULTS OF VARIOUS SENSITIVITY CASE SCREENING ANALYSES

Q. Which of the seven steps listed in the previous section will your testimony address in more detail?

A. My testimony will address the work that was performed for the following four analytical steps:

- Step 2: Initial Cost-Effectiveness Screening of DSM Measures;
- Step 3: Determine Maximum Incentive Levels for DSM Measures and Finalize Cost-Effectiveness Screening;
- Step 5: Develop DSM Portfolios;
- Step 6: Develop Resource Plans; and,
- Step 7: Analysis of Resource Plans.

FPL witness Haney's testimony will address the work that was performed for Steps 1 and 4.

Q. What are the objectives of the initial screening calculations of DSM measures performed in Step 2?

A. The objectives of the initial cost-effectiveness screening performed in Step 2 are to: (i) compare the present value of the DSM-related benefits and costs, to all customers, that are applicable to the cost-effectiveness test being utilized, and (ii) compare the present value of the DSM-related benefits and costs that apply to DSM participants. Those DSM measures that emerge with positive net benefits (i.e., the present value of benefits is greater than the present value of DSM costs accounted for by each cost-effectiveness test) are said to have "survived" the initial screening. These surviving DSM measures are potentially cost-effective DSM resource options for the FPL system. As previously discussed, these DSM measures are evaluated further in Step 3 to finalize the cost-effectiveness analysis for each measure and to finalize the incentive payment amount for each measure.

Q. How are these initial screening calculations carried out?

A. FPL's cost-effectiveness screening of each DSM measure that emerged from Step 1 followed two cost-effectiveness screening "paths." One path examined the cost-effectiveness of each DSM measure from the perspective of the E-RIM test, the Participant test, and the two-year payback criterion that addresses the issue of free riders. The other path examined the cost-effectiveness of each DSM measure from the perspective of the E-TRC test, the Participant test, and the two-year payback criterion.

Prior to proceeding down each of these two cost-effectiveness screening paths, FPL first took the 2,321 DSM measures that were identified for FPL in the technical potential analyses and reduced those measures to a more workable number of measures. This reduction was accomplished by grouping certain commercial and industrial measures that are identical except for the fact that the measure would be applied to a different building type. Each of these identical commercial and industrial measures was reduced to a single "collapsed" DSM measure for purposes of cost-effectiveness screening. (Residential and new construction measures were not collapsed.) Then, at the conclusion of the cost-effectiveness screening work, those "collapsed" measures that passed all of the screening steps are "expanded" so that all of the applicable building types for those measures are individually accounted for in the achievable potential work that follows.

Therefore, FPL's cost-effectiveness screening work evaluated 844 DSM measures, some of which had been collapsed as mentioned above. These 844 measures then started down the two screening paths described above. Each path utilized up to five screening steps as applicable to the cost categories that are included in the specific cost-effectiveness test, E-RIM or E-TRC, being utilized, the Participant test, and the two-year payback criterion.

These five cost-effectiveness screening steps each utilize a full accounting of projected benefits from DSM and a step-by-step accounting of DSM-related costs. These screening steps can be summarized as follows:

Screening Step (1): In the initial screening step, each of the 844 DSM measures is evaluated using only the costs of unrecovered revenue requirements for the E-RIM test, and the participant's out-of-pocket costs for the E-TRC test. For purposes of this docket, the results of this screening step are referred to the "economic potential" for DSM (despite the fact that these results represent only the beginning step of a multi-step economic analysis). Those measures passing this screening step are carried forward to Screening Step (2), while measures failing at this step are dropped from further analyses.

Screening Step (2): In the second screening step, administrative costs are now added to those costs considered in the initial screening step for both the E-RIM and E-TRC paths. As before, only those measures passing this step are carried forward.

Screening Step (3): This screening step applies only to the E-RIM screening path and only to certain DSM measures. In this step, for those remaining measures that do not pass the Participant test without an incentive payment, the amount of incentive payment needed to be added to result in a Participant test benefit-to-cost ratio of 1.00 is first calculated. Then that incentive payment is also applied for the E-RIM test, and it is determined if the measure still passes the E-RIM test. Those measures passing this step are carried forward. (Note that this screening step does not apply to the E-TRC path because the TRC test does not account for incentive payments made by a utility to participating customers.)

Screening Step (4): The two-year payback criterion is applied in this step to both of the paths. For each remaining measure, a calculation is made to see if a participant's incremental out-of-pocket costs will be fully recovered from bill savings in two years or less without any incentive payment from the utility. Only those measures for which the participant's costs are not fully recovered in two years are carried forward to the last screening step.

Screening Step (5): The two-year payback criterion is again applied in this step to both of the paths, but this time the utility's incentive payment is included. The incentive payment needed, for certain measures, to make the Participant test equal 1.00 is now included in the two-year payback calculation. Those measures passing this final screen are deemed to have passed FPL's cost-effectiveness screening.

Q. How did FPL determine what the type and cost of the competing generating unit would be that the DSM measures would be compared to in these cost-effectiveness screening steps?

A. Using the projection of resource needs presented in Exhibit SRS-1, it is clear that FPL's next significant resource need is projected to be in the year 2019. FPL projects that if the 2019 resource need were to be met with a Supply option, FPL's construction option would be a combined cycle (CC) unit similar to the 3x1 G CC units now being constructed at FPL's West County Energy Center (WCEC). Because no site for a potential generating unit to be added in 2019 has been selected, it was assumed that, for cost-effectiveness screening purposes, the generating unit that DSM would be compared to would be a greenfield CC unit.

FPL developed a "Supply Only" resource plan for purposes of the analyses in this docket which meets the capacity needs outlined in Exhibit SRS-1. This resource plan assumes no incremental DSM signups after 2009, includes a short-term purchase in 2017 to address the small one-year resource need in that year, and includes a new greenfield CC unit in 2019. The Supply Only resource plan is similar to the resource plan presented in FPL's 2009-2018 Ten Year Site Plan with three exceptions: incremental DSM signups after 2009 have been removed, the return-to-service dates of some of FPL's generating units that will be temporarily placed on Inactive Reserve status have been changed, and a five-month firm power purchase in 2017 for 160 MW has been added.

The cost and performance inputs assumed for this 2019 CC unit are similar to those for the CC unit used in FPL's determination of need filings for WCEC Unit 3 and for the conversions/modernizations of FPL's existing units at the Cape Canaveral and Riviera sites. The capital and operating costs were updated to account for current projections of cost escalation to an in-service year of 2019, while the size of the unit (1,219 MW summer rating) and the heat rate (6,582 BTU/kWh) were unchanged.

Q. What were the results of the cost-effectiveness screenings performed in Step 2?

A. The results of the cost-effectiveness screenings are presented in Exhibit SRS-4. As shown in this document, FPL started with 844 DSM measures in both its E-RIM and E-TRC cost-effectiveness screening paths after first collapsing the original list of 2,321 total DSM measures as explained above.

In screening Step (1), the E-RIM test screening, 665 DSM measures remained in the E-RIM path after accounting for unrecovered revenue requirements, and 641 DSM measures remained in the E-TRC path after accounting for participants' out-of-pocket costs.

The inclusion of administrative costs in screening Step (2) resulted in the remaining number of measures further lowering to 602 in the E-RIM path and 585 in the E-TRC path.

Screening Step (3), which accounts for incentive payments and applies only to the E-RIM path as explained above, resulted in the number of remaining measures in the E-RIM path being reduced to 476 measures. The number of remaining measures in the E-TRC path remained unchanged at 585.

Screening Step (4) applies the two-year payback criterion without incentives to the remaining DSM measures in both paths. This resulted in the number of remaining measures lowering to 279 in the E-RIM path and 310 in the E-TRC path.

Finally, the two-year payback criterion with incentives was applied in screening Step (5) to determine the final number of collapsed DSM measures that passed FPL's cost-effectiveness screening: 279 for E-RIM and 305 for E-TRC.

These DSM measures were then expanded back to derive a total number of DSM measures passing FPL's cost-effectiveness screening for both paths. Those numbers were 885 measures for E-RIM and 928 measures for E-TRC. These measures, along with their respective incentive payment levels, were then transmitted to Itron in order to calculate the achievable potential for each of these measures. FPL witness Haney's and Itron witness Rufo's testimonies discuss the achievable potential work.

Q. Did FPL perform any sensitivity case analyses in regard to DSM cost-effectiveness screening?

A. Yes. The FPSC Staff requested that the utilities involved in this docket perform sensitivity cases in regard to DSM cost-effectiveness screening in order to better understand what impact various assumptions might have on the cost-effectiveness of DSM measures. To that end, FPL performed five sensitivity DSM cost-effectiveness screening analyses in which only one or two assumptions were changed from the assumptions used in the "base case" analyses previously described. All other assumptions from the base case were unchanged in these sensitivity cases.

The five sensitivity cases FPL analyzed are the following:

- Sensitivity Case 1: increase the capital cost of the avoided generation unit by 10%;
- Sensitivity Case 2: decrease the capital cost of the avoided generation unit by 10%;
- Sensitivity Case 3: use a high band fuel cost forecast and a high band CO_2 compliance cost forecast;
- Sensitivity Case 4: use a low band fuel cost forecast and a low band CO_2 compliance cost forecast; and,
- Sensitivity Case 5: assume there are no compliance costs for CO_2.

Q. Please discuss the basis for these changed assumptions.

A. For Sensitivity Cases 1 and 2, the amount of change, a 10% increase or decrease from the base case assumption, in the projected capital cost of a future generation unit was selected because it was deemed to be within the range of change in the projected capital cost for new generation that FPL might see over the course of a typical year or so; i.e., if this screening analysis had been done a year earlier or later than now.

