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

REBUTTAL TESTIMONY & EXHIBITS OF:

STEVEN R. SIM

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

FLORIDA POWER & LIGHT COMPANY

REBUTTAL TESTIMONY OF DR. STEVEN R. SIM

DOCKET NO. 080407 - EG

JULY 30, 2009

Q. **Please state your name and business address.**

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

Q. **Have you previously submitted direct testimony in this proceeding?**

A. Yes.

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

A. Yes. I am sponsoring the following three exhibits that are attached to my rebuttal testimony:

Exhibit SRS - 13: Comparison of Projected CO_2 Allowance Costs: FPL and Congressional Budget Office (CBO) Projections;

Exhibit SRS - 14: Screening Curve Results for a 2019 CC Unit: With No System Impacts (2009$); and,

Exhibit SRS - 15: Screening Curve Results for a 2019 CC Unit: With Only Two System Impacts (2009$).

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

A. The purpose of my rebuttal testimony is to discuss and/or respond to a number of statements and recommendations made by GDS and NRDC-SACE witnesses who have filed testimony in this docket. The GDS witnesses whose testimony I will discuss are Witness Guidry and Witness Spellman who provided collective or panel testimony. (I will generally refer to their testimony as the 'GDS' testimony.) The NRDC-SACE witnesses whose testimony I will discuss are Witnesses Wilson, Cavanagh, and Mosenthal, and Witness Steinhurst.

Q. How is your rebuttal testimony structured?

A. My rebuttal testimony is divided into two parts. In the first part of my testimony I will be discussing testimony from GDS. This part of my testimony appears on pages 2 through 42. In the second part of my testimony I will be discussing testimony from NRDC-SACE. This part of my testimony appears on pages 43 through 104. For those issues raised by both GDS and NRDC-SACE, I mention the topic only briefly in the GDS portion of my testimony and refer the reader to the NRDC-SACE portion of my testimony for a more detailed discussion.

Part 1: Rebuttal Testimony Addressing GDS

Q. Please provide an overview of this portion of your rebuttal testimony that addresses issues raised by the GDS testimony.

A. I have organized my comments regarding GDS's testimony into the following four categories for discussion:

I. GDS's Extreme and Unsupported Goals Recommendations;

II. GDS's Misleading Statements Regarding the RIM Test;

III. Errors Made by GDS Witnesses; and,

IV. Summary

I. GDS's Extreme and Unsupported Goals Recommendations

Q. How would you characterize GDS's recommendations for setting DSM goals?

A. GDS recommended goals for both non-renewable DSM measures and for renewable DSM measures. I would characterize their recommendations for both types of goals as extreme and unsupported. For these reasons, GDS's recommendations for goals setting do not deserve serious consideration.

Q. Would you please discuss further starting with their recommendation for non-renewable DSM goals?

A. Yes. Let me start by summarizing how GDS developed its recommendations for these goals. Their approach to developing these goals has two parts. Part 1 focuses on developing a new estimate for Achievable Potential by using the highest starting point value they could find, then making a series of adjustments that only move the Achievable Potential in one direction – higher. GDS proceeded as follows:

- Started with the highest Achievable Potential value derived in the Collaborative work;

- Then increased that Achievable Potential value by largely ignoring the two-year payback criterion agreed to by all of the Collaborative members (to address free riders), including NRDC-SACE, and adding back all measures eliminated by this criterion for all but very large commercial and industrial customers;
- Increased the Achievable Potential value again by assuming higher market penetration levels than those developed by the Collaborative after months of work; and,
- Increased the ever-growing Achievable Potential value again by adding back certain DSM measures that the Collaborative excluded from the Technical Potential analyses.

Q. What is the resulting Achievable Potential value that GDS arrives at with this ever-escalating approach?

A. I will discuss their recommendation in terms of Summer MW. This value is the most important value to FPL in regard to system reliability because the Summer reserve margin drives the need for new resources on FPL's system.

To put GDS's revised projection of Achievable Potential for FPL in perspective, the maximum Achievable Potential Summer MW value for FPL, using the more lenient E-TRC test ("more lenient" because it does not account for all DSM-related costs, thus setting a lower standard for DSM to meet), was determined to be approximately 1,100 MW over the 10-year period. However, GDS's adjustments resulted in an Achievable Potential value of

5,554 MW over the 10-year period as is shown in their Exhibit RFS-20, page 1 of 7. Therefore, GDS's estimate is more than 5 times higher than the Achievable Potential value developed by the collaborative efforts of the utilities, NRDC-SACE, and Itron.

Q. What does GDS do in the second part of their approach to developing their recommendation for DSM Goals?

A. Perhaps recognizing that their Achievable Potential values might be on the high side for setting goals, GDS recommends that the goals be set for the first 5 years at 50% of their Achievable Potential value to provide a "transition period", but ramps back towards their recalculated Achievable Potential values for the second 5 years. Therefore, GDS recommends a 10-year Summer MW goal for FPL of 4,320 MW as is shown in their Exhibit RFS-21, page 1 of 7.

Q. How would GDS's recommended Summer MW goals compare with FPL's current DSM goals that were set in 2004?

A. GDS's recommendation would set new goals for FPL at a level more than 5 times FPL's current goals. I would certainly term this recommendation as extreme, especially considering that FPL's projected resource needs have dropped. (I will discuss FPL's projected resource needs later in this testimony.)

Q. Other than GDS's recommendation being extremely high, what other reactions to their recommendation do you have?

A. I stated earlier that I view GDS's recommended goals as both extreme, and unsupported, as described below.

First, GDS's recommendation is not based on FPL's most recent planning process as is required by the DSM goals rule. FPL witness Dean will discuss the regulatory compliance aspect of this. I'll address this from a resource planning perspective.

As FPL's planning process is applied in this docket, one could say there were 6 major steps: (i) Technical Potential analysis; (ii) screening of DSM measures and determination of incentive payment levels; (iii) Achievable Potential analysis; (iv) DSM portfolio development; (v) resource plan development; and (vi) resource plan analysis.

It is clear that GDS's recommendation was not based on FPL's planning process because GDS chose to stop at the end of process step (iii) Achievable Potential analysis. GDS then modified (ever upwards) the Achievable Potential value and selected arbitrary percentages of that value for each of two 5-year periods as the recommended goals.

By choosing to stop halfway through the resource planning process, GDS ensured that: there was no consideration of FPL's projected resource needs or any economic analysis performed as part of the resource planning process to create a DSM portfolio (step (iv)); there was no consideration of FPL's remaining resource needs in years after the 2010 – 2019 time period nor the development of resource plans to meet those needs (step (v)); and there was no economic analyses of resource plans (step (vi)).

In regard to step (iv) in which consideration of FPL's projected resource needs should have been taken into account, GDS chose not to consider these resource needs. As a consequence, GDS's recommendations would result in FPL's goals being set solely on the basis of their adjusted Achievable Potential value, instead of using the Achievable Potential value as <u>an input</u> to the remainder of the resource planning process. GDS either did not understand FPL's resource planning process, or they consciously chose to use their fabricated input value as their final answer, rather than correctly using it as an input to the proper remaining analysis steps. As a result, when comparing GDS's recommendation of 4,320 MW to FPL's projected resource needs of 607 MW at the meter (or 664 MW at the generator) if those resource needs are met solely by DSM, GDS is recommending that FPL's goals be set such that FPL would be adding DSM resources that are <u>more than 7 times</u> the amount of DSM needed to meet its resource needs.

Q. Please provide a capsule summary of the extreme nature of GDS's recommended goals for FPL regarding non-renewable DSM.

A. In terms of Summer MW, GDS's recommendations for FPL in regard to goal-setting are:

- based on GDS revisions to the Achievable Potential value for FPL that are 5 times the value developed by the Collaborative and Itron;
- more than 5 times the level of FPL's current goals set in 2004 when load growth was significantly higher than it is today; and,
- more than 7 times FPL's total resource need over the 10-year period.

In light of these comparison results, calling GDS's recommended goals "extreme" is actually an understatement.

Q. You stated that GDS's recommendation is to add 7 times the resources that are needed to meet FPL's total resource need over the next 10 years. In terms of Summer reserve margin, what does GDS's recommendation equate to?

A. FPL's E-RIM 664 MW resource plan results in a projected Summer reserve margin of 20% consistent with the Commission-approved reserve margin planning criterion. If GDS's recommendation for 4,320 MW is substituted into this same resource plan, FPL's projected Summer reserve margin for 2019 would skyrocket to 44%.

That such a significant reserve margin would result from GDS's recommendation is a direct result of GDS's failure to utilize FPL's resource planning process, thereby failing to consider system considerations such as reserve margin and system reliability.

Q. Can you provide an analogy as to what a similar "stop halfway" approach might look like in a need determination filing for a Supply option?

A. This "stop halfway" approach is so bizarre compared to actual resource planning practice that it is difficult to envision a truly analogous example that might actually take place in regard to Supply options and a need determination filing. However, the following example probably comes close.

Let's assume that a utility does the following three steps of a multi-step resource planning process, stops its work there, and then seeks Commission approval of new Supply options. The utility first determines what types of Supply options it can build in its Step (i) (similar to a Technical Potential study). The utility then performs some preliminary economic analysis to select several of the more promising types of generating units in its Step (ii) (similar to DSM economic screening). Finally, the utility determines how many of each of these types of generating units it believes it can physically build in the next 10 years in its Step (iii) (similar to an Achievable Potential analysis). In our example, let's say the utility decides in its Step (iii) that it can build a total of 30 generating units of various types over a 10-year period (i.e., 30 is the Achievable Potential for these new generating units).

In this analogous example, the utility decides not to take into account its resource needs to see how many new generating units it really needs to meet its resource needs (Step (iv)). The utility also does not create different resource plans with different numbers or types of these new generating units in various years (Step (v)), and the utility doesn't perform economic evaluations of those resource plans (Step (vi)).

Instead, the utility petitions the Commission for approval to build an arbitrary number (let's say 50%) of the total achievable number of 30 new generating units. The utility then petitions the Commission for approval to build 15 new generating units over the next 10 years.

To put it mildly, I would not expect the Commission to seriously consider such a request. But this is precisely the type of request GDS is making with its recommendations for setting goals.

Q. In addition to GDS not using FPL's planning process, you stated that there was a second reason that leads to the conclusion that GDS's recommendations for goals are completely unsupported. Would you please discuss that now?

A. Yes. The second reason that GDS's recommendations are completely unsupported is that there is no analysis of the economic impacts to all of FPL's customers that would result from GDS's recommendation. The only mentions of "economic analysis" are several statements such as this one on page 32, lines 12 – 13: *"measures…that cost far less than new power supply resources on a cost per lifetime saved basis."*

By this statement, GDS is attempting to make a case that the cost to reduce a kWh is low compared to the cost to produce a kWh with a new generating unit. The only quantitative "support" GDS provides for this statement is represented by the following statement on page 34, lines 1 – 2, of its testimony: *"…measures that have a levelized cost per lifetime kWh saved less than 2.5 cents per kWh saved."* By this statement, GDS is claiming that DSM can reduce a kWh at a levelized cost of less than 2.5 cents per kWh. (GDS appears to offer no comparative levelized costs for new generating units.)

However, GDS's levelized cost values appear to be the result of a very selective exercise. As footnote 8 on page 34 shows, GDS has chosen to include only *"…measures with a two-year payback period or less…"* in its calculation. Because such DSM measures tend to have higher kWh reduction values that result in rapid payback to the participant, GDS has carefully selected only measures for its calculation that will tend to have large denominators (the kWh reduction value), thus assisting in low cost per kWh outcomes. Yet, as I will discuss next, this careful selection of DSM measures by GDS is *irrelevant* as it pertains to the "justification" for their recommendations.

Q. Why is this highly selective choice of DSM measures irrelevant?

A. GDS's careful selection of certain DSM measures is irrelevant because a levelized cents per kWh approach to analyzing resource options is absolutely the wrong analytical approach to use for evaluating a variety of resource options. The severe limitations with this approach, commonly referred to as a "screening curve" approach, have long been recognized by utility resource planners.

However, GDS, like NRDC-SACE, believes that a simple screening curve approach constitutes a meaningful economic analysis of adding a resource option to a utility system. This is a fundamental error. Therefore, the economic "justification" for their recommendations is fundamentally flawed.

I discuss this fundamental error in depth in the second part of this rebuttal testimony in which I address NRDC-SACE's testimony beginning on page 81. Therefore, I will not address it here in detail. Suffice it to say that the DSM goals rules ensure that a full economic analysis is to be performed by requiring that the utility's resource planning process be used. One of the reasons for this requirement is to avoid parties providing incomplete and incorrect economic analyses in an attempt to support inappropriate resource option decisions, as GDS (and NRDC-SACE) attempts to do here with a simple screening curve calculation.

Q. **Turning attention to GDS's recommendation for goals for renewable DSM measures, are these recommendations as extreme and unsupported as their recommendations for non-renewable DSM measures?**

A. Yes.

Q. **Would you please explain?**

A. Yes. Let me first summarize what GDS is recommending. GDS admits that none of the renewable DSM measures they deem as worthy to set goals for were found to be cost-effective to either potential participants or to the general body of ratepayers – regardless of whether the E-RIM or E-TRC test was used. Nevertheless, GDS wants to set goals for these measures. This recommendation will result in a significant amount of money being spent that will be recovered from all of FPL's customers, fully recognizing that the general body of customers will not benefit from these expenditures.

In fact, getting the utilities and their customers to spend large amounts of money appears to be GDS's primary objective. GDS does not recommend MW or GWh goals as they recommend (at an extreme level) for non-renewable DSM measures. Instead, they recommend setting <u>spending</u> goals. GDS has chosen a completely arbitrary dollar amount of 10% of a utility's average annual ECCR expenditures over the last 5 years as their recommended "spending goal".

Q. Approximately how much money does this equate to for Florida utilities over the 10-year period?

A. GDS estimates that about $24.5 million should be spent each year for an expenditure of about $245,000,000, or a quarter of a billion dollars, over the ten-year period. This obviously represents a large amount of money.

Q. What would this money actually be spent for?

A. GDS first explains on page 74, lines 21 – 22, that the two renewable DSM measures it would like to set spending goals for, solar thermal and photovoltaics, "*... should be designated as research and development programs (R&D) in order to allow for recovery through the ECCR clause.*" GDS then explains on page 76, line 20, that it really doesn't intend for these expenditures to be used for R&D as the term is generally understood, but that: "*The funds should be used as one-time rebates for demand-side renewable energy system.*" In other words, provide subsidies for these renewable technologies.

GDS states on page 75, lines 7 – 9, that it believes: "*By continuing to provide some level of financial support for these emerging technologies, costs should decrease over time.*" My immediate reaction to this sentence is that solar water heating is <u>not</u> an "emerging technology". Solar water heaters have been in use in Florida for approximately a century.

Q. Does GDS offer any analysis to support their premise that providing subsidies directly to customers for renewable energy equipment will lead to lower equipment costs in the long run in Florida?

A. No. GDS offers no analysis to support this premise.

Q. In your experience, have subsidies for renewable energy equipment resulted in lower long-term prices for this equipment in Florida?

