BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

In the Matter of:

COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS (FLORIDA POWER & LIGHT COMPANY).	DOCKET NO. 130199-EI
COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS (DUKE ENERGY FLORIDA, INC.).	DOCKET NO. 130200-EI
COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS (TAMPA ELECTRIC COMPANY).	DOCKET NO. 130201-EI
COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS (GULF POWER COMPANY).	DOCKET NO. 130202-EI
COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS (JEA).	DOCKET NO. 130203-EM

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VOLUME 6

Pages 1290 through 1549

PROCEEDINGS: HEARING

COMMISSIONERS PARTICIPATING: CHAIRMAN ART GRAHAM
COMMISSIONER RONALD A. BRISÉ
COMMISSIONER LISA POLAK EDGAR
COMMISSIONER EDUARDO E. BALBIS
COMMISSIONER JULIE I. BROWN

DATE: Wednesday, July 23, 2014

TIME: Commenced at 10:26 a.m.
Concluded at 1:30 p.m.

PLACE: Betty Easley Conference Center
Room 148
4075 Esplanade Way
Tallahassee, Florida

REPORTED BY: LINDA BOLES, CRR, RPR
Official FPSC Reporter
(850) 413-6734

APPEARANCES: (As heretofore noted.)

I N D E X

WITNESSES

EXHIBITS

P R O C E E D I N G

(Transcript continues in sequence from Volume 5.)

MR. BUTLER: FPL would call Mr. Koch to the stand.

Whereupon,

THOMAS R. KOCH

was called as a witness on behalf of Florida Power & Light Company and, having first been duly sworn, testified as follows:

EXAMINATION

BY MR. BUTLER:

Q Mr. Koch, you've previously been sworn; correct?

A Yes, that's right.

Q Okay. Would you please state your name and business address for the record.

A Thomas R. Koch, 9250 West Flagler Street, Miami, Florida.

Q And by whom are you employed and in what capacity?

A Florida Power & Light as a Senior Manager, DSM Strategy, Cost, and Performance.

Q Thank you. Have you prepared and caused to be filed in this docket 15 pages of rebuttal testimony?

A Yes, I have.

Q Do you have any changes or revisions to your prefiled rebuttal testimony?

A No, I don't.

Q So if I asked you the same questions contained in your rebuttal testimony today, would your answers be the same?

A Yes.

MR. BUTLER: Mr. Chairman, I ask that Mr. Koch's prefiled rebuttal testimony be inserted into the record as though read.

CHAIRMAN GRAHAM: We will insert Mr. Koch's prefiled rebuttal testimony into the record as though read.

MR. BUTLER: Thank you.

BY MR. BUTLER:

Q Mr. Koch, you have no exhibits to your rebuttal testimony; correct?

A That's correct.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

FLORIDA POWER & LIGHT COMPANY

REBUTTAL TESTIMONY OF THOMAS R. KOCH

DOCKET NO. 130199-EI

JUNE 10, 2014

Q. Please state your name and business address.

A. My name is Thomas R. Koch. My business address is 9250 W. Flagler Street, Miami, Florida 33174.

Q. Have you previously submitted testimony in this proceeding?

A. Yes.

Q. What is the purpose of your rebuttal testimony?

A. The purpose of my rebuttal testimony is threefold. First, in response to the proposals by EDF witness James Fine, Sierra Club witness Tim Woolf and SACE witness Karl Rábago that the Commission continue the current solar photovoltaic (PV) rebate pilot programs, I describe FPL's proposal for a solar research and development (Solar R&D) project that could replace all of FPL's current solar pilot programs (Solar Pilots). If approved, FPL would conduct the Solar R&D project which could be viewed as the next phase of research into solar PV technology, gathering information on a wide range of applications from demand-side PV on customer premises, to larger distributed PV facilities, and ultimately to central-station PV facilities. It would replace the expiring Solar Pilots which have been shown not to be cost-effective by wide margins under both RIM and TRC cost-effectiveness tests. The second purpose is to rebut the assertion that FPL's

Demand-Side Management (DSM) costs are "inflated," that is made by SACE witness Natalie Mims and, to a lesser degree, Sierra Club witness Woolf. Finally, I rebut assertions by Ms. Mims and Mr. Woolf regarding the appropriateness and completeness of the utilities' 2009 Technical Potential Study and 2014 update.

I. FPL'S PROPOSED SOLAR R&D PROJECT

Q. Dr. Sim's rebuttal testimony recommends that the current solar PV pilot programs be discontinued because they are not cost effective and concludes that the money currently spent on those programs could be used more productively to conduct a limited Solar R&D project that would gather information on the system impacts of both DSM and non-DSM PV applications. Please describe FPL's Solar R&D proposal.