For Sensitivity Cases 3 and 4, FPL used its November 2008 fuel cost forecast base case assumption as the starting point for the high and low fuel cost forecasts. These base case forecasted costs for all fuel types were then increased in the high fuel cost forecast (and decreased in the low fuel cost forecast) by certain fixed percentage values. These percentage values typically vary from one fuel type to the next and from one forecast to another.

Regarding the CO_2 compliance cost forecasts, FPL used forecasts that were prepared at the same time its base case CO_2 compliance cost forecast was prepared. (All of these compliance cost forecasts were used in FPL's most recent determination of need filings and are being used in FPL's current nuclear cost recovery filing.) The highest forecasted CO_2 compliance cost was used in Sensitivity Case 3, and the lowest non-zero forecasted CO_2 compliance cost was used in Sensitivity Case 4. In both of these sensitivity cases, the base case assumptions for SO_2 and NO_x compliance costs were unchanged.

Finally, FPL assumed that there were no CO_2 compliance costs in Sensitivity Case 5. Just as in the previous two sensitivity cases, the base case assumptions for SO_2 and NO_x compliance costs were unchanged.

Q. What was the nature of the sensitivity case screening analyses that were carried out?

A. These sensitivity case analyses were "economic potential" analyses as previously described. This means that only a subset of DSM-related costs are included in the sensitivity case analyses. The subset of DSM-related costs that are included are unrecovered revenue requirements for the E-RIM test and participant costs for the E-TRC test. This is analogous to Step 1 shown previously in Exhibit SRS-4.

Using the changed assumptions for each sensitivity case, FPL performed a DSM cost-effectiveness screening on the same 844 collapsed DSM measures as in the base case analyses. The measures that passed this one-step screening were then expanded back to capture the full number of DSM measures that passed the sensitivity screening. Next, FPL matched those measures to the corresponding technical potential projections of MW and GWh reduction for each measure.

The number of passing measures, the MW reduction potential, and the GWh reduction potential were then totaled to provide an "economic potential" set of values for each sensitivity case. Finally, the number of measures, MW reduction potential, and GWh reduction potential values for the sensitivity cases were compared to the corresponding "economic potential" values from the screening Step 1 analysis in the base case. This comparison allows one to roughly gauge the impact that the assumption change has for a one-step-only screening of DSM cost-effectiveness.

It is important to note that the results of these one-step-only screening analyses of the sensitivity cases played no role in the full base case analyses that are presented in the subsequent sections of my testimony. As previously mentioned, the sole intent of these sensitivity cases was to respond to Staff's inquiry regarding what impact various assumptions may have on DSM cost-effectiveness.

Q. What were the results of these sensitivity case analyses?

A. The results of these sensitivity case analyses are presented in Exhibit SRS-5 with the E-RIM test results presented first, followed by the E-TRC test results. Both sets of results begin by listing the number of expanded DSM measures that passed a comparable analysis using all base case assumptions, plus the projected total MW and GWh reduction potential values for these passing measures. Then the resulting number of measures, MW reduction potential, and GWh reduction potential for each of the five sensitivity cases are shown.

These results are presented in Columns (1), (2), and (3), respectively, of Exhibit SRS-5. Then the changes in the number of passing measures, MW reduction potential, and GWh reduction potential for each sensitivity case compared to the base case are presented in terms of the percentage increases or decreases. These results are presented in Columns (4), (5), and (6).

Based on the results of these sensitivity analyses (that include only a subset of the total DSM-related costs), I offer the following observations:

- The overall results of the sensitivity cases show that changing to these assumptions would decrease the "economic potential" DSM value for FPL much more than it would increase that value. Consequently, one could contend that the assumptions used in FPL's base case analyses are, if anything, biased towards more DSM rather than less. However, FPL believes that it is simply using the best assumptions available for its DSM Goals work.

- The E-RIM results are more impacted by the sensitivity case assumptions than are the E-TRC results. This is due to the fact that the E-RIM test, because it includes all DSM-related costs while the E-TRC test does not, generally has a lower benefit-to-cost ratio for a given DSM measure than does the E-TRC test. Therefore, any change in assumption is more likely to "move" a DSM measure that passes the E-RIM test from cost-effective to non-cost-effective, and vice versa, than is the case with a DSM measure that only "passes" the E-TRC test.
- The projected capital costs of the avoided generating unit in Sensitivity Cases 1 and 2 have a minimal impact on these results.
- The high fuel plus high CO_2 assumptions in Sensitivity Case 3 have a moderate impact on the results and affect potential GWh savings more than MW savings.
- The low fuel plus low CO_2 assumptions in Sensitivity Case 4 have a more pronounced impact on the results –and in the negative direction – they lower the DSM potential, than did Sensitivity Case 3.

- Finally, the assumption of no CO_2 costs in Sensitivity Case 5 had a very large negative impact on the E-RIM results, but a much smaller negative impact on the E-TRC results. (This helps point out what a significant change the incorporation of environmental compliance costs into the previous version of the RIM and TRC tests to produce the E-RIM and E-TRC tests were. In addition, these results again point out that the E-TRC test, because it does not account for all DSM-related costs, typically results – erroneously –in much larger benefit-to-cost ratios than does the E-RIM test. Therefore, even the loss of the CO_2 compliance costs does not appreciably affect the results from this sensitivity case.)

VII. THE DEVELOPMENT OF THE DSM PORTFOLIOS AND THE DSM-BASED RESOURCE PLANS

Q. Once FPL had received the projected achievable potential values for each measure, how were these projections then utilized to develop the four DSM portfolios?

A. After the achievable potential work was completed, FPL had two lists (one for E-RIM and one for E-TRC) of DSM measures that included three achievable potential projections of DSM measures, MW reductions, and GWh reductions.

The development of three achievable potential projections was agreed to in the collaborative effort. These three achievable potential projections were based on three different levels of incentives for each measure: (i) the maximum incentive level for each measure that did not violate the two-year payback criterion; (ii) the lower of this two-year payback maximum incentive level or 33% of the participant's cost for the measure; and (iii) the lower of the two-year payback maximum incentive level or 50% of the participant's cost for the measure. FPL witness Haney's testimony discusses how these three incentive levels were selected as part of the collaborative effort.

For purposes of its economic and non-economic analyses, FPL chose to focus on the first achievable potential projection; i.e., the projection based on the maximum incentive level that did not violate the two-year payback criterion. The use of this projection is consistent with FPL's prior DSM analyses and results in the largest achievable potential of the three projections.

The E-RIM and E-TRC lists of DSM measures and their corresponding achievable potential values were then applied to solve the same question: how much DSM should be included in a DSM portfolio that addressed at least FPL's projected annual resource needs to meet those needs at the lowest present value DSM costs associated with the cost-effectiveness test in question.

Four DSM portfolios were then developed: two portfolios were based on the E-RIM list of DSM measures, and two were based on the E-TRC list of DSM measures. Two portfolios, one for E-RIM and one-for E-TRC, were designed to utilize at least 664 MW of incremental DSM by 2019 (which will allow FPL to fully meet all of its projected resource needs through 2019), and to do so with the lowest present value costs that are applicable to each of the cost-effectiveness tests.

The resulting E-RIM portfolio utilized 664 MW and the E-TRC portfolio utilized 1,093 MW. More MW were utilized in the E-TRC portfolio because the costs applicable to the E-TRC test were lowered to the maximum extent possible by utilizing more than the 664 MW required to meet FPL's resource needs. These two portfolios are labeled the E-RIM 664 MW portfolio and the E-TRC 664/1,093 portfolio.

The other two portfolios simply utilized all of the projected achievable potential DSM. This resulted in 949 MW of incremental DSM by 2019 for the E-RIM based portfolio and 1,153 MW of incremental DSM by 2019 for the E-TRC based portfolio. These two portfolios are labeled the E-RIM 949 MW portfolio and the E-TRC 1,153 MW portfolio. The rationale for the latter two portfolios was that although the first two portfolios described above would allow FPL to fully meet all of its resource needs through at least 2019, FPL wanted to analyze whether the highest projected level of potentially cost-effective DSM might be even more cost-effective by deferring generation additions after 2019 and/or further delaying the return to active service of the units that will be placed temporarily on Inactive Reserve status.

Q. How did FPL perform the analyses with which these four DSM portfolios were developed?

A. These analyses were performed using linear programming (LP) analysis techniques. In LP analyses, many potential solutions – in this case, different potential DSM portfolios - are examined by the LP model until one solution is selected that alone accomplishes the "objective function" after meeting all necessary constraints for a solution.

In these LP analyses, the objective function was to minimize the present value of the net DSM-related costs of a DSM portfolio that are applicable to the specific cost-effectiveness test in question, E-RIM or E-TRC. The DSM-related net costs are derived by first calculating all of the DSM costs that are applicable to the specific cost-effectiveness test in question, then subtracting out certain system costs that will be avoided by DSM but which may vary from the analysis of one DSM measure to another. These system avoided costs represent a subset of the benefits projected for a DSM measure and include: emission and fuel costs avoided by the kWh reduction aspect of a DSM measure, and transmission capital and O&M fixed costs that are avoided by the kW reduction aspect of a DSM measure. The LP's solution is the DSM portfolio that results in the lowest present value of these net costs.

There were three types of constraints utilized in the LP analyses. First, the DSM portfolio must at least meet FPL's projected annual resource needs: 664 MW by the end of 2019. Second, the different DSM measures must meet a set of DSM practical constraints relating to DSM implementation. Third, the total amount of additional load control must be limited to the amount of load control that is usable by the utility from a load shape perspective.

Q. Why are the first two types of constraints needed?

A. The first type of constraint, at least meeting projected annual resource needs, ensures that the DSM portfolio will enable the FPL system to meet its reserve margin reliability criterion and provide reliable electric service for its customers. The second type of constraint ensures that the DSM portfolio is practical to implement. FPL witness Haney's testimony addresses this second type of constraint.