A. My personal experience applies only to solar water heaters, and that experience tells me that the answer is no for solar water heaters. Prior to joining FPL, I worked at the Florida Solar Energy Center for roughly two years. Shortly after joining FPL, based on my experience with solar water heaters and knowledge of Florida's solar industry, I was asked to help design and implement FPL's Conservation Water Heating program that provided incentives to encourage the implementation of various water heating technologies including solar water heaters. This program was offered for several years in the early 1980s and was offered during the time that the federal government was offering a substantial tax credit on solar water heaters.

The program was successful for several years, resulting in FPL providing incentives for approximately 50,000 solar water heater installations. However, over the course of those years, the cost of solar water heaters increased dramatically. In the first year of the program, the average price of a solar water heater was about $2,000. This average price rose rapidly to approximately $3,000 over the course of just a few years. When the federal tax credits ended around 1985, the solar water heater market in Florida found itself in an unhealthy economic situation because the industry had become dependent on the federal subsidies and higher solar water heater costs. It took years for the industry in Florida to restructure to the new economic reality.

My experience with solar water heaters leads me to conclude that GDS's contention – that use of subsidies paid to individual consumers for expensive energy equipment will lead to long-term price reductions for this type of equipment – is unlikely to happen, and may well result in even higher prices.

As part of the work for this docket, prices for solar water heaters were researched both during the early stages of the Collaborative's efforts and then more recently. The findings were that prices for solar water heaters of comparable size to those discussed above range from roughly $3,500 to $6,000. I believe that there is evidence that prices are once again trending upwards due to announcements of state and federal subsidies. Clearly, such price increases make solar water heaters less cost-effective to potential customers.

Q. Would you please summarize your reactions to GDS's recommendation for renewable DSM goals?

A. Yes. GDS's recommendation to establish arbitrary "spending goals" (with very large expenditures) to subsidize DSM measures, that clearly do not benefit the general body of customers, is a bad idea. GDS offers no analysis to support its recommendation. The stated objective of lowering renewable equipment cost in the long run through subsidies is, in my opinion, unlikely to occur. In fact, Florida has a fairly recent example in which exactly the opposite outcome has occurred.

Therefore, GDS's recommendation regarding renewable DSM goals is, just like its recommendation for non-renewable DSM goals, both extreme and unsupported. Both of GDS's goals recommendations would, if implemented, result in very large DSM expenditures that would increase electric rates and result in increasing levels of cross-subsidization between customer groups.

Q. Does GDS recognize the problems that would directly result from their recommendations – increased electric rates and cross-subsidization between customer groups?

A. Yes. They clearly recognize the first problem of increased rates that would result from their recommendations. GDS shows this on page 54, lines 13 – 15, where they state: "*...how can the Commission increase the level of conservation while, at the same time, mitigate the rate impact on customers...*" GDS also recognizes the second problem that would directly result from their recommendations, cross-subsidization of customer groups (also referred to as "equity concerns"). They show this on page 60, lines 2 – 4, where they state: *"The FEECA utilities can address these equity concerns by offering a comprehensive list of energy efficiency measures and educational materials available to all electric customers..."*

GDS does propose "solutions" to both of these problems that would result from their recommendations that I will discuss. However, I would like to first discuss a misleading comparison made by GDS that was designed to make one believe that the increased rate impact from DSM is not "too bad" when compared to other resource options.

Q. What is this misleading comparison?

A. The comparison begins on page 56, lines 11 – 21, and page 57, lines 1 – 3. On these pages GDS seems to take comfort in a study that concluded that (paraphrasing) DSM would likely result in <u>increases in levelized electric rates over a 20-year period</u> ranging from 0.14 to 3.28 percent. The comparison concludes on page 58, lines 1 – 10, and footnote 22. Here GDS states that: "*Supply-side investments can increase electric rates by 10 percent or more.*"

In support of the "10 percent or more" statement, GDS again carefully selects an example. GDS points to a calculation of the projected rate increase for Georgia Power Company in 2016 when two new nuclear units were projected to come in-service. The projected increase in nominal rates for that single year - is more than 12% as GDS correctly states.

However, the comparison is misleading for two reasons. First, this is not an "apples-to-apples" comparison. The DSM value is a 20-year, net present value levelized number. The Georgia Power value is a nominal value for a single future year. The two values are simply not comparable because they are calculated completely differently and represent completely different types of values.

Second, GDS has carefully selected the one year in Georgia Power's calculation of rate impacts that is probably the highest year of rate impact; i.e., the year in which both nuclear units go in-service. Based on the calculations FPL has performed for its new nuclear units, I would expect the rate impacts to be dramatically different in subsequent years. In each year after the in-service year, I would expect to see declining capital revenue requirement costs, and increasing system fuel and environmental compliance cost savings.

I would expect the nuclear unit to show significant savings compared to competing options on a cumulative present value of revenue requirements (CPVRR) basis. (Otherwise, it is unlikely that Georgia Power would have brought the new nuclear units before their Commission.) And, if the new nuclear units were more economical than the competing resource options on a

CPVRR basis, I would expect the levelized electric rate value for the nuclear units to also be lower than the levelized electric rate value for the competing options. If this were the outcome, then Georgia Power's new nuclear units would result in a projected <u>decrease</u> in levelized electric rates compared to GDS's example of <u>increased</u> levelized electric rates for DSM measures that would be implemented as a result of their recommendations.

It is interesting that GDS stopped halfway (actually, less than halfway) in yet another analysis. GDS did not attempt to develop what could have been a more meaningful analysis that would have included a multi-year levelized rate impact for Georgia Power's new nuclear units. Regardless of the reasons they chose not to attempt a more meaningful analysis, the comparison that GDS chose to offer is misleading in several ways as noted above.

Q. Let us return to GDS's proposed solutions to the problems of increased electric rates and cross-subsidization of customer groups that would result from their recommended goals. What do they propose as solutions?

A. Their solution to the problem of increasing electric rates is to institute a "rate cap" that would limit how much of an increase to electric rates from DSM would be allowed. Regarding the cross-subsidization problem, as indicated in the quote above from page 60 of their testimony, GDS's solution (and NRDC-SACE's as well, as described later in this rebuttal testimony) is to simply add more DSM measures of the type that caused the problem in the first place.

Q. What is your reaction to these proposed solutions?

A. I find GDS's proposed "solutions" to be both interesting and unnecessary.

Q. What do you find interesting about these proposed solutions?

A. There are two aspects of these proposed solutions that I find interesting. First, the proposed solution to increasing electric rates due to DSM, the "rate cap" concept, would require considerable work and consensus to set up an agreed upon methodology that could be used to accurately calculate impacts. I believe this would be especially true in the State of Florida which does not have regularly scheduled rate cases. However, even if this obstacle were to be overcome, the practice of administering a rate cap for DSM, would undoubtedly result in the equivalent of regularly scheduled, perhaps annual, mini-rate cases that would almost certainly be contentious.

The 'rate cap' concept would certainly result in more regulatory work for all parties involved in DSM. Thus, while GDS's proposed solution may seem fine for them, additional and unnecessary regulatory workload is probably not a desired goal of either electric utilities or regulatory bodies such as the Commission.

I also find the concept of having both a rate cap to address DSM-induced increased electric rates, and implementing additional DSM in an attempt to address cross-subsidization, to be interesting because they seem contradictory to me. If, as GDS contends, cross-subsidization should be addressed by more

DSM programs of the type that caused the problem in the first place (a "solution" approach that I do not believe will work), then one adds more and more DSM programs. However, the addition of more of these DSM programs results in ever-increasing electric rates that will trigger the rate cap to come into play.

Clearly, something has got to give at some point. Either one stops adding new DSM programs of this type to honor the rate cap criterion (which keeps rates from rising even higher, but leaves an increased level of cross-subsidization), or one readjusts the rate cap upwards (allowing more DSM programs of this type to be implemented in an attempt to lower the cross-subsidization levels, but resulting in increasing electric rate levels.) The contradictory nature of this "dual approach" would likely add even more to the regulatory workload.

Both of the problems I've discussed – increased electric rates and cross-subsidization of customer groups – are the direct result of implementing DSM programs that would fail the E-RIM test, but "pass" the E-TRC test. The answer is obvious: we should evaluate DSM measures and set DSM goals using the E-RIM test.

II. GDS's Misleading Statements Regarding the RIM Test

Q. Did GDS make misleading statements about the RIM test?

A. Yes. GDS made a number of misleading statements regarding the rate impact measure or RIM test. I will discuss four such statements that I will paraphrase for the moment as follows: (i) the RIM test should not be used because it is not an "economic efficiency" test; (ii) the RIM test is the "most restrictive" test; (iii) Supply options are not evaluated using the RIM test; and (iv) energy efficiency (EE) programs do not pass the RIM test.

I will address each of these misleading comments. Then I will contrast these misleading comments about the RIM test with my observations about the RIM test from the standpoint of an individual who has been involved in DSM development and resource planning in the State of Florida for about 30 years.

Q. What is your reaction to the comment that RIM is not an "economic efficiency" test?

A. Let's first look at GDS's statement on page 45, lines 15 – 16: *"…the RIM and E-RIM tests are not appropriate as primary tests because they are not tests of economic efficiency."* GDS does not define what it means by 'economic efficiency'. For purposes of this discussion, I'll assume the term refers generally to determining the total costs of goods or services.

The evaluation of DSM measures using a cost-effectiveness test is merely the first step in an overall economic analysis that seeks to compare DSM options with Supply options.

In such an analysis, the item of paramount importance from a resource planning perspective is to include all relevant costs and benefits that can be accurately identified for both types of resource options that are incurred and/or realized by all customers. Only by doing this is the resource planner, and the Commission, able to ensure that resource options are being compared on a level playing field with complete information.

Only the use of the E-RIM test ensures that all relevant DSM-related costs are accounted for. (The E-TRC test cannot do this because it omits both incentive payments to participants and unrecovered revenue requirements, both of which are ultimately incurred by the general body of ratepayers.) Therefore, because the E-RIM test ensures that all DSM-related costs are accounted for, it is the correct test with which to begin the evaluation of DSM options for a utility system.

Q. What is the next misleading GDS comment about the RIM test that you wish to discuss?

A. On page 37, line 16, GDS quotes a NAPEE document which states: "*...it* (the RIM test) *is the most restrictive of the five cost-effectiveness tests.*"

Q. What is your reaction to this?

A. I assume that GDS's decision to include this statement, which was derived from a document advocating energy efficiency measures, was intended as a disparaging remark regarding the RIM test. However, as a resource planner, I read it as a ringing endorsement for the RIM test.

When comparing the RIM and TRC tests, the benefits calculations are identical for both tests. The two tests differ only in regard to DSM-related costs that are included in each calculation. Because the RIM test accounts for all DSM-related costs that are incurred by all customers, and the TRC test omits two significant costs as was just discussed, the RIM test will naturally be "more restrictive" than the TRC test.

However, because the real objective in resource planning is to evaluate resource options with all of the costs that will be incurred by all customers accounted for, I would replace the words "most restrictive" to "most accountable", "most complete", or "most informative." This is a most admirable trait to have.

Q. What is the next misleading statement regarding the RIM test that GDS makes?

A. On page 53, lines 2 – 4, GDS states: *"The RIM test is uniquely applied to DSM measures and is not considered for any supply-side investments, providing an unfair playing field for comparing utility investments."*

Q. What is your reaction to this statement?

A. I have several reactions. First, GDS's statement is not correct. When using the RIM test, both the DSM option and the competing Supply option are evaluated. Therefore, one is evaluating a Supply option at the same time one is evaluating a DSM option. (This is also the case with a TRC test evaluation.)

Second, I believe the argument that GDS was trying to make is that when only Supply options are evaluated against each other, the RIM test is not used. This would have been a correct statement, but an irrelevant one. When evaluating only Supply options, neither the RIM nor the TRC test is used.

Supply options are typically large resource options ranging from a few dozen MW to over 1,000 MW in size. There are typically only a few dozen Supply options that are suitable for a given utility to consider at a given time. Due to its size, each Supply option will generally have a noticeable impact on the utility system if it is chosen. Therefore, Supply options readily lend themselves to analyses of resource plans in which one or more of the competing Supply options are incorporated into resource plans that are then analyzed using sophisticated computer models.

On the other hand, individual DSM options are much smaller with demand reduction values close to 1 kW per installation. In addition, the utility may have hundreds or thousands of DSM measures that are potentially suitable for it to consider. Because of the small nature of individual DSM measures, they do not lend themselves well to direct analysis of resource plans because their small size would result in small system impacts that would be very difficult (if not impossible) to accurately judge. Nor would it be practical to even attempt to evaluate hundreds or thousands of DSM measures individually in resource plan analyses due to the time it takes to set up these analyses.

Consequently, several DSM "cost-effectiveness tests" were created (and are still being created as evidenced in this docket) so that analyses of individual DSM measures could be carried out quickly and with reasonable accuracy. In this way, large numbers of DSM measures can be "screened" using these tests. Then the best DSM measures can be combined into DSM portfolios for the much more meaningful resource plan analyses against Supply options.

But, let's take another look at how two Supply options are actually compared. There are two key characteristics of such an evaluation. The first key characteristic is that the evaluation is performed with a full accounting of costs for the two Supply options. The second key characteristic is that an evaluation between two Supply options is simultaneously an evaluation of both system costs and system average electric rates.

Because the utility system will be serving the same amount of kWh regardless of which Supply option is selected, the typical analytical approach is to evaluate the present value of system net costs for each Supply option. However, this also represents a comparison from an electric rate perspective. The system costs for each Supply option represent the numerator, and the identical number of kWh served represent the denominator, in a system average electric rate calculation. Due to the fact that the denominator does not change, the Supply option with the lowest system cost will also result in the lowest system average electric rate. Consequently, the evaluation of only Supply options is simultaneously an evaluation of both costs and system average electric rates.

Now let's return to the RIM and TRC tests. The TRC test clearly is not concerned with electric rate impacts. Furthermore, the TRC test omits two significant DSM-related costs, incentive payments and unrecovered revenue requirements. Therefore, the TRC test is definitely not evaluating a DSM option versus a Supply option in a manner that is consistent with how two Supply options are compared.

Fortunately, the RIM test both takes an electric rate perspective and accounts for all costs, including all DSM-related costs. Consequently, even though the RIM test itself is not used when two Supply options are evaluated, the RIM test does evaluate a DSM option versus a Supply option in an approach that is consistent with how two Supply options are evaluated.

Q. What is the final misleading statement that GDS makes that you will discuss?

A. On page 53, lines 4 – 5, in discussing the type of DSM programs that pass the RIM test, GDS states: "*...energy efficiency programs typically do not* (pass the RIM test)*...*"

Q. What is your reaction to this statement?

A. I have several reactions. First, the statement is simply inaccurate as shown by the large number of energy efficiency measures that have been part of DSM programs implemented by Florida utilities for decades that have passed the original RIM test. Second, the statement is also irrelevant to this docket because Florida utilities did not use the original RIM test in their analyses; they used the enhanced E-RIM test.

The enhanced E-RIM test results in even more energy efficiency measures passing DSM screening than was the case with the original RIM test. As shown in Exhibit SRS-4 in my direct testimony, FPL's DSM screening resulted in 885 total measures passing the E-RIM screening path and 928 total measures passing the E-TRC screening path. After subtracting the half-dozen or so non-energy efficiency measures that passed both screening paths, it is clear that 95% as many energy efficiency measures passed the E-RIM path as passed the E-TRC path. (There will be some differences in the specific measures that pass these tests, and in the system impacts those measures will have, including impacts on electric rates.)