A. As Dr. Sim notes, SACE, Sierra Club and Environmental Defense Fund all recommend that further evaluation is needed to determine the costs and benefits of DSM PV. FPL believes that the cost and benefits of solar (or any resource option for that matter) are best assessed and considered in the context of a particular proposal for a resource option, rather than in an abstract or generic proceeding. It is clear without the benefit of any incremental research that the installed cost of utility scale PV is significantly lower than roof top solar. However, FPL does agree that there is some merit to better understanding system impacts of different forms of solar. To this end, FPL proposes to continue and expand an initiative to gather data from a range of PV installations across the spectrum of

applications and located throughout FPL's service territory, which would be metered and instrumented to gather information on issues such as the following:

- impacts of PV installations on the transmission and distribution network based on the size of the PV installations, their location and loading conditions on the network;
- energy output characteristics of different PV installations based on factors such as location, size and configuration;
- differences in customer electric consumption patterns based on whether PV is located behind the customer's meter vs. grid-connected; and
- effects of locational diversity for PV installations.

FPL would gather data from existing PV installations and may include a limited number of targeted additional PV installations at appropriate locations around the FPL service territory. We expect that arrangements could be made with an appropriate sample of customers with existing DSM PV installations to limit the investment required to gather information for that type of application. FPL also could rely upon data collected at its DeSoto and Space Coast central-station PV facilities. To ensure that the full range of locations and types of application are covered, FPL expects that it would need to install several distributed PV systems of varying size throughout the service territory, relying either on utility property or leases with customers for the necessary access. All installations would be used to collect data on both the level of electric output that can be expected from different types of installation and the impacts (positive and negative) that the installations have on the electric grid. FPL would submit the exact scope and

parameters of such a Solar R&D project for Commission approval during the DSM Plan phase, subsequent to this goal-setting proceeding. The annual cost for the Solar R&D project would depend on specifics of implementation.

Q. Why does FPL believe that this Solar R&D project would be preferable to the current Solar Pilots?

A. The current Solar Pilots constitute a large and concentrated cross-subsidy of a small number of customers who receive rebates to install their own systems, by the vast majority of customers who don't. For example, through year-end 2013 approximately 950 DSM PV systems were installed – a miniscule fraction of FPL's total customer base. Those 950 systems received rebates totaling approximately $15.8 million, an average of about $16,500 per system. FPL learns little from those pilots, other than confirming that people will rush to get in line for giveaways. In contrast, the R&D project would gather data that will be useful to FPL and our customers in determining the impacts that different PV applications have on FPL's electric system.

Q. Would this Solar R&D project be consistent with FEECA's requirements for demand-side renewable energy systems?

A. Yes. FEECA directs the Commission to adopt goals that will, among other things, "increase[] the development of demand-side renewable energy systems." Section 366.82(2), F.S. As FPL witness Deason discusses in his rebuttal testimony, goals under FEECA are to promote *cost-effective* DSM measures, and if available information shows that there are no cost-effective applications for a particular DSM measure, then it is appropriate for the Commission to set a goal of zero for that measure. Both my direct testimony and FPL witness Sim's rebuttal testimony show that the current Solar Pilots are

not cost-effective, by wide margins and under both the RIM and TRC tests. At present, no other cost-effective applications for DSM PV have been identified. By gathering information about system impacts of DSM PV, the Solar R&D project would be an efficient resource to help FPL evaluate the development of DSM PV.

II. UNFOUNDED ASSERTIONS REGARDING FPL'S DSM COSTS

Q. What does SACE witness Mims contend regarding the level of costs that FPL and the other FEECA Utilities have incurred for their DSM programs?

A. She has two primary contentions:

- *"...more than a third of the program impacts associated with Utilities portfolio have costs that are significantly above the average cost of comparable programs."* (page 29, lines 16-17)
- *"Recent reports also indicate Florida's energy efficiency costs are inflated"* (page 30, line 9)

Q. On what does SACE witness Mims base her assertions?

A. Her assertions are based on a single benchmarking study produced by Lawrence Berkley National Laboratory (LBNL), although she characterizes this one document as multiple "reports." The LBNL's primary comparative metric is the so-called levelized Cost of Saved Energy (CSE). This metric attempts to portray an Energy Efficiency program's present value life-cycle cost (installation cost minus the avoided cost from the estimated future energy savings) divided by the future estimated kWh savings.

Q. Is the LBNL's CSE a valid metric to support Ms. Mims' assertions?

A. No. There are three main deficiencies with trying to use the CSE as Ms. Mims does. First, the CSE omits demand savings, arguably the most important benefit of all DSM programs, including Energy Efficiency programs. Second, it ignores the impact of lost revenues, a significant component of any RIM-tested program. Any truly representative metric must reflect all costs, including lost revenues. For these two reasons, CSE is not a complete or valid metric to gauge or compare DSM programs or portfolios. The third deficiency is with the LBNL's execution of the study itself, which suffers from many of the typical problems inherent in DSM benchmarking, as well as major data integrity problems that render its results meaningless and unusable.