Q. Why is the third type of constraint needed?

A. The third type of constraint is needed to ensure that the amount of incremental load control that is signed up is actually usable on the FPL system on Summer peak days. FPL has utilized this constraint in its DSM analyses, and in its DSM Goals filings, for many years.

FPL's analyses of the amount of incremental load control from 2010 through 2019 that would be usable on its system showed that value was approximately 350 MW. However, the projection of the achievable potential for load control was 304 MW. Therefore, the projection of the achievable potential amount of incremental load control became the limiting factor in regard to incremental load control by 2019.

Q. FPL then utilized the four DSM portfolios discussed earlier to develop four DSM-based resource plans. Why is it appropriate to develop multi-year resource plans for the analysis of DSM options?

A. It is not only appropriate to do this, but also necessary if one is to capture and fairly compare all of the impacts that competing resource options with different capacity amounts, terms-of-service, heat rates, types of fuel, MW and GWh reduction impacts, and costs will have on FPL's system.

For example, assume we are comparing two Supply options, Option A and Option B, that both offer the same amount of capacity. Option A has a heat rate of 7,000 BTU/kWh and is offered to FPL for 15 years. Option B has an 8,000 BTU/kWh heat rate and is offered for 20 years. Evaluating these options from a resource plan perspective allows one to capture the economic impacts of both the heat rate and term-of-service differences. The lower heat rate of Option A will allow it to be dispatched more than Option B, thus reducing the run time of FPL's existing units more than will Option B. This results in greater production cost savings for Option A. However, Option B's longer term-of-service means that it defers the need for future generation for a longer period. Therefore, Option B will provide capacity avoidance benefits for more years.

Only by taking a multi-year resource plan approach to the evaluation can factors such as these for competing Supply options be captured and effectively compared. In the case of DSM options, there are similar somewhat contradicting impacts upon the utility system. For example, the GWh reduction effect of DSM lowers the amount of energy that must be served, but the MW reduction effect of DSM is designed to defer/avoid the addition of new generating units that, if added, may significantly improve the fuel efficiency of the utility system. Consequently, one aspect of DSM (GWh reduction) can decrease system fuel usage, but the other aspect of DSM (MW reduction) will avoid the addition of fuel-efficient new units that would have also lowered system fuel usage if the DSM options had not been implemented, thus increasing system fuel usage.

Once again, only by taking a multi-year resource plan approach to the evaluation can these contradicting impacts of DSM upon the utility system be properly captured and compared.

Q. Why are "filler" units needed in a multi-year resource plan evaluation?

A. The "filler" units are needed in a multi-year resource plan analysis to ensure that FPL's capacity needs are met for 2021–2043 (i.e., after the new nuclear Turkey Point Units 6 & 7 are added, respectively, in 2018 and 2020, and the 2010 through 2019 DSM portfolios have been added.) In this way the resource plans being compared all meet FPL's reliability criteria for each year in the analysis period, ensuring both that the resource plans are comparable and that the comparative results of the evaluation are meaningful.

Q. Please discuss how these resource plans were developed and describe the resulting resource plans.

A. Using the projection of FPL's resource needs that were presented in Exhibit SRS-1, and the four DSM portfolios previously discussed, four DSM-based resource plans were created. Using each of the four DSM portfolios, the MW reductions for that DSM portfolio were first applied to Exhibit SRS-1, resulting in a new projection of remaining resource needs. FPL then added new generating units (each a 553 MW CC unit) as needed to meet these remaining resource needs in all years. In addition, the return-to-active service date of the FPL units about to be temporarily placed on Inactive Reserve status also varied according to reserve margin levels.

The resulting four DSM-based resource plans are similar to the Supply Only plan except that the incremental DSM altered three aspects of the Supply Only plan: the 160 MW five-month purchase has been removed, the return-to-service dates for FPL's units that will be temporarily placed on Inactive Reserve status change, and the timing and number of filler units added after 2020 change. These four DSM-based resource plans, and the previously developed Supply Only resource plan were then evaluated from both an economic perspective and a non-economic perspective.

VIII. THE RESULTS OF THE ECONOMIC ANALYSES

Q. **What fuel cost and environmental compliance cost forecasts were used in the economic analysis?**

A. In the economic analysis, FPL used the same fuel cost and environmental compliance cost forecasts used in developing FPL's January 2009 load forecast and which are being used in FPL's current nuclear cost recovery filing. These fuel cost and environmental compliance cost forecasts represent medium-level natural gas costs and medium-level CO_2 compliance costs. Selected fuel cost forecast values are presented in Exhibit SRS-6 and the environmental compliance cost projections are presented in Exhibit SRS-7.

Q. **Were these fuel cost and environmental compliance cost projections used in all of the economic analyses conducted for this filing?**

A. Yes. With the sole exception of the five sensitivity cases requested by Staff, these fuel cost and environmental compliance cost projections were used in the cost-effectiveness screening analyses of individual DSM measures, the development of the DSM portfolios, and in the economic analyses of the resource plans.

Q. **What were the results of the economic analysis of the resource plans?**

A. The results of the economic analyses of the resource plans are presented in Exhibit SRS-8. As previously discussed, the projected levelized system average electric rate for each resource plan is developed and compared.

In addition to these levelized electric rate results of the economic analyses, Exhibit SRS-8 also states whether each resource plan will result in one group of customers subsidizing other groups of customers in regard to the resource plan's effect on electric rates – a very important consideration. This impact is referred to as cross-subsidization of different groups of customers.

Q. Would you please discuss the results presented in Exhibit SRS-8?

A. Yes. The five resource plans are first presented in order of their projected levelized system average electric rate. The resource plan with the lowest projected levelized system average rate is the E-RIM 664 MW plan. The Supply Only plan is projected to have the next lowest levelized rate. The remaining three DSM-based plans have higher projected levelized system average electric rates than the Supply Only plan. The two E-TRC-based plans are projected to have the highest levelized rates by a substantial margin.

The exhibit also indicates whether each resource plan will avoid or minimize the cross-subsidization of one customer group by another. In the absence of a DSM-based resource plan, the Supply Only plan would do so. However, the E-RIM 664 MW plan has an even lower levelized rate and will also avoid or minimize cross-subsidization of customers. The other three DSM-based plans are projected to result in higher levelized rates than either the E-RIM 664 MW or Supply Only plan. Therefore, these plans will not avoid or minimize cross-subsidization of customers. I will return to the issue of cross-subsidization later in my testimony.

Q. Were the five resource plans evaluated on the basis of the total costs of the plans?

A. No, because an evaluation of system costs alone would be meaningless when analyzing DSM options versus Supply options.

As discussed previously in Section I of my testimony, it is appropriate to conduct analyses of competing Supply options on a total cost basis (such as cumulative present value of revenue requirements) because in such a case a total cost analysis equates to a rate analysis. This is because the number of kWh over which the system costs are recovered does not change. Therefore, the lowest cost plan will also be the lowest plan in terms of levelized system average electric rates.

However, when evaluating DSM options versus Supply options, the number of kWh over which the system costs are recovered does change with the DSM options. Therefore, an evaluation of only total system costs in such a comparison of Supply versus DSM options cannot tell one which option results in the lowest rates. One needs to account for the number of kWh that the system costs will be recovered over in order to determine the option that results in the lowest electric rates. FPL has used exactly this approach in its calculation of levelized system average electric rates.

Q. How is the levelized system average electric rate for a resource plan calculated?

A. Exhibit SRS-9 presents the calculation of the levelized system average electric rate for one of the resource plans, the E-RIM 664 MW resource plan. The calculation consists of three basic steps. First, the projected annual revenue requirements and annual kWh served are used to calculate a projected system average electric rate for each year. Second, each of these projected annual electric rates is present valued and these present values are summed. Third, an annual electric rate value is developed that, when held constant in each year, with these values present valued and summed, has an identical present value sum to that of the present value sum in the second step. This constant electric rate value is the levelized system average electric rate for this resource plan. A levelized system average electric rate for each of the other four resource plans is calculated in the same manner.

Q. Are the differences in the levelized system average electric rates between the five resource plans presented in Exhibit SRS-8 meaningful?

A. Yes. Because a levelized system average electric rate perspective is not typically used in analyses of Supply options (because a comparison of system costs in Supply Option-only evaluation equates to a rate comparison as previously discussed), the significance of the differentials in these levelized rates may not be readily apparent.

A cursory glance at these levelized system average electric rates appears to show relatively little differences between the values. However, after one considers that these rates will are applicable to energy usage of more than 100,000 GWh per year over a 34-year period, the differences shown in Exhibit SRS-8 take on more significance.

The significance of these differences is perhaps most readily seen by determining the amount of additional cost that would need to be incurred to raise the levelized system average electric rate of 14.7183 cents/kWh for the E-RIM 664 MW plan to the levelized rate for another plan. For example, let's take the E-TRC-based plan with the lowest levelized system average rate of the two E-TRC-based plans, the E-TRC 664/1,093 plan's rate of 14.7779 cents/kWh.

In terms of a one-time additional cost, the E-RIM 664 MW plan would have to incur an additional cost of approximately $830,000,000 in 2010, or of approximately $2,180,000,000 in 2019, in order to raise its levelized system average rate to match that of the E-TRC 664/1,093 plan.

As evidenced by this example, the levelized system average electric rate differences are meaningful, and the E-RIM 664 MW plan's advantage is significant.

Q. For this docket, the FPSC Staff requested that a projection of customer bills be made assuming a usage of 1,200 kWh. What were the results of this projection?