Therefore, any claim or suggestion that the enhanced version of the RIM test, the E-RIM test, does not find large numbers of energy efficiency measures cost-effective is completely unjustified and inaccurate.

Q. **You stated earlier that you wished to contrast these misleading statements regarding the RIM test with your perspective of cost-effective analyses as someone who has analyzed Supply and DSM options in Florida for almost 30 years. What comments would you make?**

A. The misleading statements I've just discussed are representative of similar statements that I have heard over the years from individuals and organizations whose objective always seems to be that "DSM is always the best resource option and the utilities should always be implementing ever-increasing amounts of DSM."

For these individuals and organizations, the RIM test (and by implication, the E-RIM test) will always be deemed 'too restrictive' because these tests require that all DSM-related costs are accounted for when evaluating DSM versus competing Supply options.

As one whose primary job is to evaluate utility resource options, I believe that the State of Florida has followed the correct path for years by using the RIM test as the primary DSM cost-effectiveness path. It simply is the only DSM cost-effectiveness test that allows the comparison of DSM and Supply options with a complete accounting of costs related to both types of options.

Q. Why did FPL file two portfolios based on a TRC-based perspective (the E-TRC portfolios) if it believes that a RIM-based perspective (the E-RIM portfolios) is the correct perspective?

A. FPL filed portfolios based on both a RIM-based perspective (E-RIM) and a TRC-based perspective (E-TRC) because the Commission and Staff required the utilities to do so. FPL would not have filed portfolios based on a TRC-based perspective otherwise. However, FPL recognizes that the request from the Commission and Staff was likely made because this proceeding was expected to be contentious.

Q. Why did FPL utilize the E-RIM and E-TRC tests?

A. FPL believes that the E-RIM test is the only cost-effectiveness test, that when combined with the Participant test, meets the requirements of HB 7135. In addition, FPL believes the correct approach to analyzing DSM measures is to include environmental compliance costs, including CO_2 compliance costs, to ensure that both Supply and DSM resource options are evaluated on a level playing field. It appears unrealistic to assume that CO_2 compliance costs will not be in place during the 10-year period addressed in this DSM goals docket. Therefore, the enhanced E-RIM test was developed and used in the analyses for this docket. In order to respond to the requests of the Commission and Staff for both a RIM-based and TRC-based perspective, the E-TRC test was also developed and used.

The Commission Staff indicted that it wanted to base goals on analytical results and stated that it expected analyses using both RIM-based and TRC-based perspectives. Staff also requested that the utilities conduct a number of sensitivity cases using different assumptions related to environmental compliance costs, capital costs, fuel, etc.

The utilities' analyses presented in this docket are based on these enhanced cost-effectiveness tests. Therefore, disparaging remarks about the original RIM test are simply irrelevant because that test was not used in these analyses. More importantly, from my perspective as a resource planner, I believe similar statements, if applied to the E-RIM test, are missing a very important point regarding the E-RIM and E-TRC tests.

Regarding the E-TRC test, I believe that this test, although enhanced in regard to the calculations of system environmental-based costs and benefits from DSM, is still fundamentally flawed because it does not account for all DSM-related costs. However, I believe that the E-RIM test truly represents an enhancement over the original RIM test. The original RIM test uniquely had the desirable attributes of considering both a cost and a rate perspective, of ensuring that all DSM-related costs were accounted for, and minimizing cross-subsidizations between customer groups. It now also accounts for the system environmental-based costs and benefits from DSM.

In the past, an argument could be made that it may be wise to use the TRC test – despite its fundamental flaws – because it "passed" additional numbers of energy efficiency DSM measures, and that these measures could be helpful in reducing emissions. (However, the value of those emissions was typically not quantified).

The introduction of the E-RIM test now eliminates any such rationale to use a fundamentally flawed test in order to address system emissions. The E-RIM test not only quantifies the system emission impacts from DSM and Supply options, it also applies environmental compliance costs to these system emission impacts.

By accounting for these environmental impacts, many more DSM measures pass the E-RIM test compared to the number that would have formerly passed the original RIM test. Using FPL's screening results for its "collapsed" DSM measures that are presented in Exhibit SRS-4 of my direct testimony, plus a rerun of the screening analysis of these same measures after removing just the CO_2 compliance costs, the following picture emerges which is indicative of results I would expect when using the four tests:

- 166 measures passed the original RIM test;
- 279 measures passed the enhanced E-RIM test;
- 294 measures passed the original TRC test; and,

- 305 measures passed the enhanced E-TRC test.

Clearly, the number of measures that pass the E-RIM test has significantly increased. In fact, the numbers of DSM measures passing the E-RIM and the original TRC tests are very comparable. The number of measures passing the E-RIM and E-TRC tests are also comparable. (As mentioned previously, there will be some differences in the specific measures that pass these tests, and in the system impacts, including electric rate impacts, the measures will have.)

FPL began to analyze Supply options two years ago using environmental compliance costs for CO_2, plus compliance costs for other emissions. Now, the introduction of the new E-RIM test allows the analysis of Supply and DSM options to be conducted on a level playing field that fully includes system emission compliance costs (including costs for CO_2), plus a full accounting of all costs for both types of resource options.

The enhanced E-RIM test is definitely the preferred approach to take in cost-effectiveness analyses of DSM options.

III. Errors Made by GDS Witnesses

Q. Were there errors in GDS's testimony?

A. Yes. I will address two errors that were made in GDS's discussion of the analytical process used by FPL to develop its proposed DSM goals.

Q. What was the first error that GDS made that you will discuss?

A. The first error was GDS's claim on page 38, lines 12 – 14, of its testimony that: *"The Florida utilities also use the Participant test to identify and eliminate energy efficiency measures with a short payback period that consumers likely could be doing anyway."* This is incorrect. FPL did not use the Participant test for this purpose.

In an analysis such as the DSM goals analysis that addresses multiple years, the Participant test looks at the DSM signups over a number of years. Then the net present value of costs and benefits for all of these participants, as a group over all years, are tallied up and compared to develop a net present value benefit-to-cost ratio. In such cases, the issue of how many months or years it takes for the average participant to have his/her costs equaled by the benefits the participant receives (the "payback" period) can be difficult to judge by looking only at the Participant test's net present value results.

Consequently, FPL utilized another analysis that examined an average individual participant and calculated whether total benefits received in 2 years (bill savings, etc.) exceeded the participant's original cost of participation (costs of the DSM measure). This approach provides a more accurate view of the length of time until "payback" is achieved for the average participant.

(NRDC-SACE witnesses also had trouble with how the Participant test was used in FPL's analyses. Therefore, this subject is addressed in the second part of my rebuttal testimony in response to the problems with NRDC-SACE's testimonies.)

Q. What is the second error that GDS made that you will discuss?

A. On page 24, lines 16 – 17, GDS states: *"Some utilities used an incorrect optimization methodology to select a cost effective portfolio of energy efficiency measure."* GDS returns to that subject on page 67 where, on lines 3 – 6, they state: *"For FPL maximum achievable (TRC or E-TRC) estimates upon which the revised goals were built were estimated using a linear programming model run with an incorrect optimization function that caused projections of energy efficiency savings to be too low."*

With these two statements, GDS makes several errors. In addition, GDS shows a lack of understanding of how FPL's linear programming (LP) model works. GDS could have easily avoided their confusion regarding the LP model and how it was used by FPL.

Q. What were these errors?

A. First, GDS refers to *"Some utilities..."* FPL utilized an LP model approach, but I am not aware that other utilities used such an approach. GDS's lack of specificity in these statements points out that it does not really know how each utility conducted its analyses. Second, GDS's reference to *"...FPL maximum achievable (TRC or E-TRC) estimates..."* is incorrect. FPL is no longer conducting analyses using the original TRC test, nor using the original RIM test. FPL's analyses are now using an enhanced version of those tests that are referred to as the E-RIM and E-TRC tests. (GDS's testimony does frequently refer to the enhanced E-TRC test, but appears to go out of its way to avoid discussing the E-RIM test or the results that occur from using that enhanced test.)

Third, and most important, GDS's statement that: *"...FPL maximum achievable (TRC or E-TRC) estimates upon which the revised goals were built were estimated using a linear programming model..."* shows a complete lack of understanding of how the LP model was used and of the entire Collaborative process that the utilities, NRDC-SACE, and the consultant Itron carried out. The maximum achievable estimates, regardless of whether these estimates were based on the E-RIM or E-TRC tests, were developed by Itron based on the results of the economic screening of DSM measures. Itron then provided the achievable potential estimates for each measure for the 10-year period to FPL.

Only after the achievable potential information is delivered to FPL can FPL begin the process of developing DSM portfolios. That subsequent process is where the LP model is used. Therefore, the LP model was not used to create the achievable potential estimates for DSM measures as GDS claims.

GDS has it backwards. The achievable potential estimates are used as an input to the work carried out with the LP model.

Q. You stated earlier that GDS could have easily avoided their confusion regarding the LP model and how it is used by FPL. How could GDS have done so?

A. A number of weeks before GDS filed its testimony, the FPSC Staff informed FPL that Witness Spellman was interested in learning more about FPL's LP model and how it was used. FPL extended an invitation to GDS for Witness Spellman to give me a call to discuss the LP model and its use. FPL also made examination of the LP model available in its Miami office, through responses to discovery requests. GDS never took advantage of either invitation, but decided instead to proceed to characterize a model they do not understand, nor tried to understand, as "...*an incorrect optimization methodology...*" in their testimony.

IV. Summary

Q. Please summarize your rebuttal testimony regarding GDS's testimony.

A. I will do so with the following summary statements.

(1) GDS's recommendations for FPL's goals for non-renewable DSM measures are both extreme and unsupported. In terms of Summer MW, GDS's recommended goals for FPL are more than 5 times FPL's current DSM goals which were set in 2004 when projected load growth was significantly higher than it is today. Even more bizarre is the fact that GDS's recommended goals for FPL are more than 7 times FPL's projected resource needs. GDS chose not to recommend goals based on FPL's most recent resource planning process as required by DSM goals rules. Instead, they chose to stop halfway through the resource planning process, select the highest starting point number they could find, then make a series of adjustments that resulted in an ever-increasing projection of Achievable Potential upon which arbitrary percentages were then applied to derive a recommended goals level.

(2) GDS's recommendations for FPL's goals for renewable DSM measures are also extreme and unsupported. GDS even admits that the analyses carried out by the Collaborative shows that none of the renewable DSM measures it has in mind, solar water heaters and

photovoltaics, were shown to be cost-effective for either the participant or the general body of ratepayers. Nevertheless, GDS recommends that Florida's utilities (and their customers) spend approximately $245,000,000 to encourage the implementation of these measures over the next 10 years. Their premise for recommending this – these subsidies will result in lowered renewable equipment costs for 'emerging technologies' in the long-run – is contradicted by my experience in Florida involving solar water heaters.

(3) GDS does admit that its recommendations will result in increased electric rates and cross-subsidization of customer groups. This comes about from implementing DSM measures that fail the E-RIM test, but "pass" the E-TRC test. GDS's proposed remedy – a dual approach involving a 'rate cap' and ever-increasing number of DSM measures that caused the problem in the first place – is contradictory and would result in increased and unnecessary regulatory workload. Regarding the problem of increased rates, GDS provided a very misleading "comparison" that attempts to contrast rate impacts for DSM and new nuclear units. This comparison was presented in hopes of showing that increased rates resulting from their recommendations "aren't too bad". However, their comparison is so flawed that a critical look at it led me to the opposite conclusion. Most importantly, GDS chose not to recommend the obvious solution to both of these problems: simply use the E-RIM test to evaluate DSM measures and to set DSM goals.

(4) GDS offers absolutely no economic analyses to support its recommended goals. Their entire economic argument is based on "cents/kWh" screening curve values that someone else performed. GDS either does not know, or chooses to ignore, the fact that screening curve analyses are fundamentally flawed as an analytical approach when evaluating two dissimilar resource options such as DSM and baseload generating units. (This topic is discussed in depth in the second part of my rebuttal testimony in response to NRDC-SACE.)

(5) GDS made a series of misleading statements about the RIM test. Not only are these statements misleading, irrelevant, and/or incorrect, GDS completely missed the point that FPL did not use the original RIM test for these analyses. FPL used an enhanced version of the original RIM test, the E-RIM test.

(6) Finally, GDS made several errors in their discussions regarding FPL's use of the Participant test and the use of FPL's linear programming (LP) model. GDS does not understand how FPL actually utilized those analytical tools. Additionally, their confusion regarding the use of the LP model was completely avoidable because FPL extended an invitation to Witness Spellman to discuss and examine the model. GDS chose not to take advantage of that invitation.

In conclusion, GDS made a number of highly questionable choices that led them to produce recommendations for extreme and unsupported goals. A partial list of these GDS choices include: (i) to not use the results of the utilities' most recent planning process (as required by the DSM goals rule); (ii) to not perform any economic analyses; (iii) to not recommend the simple and obvious solution to avoiding increased electric rates and cross-subsidization of customer groups (that will directly result from the recommendations they did make), but to instead offer proposed "solutions" that are contradictory in nature and would result in substantial increased regulatory workloads for all parties; and (iv) to decline an invitation to discuss and examine FPL's analytical process so that GDS had a full understanding of FPL's analysis; (v) to fail to take into account the projected resource needs of Florida's utilities; (vi) to base their recommendations on a series of largely arbitrary assumptions; and, (vii) to ignore a primary fact in this docket - that Florida's utilities did not use the original RIM test, but instead used an enhanced E-RIM test – then making a number of misleading (but irrelevant) statements about the original RIM test.

Any one of these choices GDS made casts serious doubt about the appropriateness of its recommended goals. When considering the totality of the choices GDS made, its resulting recommended goals do not rise to the level of deserving serious consideration in this docket.

Part 2: Rebuttal Testimony Addressing NRDC-SACE

Q. Please provide an overview of your rebuttal testimony that addresses issues raised by the NRDC-SACE testimonies.

A. I first reflect on the statement made by Witness Wilson in which he articulated what I will refer to as an "objectives statement" for NRDC and SACE, at least in regard to this docket. I will briefly discuss how narrowly focused this objective is, then move on to discuss a number of statements and recommendations that NRDC-SACE witnesses make in regard to meeting this objective and how these relate to resource planning and the setting of DSM goals. I will discuss a number of these statements that are clearly in error and why certain recommendations are simply inappropriate for setting DSM goals in the state of Florida. In discussing these statements and recommendations, I have organized my comments into the following six categories for discussion:

I. NRDC-SACE's Objectives Statement;
II. Resource Planning Problems with NRDC-SACE's Recommendations;
III. Problems with the TRC Test;
IV. Errors Made by NRDC-SACE Witnesses;
V. NRDC-SACE's "Economic Analysis"; and,
VI. Summary

I. NRDC-SACE's Objectives Statement

Q. Has NRDC-SACE provided a clear picture of their objectives in this docket?

A. Yes. NRDC-SACE's objectives are clearly stated at page 5, lines 9 – 11, of Witness Wilson's testimony: *"NRDC and SACE advocate for the reduction in greenhouse gas emissions, and share a history of advocating for energy conservation in the interests of reducing air pollution and protecting consumers from unnecessary, risky and costly energy choices."* Because this statement defines their objectives, I'll refer to this statement in the remainder of my testimony as the "objectives statement" for NRDC-SACE for this docket.