A. Exhibit SRS-10 presents the projected annual electric rates and the projected bills corresponding to a usage of 1,200 kWh for the time period of 2010 through 2019. Also included in this exhibit is the projection of the differentials in the customer bills between each DSM-based resource plan and the Supply Only plan. The results of these projections can be summarized as follows:

- Higher customer bills are projected for each year from 2010 through 2018 for each of the four DSM-based resource plans compared to the Supply Only plan which is projected to have the lowest customer bills for this time period.
- During 2010-2018, the E-RIM 664 MW plan results in the lowest bills of the four DSM-based plans. The E-RIM 949 MW plan provides the next lowest bills. The two E-TRC-based plans result in the highest bills.
- In 2019, when the new CC unit being added in the Supply Only plan comes in-service, the bill differentials for all of the DSM-based plans compared to the Supply Only plan are substantially lowered. However, only the two E-RIM plans are projected to have lower bills than the Supply Only plan with the E-RIM 664 MW

plan projected to provide the lowest bill. The E-TRC-based plans are projected to continue to result in higher bills than with the Supply Only plan.

These results are expected. DSM typically puts upward pressure on rates, and bills, in the years prior to avoiding the generating unit the DSM is "aimed at". This is typically seen in cost-effectiveness analyses of individual DSM measures. Also expected is that this near-term impact of placing upward pressure on rates and bills is minimized by the E-RIM test. Conversely, the E-TRC test does not allow the consideration of impacts on electric rates and, because this test does not include all relevant DSM-related costs for a DSM measure, the use of this test typically results in higher electric rates.

Q. Returning to Exhibit SRS-8, this exhibit presents information regarding which of the five resource plans will avoid/minimize the potential for cross-subsidization of one customer group by another. Would you please explain what is meant by this?

A. Yes. When a resource option, Supply or DSM, is selected, it will have an impact on FPL's electric rates that apply to all customers and on the bills all customers will pay. The basic concept is whether the impact of the resource selection on electric rates and bills will result in one group of customers subsidizing other customers. Stated another way, does the resource selection create two groups of customers: one group of "winners" and one group of "losers" from the resource selection.

For example, consider the case when FPL evaluates only Supply options. Because all customers on FPL's system are served by the Supply option if that option is chosen, all customers are "participants" in the selected Supply option. All customers' rates and bills move in the same "direction"; either up or down from year to year compared to another Supply option that could be selected. Therefore, there is no subsidization of one group of customers by another group.

However, the same is not true for DSM options. With DSM options, customers have a choice to participate or not participate in DSM options for which they are eligible. Furthermore, customers cannot participate in DSM options they are ineligible for or in measures which they may have already installed. This leads to an additional, and important, consideration of how different groups of customers, participants and non-participants, are impacted when DSM options are selected. If the utility selects to offer a DSM option that places upward pressure on electric rates, the result will be the formation of two groups of customers: one group of "losers" who do not, or cannot, participate in the DSM option and face higher rates and bills, and one group of "winners" who can and do, participate in the DSM option and, through reduced usage, reduce their bills.

This outcome is undesirable because one group of customers (the non-participants) subsidizes the other group of customers (the participants) through higher electric rates caused by the imposition of the DSM option; i.e., cross-subsidization of one customer group by another. Avoiding this undesirable outcome is accomplished by accounting for the effect on electric rates when selecting DSM options. Therefore, the choice of which DSM cost-effectiveness test is used to select DSM programs is crucial.

When using an E-RIM cost-effectiveness test, only those DSM options that are not projected to increase system electric rates over the life of the analysis period above what the electric rates would be if the competing Supply option had been chosen are selected. This means that all customers, participants and non-participants alike, are at least as well off in regard to electric rates and bills over this period than if the Supply option had been chosen. Non-participants will be no worse off because their rates, and therefore their bills, will be no higher than if the competing Supply option had been chosen. Participants will be better off due to reduced usage lowering their bills.

Therefore, when selecting DSM options using the E-RIM test, cross-subsidization of customers is avoided or minimized. This is shown in Exhibit SRS-8 by the fact that the projected levelized system average rate for the E-RIM 664 MW plan is the lowest of any of the five plans. Furthermore, the E-RIM 949 MW plan has lower projected levelized rates than does either of the E-TRC-based plans.

Thus, the use of the E-RIM test is clearly the best cost-effectiveness test to use in regard to the objective of avoiding or minimizing cross-subsidization of customer groups, and the E-RIM 664 MW plan is the best plan in regard to avoiding or minimizing cross-subsidization of customer groups.

Q. Is it possible for a utility to avoid having any "losers" and avoiding the cross-subsidization problem by simply offering enough DSM options so that all customers will participate in a DSM program?

A. No. Although this sounds nice in theory, it is simply not possible for at least two reasons. First, DSM options are voluntary and customers cannot (and should not) be forced to participate in these options.

Second, a large electric utility like FPL serves a wide diversity of customers and customer groups. FPL serves large numbers of residential, small business, and large commercial and industrial customers. An even greater diversity of individual customers exists, including low-income, fixed income, middle class, and wealthy customers. In addition, these customers live in many types of homes, including single-family detached homes, single-family attached homes, multi-unit homes, and manufactured homes. Some of these customers live in the area year-round, while others live in FPL's service territory only part-time.

These, and other, diverse aspects of FPL's customers result in FPL offering many different DSM options in order to reach as many customers as possible.

As a consequence, not all DSM programs are attractive and/or appropriate for all customers. A few examples of this include:

- A business customer will not be eligible for any residential DSM program (and vice versa);
- A low-income or fixed income residential customer may not be eligible for, or interested in, a DSM program that focuses on expensive equipment such as very high efficiency air conditioners, renewable energy equipment, or swimming pool pump controls, etc.;
- Conversely, a more affluent customer may not be eligible for a program designed to address the energy use of low-income or fixed income customers;
- Customers with special medical needs may not be interested in DSM programs in which the utility has direct control of customer appliances or equipment; and,
- Customers who have already installed a number of energy efficient devices in their home or business may simply not be interested in, or helped by, additional DSM options.

These examples serve to point out that no matter how many DSM options a utility offers, there will always be customers who either cannot, or who choose not to, participate in a number of specific DSM options. Each such

DSM option that is offered that does not pass the E-RIM test automatically creates new classes of winner and losers with one class subsidizing the other.

Therefore, although it may at first appear to some that one could address a cross-subsidization problem caused by the introduction of a DSM program that failed the E-RIM test by introducing other DSM programs that also failed the E-RIM test, such an approach is not feasible. As was pointed out in the discussion above, participation in DSM programs is voluntary and DSM programs typically have eligibility requirements (such as programs addressing specific rate classes). Therefore, attempting to remedy a cross-subsidization problem by adding even more of these DSM programs that result in cross-subsidization cannot succeed. Instead of solving the original cross-subsidization problem, the result will be a cascading series of cross-subsidizations that aggravates the original problem.

I believe that this outcome will occur in any electric utility that would try to take this approach. However, the possibility of such an approach is of particular concern in Florida. This state has a large number of residents living on fixed- or low-incomes that will not be able to participate in a variety of DSM options. This ineligibility, coupled with their limited income, makes it even more important to avoid having these more vulnerable customers subsidizing other customers who could participate in DSM options that would raise electric rates higher than the rates would be if the Supply option had been chosen.

In summary, an approach of trying to address a problem of cross-subsidization resulting from one program by offering even more such DSM options only complicates the problem and makes it bigger. Furthermore, due to Florida's large numbers of low- and fixed-income residents, this incorrect approach is especially troubling because of the increased financial strain this would place on these more vulnerable residents. This issue may become even more important in years in which the economy is "down".

Q. How would you summarize the economic analyses results?

A. There are two results from the economic analyses that stand out. First, the E-RIM 664 MW plan meets FPL's resource needs through 2021 while providing the lowest levelized system average electric rates over the analysis period and the lowest rates of any of the four DSM-based resource plans for 2010- 2019. Second, the E-RIM 664 MW plan meets FPL's resource needs while best avoiding or minimizing cross-subsidization of one customer group by another. These two factors combine to make the E-RIM 664 MW plan the best resource plan from an economic perspective.

IX. THE RESULTS OF THE NON-ECONOMIC ANALYSIS

Q. What different perspectives of the FPL system were considered in the non-economic analysis?

A. The non-economic analysis focused on two perspectives in regard to the five resource plans. The first perspective is a direct comparison of projected system SO_2, NO_x, and CO_2 emissions for the FPL system for each of the resource plans. The second perspective is a direct comparison of projected system oil and natural gas usage for the resource plans.

Q. What were the results of the Non-Economic Analysis from the first perspective, a comparison of system emissions for the resource plans?

A. A comparison of projected system SO_2, NO_x, and CO_2 emissions for each resource plan is presented in Exhibit SRS-11.

In regard to projected annual SO_2 and NO_x usage, the results can be summarized as follows:

- For the years 2010 through 2018, all of the DSM-based plans are projected to have lower system emissions than the Supply Only plan. The E-TRC-based plans, due to their greater energy reduction, result in lower projected system emissions usage than the E-RIM-based plans.
- However, in 2019, the introduction of the 2019 CC unit in the Supply Only plan flips these results as this new CC unit enables

the Supply Only plan to have the lowest projected system emissions of any plan. The reason for this is that the highly efficient CC unit, which has very low SO_2 and NO_x emission rates compared to most units on FPL's system and which will operate at a high capacity factor, lowers system emissions more than the combined effect of ten years of incremental DSM that "operates" on FPL's system for many fewer hours per year than does the CC unit. The relative positions of the four DSM-based plans remain unchanged.

- Then, in 2021, the results flip again as the E-RIM 664 MW plan emerges as having the lowest projected system emissions of the four DSM-based plans. The reason for this is that in 2021, two 2x1 CC filler units are added in the E-RIM 664 MW plan while only one 2x1 CC filler unit is added in each of the other three DSM-based plans. This is due to the lower MW reduction (664 MW) associated with this plan compared to the other three DSM-based plans.

These results for projected system SO_2 and NO_x emissions demonstrate two things. First, they show that in regard to these system emissions for FPL's system, the answer as to which of the five resource plans is the best in emission reduction may vary greatly from one year to the next. Second, it points out that both MW and GWh reduction values due to DSM play a significant role in determining the answer to the question of "which resource plan results in lowering these system emissions the most on FPL's system?" Furthermore, the roles that DSMs MW and GWh reduction play are contradictory. The GWh reductions reduce these system emissions while the MW reductions will increase these system emissions by avoiding a highly efficient new generating unit with low emission rates that would have operated at high capacity factors.

Q. Are the results for projected system CO_2 emissions similar?

A. No. In regard to projected CO_2 emissions, the four DSM-based resource plans will result in lower system emissions than the Supply Only plan for all years addressed in the exhibit. The E-TRC-based plans result in lower projected system emissions than the E-RIM-based plans.

Q. What were the results of the Non-Economic Analysis from the second perspective, a comparison of projected FPL system usage of oil and natural gas for the resource plans?

A. Exhibit SRS-12 presents the results of this comparison in terms of projected annual system use of oil and natural gas for each of the five resource plans in terms of millions of mmBTU of oil and natural gas.

In regard to projected annual oil usage, the results are similar to the results for system SO_2 and NO_x emissions. The oil usage results can be summarized as follows:

- For the years 2010 through 2018, all of the DSM-based plans are projected to have lower system oil usage than the Supply Only plan. The E-TRC-based plans, due to their greater energy reduction, result in lower projected system oil usage than the E-RIM-based plans.
- However, in 2019, the introduction of the 2019 CC unit in the Supply Only plan flips these results as this new CC unit enables the Supply Only plan to have the lowest projected system oil usage of any plan. The reason for this is that the highly efficient CC unit, operating at a high capacity factor, lowers oil usage more than the combined effect of ten years of incremental DSM that "operates" on FPL's system for many fewer hours per year than does the CC unit. The relative positions of the four DSM-based plans remain unchanged.
- Then, in 2021, the results flip again as the E-RIM 664 MW plan emerges as the lowest of the four DSM-based plans. The reason for this is that in 2021, two 2x1 CC filler units are added in the E-RIM 664 MW plan while only one 2x1 CC filler unit is added in each of the other three DSM-based plans. This is due to the lower MW reduction (664 MW) associated with this plan compared to the other three DSM-based plans.

These results demonstrate two things. First, they show that in regard to system oil usage on FPL's system, the answer as to which of the five resource plans is the best in reducing oil usage may vary greatly from one year to the next. Second, it points out that both MW and GWh reduction values due to DSM play a role in determining the answer to the question of "which resource plan results in lower system oil usage on FPL's system?" Furthermore, the roles that DSM's MW and GWh reduction play are contradictory. The GWh reductions reduce system oil usage while the MW reductions will increase system oil usage once a highly efficient non-oil burning new unit is avoided.

Q. Are the results for system natural gas usage similar?

A. No. The natural gas results are different primarily because the 2019 CC unit added in the Supply Only plan, and the 2x1 CC units being added in all five plans, are gas-burning units. In regard to projected natural gas usage, the four DSM-based resource plans will result in lower system gas usage than the Supply Only plan for all years addressed in the exhibit. The E-TRC-based plans result in lower projected natural gas usage than the E-RIM-based plans. (However, even after accounting for this fact in the economic analyses, the E-TRC-based plans are projected to result in the highest levelized system average rates.)

Q. How would you summarize the results of the non-economic analyses?

A. I'd summarize these results in two points. First, the results are truly a mixed bag. The E-TRC plans are projected to result in lower natural gas usage and CO_2 emissions for FPL's system. However, at least four of the plans – E-RIM

664 MW, Supply Only, E-TRC 1,153 MW, and E-TRC 664/1,093 MW – are projected to result in the lowest system oil usage, SO_2, and NO_x emissions for at least one year. In my opinion, no one plan emerges as the clear winner in the non-economic analyses.

Second, and perhaps most important, the economic impacts of the projected fuel usage and emissions for each of the five resource plans have already been accounted for in the economic analyses discussed previously. FPL has long accounted for system fuel usage costs in its DSM analyses. With FPL's enhancement of the previous RIM and TRC tests to now account for the environmental compliance costs for system emissions with the E-RIM and E-TRC tests, the economic impacts of environmental compliance are accounted for in the same way as they are when Supply options are evaluated.

Therefore, the fact that the results of the non-economic analyses are inconclusive is of little consequence, because the economic impacts of system fuel usage and emissions have been fully accounted for in the economic analysis.

X. SUMMARY OF ANALYSIS RESULTS AND CONCLUSIONS

Q. Would you please summarize the results of the economic and non-economic analyses?

A. Yes. In regard to the economic analyses, the E-RIM 664 MW plan emerged as the clear winner. It yielded the lowest levelized system average electric rates, and it best avoided or minimized cross-subsidization of one group of customers by another. Regarding the non-economic analyses, although no one plan emerged as the clear winner, all of the economic impacts of system fuel usage and emission have been fully accounted for in the economic analyses that identified the E-RIM 664 plan as the clear economic winner.

Q. Based on these results, which DSM portfolio should be the basis for FPL's DSM Goals?

A. For the reasons discussed above, FPL believes that the E-RIM 664 MW portfolio should be the basis for FPL's DSM Goals for the 2010 – 2019 time period. This DSM portfolio fully meets FPL's projected resource needs through 2019, results in the lowest average electric rates over the term of the analyses for all five plans, results in the lowest average rates and bills among the four DSM-based resource plans for the 2010 – 2019 time period, best avoids or minimizes cross-subsidization of one customer group by another, results in lower SO_2 and NO_x system emissions and system oil usage than the Supply Only plan for most years, and results in the lowest system SO_2 and NO_x emissions and system oil usage of any plan for at least one year.

Q. Returning to a topic previously discussed, when one combines FPL's proposed DSM Goals amount with the 895 MW of energy efficiency projected to result from the updated federal appliance efficiency and lighting standards, what total amount of energy efficiency/DSM are FPL's customers projected to receive in the 2010 – 2019 time frame?

A. The resulting total demand and energy reduction from these federal standards and FPL's proposed DSM Goals is projected to be 1,559 MW at the generator (= 895 MW + 664 MW) over the next 10 years.

When you consider that the 895 MW projected to be delivered from the updated federal standards is <u>in addition to</u> the amount of demand reduction from federal standards that was captured in previous FPL load forecasts, it is evident that FPL's customers are projected to receive significantly more energy efficiency/DSM in the next ten years than they were projected to receive through FPL's current DSM Goals. That comparison would be the projected 1,559 MW at the generator for the next ten years versus FPL's current DSM Goals of 880 MW at the generator.

Q. Do you consider 664 MW to be an appropriate amount of DSM for FPL to propose as its DSM Goals for the next 10 years?

A. Yes, for several reasons. First, the impacts of any updates in federal standards for appliance efficiency and lighting are two-fold. These federal standards will both lower the potential contribution from utility DSM programs and lower FPL's projected resource needs for any new resource including DSM.

When one considers that the projected impact of the updated federal standards - 895 MW over the ten year period - is virtually identical to FPL's current DSM Goals amount of 880 MW, it is clear how large an impact the federal standards will have on FPL's resource needs and the potential for utility DSM efforts. Truly significant reductions in FPL projected resource needs and in the potential contribution from utility programs occur from these updated federal standards.

Second, conditions and circumstances have changed regarding the outlook for future growth on FPL's system compared to conditions that existed when FPL's previous goals were set five years ago. In addition to the significant impact of the updated federal standards, the Florida economy is in a "down" period and the rate of customer growth on FPL's system has reduced considerably. These factors also serve to lower FPL's projected load growth and its need for additional resources, whether DSM or Supply. When setting new goals for DSM in such a time as this, one would logically expect lower goals to be set compared to goals that would have been set in times of much more robust load growth.

Finally, FPL has long considered the fact that DSM programs can be ramped up or ramped down fairly quickly to be one of DSM strongest attributes. In fact, FPL has utilized this DSM attribute very recently. In the late Summer of 2005, FPL experienced an unexpected peak load that resulted in FPL seeking new resources that could be deployed quickly. FPL significantly ramped up a number of its existing DSM programs and successfully petitioned the Commission for approval to implement new programs. As a result, FPL was able to increase its DSM capability significantly as early as 2007.

What FPL is facing now in regard to its projected lower load growth could be considered to be the "flip side" of what it experienced in the Summer of 2005. And, just as FPL ramped up its DSM efforts to meet a higher-than-projected resource need, it now proposes to ramp down its DSM efforts to a modest degree in response to a lower-than-previously-projected resource need. This adjustment to changing conditions is not only logical, but also an economical move for FPL's customers. And, as it did in response to changed conditions in 2005, FPL is both willing and able to ramp its DSM efforts up to meet increased resource needs in the future if this ramping up of DSM proves to be the most economical option for FPL's customers.

Therefore, a total of 664 MW of incremental DSM, as presented in the E-RIM 664 MW portfolio, is an appropriate amount of DSM for FPL to propose as its DSM Goals for 2010 through 2019. This amount of DSM is based on FPL's resource planning work and it is cost-effective for FPL's customers. For these reasons, FPL requests FPSC approval for the E-RIM 664 MW portfolio as its DSM Goals.