This objectives statement advocates a very narrow focus: NRDC-SACE wants to accomplish one specific thing (reduction of greenhouse gases), and they want to accomplish it in only one way (through the kWh reduction attribute of energy conservation measures).

In the remainder of my rebuttal testimony I discuss various ways in which this very narrow focus, plus some distinct errors made by NRDC-SACE witnesses, results in NRDC-SACE making recommendations that are clearly not in the best interest of FPL's customers.

II. Resource Planning Problems with NRDC-SACE's Recommendations

Q. What type of resource planning problems result from the narrow focus taken by NRDC-SACE witnesses and their resulting recommendations?

A. There are a number of such problems. Certain conflicts relating to Florida regulations or statutes that arise from NRDC-SACE's recommendations will be addressed by FPL witness Dean. Other problems specifically relating to cost-effectiveness tests for screening DSM measures will be addressed in section III of my testimony regarding NRDC-SACE. In this section, I focus on three recommendations or statements made by NRDC-SACE witnesses.

Q. What is the first statement you wish to discuss?

A. Witness Steinhurst makes the following recommendation regarding DSM kWh goals on page 30, starting on line 4, of his testimony: *"I recommend that the Commission set savings goals at that level (no less than 1%) for annual electric energy sales for the years 2010 through 2019."* He then states that this recommendation is only on an interim basis until a higher percentage of annual sales goals can be set. Then, starting on line 14 of that same page, he makes the following recommendation regarding DSM kW goals: *"My recommendation with respect to winter and summer peak demand savings goals is to set the goals at the sum of (a) the peak demand savings impact for each season from the utility energy efficiency programs needed to deliver my recommended electric energy savings goal of 1% per year, plus (b) the additional peak demand savings impact for each season from each utility's* *demand response and load control initiatives in place or proposed (as approved by the Commission)."*

Q. Are there any problems with this recommendation?

A. Yes, a number of them. Let me discuss a few of the more serious problems.

First, this recommendation for how goals could be set is in no way based on any analysis of Florida-specific costs or other Florida-specific conditions. It also completely ignores Rule 25 – 17.0021(3), Florida Administrative Code (F.A.C.) which states that the setting of DSM goals is to be "based on the utility's most recent planning process."

In addition, Witness Steinhurst's recommendation completely ignores the results of the thousands of man-hours and the high cost – more than a million dollars and counting – that have been expended in an extensive collaborative effort involving Florida utilities, NRDC-SACE, and the consultant Itron to provide a thorough analytical basis for Florida-specific DSM goals. Just because another jurisdiction outside of Florida may have decided it was acceptable to set a goal such as the one espoused by Witness Steinhurst, this in no way justifies it for Florida's electric utility customers. Since 1994, Florida has based its DSM goals on extensive analyses to determine what level of DSM is in the best interests of electric utility customers. It makes no sense to abandon that logical approach only to set goals that are based on no

Florida-specific analyses and, instead, pull an arbitrary percentage value out of the air as a goal.

Second, I note that Witness Steinhurst's recommendation essentially is to set an annual energy goal with demand reduction as an afterthought. In other words, once you figure out what DSM energy efficiency measures will be selected to meet the annual energy goal, the associated demand reduction from those energy efficiency measures, plus load control measures, becomes your demand goal.

Q. What problems does a demand-reduction-as-an-afterthought approach bring?

A. There are several. Treating kW reduction as an afterthought ignores the significant benefits from DSM measures that are driven solely or primarily by kW reduction. To illustrate this, let me list the following detailed categories of utility system benefits or impacts that are identically recognized in both the E-RIM and E-TRC tests:

1. Generator capital;
2. Transmission interconnection capital;
3. Generator variable O&M;
4. Generator fixed O&M;
5. Generator capital replacement;
6. Firm gas transportation (as applicable);

7. Fuel Savings from avoided generator fuel;

8. System replacement fuel costs;

9. System transmission capital;

10. System transmission O&M;

11. System distribution capital;

12. System distribution O&M;

13. Environmental compliance costs from the avoided unit;

14. System replacement environmental compliance costs;

15. Net fuel savings from lower energy usage; and,

16. Net environmental compliance costs from lower energy usage.

These 16 categories of utility system benefits or impacts are included in FPL's benefit calculations of both the E-RIM and E-TRC tests. Now let's list the subset of those benefit categories that are driven on FPL's system by DSM's kWh reduction characteristics:

15. Net fuel savings from lower energy usage; and,

16. Net environmental compliance costs from lower energy usage.

Only 2 of the 16 categories of DSM-driven benefits are driven by the kWh reduction aspect of DSM measures. All of the other 14 categories are driven either solely or primarily by the demand or kW reduction aspect of DSM measures.

Depending upon a number of factors, these two kWh reduction-driven benefit categories can contribute a significant percentage of the total benefits of DSM measures. However, the kWh reduction aspect of DSM also completely drives the reduced recovery of revenue requirements (often called "lost revenues") that accompanies residential DSM measures, and partly drives the reduced recovery of revenue requirements for non-residential DSM measures. This kWh-driven reduction in the recovery of revenue requirements serves to significantly reduce the kWh-driven benefits of DSM. Thus, the net benefit of the kWh reduction aspect of DSM is significantly diminished.

The key point is that the NRDC-SACE witnesses' recommendation to treat the kW reduction aspect of DSM as an afterthought will result in not providing proper focus on the far more numerous categories of DSM benefits that are driven by the kW reduction aspect of DSM.

Q. What other problems does NRDC-SACE's kW-reduction-as-an-afterthought recommendation for goals bring?

A. Such an approach to setting goals will have undesirable system reliability and/or cost implications. If, after meeting NRDC-SACE's recommended energy goal, the resulting afterthought MW reduction does not meet the utility's projected resource needs, one of two undesirable outcomes occur. Either the utility's system is less reliable (because insufficient demand reduction has been added), or the utility will need to add additional resources

– Supply or DSM – in order to meet the system's reliability criteria. These additional resources result in more costs.

However, if the opposite happens – after meeting NRDC-SACE's recommended energy goal, the utility finds it has significantly surpassed the DSM MW amount needed to meet its projected resource needs, the utility is likely to face another problem. The utility can find that its reserve margin is now too heavily dependent upon DSM resources and, as a result, is both less reliable and more operations constrained. Florida experienced exactly that situation in the 1990s when one Florida utility became too dependent upon DSM for its reliability and had to shift course quickly to bring its Supply and DSM contributions to its reserve margin back into a more reasonable balance. This resulted in reduced system reliability at first, followed by additional costs.

The point is that NRDC-SACE's approach to DSM goals setting is backwards to what it should be in regard to utility system reliability. Energy reduction alone does virtually nothing in regard to system reliability for a utility system such as FPL's whose projected resource needs are driven solely by its reserve margin criterion. Only the peak hour kW reduction aspect of DSM contributes to meeting a reserve margin criterion, thus enabling DSM to help meet projected future resource needs.

Therefore, the kW reduction aspect of DSM should be the primary objective when setting DSM goals, ensuring that the utility fully captures the benefits and the costs of both the kW and kWh aspects of DSM measures.

Q. Does FPL's analyses fully capture the benefits and costs for both the kW and kWh aspects of DSM measures?

A. Yes. FPL's DSM analyses include all identified, quantifiable costs associated with the kW and kWh aspects of DSM measures that are recovered from its customers. Likewise, FPL's DSM analyses include all identified, quantifiable benefits associated with the kW and kWh aspects of DSM measures that are realized by FPL's customers.

Q. Is there a third aspect of Witness Steinhurst's recommendation that you would like to comment on?

A. Yes. I note that there is disagreement between NRDC-SACE witnesses Steinhurst and Mosenthal regarding the value of load control/demand response DSM programs. Witness Steinhurst clearly recommends continuing with a utility's approved load control/demand response DSM initiatives as evidenced by his earlier statement in which he recommends that load control/demand response program contributions be used to partly determine kW reduction goals. However, Witness Mosenthal takes a very dim view of load control initiatives on page 27, lines 4 – 6, of his testimony where he states: *"As a result, shutting off their air conditioner or duty cycling it during a few hours of very high system load offers virtually no financial benefit to the customer, and imposes significant costs."* I conclude from this statement that

Witness Mosenthal sees little reason to include load control programs in DSM goals.

When two self-proclaimed experts in the fields of DSM and resource planning cannot agree on the value of a prominent type of DSM program while representing NRDC-SACE, it is unclear what NRDC-SACE is really recommending in regard to setting kW reduction goals. (And, as I note later in my testimony, this is not the only instance in which NRDC-SACE's witnesses disagree.)

Q. What is the second statement made by NRDC-SACE witnesses that you wish to discuss in regard to resource planning?

A. Witness Steinhurst attempts to make the point starting on page 21, line 5, of his testimony that (paraphrasing due to length of statements) the utilities' projected costs of CO_2 compliance costs were too low. On page 22, starting at line 13, he states: *"I consider these values (projected CO_2 compliance costs) to be at the extreme low end of the reasonable range of estimates and inappropriate as a basis for meeting the requirement to adequately address the requirements of Section 366.82(3)(d) of the Florida Statutes."*

I have a couple of reactions to this comment. First, returning to NRDC-SACE's objectives statement of advocating the reduction of greenhouse gas emissions, it is hardly surprising that an NRDC-SACE witness would state that the projected compliance costs for CO_2 should be very high. If one's mission in life is to reduce greenhouse gases, one probably believes that projected CO_2 costs should be set very high. Witness Steinhurst is certainly entitled to his opinion, but an opinion is all it is. The reality is that no one knows what the actual costs of CO_2 compliance will be. Until CO_2 compliance legislation is passed and signed into law, then has survived the almost inevitable legal challenges, it is not certain there will even be CO_2 compliance costs or, if so, what these actual compliance costs will be or when the compliance costs would actually go into effect.

However, it may be illuminating to compare FPL's projected compliance costs for CO_2 with the recently published projections from the Congressional Budget Office (CBO). Exhibit SRS – 13 provides this comparison. The CBO projections are taken from page 13 of the document "Congressional Budget Office Cost Estimate, H.R. 2454 American Clean Energy Security Act of 2009, June 5, 2009".

In the exhibit, Row (A) presents the values as they appear in this CBO document with the cost values in terms of $ per metric ton (2,205 pounds). The CBO projections address the years 2011 through 2019.

Row (B) converts these values to the equivalent $ per U.S. ton (2,000 pounds) so that a direct comparison to FPL's projected costs can be made. FPL's projections for these years are presented in Row (C). (FPL's projection of CO_2

compliance costs for all years in the analyses were previously presented in Exhibit SRS-7 in my direct testimony.) Finally, Row (D) presents the difference between FPL's and CBO's projected values for the years 2013 – 2019. (One of the assumptions in FPL's projection is that, after accounting for passage of legislation, development of regulations, and likely legal challenges, these compliance costs will start to be directly accounted for in 2013. The CBO document appears to make no projection as to when these compliance costs will actually begin to be directly accounted for, but the CBO notes that it was required by Congressional procedures to provide estimates over a 10-year window.)

As shown in this comparison, the two projections are very close for the years 2013 through 2019. FPL's values are $1 lower than CBO's values for 2013, identical to CBO's values for the years 2014 through 2016, and $1 higher for the years 2017 through 2019. Therefore, FPL's projections for the 2013 – 2019 time period are very close to CBO's projections.

Second, FPL's projection of CO_2 compliance costs in the analyses presented in this docket are identical to projections and assumptions used in FPL's recent Need Determination filings and are included in FPL's current nuclear cost recovery filing. Thus, FPL is evaluating DSM and Supply options on a consistent basis in regard to projected CO_2 compliance costs as should be the case.

Before we leave this subject, it is interesting to point out that in Docket No. 090009-EI, the current nuclear cost recovery docket, Witness Mark Cooper presented testimony filed on behalf of SACE on July 15, 2009 in which he argues against continued development of new nuclear units in Florida. Witness Cooper states starting on page 14, line 23, that: *"The companies (FPL and PEF) have put a high price on carbon in their economic analyses. Without the high price on carbon, the economics of nuclear reactors would look very different."* This statement contrasts strongly with Witness Steinhurst's testimony in this docket on page 22, lines 13 – 14, regarding projected CO_2 compliance costs of FPL and other utilities in which he states: *"I consider those values to be at the extreme low end of the reasonable range of estimates..."*

It is clear that these two witnesses for SACE do not agree with each other regarding the projected compliance costs for CO_2. It is also evident that SACE has taken one position – projected CO_2 costs should be higher – when higher costs are beneficial to one objective (justifying more energy efficiency), yet has taken the opposite position – projected CO_2 cost should be lower – when lower costs are beneficial to another objective (stopping development of new nuclear units in Florida).

Q. What is the third statement made by NRDC-SACE witnesses that you wish to discuss in regard to resource planning?

A. At least one NRDC-SACE witness commented that DSM was not compared to FPL's new nuclear units. Witness Wilson does so starting on page 23, line 2, of his testimony. On page 24, starting on line 10, he states: *"..the most expensive power plant investments in recent Florida history proceeded to approval without being directly compared to energy efficiency.."*.

This statement is disappointing because he is so eager to consider avoiding the only baseload, zero CO_2 emission Supply option currently available in Florida. If NRDC-SACE truly believes that reducing CO_2 emissions is of such importance, why the eagerness to avoid a very large baseload zero CO_2 emission option? From a resource planning standpoint, such a mindset is troubling because such thinking – if it unfortunately caught on – would seek to eliminate a viable resource option that can address a number of issues (reduction of all emissions, reduced reliance on fossil fuels, etc.).

Witness Wilson's comment is disappointing in another way. This portion of his comment: *"...the most expensive power plant investments"* appears to be referring to the capital costs of new nuclear units. It is no news that the capital costs of new nuclear units are large, but surely NRDC-SACE must realize that capital cost is only one part of the story. The fuel and environmental compliance cost savings from new nuclear units are huge. For example, as stated in FPL's Need Determination filing for its new nuclear units, the projected net system fuel savings exceeded $1 billion per year. The net system environmental compliance cost savings were also very large (and would only increase if higher CO_2 compliance costs – as Witness Steinhurst recommends – were to be used.) The addition of new nuclear units would also be extremely beneficial in increasing fuel diversity in Florida.

Finally, Witness Wilson is either not aware of, or he chooses to ignore, that both the nuclear units and DSM were compared to the same greenfield combined cycle (CC) technology – a 3x1 G CC unit. A certain number of DSM measures were screened against this CC unit in the analysis for this docket and found to be potentially cost-effective for FPL's system. However, when the new nuclear units were compared to this same CC technology, the new nuclear units were projected to be less expensive than the CC unit. I would expect that fewer DSM measures would be found cost-effective if DSM was compared to a less expensive option than the CC technology used in FPL's DSM screening analyses. Witness Wilson's conclusion that just the opposite would occur is illogical.

III. Problems with the TRC Test

Q. Are there comments that have been made by NRDC-SACE witnesses regarding the TRC test that you wish to discuss?

A. Yes. There are three issues related to the TRC test that were raised by NRDC-SACE witnesses that I will discuss. These issues are: (i) which test, RIM or TRC, really meets the requirements of HB 7135; (ii) which test, RIM or TRC is better from a policy perspective; and (iii) the NRDC-SACE witnesses' belief that the TRC test is not lenient enough for their purposes.

Q. Did FPL use the RIM and TRC tests in its analyses?

A. No. The original RIM and TRC tests that the NRDC-SACE discusses in the testimonies of their witnesses were not used in FPL's analyses. Instead, FPL used enhanced versions of each test that now includes the projected environmental compliance cost impacts to the FPL system for sulfur dioxide (SO_2), nitrogen oxides (NO_x), and carbon dioxide (CO_2). These enhanced cost-effectiveness tests are referred to as the E-RIM and E-TRC tests, respectively.

The fact that FPL has moved past the original RIM and TRC tests to the enhanced E-RIM and E-TRC tests was discussed many times in FPL's direct testimonies. It is unclear if NRDC-SACE's witnesses did not read FPL's direct testimonies before writing their direct testimonies, if they did not understand what they were reading, or if they simply chose to ignore this fact.

What is clear is that by referring solely to the original RIM and TRC tests, they are discussing tests that were not used by FPL in the analyses it conducted for this docket.

However, in an attempt to clarify the situation, I will generally refer to the E-RIM test and the E-TRC tests when discussing analyses FPL carried out, but will generally leave the NRDC-SACE references to the original TRC test unchanged.

Q. What were the comments that the NRDC-SACE witnesses made in regard to the portions of HB 7135 concerning cost-effectiveness tests that you will discuss?

A. I'll summarize their comments as follows: NRDC-SACE believes that HB 7135 clearly requires the use of the TRC test and not the E-RIM test. In support of this contention, NRDC-SACE witnesses also made a very obvious effort to try to explain why they thought that the TRC test really does include incentive payments made by the utility to participating customers.

Q. What were your reactions to these statements?

A. My first reaction was that because NRDC-SACE is putting on a full court press on the issue of HB 7135 - every NRDC-SACE witness made a point to discuss this – this must be a topic they are very concerned about. My second reaction was that I might even give them one-half point for "creativity" in their argument. However, I would also deduct a full point for "desperation".

Witness Cavanagh states on page 3, lines 12 – 13, of his testimony: *"Second, in section 3(b), the legislature required the Total Resource Cost ("TRC") Test. This is readily apparent from the language of the amendment."* Witness Wilson is even more emphatic at page 22, lines 18 – 20, of his testimony: *"Florida law now requires the Commission to consider the TRC test, and does not require or authorize the use of the RIM test for the purpose of setting energy efficiency or demand-side renewable energy goals for the FEECA utilities."*

These statements simply are not accurate. The amendment's language never mentions the TRC test, or any other test, by name. If the Florida Legislature had been certain that it wanted the TRC test, it would have undoubtedly stated "use the TRC test" in the amendment language. The Legislature obviously chose not to do so, preferring instead to instruct the Commission to "take into consideration" various items in regard to DSM evaluation. It clearly left the Commission to judge what choice of test or combination of tests best take these items into consideration. In my opinion, this is one reason that the Commission Staff requested that analyses conducted for the goals docket evaluate DSM using both a RIM perspective and a TRC perspective, while accounting for CO_2 costs – so they could examine the results of actual analyses that used the perspectives of the two tests.

HB 7135 lists the items to be considered in four sections, (a) through (d), as listed on page 33, lines 1 – 8, of my direct testimony. The NRDC-SACE testimony appears to have no concern with sections (a), (c), and (d), but is very concerned with section (b). Section (b) reads as follows: "The cost and benefits to the general body of ratepayers as a whole, including utility incentives and participant contributions."

After reading this section, it is clear why NRDC-SACE is so concerned. The TRC test cannot be justified in light of section (b) which poses two significant, actually insurmountable, problems for the TRC test.

The first is the fact that the TRC test does not address utility incentive payments to customers (while the E-RIM test does address these incentive payments). Since at least the early 1990s, the Commission's approved cost-effectiveness methodology has included analyses of DSM measures and programs using the RIM, TRC, and Participant tests. When evaluating DSM using the TRC test, the approved methodology does not even include a column for the projected cost of utility incentives in the TRC test calculation page. Furthermore, whenever the omission of incentive payments in the TRC test has been pointed out as a shortcoming of the TRC test, proponents of the TRC test have defended this omission vigorously for many years by stating that such incentive payments are not real costs, but are merely "transfer payments", and are rightfully not included in a societal test such as TRC.

Now NRDC-SACE, faced with the very real problem to TRC posed by section (b) of HB 7135 that requires consideration of incentive payments, has earned one-half point for creativity. In what is equivalent to a "hail Mary" desperation pass at the end of a football game, They attempt to make the argument that (paraphrasing) the omission of the incentive payments in the TRC test is "covered" by the fact that the TRC test does include the cost of the DSM measure. Witness Wilson, on page 20, lines 12 – 14, sums up this position: "*... the TRC test does include incentives paid to customers as those incentive payments are a component of the cost of the efficiency measure, which includes both the participant's contribution and the incentive provided by the utility.*" However, this is not always the case as discussed below. (In the discussion that follows, I'll refer to the cost of the efficiency measure as the "participants' cost" because TRC test calculation page in the FPSC's approved cost-effectiveness methodology labels this cost column as "Participant Program Cost".)

Although NRDC-SACE's approach is clever, it clearly smacks of desperation (thus earning the full point deduction). The problem this approach poses for the Commission is, even if the Commission were willing to consider this "we're covered - trust me" excuse that the participants' costs "cover" or include the actual incentive payments that are required by HB 7135, one should first examine how this works in actual DSM applications. In other words, does this participant-cost-"covers"-incentive-payments idea actually work when the Commission examines DSM options? Does the participants' cost value provide the Commission with a complete and accurate accounting of DSM costs, including the incentive payments, which will be borne by all of a utility's ratepayers?

Let's examine this question by looking at two examples using representative "per participant" values for both the incentive payment and the participant's incremental cost to purchase the DSM measure.

First, let's look at the case of an energy conservation option in which the utility incentive payment to the participant is $50 and the participant's cost is $500. In this case, the participant's cost is clearly much larger than the incentive payment. In NRDC-SACE's view, the $500 participant cost easily "covers" the $50 incentive payment. However, when examining the cost-effectiveness measure under the TRC test, the Commission sees only the much larger participant cost of $500 (which is not a cost borne by all customers, this cost is borne only by the participants in that particular DSM option). The Commission does not see in the TRC test results that the incentive payments (which is a cost borne by all ratepayers) are only $50. Therefore, the Commission cannot readily see what effect the real incentive cost of $50 has on the DSM option's cost-effectiveness. From the standpoint of costs and benefits that apply to all customers, the Commission is trying to judge the cost-effectiveness of this DSM measure looking only at a "proxy" or "cover" cost for incentives – the $500 participant cost - that is 10 times higher than the actual incentive payment. Using the information supplied by the TRC test, there is simply no way that the Commission can ensure that a decision it will have to make regarding whether it is cost-effective for all customers to approve the DSM option is the correct decision. All else equal, and using NRDC-SACE's "logic," the Commission would be shown an evaluation that significantly understated the cost-effectiveness of this DSM option by using a $500 "cover" cost for incentive payments that is far too high.

Next, let's look at the case of a load control program. The situation gets even more interesting here. Load control programs typically have <u>zero</u> participant costs, but rather large incentive payments to participants. Let's assume that the incentive payment is again $50 while the participant cost is $0. However, incentive payments for load control programs are typically monthly recurring – not one-time – payments so in this case we'll assume that the incentive payment is a recurring $50 per year cost. Using NRDC-SACE's argument, the Commission will evaluate the load control program using a "proxy" or "cover" cost for incentives – the $0 participant cost – instead of the recurring $50 annual incentive payment that will actually be made. All else equal, and using NRDC-SACE's argument, the Commission would be shown a TRC test evaluation that significantly overstated the cost-effectiveness of this DSM option by using a $0 "cover" cost for incentive payments that is far too low.

It is clear that for a prominent type of DSM option – load control programs that have $0 participant costs, but substantial incentive payments – NRDC-SACE's contention that participant costs "cover" for the omission of incentive payments in TRC test is simply not accurate.

In addition, both examples point out that there is no way that the Commission can ensure that a decision it would have to make regarding whether it is cost-effective for all ratepayers to approve a DSM option is the correct decision if it does not have the actual incentive payment value to consider – as will be the case if the E-TRC test is used.

In fact, the only time NRDC-SACE's statement about the participant-cost-covers-incentive-payment is actually true is if the utility were going to make an incentive payment that is 100% of the participant's cost. For example, if a customer were going to pay an incremental $500 for a DSM measure, the utility would pay the full $500. It is not very likely that many, if any, such DSM offerings will be forthcoming in the near future for the Commission to review. This is because an incentive payment of 100% of the participant's incremental cost would result in a 0-year, 0-month, and 0-day payback. Such an offering would immediately be accompanied by the sounds of large groups of free-riders hastily assembling.

Therefore, I would suggest that NRDC-SACE's desperation "hail Mary" pass was not only "incomplete", it was so far off the mark that it completely missed the playing field.

Q. Does section (b) of HB 7135 pose another problem for the TRC test?

A. Yes. Let's return to section (b)'s language of: "the costs and benefits to the general body of ratepayers as a whole". Another significant cost of DSM measures is that of unrecovered revenue requirements. The impact of these costs clearly impacts all ratepayers by putting upward pressure on electric rates. The E-RIM test includes these costs, but the E-TRC test does not. Consequently, section (b) of HB 7135 poses two insurmountable problems for the TRC test: the TRC test does not include incentive payments nor does it include the economic impact of unrecovered revenue requirements, both of which represent costs to the general body of ratepayers as a whole. However, these mandated considerations are fully addressed when DSM measures are evaluated using a combination of the Participant and E-RIM test as FPL advocates.

While we are focused on the "ratepayers as a whole" language, I should point out a misleading impression that the testimonies of NRDC-SACE witnesses attempted to create. They mischaracterize the RIM (and by implication, the E-RIM) test as applying primarily to non-participants, and not to ratepayers as a whole, in an effort to create the impression that the E-RIM test does not address "ratepayers as a whole." An example of this is found on page 5, lines

8 – 9 of Witness Cavanagh's testimony where he states: *"..RIM focuses exclusively on rates and particularly on potential impacts to non-participants."*

This view that the E-RIM test's primary or sole focus is on non-participants is hard to reconcile with the fact that rates are charged to all ratepayers, not just DSM non-participants. The E-RIM test clearly focuses on the electric rate impacts of DSM. Therefore, the E-RIM test clearly focuses on "the general body of ratepayers."

Q. What were the comments that the NRDC-SACE witnesses made in regard to the policy implications of using the TRC test that you will discuss?

A. In Witness Cavanagh's testimony starting on page 7, line 10, he states that he believes that the TRC test is preferable to the E-RIM test from a policy perspective. On lines 11 – 13 of that same page, he instructs the Commission what its policy should be: *"The PSC's objective should be to minimize the total cost to customers of receiving reliable energy services."*

Now that he has instructed the Florida Commission as to what its policy should be, Witness Cavanagh then explains his rationale for why the TRC test is best for this specific policy. I summarize his key arguments defending the TRC test as a policy instrument as follows: (i) the TRC test focuses solely on total costs (not on costs and rates); (ii) concern with electric rate impacts will close the door on numerous energy efficiency programs; and (iii) "few, if any customers" (page 8, line 17) would not be eligible to participate in DSM if the utilities offered more programs.

Q. What is your reaction to these policy arguments?

A. First, the suggestion that the impact on electric rates should be of little concern in order to offer more DSM programs is in keeping with NRDC-SACE's narrowly focused objectives statement that seeks to promote only energy conservation. However, I disagree with his attempt to dismiss consideration of electric rates, especially when one has a choice between two or more viable resource options.

And I find that his opinion that *"the RIM test eliminates numerous highly cost-effective efficiency measures"* (page 7, lines 16 – 17) both highly misleading and irrelevant to the analyses FPL performed in this docket. It is irrelevant because FPL did not use the RIM test. FPL used the E-RIM test that accounts for environmental compliance costs as is stated numerous times in the direct testimonies of FPL witnesses. By his statement, Witness Cavanagh appears to be still fighting a battle from yesteryear.

Furthermore, an examination of the total number of DSM measures that passed the E-RIM and E-TRC test in these analyses shows why his statement is highly misleading. Exhibit SRS-4 of my direct testimony shows that 885 DSM measures passed the screening with the E-RIM and Participant tests, and

928 DSM measures passed the screening with the E-TRC and Participant tests. More measures did pass the more lenient E-TRC test (that does not account for all DSM-related costs that are borne by all customers), but 95.4% as many measures passed the E-RIM screening path as passed the E-TRC screening path. Although there will undoubtedly be some meaningful differences in the specific measures that passed each test, the percentage difference between the number of measures that passed the two tests is small. This outcome from the actual analyses is certainly not what one would expect from Witness Cavanagh's misleading statement.

Third, NRDC-SACE's witness appears to be little troubled by the fact that use of the TRC test instead of the E-RIM test would increase cross-subsidization between groups of customers for each DSM measure that passed the more lenient TRC (or E-TRC) test, but failed the E-RIM test. The fact that non-participants would subsidize participants for each such DSM measure is apparently not a concern for NRDC-SACE. Witness Cavanagh's answer to this very real problem when using the TRC test seems a bit cavalier: offer more of the same type of DSM programs that would cause the problem in the first place.

His testimony points to the Hood River Conservation Project as evidence of what is possible. On page 9, lines 9 – 12, he states: *"in a demographically representative Northwest county in the mid-1980s, more than 90% of eligible* *households accepted utilities' invitations to contribute to a county-wide conservation resource..."*

It appears that this reference is intended to show that a very high participation rate was able to be achieved in a conservation project 20 years ago, in one county, presumably in the Northwestern U.S. That's fine, but the example also shows that even in a very successful DSM project which this appears to be, approximately 10% of eligible households chose not to participate. That percentage of eligible customers alone that did not participate is significant. However, his statement does not provide information as to how many households were ineligible to participate, but it's probably safe to assume that the number is greater than zero or else he would not have needed the "eligible" qualifier. Therefore, from his statement one may conclude that the total percentage of non-participating customers – due to either ineligibility or choice – may be significantly larger than 10%.

Therefore, his example is not very persuasive in regard to diminishing valid concerns about cross-subsidization of customer groups regarding offering DSM measures that fail E-RIM, but pass E-TRC. In addition, his suggestion of simply offering more such programs – programs that will likely have penetration rates substantially lower than his model example – is not convincing, especially in a state such as Florida that has so many fixed- and low-income residents that make the cross-subsidization issue of higher concern.

Q. Do you believe the E-RIM test is better from a policy perspective than the E-TRC test?

A. Yes. There are three main reasons why I believe that the E-RIM test is clearly the better test from a policy perspective. First, the E-RIM test includes all relevant DSM-related costs that will be borne by all of the utility's customers. The E-TRC test does not include two of these costs as discussed previously. This fact allows the Commission to have a complete picture of all DSM-related costs and benefits that impact all customers when the Commission is judging the cost-effectiveness of DSM options using the E-RIM test.