Q. Does this conclude your testimony?

A. Yes.

Projection of FPL's Resource Needs for 2010 - 2019 with No Incremental DSM Signups After 2009

Summer

	(1)	(2)	(3) = (1)+(2)	(4)	(5)	(6)=(4)-(5)	(7)=(3)-(6)	(8)=(7)/(6)	(9)=((6)*1.20)-(3)	(10)=(9)/1.20)
August of the Year	Projections of FPL Unit Capability * (MW)	Projections of Firm Purchases (MW)	Projection of Total Capacity (MW)	Peak Load Forecast * * (MW)	Summer DSM Forecast * * * (MW)	Forecast of Firm Peak (MW)	Forecast of Summer Reserves (MW)	Forecast of Summer Res. Margins w/o Additions (%)	MW Needed to Meet 20% Reserve Margin if Provided by Supply Options Only (MW)	MW Needed to Meet 20% Reserve Margin if Supplied by DSM Options Only (MW)
2010	20,809	2,107	22,916	21,147	2,044	19,103	3,813	20.0%	7	6
2011	21,946	2,062	24,008	21,368	2,044	19,324	4,684	24.2%	(820)	(683)
2012	22,230	1,961	24,191	21,933	2,044	19,889	4,302	21.6%	(324)	(270)
2013	23,553	1,961	25,514	22,249	2,044	20,205	5,309	26.3%	(1,268)	(1,057)
2014	24,760	2,011	26,771	23,533	2,044	21,489	5,282	24.6%	(984)	(820)
2015	24,760	2,011	26,771	24,142	2,044	22,098	4,672	21.1%	(252)	(210)
2016	26,611	700	27,311	24,772	2,044	22,728	4,583	20.2%	(37)	(31)
2017	27,169	700	27,869	25,401	2,044	23,357	4,511	19.3%	**160**	**134**
2018	28,269	700	28,969	26,143	2,044	24,099	4,869	20.2%	(49)	(41)
2019	28,269	700	28,969	26,848	2,044	24,804	4,165	16.8%	**796**	**664**

Winter

	(1)	(2)	(3) = (1)+(2)	(4)	(5)	(6)=(4)-(5)	(7)=(3)-(6)	(8)=(7)/(6)	(9)=((6)*1.20)-(3)	(10)=(9)/1.20)
January of the Year	Projections of FPL Unit Capability * (MW)	Projections of Firm Purchases (MW)	Projection of Total Capacity (MW)	Peak Load Forecast * * (MW)	Winter DSM Forecast * * * (MW)	Forecast of Firm Peak (MW)	Forecast of Winter Reserves (MW)	Forecast of Winter Res. Margins w/o Additions (%)	MW Needed to Meet 20% Reserve Margin if Provided by Supply Options Only (MW)	MW Needed to Meet 20% Reserve Margin if Supplied by DSM Options Only (MW)
2010	24,661	2,191	26,852	18,790	1,813	16,977	9,875	58.2%	(6,480)	(5,400)
2011	22,334	2,095	24,429	19,120	1,813	17,306	7,122	41.2%	(3,661)	(3,051)
2012	23,761	2,095	25,856	19,710	1,813	17,896	7,959	44.5%	(4,380)	(3,650)
2013	24,057	1,970	26,027	20,098	1,813	18,285	7,742	42.3%	(4,085)	(3,404)
2014	25,400	2,020	27,420	21,154	1,813	19,341	8,079	41.8%	(4,210)	(3,509)
2015	26,710	2,020	28,730	21,882	1,813	20,069	8,660	43.2%	(4,647)	(3,872)
2016	26,710	1,090	27,800	22,396	1,813	20,583	7,217	35.1%	(3,100)	(2,584)
2017	28,586	700	29,286	22,912	1,813	21,098	8,187	38.8%	(3,967)	(3,306)
2018	29,150	700	29,850	23,466	1,813	21,653	8,197	37.9%	(3,866)	(3,222)
2019	30,250	700	30,950	24,019	1,813	22,206	8,744	39.4%	(4,302)	(3,585)

* FPL generating unit capability values are generally consistent with those presented in FPL's 2009-2018 Ten Year Site Plan (Site Plan). The return to service dates of generating units temporarily placed on inactive reserve status may differ from those in the 2009 Site Plan.

* * The Peak Load Forecast is FPL's January 2009 load forecast.

* * * DSM values shown represent no incremental DSM signups after December 2009.

Economic Elements Included in the DSM Cost-Effectiveness Tests: Benefits Only

Economic Elements	Participant-Incurred Economic Impacts	Included in the Participant Test ?	Utility-Incurred Economic Impacts	Included in the RIM Test?	Included in the TRC Test?
Benefits					
Generation Capital and O&M			X	Yes	Yes
Transmission Capital and O&M			X	Yes	Yes
Distribution Capital and O&M			X	Yes	Yes
Net System Fuel Impacts			X	Yes	Yes
Bill Savings by Participants	X	Yes			
Incentives Received by Participants	X	Yes			
Tax Credits Received by Participants	X	Yes			

Notes: - "X" indicates that this economic element is an actual benefit resulting from a DSM measure.
- "Yes" indicates that this economic element is included in the DSM cost-effectiveness test.

Economic Elements Included in the DSM Cost-Effectiveness Tests: Benefits and Costs

Economic Elements	Participant-Incurred Economic Impacts	Included in the Participant Test ?	Utility-Incurred Economic Impacts	Included in the RIM Test?	Included in the TRC Test?
Benefits					
Generation Capital and O&M			X	Yes	Yes
Transmission Capital and O&M			X	Yes	Yes
Distribution Capital and O&M			X	Yes	Yes
Net System Fuel Impacts			X	Yes	Yes
Bill Savings by Participants	X	Yes			
Incentives Received by Participants	X	Yes			
Tax Credits Received by Participants	X	Yes			
Costs					
Utility Equipment & Administration			X	Yes	Yes
Incentives Paid to Participants			X	Yes	**No**
Unrecovered Revenue Requirements			X	Yes	**No**
Participants Capital and O&M	X	Yes			Yes

Notes: - "X" indicates that this economic element is an actual benefit or cost resulting from a DSM measure.
- "Yes" indicates that this economic element is included in the DSM cost-effectiveness test.

Summary Results of the DSM Cost-Effectiveness Screenings

		Notes
Total Number of DSM Measures Identified in Technical Potential Work for FPL =	2,321	(1)
Number of "Collapsed" DSM Measures Evaluated in Cost-Effectiveness Screening =	844	(2)

Screening Step	E-RIM Test Screening	E-TRC Test Screening	Notes
Step (1) Total Number of DSM Measures at Starting Point =	844	844	
a) Number of DSM Measures Removed After Accounting for Unrecovered Revenue Requirements in the E-RIM Test =	179	N.A.	(3)
b) Number of DSM Measures Removed After Accounting for Participant Costs in the E-TRC Test =	N.A.	203	(4)
c) Number of DSM Measures Remaining After Screening Step 1 =	665	641	
Step (2) Number of DSM Measures Removed After Also Accounting for Administrative Costs =	63	56	
Number of DSM Measures Remaining After Screening Step 2 =	602	585	
Step (3) Number of DSM Measures Removed in the E-RIM Test After Also Accounting for Incentive Payments Needed to Bring the Participant Test ratio up to 1.00 for Certain Measures =	126	N.A.	(5)
Number of DSM Measures Remaining After Screening Step 3 =	476	585	
Step (4) Number of DSM Measures Removed If Participant Payback is Less Than 2 Years Without Incentive Payments =	197	275	
Number of DSM Measures Remaining After Screening Step 4 =	279	310	
Step (5) Number of DSM Measures Removed Because Participant Payback is Less than 2 Years With Incentive Payments Needed to Make Participant Test = 1.00 for Certain Measures =	0	5	
Number of DSM Measures Remaining After Screening Step 5 =	279	305	
Final Number of "Collapsed" DSM Measures Remaining After the Cost-Effectiveness Screening =	279	305	
Final Number of "Expanded" DSM Measures Remaining After the Cost-Effectiveness Screening =	885	928	

Notes:

(1) This is the number of total DSM measures that were identified in the Technical Potential Work for FPL.

(2) This is the reduced number of DSM measures that were evaluated in the cost-effectiveness screening after "collapsing" all measures that are identical except for building type into one measure for evaluation purposes.

(3) The E-RIM Test accounts for the impacts of unrecovered revenue requirements on electric rates. The E-TRC Test does not recognize unrecovered revenue requirements as an economic impact of DSM measures.

(4) Participant costs are not costs that all customers of an electric utility pay for. In addition, these costs are already accounted for in the Participant Test. Therefore, these costs are not accounted for in the E-RIM Test that accounts for all costs incurred by all utility customers. Despite the fact that these costs are already accounted for in the Participant Test, the E-TRC also includes these costs.

(5) Incentive payments by a utility to participating customers are costs that all customers of an electric utility pay for. Therefore, incentive payments are accounted for in the E-RIM Test. However, the E-TRC Test does not account for these costs.