Second, the fact that the E-RIM test includes a complete picture of costs and benefits, and also addresses the electric rates perspective, provides the Commission with even more information with which to make its DSM decisions.

Third, the use of the E-RIM test serves to ensure that non-participants in any DSM program will not be subsidizing participants in that program. This protects all customers, especially the most vulnerable customers such as fixed- and low-income customers.

Q. What testimony did NRDC-SACE witnesses provide which indicates that the TRC test is too restrictive and should be made even more lenient to "justify" even more DSM measures?

A. Witness Steinhurst's testimony provides ample evidence that NRDC-SACE believes that the TRC test is too restrictive and should be modified to allow even more DSM measures to "pass" an even more lenient "test".

Starting on page 46, line 8, of his testimony, Witness Steinhurst states that: *"I recommend three adjustments to the TRC test."*: I'll summarize those as follows: (i) include values for carbon costs; (ii) increase by 10% the projected benefits attributed to avoided T&D and other items; and (iii) lower by 10% the projected costs of DSM measures.

Q. What is your reaction to this?

A. In regard to (i), I can only assume that he didn't bother to read the utilities' direct testimonies which repeatedly state that projected CO_2 costs were included in both the E-RIM and E-TRC analyses, and that the original RIM and TRC tests were not utilized by the utilities.

Regarding (ii) and (iii), I assume that he believes it is a "best practice" to throw in arbitrary multipliers that act as "adders" to benefits and "reducers" to costs. However, it doesn't strike me as being the most rigorous or intellectually honest way to conduct an analysis. (Also, because the benefit calculations for the E-RIM and E-TRC tests are identical, Witness Steinhurst probably would not object to throwing in the 10% adder for certain benefits for E-RIM analyses as well. And, because a DSM option is the same regardless of the test it is being evaluated under, he would probably not object either with reducing DSM costs in an E-RIM test.)

However, FPL does not believe this is the proper way to conduct analyses of resource options. Analyses of all resource options – Supply and DSM - should strive to include all relevant costs and benefits that both impact all of FPL's customers and which can be accurately quantified. Witness Steinhurst's recommended approach of using arbitrary adders and reducers just invites analytical chaos and guarantees less than optimal resource option decisions.

It should be noted, however, that Witness Steinhurst's recommendation makes perfect sense when keeping in mind NRDC-SACE's very narrow objectives statement that seeks to push energy conservation as their chosen resource option. Witness Steinhurst's recommendation to boost certain DSM benefits and drop DSM costs by an arbitrary amount would certainly result in more DSM options "passing" his cost effectiveness test of choice, TRC. Apparently the fact that the TRC test already presents a lower hurdle for DSM options is not good enough for NRDC-SACE's objective. NRDC-SACE recommends making the test even more lenient by changing what should be accurate cost and avoided cost values by arbitrary multipliers to make DSM appear more cost-effective.

Q. Is this the extent of NRDC-SACE's recommendations regarding lowering the already low hurdle posed by the TRC test?

A. No. NRDC-SACE has more recommendations to make. On page 35, lines 11 – 13, Witness Steinhurst states: *"I would note that if the Florida State incentives available for PV are counted as a reduction to the capital cost of PV units – an assumption that is not normally made in the TRC – the technology does pass the TRC."* NRDC-SACE, not content to merely modify the cost and benefit inputs by arbitrary multipliers to make DSM measures appear more cost-effective, is now considering changing the basic nature of the TRC test itself so that the full participant cost of the equipment now included in this societal test doesn't have to be counted. This would certainly make even more DSM appear to be cost-effective.

Q. Does NRDC-SACE propose any other changes to the TRC test?

A. Yes. On page 53, lines 8 – 11, Witness Steinhurst suggests lowering the threshold cost-effectiveness ratio (1.00 in Florida, but who knows what the threshold is in "best practice" states) for programs that address various customer groups.

Q. How would you characterize NRDC-SACE's recommendations regarding making the TRC test more lenient?

A. I would characterize these recommendations as entirely consistent with NRDC-SACE's objectives statement of promoting only energy conservation options. Therefore, NRDC-SACE seeks to "justify" as many DSM measures as they can. Accordingly, their witnesses advocate starting with the TRC test that does not include all DSM-related costs that impact all utility ratepayers. Then they advocate the introduction of arbitrary adders to benefits and reducers to costs to lower the hurdle to passing the 1.00 benefit-to-costs threshold even more. They also suggest changing the basic nature of the TRC test to avoid having to account for the full participant cost of DSM equipment. Finally, they suggest lowering the threshold cost-effectiveness ratio for DSM measures that address certain groups of customers in order to "justify" even more measures.

I would also characterize these recommendations as very disappointing if your objective is to evaluate DSM and Supply options on a level playing field using rigorous analyses.

IV. Errors Made by NRDC-SACE Witnesses

Q. Did NRDC-SACE's witnesses make errors in their statements regarding FPL's analyses that were conducted for this docket?

A. Yes. At least two such errors were made: one in the testimony of Witness Mosenthal, and one in the testimony of Witness Steinhurst.

Q. What error did Witness Mosenthal make regarding FPL's DSM analyses?

A. On page 7, lines 13 – 15, Witness Mosenthal makes the following statement: *"The analysis inappropriately removes an additional large portion of* *potential from any measures that do not pass the participant test absent any utility incentives or federal tax credits."* He then spends approximately 3 pages of his testimony starting on page 25, line 6, stating again that this analysis step was wrong. He points to my direct testimony as proof that all of the FEECA utilities did this (page 25, lines 18 -19 and footnote 22).

Witness Mosenthal's unfortunate claim allows him to impressively make two mistakes with just one statement. The first mistake is his assumption that my testimony addresses the analytical processes for all FEECA utilities. It does not. My testimony addresses only FPL's analytical process. The second - and more important - mistake is to claim that FPL's analyses did this analysis step when FPL did not.

In a footnote, Witness Mosenthal refers to page 36 in my direct testimony. This page provides an overview version of the basic steps in FPL's analytical process. However, there is nothing on page 36 that states that FPL will screen out DSM measures by examining the Participant test results before applying any incentive payment to participants, then dropping those measures that do not pass the Participant test at that point.

Because he did not refer to the more detailed explanation of the individual steps in FPL's cost-effectiveness screening analysis of DSM measures that is found in my testimony on page 48, line 1, through page 49, line 15, and in

Exhibit SRS-4, it is unclear if Witness Mosenthal actually read these portions of my direct testimony. If he had read through this more detailed information, he would perhaps have understood that at no time did FPL drop a measure for failing the Participant test with the assumption of no incentive payment. In fact, FPL did not screen out any measures based on the results of the Participant test.

As part of its obligation to address/minimize free-riders, FPL appropriately screened out measures most likely to result in free-riders and used a two-year payback criterion for this purpose. (I note that the two-year payback criterion for screening of DSM measures was a decision made by all members of the Collaborative, including Witness Wilson who represented NRDC-SACE in the Collaborative. I'll return to this issue momentarily.)

FPL addressed the two-year payback criterion in the DSM measure screening work in two separate steps. These two steps appear as Steps 4 and 5 in Exhibit SRS-4. In Step 4, FPL screened out measures that would result in less than a two-year payback without any incentive payment. Setting aside overlap measures that were screened out in both the E-RIM and E-TRC screening paths, a total of 472 measures (= 197 measures in the E-RIM path plus 275 measures in the E-TRC path) were screened out in Step 4 because their payback was less than 2 years without any incentive.

In Step 5, FPL screened out remaining measures that would result in less than a two-year payback after first assuming an incentive payment level that would result in the Participant test achieving a ratio of 1.00. A total of 5 measures were screened out in this step. Therefore, of the total measures screened out in these two steps due to the two-year payback criterion, 99% (= 472/477) of the measures screened out were due to the measure having a payback of less than 2 years without any incentive payment (i.e., the results in Step 4).

Perhaps Witness Mosenthal was confused by the differences between the Participant test and the application of a two-year payback criterion for participants in Florida. The Participant test is a comparison of the net present value costs and benefits for all participants over the entire period of the analysis. Unless the assumption is that all participants in a DSM measure will be signed up in a single year, the Participant test does provide a clear picture of how long it may take for a participant's out-of-pocket costs to be recovered.

The two-year payback criterion is evaluated in a completely separate analysis that looks solely at the first two years after a single participant chooses the DSM measure. The two-year payback criterion analysis simply calculates whether a participant's costs are fully recovered in less than 2 years.

In any case, Witness Mosenthal can now be assured that FPL did not perform the analysis that he spent several pages deriding.

Q. You mentioned that you would return to the topic of the two-year payback criterion. Why?

A. I find the fact that at least two of NRDC-SACE's witnesses, Witness Mosenthal and Witness Steinhurst, spent considerable time in their testimonies stating that the use of the two-year payback criterion was in error to be both amazing and troubling.

During the Collaborative effort in which Witness Wilson represented NRDC-SACE, all parties agreed to the use of the two-year payback. I was on the Collaborative conference call the day this topic was discussed. When this topic was addressed, Witness Wilson readily agreed with the two-year payback criterion. He offered no alternatives and raised no objections.

At best, this is simply another instance in which NRDC-SACE witnesses do not agree with each other. However, one might also question how serious NRDC-SACE really was in attempting to work with the utilities in the Collaborative effort if they are not willing to stand behind a decision regarding the selection of a key criterion to use in the analyses which was made with the agreement of NRDC-SACE's representative. I find this possibility troubling.

Q. What error did Witness Steinhurst make regarding FPL's DSM analyses in his testimony?

A. Starting on page 4, line 15, Witness Steinhurst assumes that the FEECA utilities assigned *"zero capacity value prior to the date of the next avoided generating units"* and says that is *"not necessarily"* appropriate. He does admit that some of these benefits are *"hard to quantify"* (page 5, line 8.)

In regard to FPL's economic analyses of DSM for this docket, his assumption that DSM was credited with zero capacity (and other) benefits prior to the 2019 in-service date of FPL's avoided unit is incorrect. (However, I do agree with him that a number of the potential benefit categories he lists would be very difficult, if not impossible, to quantify accurately. There are a number of potential benefits that could be realized by DSM and/or by new generating units that would be very difficult to quantify with any meaningful level of accuracy.)

In all of FPL's economic analyses of DSM, the following categories of benefits were credited to DSM in years prior to 2019: (i) avoided transmission capital expenditures, (ii) avoided transmission O&M expenditures, (iii) avoided distribution capital expenditures, (iv) avoided distribution O&M expenditures, (v) reduced system fuel costs, and (vi) reduced system environmental compliance costs.

Q. Is there anything else about this subject that you wish to discuss?

A. Yes. Witness Steinhurst's focus on identifying and including even hard-to-quantify capacity benefits seems a bit at odds with Witness Mosenthal's recommendation that energy goals are of paramount importance with demand goals being merely an afterthought. Because capacity benefits are driven by demand reduction, Witness Steinhurst is clearly pushing for demand-driven benefits, but Witness Mosenthal is focused almost exclusively on energy reductions. I interpret this as another lack of consistency between these two NRDC-SACE witnesses in regard to what they believe the primary focus of DSM goals should really be – demand or energy reductions.

V. NRDC-SACE's "Economic Analysis"

Q. Did any of the NRDC-SACE witnesses provide a meaningful, comprehensive economic analysis that showed what the results would be for any Florida utility system if it were to adopt their recommended approach to goals setting?

A. No.

Q. Did they provide any economic analysis at all?

A. No. The entire extent of their "economic analysis" was to state in various testimonies that (paraphrasing) it costs less on a cents/kWh basis to save a kWh through DSM than to generate a kWh with a new power plant. Witness Wilson's testimony includes an Exhibit JDW-3, page 9 of 15 that shows the *"levelized cost of new energy resources in cents per kWh"* to be in the 2 to 4 cents/kWh range for energy efficiency and in the 7.3 to 10 cents per kWh range for a combined cycle unit. (Other Supply options are addressed as well.) Witness Mosenthal quotes this same price range of 2 to 4 cents per kWh for DSM on page 34, lines 2 – 3 of his testimony. Witness Steinhurst's testimony states that *"the cost of saved energy for those leading DSM programs is on the order of $0.02 – 0.03/kWh"* on page 30, lines 1 – 2. Neither Witness Mosenthal nor Witness Steinhurst state whether the values they quote are levelized values or represent some other type of value.

Unfortunately, this is the full extent of NRDC-SACE's "economic analysis" that is provided to support their recommendation of how DSM goals should be set for Florida.

Q. Did their testimonies at least provide the information used to develop these cents per kWh values so that one could determine key aspects of the calculation including, but not limited to: which DSM programs were examined, what costs were included in the calculations, what costs were excluded in the calculations, the vintage of assumptions, what years the calculation addressed, what year or years the costs were levelized to, and how the calculations were performed?

A. No.

Q. Besides the fact that no explanation or detail is provided for these calculations, what is your reaction to NRDC-SACE's use of a cents/kWh approach for comparing resource options?

A. I was both surprised and disappointed in their "economic analysis." I was surprised because the testimonies of the NRDC-SACE witnesses repeatedly attempt to make the case that the RIM test; i.e., a cost-effectiveness test that measures the impacts to the utility system's cents/kWh electric rate of competing resource options, is not the appropriate test to use in judging DSM options that compete with Supply options. Nevertheless, all three of these NRDC-SACE witnesses have attempted to compare competing resource options on a cents/kWh basis and state that the results of this electric rate comparison should be used to justify the selection of DSM options.

Therefore, despite their protestations to the contrary, it is obvious that the NRDC-SACE witnesses really believe that a comparison of resource options that is based on an electric rate comparison is the correct way by which to conduct economic analyses of competing resource options. On that basic point the NRDC-SACE and I are in complete agreement.

However, I was also disappointed because NRDC-SACE's witnesses have selected an analytical approach that is fundamentally flawed for the analysis they are trying to use it for: an economic comparison of two very different resource options.

Q. Why is their analytical approach fundamentally flawed when used to compare two resource options that are as different as a DSM measure and a Supply option?

A. The problems in using this analytical approach for comparing two widely dissimilar resource options such as DSM and a Supply option have been previously discussed in prior Commission proceedings. However, if NRDC-SACE (and GDS) truly believe that this is a "best practice" analytical approach, it is probably worthwhile to discuss this issue again in depth.

Let's start by focusing on Witness Wilson's levelized cost values. (Although it is reasonable to assume that the cents/kWh values used by witnesses Mosenthal and Steinhurst are also levelized cost values, their failure to adequately describe what these values represent leaves one unsure.)

The analytical approach behind the levelized cost values presented by Witness Wilson is generally referred to as a "screening curve" analysis. In a screening curve analysis, one looks at a resource option, assumes that it operates at a given capacity factor or a range of capacity factors, and then calculates the present value costs of operating <u>only this individual resource option</u> over a number of years. These costs are then typically presented in terms of a levelized (or constant) $/MWh, or the equivalent levelized cents/kWh, value over the years addressed in the analysis.

By using this analytical approach to compare two very dissimilar resource options - a DSM measure versus a Supply option (for example, a baseload generating unit such as a combined cycle or nuclear unit) - NRDC-SACE (and GDS) is making a classic error that I have seen beginning resource planners and inexperienced analysts make of trying to utilize a screening curve approach to analyze two resource options that impact the utility system in very different ways.

The usefulness of a screening curve analysis is actually very limited. It can be used in a meaningful way to compare the economics of two competing resource options that are identical or very comparable in at least the following four (4) key characteristics: (i) capacity (MW); (ii) annual capacity factors; (iii) the percentage of the option's capacity (MW) that can be considered as firm capacity at the utility's system peak hours; and (iv) the projected life of the option. If two resource options are identical or very comparable in at least these four key characteristics, then a screening curve analysis can be meaningful and one could "screen out" the less attractive of the two almost identical options. (This leads to the common terminology of this type of analysis as a "screening curve" analysis.)

However, a screening curve analytical approach that attempts to compare resource options that are not identical or even closely comparable in at least these four characteristics will produce incomplete results that are of little value. Indeed, the less comparable these characteristics are for the resource options being analyzed, the less meaningful are the results. Because a DSM measure and a combined cycle unit are about as different in terms of resource options as one can get, a screening curve approach attempting to analyze these types of resource options provides meaningless results.

The reason is because a typical screening curve analysis does not address the numerous economic impacts that these resource options will have on the utility system as a whole. Instead, a screening curve approach merely looks at the cost of operating the individual option itself. One can think of a screening curve analysis as examining the costs of a resource option if it were placed out in an open field by itself and operated without its operation having any impact on the utility system. The numerous impacts an individual resource option has on the utility system – for example, how it impacts the operation of all the other generating units on the system – is typically ignored in a screening curve approach.

However, the system impacts of any resource option are very large and can result in significant system cost savings that should be credited back to the resource option in order to have a complete picture. Any analytical approach, such as a screening curve approach, that ignores system cost impacts can only provide an incomplete, and therefore incorrect, result.

Q. Can you provide an example of a system cost impact that is not captured in a screening curve analysis for a single new resource option?

A. Yes. Let's assume that the resource option in question is a combined cycle unit. In a screening curve analysis, one assumes that this generating unit will operate at a particular capacity factor (or range of capacity factors). For purposes of this discussion, we'll assume the generating unit operates 90% of the hours in a year. Then, using the generating unit's capacity and heat rate, plus the projected cost of the fuel the generating unit would burn, the annual fuel cost of operating the generating unit for 90% of the hours in a year is calculated. This calculation is then repeated for each year addressed in the screening curve analysis.

In a screening curve analysis, the unit's annual fuel costs – which will be very large for a baseload generating unit – are added to all of the other costs (capital, O&M, etc.) of building and operating this individual generating unit. The present value total of these costs is then used to develop a levelized $/MWh or cents/kWh cost for this generating unit.

However, the screening curve analysis approach does not take into account the fact that this new baseload generating unit would not operate on a utility system at 90% of the hours in a year if it was not cheaper to operate this new unit than to operate other existing generating units on the system. In other words, for every hour the new baseload generating unit operates, the MWh it produces displace more expensive MWh that would have been produced by the utility's existing generating units. Whatever the annual fuel cost is of operating this new generating unit 90% of the hours in a year, the utility will save an even greater amount of system fuel costs saved by reducing the operation of one or more existing units during these hours.

For example, let's say that the new generating unit's annual fuel cost would be $100 million per year, but that the operation of this new unit will also result in a savings of $110 million in fuel costs from reduced operation of the system's more expensive existing units. A typical screening curve analysis will include the $100 million cost value for the individual unit, but ignore the $110 million in system fuel savings that will also occur.

For this reason a typical screening curve analysis approach utilizes an incomplete set of information and, therefore, is an incorrect way to thoroughly analyze resource options. A complete analytical approach would take into account the total system fuel cost impact of a net system fuel savings of $10 million (= $110 million in system fuel savings - $100 million in unit fuel cost) instead of only the fuel expense of the individual combined cycle unit. Consequently, a typical screening curve analysis will grossly overstate the actual net system fuel cost of the new generating unit.

In similar fashion, other system cost impacts, such as environmental compliance costs and variable O&M, are not accounted for in typical screening curve analyses because this approach does not take into account the fact that the new generating unit will reduce the operating hours of the utility's existing generating units. Nor does a screening curve approach account for the impact the resource option will have in regard to meeting the utility's future resource needs. Therefore, the screening curve approach utilizes incomplete information for a number of cost categories, thus providing incorrect results.

Q. The discussion above showed how a screening curve analytical approach utilizes incomplete information and leads to incomplete system cost results for a single new resource option. Is the screening curve approach become even more problematic when attempting to compare two or more different types of resource options?

A. Yes. This can be shown by a qualitative discussion that looks at several different types of resource options. Let's assume that a screening curve approach is used in an attempt to economically compare a few different resource options, three utility generating options and one DSM option:

- Combined cycle option A (1,000 MW)
- Combined cycle option B (1,000 MW)
- Combined cycle option C (500 MW)
- DSM option (100 MW)

Let's assume that the first comparison attempted is of two virtually identical combined cycle (CC) units, CC options A and B, in which the four key characteristics of the two CC units are identical. But let's assume that the capital cost of CC option A is lower by $1 million than the capital cost of CC option B.

In this comparison, even though a screening curve analysis will not provide an accurate system net cost value as per the above discussion, because the impacts to the operation of existing generating units on the system will be identical from two CC units that are the same in regard to capacity (1,000 MW), capacity factor (due to an assumption of identical heat rates and other factors that drive capacity factor), the amount of firm capacity (1,000 MW) each unit will provide, and the life of the two units, a screening curve analysis will give a meaningful comparison of the two options. (In other words, even though the results will not be accurate from a system cost perspective for either of the two options, the results will be "off" by the same amount and in the same direction.) As would be expected, the screening curve results will show that CC option A results in a slightly lower $/MWh value for CC option A compared to CC option B due to its $1 million lower capital costs.

As this example shows, a screening curve analytical approach can produce meaningful results in a case in which the four above-mentioned characteristics of resource options are identical or very comparable. However, as the on-going discussion will show, once these factors for competing resource options are no longer comparable, a typical screening curve approach cannot produce meaningful results.

Q. Why would a screening curve approach break down if one attempted to compare otherwise identical generating units that differ only by their size such as CC option A (1,000 MW) and CC option C (500 MW)?

A. Now at least one of the four key characteristics of resource options that must be identical or very comparable in order for a screening curve approach to provide meaningful results differ significantly between CC option A and CC option C. This is the capacity of the two options: 1,000 MW for CC option A and 500 MW for option C. Even if one were to assume that all other assumptions for the two units were identical (capacity factor, percentage of capacity that is firm capacity, life of the units, heat rate, capital cost per kW, etc.), the significant difference in capacity offered by the two options would cause a screening curve approach to yield incomplete, and therefore incorrect, results.

The capacity difference between these options would result in at least two system impacts that would not be captured by a screening curve approach. The first of these is the impact of each of the two CC options on the utility's future resource needs. The 1,000 MW of CC option A will address the utility's future resource needs twice as much as will the 500 MW of CC option C. Therefore, CC option A will avoid/defer future resource additions to a greater extent that will CC option C. This will show up in a system cost analysis in the form of different system capital, fuel, O&M, environmental compliance, etc. costs beginning at some point in the future when the utility begins to have resource needs.

In addition, even prior to that point in the future when new resources are needed, the 500 MW greater capacity of CC option A will result in different system fuel cost, variable O&M, and environmental compliance cost impacts as the operation of the utility's existing generating units are reduced to a greater extent than with CC option C.

None of these system economic impacts that are driven by the difference in the capacity of two competing resource options are typically captured in a screening curve approach. The earlier discussion pointed out that a screening curve approach applied to even a single new resource option will omit a variety of significant system cost information that is necessary to develop a complete cost perspective of the one resource option. Now we see that an attempt to use a screening curve approach to compare the economics of two resource options that differ significantly in only their capacity will omit an even greater amount of important system cost information. Therefore, the use of a screening curve approach is definitely flawed when used to compare two new resource options that differ in just one of the four key characteristics listed above.

Q. The previous examples discussed only Supply options. Do similar problems exist if one were to attempt to compare DSM options to supply side options using a screening curve approach?

A. Yes. All of the problems inherent in using a screening curve approach that omits the system cost impacts discussed above are equally applicable whether Supply or DSM options are being addressed.

In this example, the system impacts of the lower amount of DSM (100 MW) on future resource needs would not be captured in a typical screening curve analysis. This would lead to the same type of incomplete and incorrect analysis discussed previously. Even if one were to adjust the 100 MW of demand reduction from DSM to account for the fact that 100 MW of DSM would be equivalent to 120 MW of supply side capacity (if the utility had a 20% reserve margin criterion), 120 MW of one option will be at a disadvantage compared to larger resource options in terms of avoiding/deferring future resource needs of the utility.

In addition, DSM options vary widely in terms of their actual contribution during system peak hours. Many DSM programs reliably reduce demand during the summer and winter peak hours such as load control, building envelope, heating/ventilation/air conditioning (HVAC) programs to name a few. However, other DSM programs may contribute little or no demand reduction at the summer peak hour, at the winter peak hour, or at either peak hour. A streetlight program would be an example of such a program.

Presentations of screening curve analyses of DSM options, such as in Witness Wilson's exhibit, typically lump a wide variety of DSM options together regardless of the capability of these DSM options to lower peak hour demand. This form of presentation further clouds one's understanding of what DSM options are actually being addressed and does not allow an observer to fully understand the breadth of the system impacts that are not being captured in a screening curve analysis.

Q. Please summarize why a comprehensive economic analysis that includes system cost impacts of resource options, such as the analytical process FPL utilized, is superior to the NRDC-SACE screening curve "economic analysis" approach?

A. There are a large number of cost impacts to consider if one is attempting to provide a complete analysis of competing resource options. Some of these cost impacts are driven solely from the operation of the resource option itself while other cost impacts are utility system impacts driven by integrating and operating a resource option with the utility's existing generating units.

A screening curve approach typically addresses only the costs of operating the individual unit itself. As discussed above, this approach omits all of the system cost impacts that are crucial to capturing the complete costs of a resource option.

In contrast, a system economic approach – such as that utilized by FPL in the analyses presented in this docket - not only captures all of the costs of operating the individual resource option, but also captures the system costs and cost savings of operating the entire FPL system with the resource option.

Q. Can you provide a quantitative example of how the cents per kWh results of a typical screening curve approach might change if one were to account for even one or two system impacts that are typically omitted by this analytical approach?

A. Yes. Staff Interrogatory Number 57 in this docket requested the results of a screening curve analysis of the 2019 combined cycle unit used in FPL's DSM screening analyses. FPL provided these results, along with a condensed version of the qualifiers discussed at length above that explain the significant limitations of using this levelized cost value when comparing a combined cycle unit to very dissimilar resource options.

The levelized cost value FPL provided in response to Staff's request is $162/MWh assuming a 90% capacity factor with costs levelized in 2019$. This value is equivalent to a levelized 16.2 cents/kWh in 2019$. (Screening curve analyses are often presented in levelized $/MWh values for either the in-service year of the unit or for the year in which the analysis was performed.) As previously mentioned, NRDC-SACE provides no information regarding what year $ their levelized values are in. Let's give them the benefit of the doubt and assume that they at least tried to put the values for the resource options (which would almost certainly have different in-service years) on a common year basis. This is most commonly done through levelizing costs to the year in which the analysis was done. Therefore, let's convert the $162/MWh value in 2019$ to an equivalent 2009$ value.

Exhibit SRS-14 provides the summary page of that analysis. The levelized value for this same unit at a 90% capacity factor now becomes $69/MWh in 2009$. This value is highlighted in the box on the left-hand side of the page. This exhibit shows that FPL accounted for all projected costs of building and operating this <u>individual unit</u> over the projected 25-year life of the unit. The calculation does not account for offsetting system cost impacts as is typical in screening curve analysis. Because NRDC-SACE presented their values in terms of cents/kWh, I'll do so as well. The $69/MWh value translates to 6.9 cents/kWh. (NRDC-SACE's value for a CC unit was in the 7.3 to 10.0 cents/kWh range.)

Exhibit SRS-15 now takes a more realistic, but still highly conservative assumption (in order to make the math easier to follow and to be consistent with the system fuel cost savings example discussed above). In Exhibit SRS–

15, the impacts of only two of the many system impacts have been included: system fuel savings and system environmental compliance cost savings.

The conservative assumption used is that both the system fuel cost savings and the system environmental compliance cost savings will be 10% of the combined cycle unit's costs in those categories. For example, the fuel cost value for this individual unit for the year 2019 in Exhibit SRS–14 is $865,447 (in $000). The new assumption used in developing Exhibit SRS-15 is that the system would actually realize a saving of 1.10 x $865,447 ($000) = $951,992 ($000) from reduced operation of the other units on the system.

Consequently, a net system fuel savings of $86,545 ($000) (= $951,992 - $865,447) would occur. This value shows up as a negative value, ($86,545) ($000), in Exhibit SRS–15 for the 2019 fuel cost value to denote this savings. A similar calculation is made for all years for the fuel costs and the environmental compliance costs.

Even with this conservative assumption for FPL's system, the screening curve's levelized cost value for the combined cycle unit at a 90% capacity factor has now dropped from $69/MWh or 6.9 cents/kWh to $12/MWh or 1.2 cents/kWh.

Therefore, even by making a simple adjustment to a screening curve analysis to account for only two of many system impacts of adding a combined cycle to a utility system such as FPL's, the levelized cost projection from the screening curve analysis is dramatically lowered from 6.9 cents/kWh to 1.2 cents/kWh. And, as discussed previously, there are a number of other system impacts that still not accounted for in this example.

The moral of the story is that, by leaving out system cost impacts, typical screening curve analyses are based on very incomplete information and can provide very misleading results as demonstrated by this example. This points out how meaningless the cents per kWh values are that NRDC-SACE presented as its "economic analysis."

Q. In summary, how should one view any economic analysis based only on a screening curve analysis?

A. When a person attempts to justify a resource option selection solely with a screening curve analysis, the individual attempting to use such an analysis as justification either does not understand how utility systems work, or knows better but is trying to sneak out a decision that would be based on very incomplete information.

The Commission, and any other interested party, should view a screening curve analysis as an approach that utilizes only an incomplete subset of information, and which, therefore, provides incorrect analysis results.

Therefore, resource decisions should not be based upon this analytical approach because a full accounting of system cost impacts has not been presented.

It is for these reasons that FPL does not make resource decisions, nor seek Commission approval for resource additions, based solely on screening curve analyses. FPL's IRP analyses are designed to capture all relevant, quantifiable option costs and system cost impacts in its analyses of competing options including Supply and DSM options. FPL utilized this comprehensive analytical approach in the analyses presented in this docket.

VI. Summary

Q. Please summarize your rebuttal testimony regarding NRDC-SACE.

A. I'll do so with the following summary statements.

(1) What I have referred to as NRDC-SACE's objectives statement – to reduce greenhouse gas emissions and to do so only with energy conservation – drives the testimonies of NRDC-SACE's witnesses. Without this objectives statement, the NRDC-SACE testimonies would be very puzzling given that Florida utilities and NRDC-SACE have just completed an expensive, many months long collaborative

effort to provide a sound analytical basis on which to set DSM goals for Florida's electric utility customers.