Results of Sensitivity Case Analyses of DSM Cost-Effectiveness Screening: Economic Potential Screening Analyses Only *

Description of Cases	E-RIM - Passing Measures (1) Number of DSM Measures Passing	(2) Projected Economic Potential Summer MW at Generator	(3) Projected Economic Potential Annual GWh at Generator	(4) Change from Base Case No. of Measures (%)	(5) Change from Base Case Summer MW at Generator (%)	(6) Change from Base Case Annual GWh at Generator (%)
Base Case	1,993	6,593	20,125	---	---	---
Sensitivity 1: Increase Generator Capital Cost by 10%	2,007	6,603	20,172	1%	0%	0%
Sensitivity 2: Decrease Generator Capital Cost by 10%	1,985	6,588	20,107	0%	0%	0%
Sensitivity 3: With High Fuel and CO_2 Cost Forecasts	2,296	7,905	31,564	15%	20%	57%
Sensitivity 4: With Low Fuel and CO_2 Cost Forecasts	1,450	6,051	16,951	-27%	-8%	-16%
Sensitivity 5: With No CO_2 Costs	1,276	5,940	15,937	-36%	-10%	-21%

Description of Cases	E-TRC - Passing Measures (1) Number of DSM Measures Passing	(2) Projected Economic Potential Summer MW at Generator	(3) Projected Economic Potential Annual GWh at Generator	(4) Change from Base Case No. of Measures (%)	(5) Change from Base Case Summer MW at Generator (%)	(6) Change from Base Case Annual GWh at Generator (%)
Base Case	1,773	5,218	22,077	---	---	---
Sensitivity 1: Increase Generator Capital Cost by 10%	1,773	5,218	22,077	0%	0%	0%
Sensitivity 2: Decrease Generator Capital Cost by 10%	1,766	5,211	22,052	0%	0%	0%
Sensitivity 3: With High Fuel and CO_2 Cost Forecasts	1,847	5,592	24,189	4%	7%	10%
Sensitivity 4: With Low Fuel and CO_2 Cost Forecasts	1,622	4,520	19,768	-9%	-13%	-10%
Sensitivity 5: With No CO_2 Costs	1,707	5,152	21,688	-4%	-1%	-2%

* The cost-effectiveness screening of DSM measures for "economic potential" includes only: unrecovered revenue requirements for E-RIM, and participant costs for E-TRC, as DSM-related costs.

Fuel Cost Forecast Values Utilized in the Analyses

Year	Natural Gas (Nominal $ per mmBTU)	Oil (Nominal $ per mmBTU)	Coal (Nominal $ per mmBTU)
2010	$8.29	$9.31	$2.26
2011	$8.15	$11.26	$2.31
2012	$8.27	$11.44	$2.29
2013	$8.44	$13.20	$2.32
2014	$8.85	$13.65	$2.35
2015	$9.36	$14.16	$2.96
2016	$9.87	$14.96	$3.00
2017	$10.48	$15.75	$3.05
2018	$11.29	$16.52	$3.10
2019	$12.31	$17.94	$3.15
2020	$12.98	$17.92	$3.20
2021	$13.24	$18.33	$3.26
2022	$13.50	$18.74	$3.33
2023	$13.77	$19.16	$3.39
2024	$14.05	$19.59	$3.44
2025	$14.33	$20.03	$3.50
2026	$14.62	$20.48	$3.54
2027	$14.91	$20.94	$3.59
2028	$15.21	$21.41	$3.65
2029	$15.52	$21.89	$3.69
2030	$15.83	$22.39	$3.76
2031	$16.14	$22.89	$3.82
2032	$16.47	$23.41	$3.88
2033	$16.80	$23.93	$3.94
2034	$17.13	$24.47	$4.01
2035	$17.48	$25.03	$4.08
2036	$17.83	$25.59	$4.14
2037	$18.18	$26.17	$4.21
2038	$18.55	$26.76	$4.28
2039	$18.92	$27.37	$4.36
2040	$19.30	$27.98	$4.43
2041	$19.68	$28.62	$4.51
2042	$20.08	$29.26	$4.58
2043	$20.48	$29.93	$4.66

Note: The forecasted fuel cost values shown above are a subset of the numerous fuel cost forecasted values for delivery to different plants, from different pipelines, etc.

The Environmental Compliance Cost Forecasts Utilized in the Analyses

Year	SO_2 (Nominal $ per ton)	NO_X (Nominal $ per ton)	CO_2 (Nominal $ per ton)
2010	$1,277	$873	$0
2011	$1,398	$956	$0
2012	$1,532	$1,047	$0
2013	$1,677	$1,146	$14
2014	$1,837	$1,256	$16
2015	$2,013	$1,375	$17
2016	$2,204	$1,507	$19
2017	$2,413	$1,649	$21
2018	$2,641	$1,805	$23
2019	$2,891	$1,975	$25
2020	$3,164	$2,162	$27
2021	$3,466	$2,368	$29
2022	$3,796	$2,593	$33
2023	$4,157	$2,841	$35
2024	$4,554	$3,112	$39
2025	$4,988	$3,408	$43
2026	$4,877	$2,909	$46
2027	$4,767	$2,482	$50
2028	$4,659	$2,119	$55
2029	$4,554	$1,809	$62
2030	$4,453	$1,545	$67
2031	$4,320	$1,158	$73
2032	$4,178	$751	$79
2033	$4,026	$322	$86
2034	$3,864	$0	$93
2035	$3,691	$0	$101
2036	$3,508	$0	$109
2037	$3,312	$0	$118
2038	$3,105	$0	$128
2039	$2,885	$0	$138
2040	$2,653	$0	$149
2041	$2,407	$0	$160
2042	$2,147	$0	$172
2043	$1,872	$0	$185

Comparison of the Five Resource Plans: Economic Analyses Results and Consequences

Resource Plan	Levelized System Average Electric Rate (cents/kWh)	Avoids/ Minimizes Cross-Subsidization of Customer Groups?
E-RIM 664 MW	14.7183	Yes
Supply Only	14.7233	Yes *
E-RIM 949 MW	14.7374	No
E-TRC 664/1,093 MW	14.7779	No
E-TRC 1,153 MW	14.7836	No

* This resource plan would avoid or minimize cross-subsidization of customer groups in the absence of the E-RIM 664 MW plan.

Example of Levelized System Average Electric Rate Calculation for One Resource Plan: E-RIM 664 MW

Year	(1) Annual Discount Factor 8.89%	(2) Resource Plan Variable Costs ($000, Nom)	(3) Resource Plan Fixed Costs ($000, Nom)	(4) Non-Resource Plan Other System Costs ($000, Nom)	(5) = (2)+(3)+(4) System Revenue Requirements ($000, Nom)	(6) Load Forecast NEL (GWh)	(7) DSM Energy Reduction (GWh)	(8) = (6) - (7) Load Forecast NEL Adjusted by DSM (GWh)	(9) = ((5)/(8))/10 Annual Electric Rate (cents/kWh, NOM)	(10) = (9) *(1) Annual Electric Rate (cents/kWh, NPV)	(11) Nominal Levelized System Average Rate (cents/kWh)	(12) = (11) * (1) NPV Levelized System Average Rate (cents/kWh)
2009	1.000	4,409,751	1,643	5,819,586	10,230,980	109,481	180	109,302	9.36032	9.36032	14.7183	14.7183
2010	0.918	4,840,275	34,596	6,588,661	11,463,532	110,242	313	109,929	10.42813	9.57703	14.7183	13.5170
2011	0.843	4,829,362	285,436	7,079,168	12,193,966	111,961	373	111,588	10.92771	9.21676	14.7183	12.4138
2012	0.775	4,958,620	548,626	7,909,257	13,416,504	114,850	463	114,387	11.72900	9.08520	14.7183	11.4007
2013	0.711	5,496,581	733,932	8,086,288	14,316,801	116,062	536	115,526	12.39272	8.81586	14.7183	10.4702
2014	0.653	6,022,734	1,093,697	8,389,408	15,505,839	121,174	627	120,547	12.86292	8.40353	14.7183	9.6157
2015	0.600	6,658,074	1,250,945	8,641,837	16,550,855	123,837	724	123,113	13.44362	8.06609	14.7183	8.8309
2016	0.551	7,403,142	1,212,586	8,829,710	17,445,438	126,313	823	125,490	13.90188	7.66029	14.7183	8.1101
2017	0.506	8,099,123	1,171,260	9,129,511	18,399,893	128,944	928	128,015	14.37321	7.27361	14.7183	7.4482
2018	0.465	8,526,096	1,138,699	9,563,953	19,228,748	132,176	1,040	131,137	14.66312	6.81470	14.7183	6.8403
2019	0.427	9,297,129	1,107,185	9,880,529	20,284,843	135,429	1,158	134,271	15.10741	6.44815	14.7183	6.2821
2020	0.392	9,518,331	1,036,385	10,152,261	20,706,977	139,252	1,218	138,033	15.00144	5.88034	14.7183	5.7693
2021	0.360	9,940,799	1,270,826	10,448,372	21,659,996	143,272	1,215	142,058	15.24733	5.48893	14.7183	5.2985
2022	0.331	10,540,097	1,558,112	10,482,842	22,581,051	146,522	1,215	145,307	15.54022	5.13778	14.7183	4.8660
2023	0.304	11,034,880	1,891,393	10,653,687	23,579,960	149,550	1,215	148,335	15.89638	4.82660	14.7183	4.4689
2024	0.279	11,762,407	2,182,355	10,857,195	24,801,956	152,253	1,218	151,035	16.42131	4.57905	14.7183	4.1042
2025	0.256	12,467,564	2,525,924	10,875,085	25,868,572	154,913	1,215	153,698	16.83078	4.31019	14.7183	3.7692
2026	0.235	13,166,399	2,975,572	10,988,177	27,130,148	157,662	1,215	156,447	17.34139	4.07850	14.7183	3.4616
2027	0.216	14,025,625	3,273,866	11,196,699	28,496,190	159,980	1,215	158,765	17.94867	3.87680	14.7183	3.1791
2028	0.198	14,765,643	3,481,312	11,408,597	29,655,552	162,307	1,218	161,089	18.40943	3.65179	14.7183	2.9196
2029	0.182	15,658,239	3,679,260	11,668,592	31,006,091	164,832	1,215	163,617	18.95043	3.45230	14.7183	2.6813
2030	0.167	16,622,594	4,062,240	11,933,713	32,618,546	167,166	1,215	165,951	19.65553	3.28851	14.7183	2.4625
2031	0.154	17,547,061	4,383,294	12,188,088	34,118,442	169,286	1,215	168,072	20.29993	3.11913	14.7183	2.2615
2032	0.141	18,761,015	4,752,111	12,460,995	35,974,120	170,995	1,218	169,777	21.18903	2.99002	14.7183	2.0769
2033	0.130	20,703,413	5,262,784	12,769,244	38,735,442	171,316	1,215	170,101	22.77204	2.95114	14.7183	1.9074
2034	0.119	20,875,574	5,403,838	12,691,222	38,970,634	166,462	1,215	165,247	23.58328	2.80683	14.7183	1.7517
2035	0.109	22,280,672	5,260,665	13,098,211	40,639,547	169,218	1,215	168,003	24.18980	2.64405	14.7183	1.6088
2036	0.100	24,199,846	5,726,854	13,496,305	43,423,005	170,360	1,218	169,142	25.67259	2.57710	14.7183	1.4775
2037	0.092	25,449,635	6,209,776	13,824,457	45,483,868	171,191	1,215	169,976	26.75896	2.46692	14.7183	1.3569
2038	0.085	26,727,645	6,389,901	14,206,985	47,324,532	172,900	1,215	171,686	27.56463	2.33379	14.7183	1.2461
2039	0.078	28,119,391	6,572,992	14,632,463	49,324,845	174,746	1,215	173,531	28.42418	2.21016	14.7183	1.1444
2040	0.071	29,613,013	6,780,549	15,071,721	51,465,284	176,869	1,218	175,651	29.29977	2.09230	14.7183	1.0510
2041	0.066	31,213,720	7,015,353	15,483,591	53,712,665	178,805	1,215	177,591	30.24522	1.98354	14.7183	0.9653
2042	0.060	32,823,329	7,500,169	15,908,991	56,232,489	180,763	1,215	179,548	31.31888	1.88632	14.7183	0.8865
2043	0.055	35,486,685	7,910,180	16,348,291	59,745,156	182,580	1,215	181,366	32.94183	1.82214	14.7183	0.8141
										171.17575		171.17575