(2) NRDC-SACE's testimonies completely ignore the results of this large-scale analytical effort and, to a great extent, ignore the analytical process except to claim that it is flawed. In so doing, NRDC-SACE's witnesses appear to have amnesia in regard to the fact that Witness Wilson was an active participant in the collaborative and helped shape the process. In one instance when NRDC-SACE does discuss the Collaborative's analytical work, NRDC-SACE now claims that one key criterion – the two-year payback criterion utilized to address/minimize free-riders as the utilities are required to do – was something the utilities erred in choosing. NRDC-SACE ignores the inconvenient fact that the selection of this key criterion was readily agreed to by their representative, Witness Wilson. The impression NRDC-SACE's testimonies have given me is that a great deal of their testimony could have been written before the collaborative effort even began. Therefore, NRDC-SACE has raised doubt as to how serious they really have been in participating in, and contributing to, the collaborative analytical effort that Florida's DSM goals are to be based on.

(3) After completely ignoring the results of the Collaborative's analytical efforts, NRDC-SACE has chosen to recommend that Florida set goals almost exclusively on an energy reduction basis using an arbitrarily

chosen percentage value tied to energy sales. They offer no analysis at all, much less a thorough analysis using Florida-specific information, to support their position. The closest they came to an economic analysis is to provide vague cents per kWh values for DSM and Supply options with no explanation as to how those values were derived. As discussed in section V of my testimony, the analytical process they used is fundamentally flawed when used to compare two such different resource options as DSM and baseload generating units. Therefore, NRDC-SACE has provided absolutely no analyses to support their recommended goals.

(4) NRDC-SACE completely ignores the fact that the utilities did not use the original RIM and TRC tests in their analyses, and discuss only those two tests that are not applicable to the current discussion. However, NRDC-SACE clearly recognizes that the language in HB 7135 poses real problems for their position that the TRC test should be used. These problems arise because the TRC test does not include all DSM-related costs that impact all ratepayers which the amendment's language requires be included. Neither incentive payments to participants nor the reduction in recovered revenue requirements – two costs that impact all ratepayers – are included in the TRC test. In regard to incentive payments, NRDC-SACE's witnesses mounted a creative, but desperate attempt to argue that the participant costs (costs that are not borne by all ratepayers) can "cover" incentive payments.

Section III of my testimony points out that one simply needs to check the Commission's approved cost-effectiveness methodology to see that incentive costs are not included in the TRC test calculation page. This section of my testimony also takes a look at how NRDC-SACE's contention that participant costs "cover" incentive costs actually works in practice. What is shown is that the Commission cannot get an accurate picture of the impact of incentive payments on DSM cost-effectiveness from looking at NRDC-SACE's suggested proxy, participant costs. In regard to the other cost impact that is missing from the TRC test (unrecovered revenue requirements), NRDC-SACE does not even attempt to mount a defense.

(5) NRDC-SACE also recommends and suggests a number of ways to further lower the bar for the already more lenient TRC test so that even more DSM measures can be "justified". Their comments strongly suggest a view that virtually all DSM options should be implemented in Florida without any honest economic analysis.

(6) NRDC-SACE shows virtually no concern for the fact that use of the TRC test will result in increased cross-subsidization of one customer group by another for each DSM measure that fail the E-RIM test but pass the more lenient E-TRC test. Their proposed solution – to implement even more such DSM measures – would only aggravate this problem. In fact, the sole example offered by NRDC-SACE for how this could conceivably work is a 20 year old project in which 10%

of <u>eligible</u> customers didn't participate, and with an unknown number of <u>ineligible</u> customers that also did not participate. All of these non-participating customers would be subsidizing the participants in a DSM measure that failed the E-RIM test. Therefore, NRDC-SACE's example to show how cross-subsidization can handled by implementing even more such DSM measures falls far short of convincing.

(7) Finally, NRDC-SACE's witnesses were completely wrong several times in their testimonies when they attacked the practices of the Florida utilities. This suggests a failure to thoroughly review, or to understand, the utilities' testimonies. It also again suggests a mindset of not caring what the Collaborative did because NRDC-SACE had another agenda all along.

In conclusion regarding NRDC-SACE, the positions I see NRDC-SACE taking – to ignore the Collaborative's extensive analyses in which they participated, to recommend substituting arbitrarily set goals that focus almost exclusively on energy reduction, to offer no analyses to support this recommendation, to once again attempt to convince a Florida Commission to ignore the fundamental flaws of the TRC test, to recommend that the already more lenient TRC test be made even more lenient, and to essentially ignore the cross-subsidization and electric rate impacts that will be of particular concern to Florida's many fixed- and low-income residents – is directly linked to the very narrow focus of their objectives statement in which energy conservation is the only resource option. While this may make sense to individuals who have such a single-minded focus, it is certainly not a reasonable way to set DSM goals that will impact all of Florida's electric utility customers.

Q. Does this conclude your rebuttal testimony?

A. Yes.

Comparison of Projected CO2 Allowance Costs:
FPL and Congressional Budget Office (CBO) Projections

Year:	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
(A) CBO Forecast (1)	--	$15	$16	$17	$18	$19	$21	$22	$24	$26
(B) CBO Forecast (2)	--	$14	$15	$15	$16	$17	$19	$20	$22	$24
(C) FPL Forecast (2)	$0	$0	$0	$14	$16	$17	$19	$21	$23	$25
(D) Difference (3)	--	--	--	-$1	$0	$0	$0	$1	$1	$1

Notes:

(1) The source of the CBO values is : "Congressional Budget Office Cost Estimate , H.R. 2454 American Clean Energy and Security Act of 2009, June 5, 2009" Page 13, Table 3, which addresses the years 2011 thru 2019 only. Dollar values are per metric ton (a metric ton equals 2,205 US pounds).

(2) Dollar values are per US (short) ton (a US ton equals 2,000 US pounds).

(3) The difference is calculated as Row (C) values minus Row (B) values.

Screening Curve Results for 2019 CC Unit: With No System Impacts (2009$)

Unit 1
Combined Cycle

Discount Factor:	0.088869
Base (MW) (blended summer/winter)	1,219
Heat Rate	6,582
Fixed O&M ($/kW-yr)	6.65
Capital Replace ($/kW-yr)	10.93
VOM ($/MWh)	1.36
Gas Transportation ($/kW-yr)	132.12
in-service year	2019
book life	25
costs in entered in year $s	2019

Combined Cycle

Capacity Factor (%)	Levelized $/kW	Levelized $/MWh
0	131	-
5	154	352
10	177	202
15	200	152
20	223	127
25	246	112
30	269	103
35	292	95
40	316	90
45	339	86
50	362	83
55	385	80
60	408	78
65	431	76
70	454	74
75	477	73
80	500	71
85	523	70
90	546	69
95	569	68
100	592	68

Nominal
$ each year

Natural Gas
1

	Fixed Costs				Variable Costs					
Year	**Capital $000**	**Fixed O&M $000**	**Capital Repl $000**	**Gas Transportation $000**	**NOx Emission $000**	**SO2 Emission $000**	**CO2 Emission $000**	**Fuel Costs $000**	**Variable O&M $000**	**Total $000**
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0
2019	258,093	8,106	13,319	161,056	694	610	103,768	865,447	14,556	1,425,649
2020	248,821	8,309	13,652	161,056	760	667	112,272	912,227	14,920	1,472,683
2021	238,528	8,516	13,994	161,056	832	731	121,135	930,501	15,293	1,490,586
2022	228,618	8,729	14,343	161,056	911	800	136,580	949,141	15,675	1,515,855
2023	219,061	8,947	14,702	161,056	998	877	146,358	968,154	16,067	1,536,221
2024	209,831	9,171	15,070	161,056	1,093	960	163,062	987,547	16,469	1,564,259
2025	200,889	9,400	15,446	161,056	1,198	1,052	180,509	1,007,328	16,881	1,593,760
2026	192,194	9,635	15,832	161,056	1,022	1,028	191,875	1,027,505	17,303	1,617,450
2027	183,630	9,876	16,228	161,056	872	1,005	210,720	1,048,085	17,735	1,649,207
2028	175,085	10,123	16,634	161,056	745	982	230,387	1,069,076	18,179	1,682,266
2029	166,541	10,376	17,050	161,056	636	960	258,285	1,090,487	18,633	1,724,024
2030	157,997	10,636	17,476	161,056	543	939	279,871	1,112,327	19,099	1,759,943
2031	149,455	10,902	17,913	161,056	407	911	304,610	1,134,603	19,576	1,799,433
2032	140,914	11,174	18,361	161,056	264	881	331,183	1,157,325	20,066	1,841,223
2033	132,374	11,454	18,820	161,056	113	849	359,684	1,180,501	20,567	1,885,418
2034	123,939	11,740	19,290	161,056	0	815	390,214	1,204,140	21,082	1,932,276
2035	115,716	12,033	19,773	161,056	0	778	422,875	1,228,252	21,609	1,982,091
2036	107,598	12,334	20,267	161,056	0	740	457,776	1,252,847	22,149	2,034,765
2037	99,481	12,643	20,774	161,056	0	698	495,030	1,277,933	22,703	2,090,316
2038	91,365	12,959	21,293	161,056	0	655	534,754	1,303,521	23,270	2,148,872
2039	83,933	13,283	21,825	161,056	0	608	577,072	1,329,621	23,852	2,211,249
2040	77,866	13,615	22,371	161,056	0	559	622,110	1,356,242	24,448	2,278,268
2041	72,484	13,955	22,930	161,056	0	507	670,002	1,383,396	25,059	2,349,390
2042	67,102	14,304	23,503	161,056	0	453	720,887	1,411,093	25,686	2,424,085
2043	61,722	14,661	24,091	161,056	0	395	774,909	1,439,344	26,328	2,502,507
2044	0	0	0	0	0	0	0	0	0	0
2045	0	0	0	0	0	0	0	0	0	0
2046	0	0	0	0	0	0	0	0	0	0
2047	0	0	0	0	0	0	0	0	0	0
2048	0	0	0	0	0	0	0	0	0	0
2049	0	0	0	0	0	0	0	0	0	0
2050	0	0	0	0	0	0	0	0	0	0
2051	0	0	0	0	0	0	0	0	0	0
NPV 2009	861,387	45,969	75,534	742,016	3,007	3,758	1,132,607	4,845,589	82,548	7,792,416
	65	3	6	56	0	0	86	368	6	592

Screening Curve Results for 2019 CC Unit: With Only Two System Impacts (2009$)

Unit 1
Combined Cycle

Discount Factor:	0.088869
Base (MW) (blended summer/winter)	1,219
Heat Rate	6,582
Fixed O&M ($/kW-yr)	6.65
Capital Replace ($/kW-yr)	10.93
VOM ($/MWh)	1.36
Gas Transportation ($/kW-yr)	132.12
in-service year	2019
book life	25
costs in entered in year $s	2019

Combined Cycle

Capacity Factor (%)	Levelized $/KW	Levelized $/MWh
0	131	-
5	129	295
10	127	145
15	125	95
20	123	70
25	121	55
30	119	45
35	117	38
40	115	33
45	113	29
50	111	25
55	110	23
60	108	20
65	106	19
70	104	17
75	102	15
80	100	14
85	98	13
90	96	12
95	94	11
100	92	10

Nominal
$ each year

Natural Gas
1

Year	Fixed Costs: Capital $000	Fixed O&M $000	Capital Repl $000	Gas Transportation $000	Variable Costs: NOx Emission $000	SO2 Emission $000	CO2 Emission $000	Fuel Costs $000	Variable O&M $000	Total $000
	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0
2019	258,093	8,106	13,319	161,056	(69)	(61)	(10,377)	(86,545)	14,556	358,079
2020	248,821	8,309	13,652	161,056	(76)	(67)	(11,227)	(91,223)	14,920	344,165
2021	238,528	8,516	13,994	161,056	(83)	(73)	(12,114)	(93,050)	15,293	332,067
2022	228,618	8,729	14,343	161,056	(91)	(80)	(13,658)	(94,914)	15,675	319,679
2023	219,061	8,947	14,702	161,056	(100)	(88)	(14,636)	(96,815)	16,067	308,195
2024	209,831	9,171	15,070	161,056	(109)	(96)	(16,306)	(98,755)	16,469	296,330
2025	200,889	9,400	15,446	161,056	(120)	(105)	(18,051)	(100,733)	16,881	284,664
2026	192,194	9,635	15,832	161,056	(102)	(103)	(19,187)	(102,750)	17,303	273,878
2027	183,630	9,876	16,228	161,056	(87)	(101)	(21,072)	(104,808)	17,735	262,457
2028	175,085	10,123	16,634	161,056	(74)	(98)	(23,039)	(106,908)	18,179	250,957
2029	166,541	10,376	17,050	161,056	(64)	(96)	(25,829)	(109,049)	18,633	238,619
2030	157,997	10,636	17,476	161,056	(54)	(94)	(27,987)	(111,233)	19,099	226,896
2031	149,455	10,902	17,913	161,056	(41)	(91)	(30,461)	(113,460)	19,576	214,849
2032	140,914	11,174	18,361	161,056	(26)	(88)	(33,118)	(115,732)	20,066	202,605
2033	132,374	11,454	18,820	161,056	(11)	(85)	(35,968)	(118,050)	20,567	190,156
2034	123,939	11,740	19,290	161,056	0	(81)	(39,021)	(120,414)	21,082	177,590
2035	115,716	12,033	19,773	161,056	0	(78)	(42,287)	(122,825)	21,609	164,996
2036	107,598	12,334	20,267	161,056	0	(74)	(45,778)	(125,285)	22,149	152,267
2037	99,481	12,643	20,774	161,056	0	(70)	(49,503)	(127,793)	22,703	139,289
2038	91,365	12,959	21,293	161,056	0	(65)	(53,475)	(130,352)	23,270	126,050
2039	83,933	13,283	21,825	161,056	0	(61)	(57,707)	(132,962)	23,852	113,218
2040	77,866	13,615	22,371	161,056	0	(56)	(62,211)	(135,624)	24,448	101,465
2041	72,484	13,955	22,930	161,056	0	(51)	(67,000)	(138,340)	25,059	90,094
2042	67,102	14,304	23,503	161,056	0	(45)	(72,089)	(141,109)	25,686	78,408
2043	61,722	14,661	24,091	161,056	0	(39)	(77,491)	(143,934)	26,328	66,394
2044	0	0	0	0	0	0	0	0	0	0
2045	0	0	0	0	0	0	0	0	0	0
2046	0	0	0	0	0	0	0	0	0	0
2047	0	0	0	0	0	0	0	0	0	0
2048	0	0	0	0	0	0	0	0	0	0
2049	0	0	0	0	0	0	0	0	0	0
2050	0	0	0	0	0	0	0	0	0	0
2051	0	0	0	0	0	0	0	0	0	0
NPV 2009	861,387	45,969	75,534	742,016	(301)	(376)	(113,261)	(484,559)	82,548	1,208,958
	65	3	6	56	(0)	(0)	(9)	(37)	6	92