Levelized System Average Electric Rate (cents/kWh) = 14.7183

Projection of Average Customer Bill and Bill Differentials Assuming 1,200 kWh Usage

1) Projection of Average Customer Bill:

Year	Supply Only Resource Plan		DSM-E-RIM 664 MW		DSM-E-TRC 664/1,093 MW		DSM-E-RIM 949 MW		DSM-E-TRC 1,153 MW	
	Projected Electric Rate (cents/kWh)	Projected Customer Bill ($/1,200 kWh)	Projected Electric Rate (cents/kWh)	Projected Customer Bill ($/1,200 kWh)	Projected Electric Rate (cents/kWh)	Projected Customer Bill ($/1,200 kWh)	Projected Electric Rate (cents/kWh)	Projected Customer Bill ($/1,200 kWh)	Projected Electric Rate (cents/kWh)	Projected Customer Bill ($/1,200 kWh)
2010	10.394	$124.73	10.428	$125.14	10.523	$126.28	10.460	$125.52	10.534	$126.41
2011	10.890	$130.68	10.928	$131.13	11.025	$132.30	10.962	$131.54	11.036	$132.43
2012	11.689	$140.27	11.729	$140.75	11.832	$141.99	11.768	$141.21	11.844	$142.12
2013	12.350	$148.20	12.393	$148.71	12.505	$150.05	12.436	$149.23	12.516	$150.20
2014	12.816	$153.79	12.863	$154.35	12.976	$155.71	12.908	$154.90	12.987	$155.85
2015	13.393	$160.72	13.444	$161.32	13.560	$162.72	13.493	$161.91	13.572	$162.86
2016	13.849	$166.19	13.902	$166.82	14.010	$168.12	13.943	$167.32	14.019	$168.22
2017	14.345	$172.14	14.373	$172.48	14.480	$173.76	14.416	$172.99	14.500	$174.00
2018	14.615	$175.38	14.663	$175.96	14.765	$177.18	14.704	$176.45	14.771	$177.25
2019	15.148	$181.78	15.107	$181.29	15.200	$182.40	15.139	$181.67	15.218	$182.62

2) Projection of Average Customer Bill Differentials:

Year	Bill Differentials for Each Plan Compared to the Supply Only Plan				
	Supply Only	E-RIM 664 MW	E-TRC 664/ 1,093 MW	E-RIM 949 MW	E-TRC 1,153 MW
2010	$0.00	$0.40	$1.54	$0.79	$1.67
2011	$0.00	$0.45	$1.62	$0.86	$1.76
2012	$0.00	$0.48	$1.72	$0.95	$1.86
2013	$0.00	$0.52	$1.86	$1.04	$2.00
2014	$0.00	$0.56	$1.92	$1.10	$2.06
2015	$0.00	$0.60	$2.00	$1.19	$2.14
2016	$0.00	$0.64	$1.93	$1.13	$2.04
2017	$0.00	$0.33	$1.62	$0.84	$1.86
2018	$0.00	$0.58	$1.80	$1.07	$1.88
2019	$0.00	($0.49)	$0.63	($0.11)	$0.84

Comparison of the Five Resource Plans: Projection of System Emissions

	SO_2 (thousand tons)				
Year	Supply Only Plan	E-RIM 664 MW Plan	E-TRC 664/1,093 MW Plan	E-RIM 949 MW Plan	E-TRC 1,153 MW Plan
2010	47.8	47.8	47.7	47.7	47.7
2011	36.6	36.6	36.5	36.6	36.5
2012	33.1	33.0	32.9	33.0	32.9
2013	35.1	35.0	34.9	35.0	34.9
2014	34.3	34.3	34.2	34.2	34.2
2015	35.4	35.3	35.3	35.3	35.2
2016	30.2	30.0	29.7	29.8	29.7
2017	30.3	30.2	29.9	30.0	29.9
2018	29.9	29.7	29.4	29.5	29.3
2019	29.1	30.6	30.2	30.5	30.2
2020	28.4	30.2	29.8	30.0	29.8
2021	28.3	29.3	29.7	29.9	29.7

	NO_x (thousand tons)				
Year	Supply Only Plan	E-RIM 664 MW Plan	E-TRC 664/1,093 MW Plan	E-RIM 949 MW Plan	E-TRC 1,153 MW Plan
2010	18.0	18.0	17.9	18.0	17.9
2011	17.8	17.7	17.6	17.7	17.6
2012	15.4	15.3	15.2	15.2	15.1
2013	11.5	11.4	11.2	11.3	11.2
2014	10.9	10.9	10.7	10.8	10.7
2015	11.9	11.8	11.6	11.7	11.6
2016	13.5	13.6	13.3	13.4	13.3
2017	14.5	14.3	14.0	14.1	14.2
2018	13.9	13.7	13.3	13.4	13.4
2019	12.5	14.6	14.1	14.3	14.0
2020	11.3	13.9	13.4	13.6	13.3
2021	11.6	13.2	13.7	13.9	13.7

	CO_2 (million tons)				
Year	Supply Only Plan	E-RIM 664 MW Plan	E-TRC 664/1,093 MW Plan	E-RIM 949 MW Plan	E-TRC 1,153 MW Plan
2010	48.6	48.6	48.5	48.5	48.5
2011	47.9	47.9	47.7	47.8	47.7
2012	47.4	47.3	47.1	47.2	47.1
2013	47.1	46.9	46.7	46.8	46.6
2014	48.3	48.1	47.8	47.9	47.8
2015	50.1	49.9	49.5	49.7	49.5
2016	48.8	48.5	48.0	48.2	48.0
2017	49.5	49.2	48.7	48.9	48.6
2018	48.7	48.4	47.7	48.0	47.7
2019	48.4	48.5	47.8	48.1	47.8
2020	47.1	47.3	46.6	46.9	46.5
2021	47.7	47.6	47.1	47.4	47.1

Comparison of the Five Resource Plans: Projection of System Oil and Natural Gas Usage

	Oil (million mmBTU)				
Year	Supply Only Plan	E-RIM 664 MW Plan	E-TRC 664/1,093 MW Plan	E-RIM 949 MW Plan	E-TRC 1,153 MW Plan
2010	12.9	12.8	12.7	12.7	12.7
2011	7.1	7.1	7.0	7.0	6.9
2012	6.4	6.2	6.0	6.1	6.0
2013	2.4	2.3	2.2	2.2	2.2
2014	2.1	2.0	1.9	2.0	1.9
2015	3.0	2.9	2.7	2.8	2.7
2016	8.5	7.9	7.2	7.4	7.3
2017	10.3	10.2	9.5	9.8	9.2
2018	9.5	9.1	8.4	8.7	7.8
2019	7.6	11.1	10.3	10.8	10.2
2020	6.2	10.1	9.4	9.8	9.4
2021	6.7	9.0	10.1	10.4	10.0

	Natural Gas (million mmBTU)				
Year	Supply Only Plan	E-RIM 664 MW Plan	E-TRC 664/1,093 MW Plan	E-RIM 949 MW Plan	E-TRC 1,153 MW Plan
2010	479.8	479.6	479.0	479.2	479.0
2011	507.6	506.7	504.8	505.4	504.6
2012	518.3	516.8	513.7	514.7	513.5
2013	494.0	491.9	487.8	489.2	487.4
2014	520.9	518.1	512.6	514.5	512.2
2015	542.1	538.6	532.1	534.3	531.7
2016	587.0	583.5	576.1	578.7	575.5
2017	607.3	602.2	593.7	596.7	593.3
2018	594.4	588.9	579.1	582.6	578.7
2019	591.9	588.0	577.4	581.0	576.4
2020	571.5	568.2	557.2	561.1	555.9
2021	585.5	581.2	571.0	575.2	570.1