Q. Please briefly describe why the first deficiency, omitting demand savings, is a concern.

A. For all DSM, including Energy Efficiency programs, demand savings is a primary benefit. Without it virtually no programs would have enough benefits to pass cost-effectiveness testing. Any energy-only based comparison, such as CSE, that ignores this parameter will yield results that are at best one-sided and at worst biased. Florida, where reducing peak demand is recognized as an essential objective of DSM, is especially negatively impacted by this omission in the CSE. By way of example, Load Management programs (ignored by LBNL) would have extremely unfavorable CSE results because they have little if any energy savings. In reality, however, Load Management provides large cost-effective demand savings, and it is a key part of any DSM portfolio and FPL's in particular. But based on CSE alone Load Management would appear to make such a portfolio "expensive." Energy Efficiency programs are also

short-changed because only their energy savings and not their demand savings are incorporated. In short, the CSE reflects SACE's inappropriate, tunnel-vision focus on energy savings and thus misses an important part of the overall DSM picture.

Q. Please briefly describe why the second deficiency, ignoring the impact of lost revenues, makes the CSE an unreliable metric for comparing DSM programs.

A. Lost revenues due to DSM Energy Efficiency programs represent a significant cost component to all customers, which will increase their electric rates. Assuming programs pass RIM; this rate uplift is mitigated by lowering other costs. However, because the lost revenue impact will vary from one Energy Efficiency program to another, and between different companies' portfolios, ignoring this impact significantly understates the effective total cost of Energy Efficiency and distorts the CSE metric. Therefore, if lost revenue impacts are excluded, performing a cursory side-by-side comparison of one CSE result to another is essentially pointless.

Q. Please discuss the third deficiency that you have pointed out, the lack of data integrity in the LBNL CSE study.

A. At first blush, the study appears to provide a somewhat straightforward metric and has the veneer of analytical rigor. However, upon closer inspection, due to several fatal shortcomings, it turns out to have little merit and its conclusions cannot be relied upon, at least concerning Florida's results. I have organized my discussion of these shortcomings into two groups: (1) problems inherent with all DSM benchmarking; and (2) problems specific to the LBNL study itself, including its enormous data integrity flaws. I will add that these shortcomings are well known; in fact several were listed by the authors

themselves. Given that this is Ms. Mims' sole piece of evidence on the topic, her failure to mention any such problems appears either sloppy or disingenuous.

Q. What problems are inherent with all DSM benchmarking studies?

A. For many utility processes benchmarking can be a very useful tool to provide comparative evaluations and FPL uses it effectively in many applications. However, like any analytical tool, it has functional limitations that can inhibit its proper execution in certain situations, and DSM programs are one of those situations. Most relevant here, is the need for benchmarking to identify, quantify and control/normalize for any divergent data, practices and circumstances. These steps are necessary to ensure a true apples-to-apples comparison. Otherwise, the results will be inaccurate and perhaps misleading.

There are many variables that affect a given utility's planning, selection and execution of its DSM programs. Some examples of these which can lead to significant differences between the programs of different companies are: climate; residential/commercial/industrial customer mix; customer load and usage patterns, legislative/regulatory mandates; how long a company has been offering DSM (unlike Florida's utilities, many have just started within the last few years); geography; demand v. energy emphasis; varying manufacturer incentives; etc. Unfortunately, few, if any, of these can be adequately quantified to allow proper data normalization in order to yield valid empirical comparisons. Additionally, the dynamic interaction among all these variables compounds the complexity and uncertainty.

To their credit, the LBNL study's authors noted their concern with these issues inherent in all DSM benchmarking studies, stating:

> *"When data are compiled from multiple states and program administrators, terminology differences can potentially make it difficult to conduct comparative analysis across states or program administrators."* (page 11)

Q. What are the problems specific to the LBNL study?

A. In the Executive Summary, the authors characterize the study as "*...the first technical report of the LBNL CSE Project...*" and "*...proof of concept....*" Therefore, it's clear that this study represents merely an initial foray, not a refined effort that has discovered how to overcome the inherent DSM benchmarking problems. Reinforcing this, the authors identified three critical specific problems with the data they were able to gather (pages 11-12):

> *"1. Energy savings and program costs are not defined consistently."*
>
> *"2. Program data are not reported consistently across states."*
>
> *"3. Programs and sectors are not characterized in a standardized fashion."*

As a result, they provided this strong caution: *"We suggest that readers consider these above issues when utilizing the information in this report for their own uses and understanding of the cost of saved energy."* (page 11)

Below I touch on just a few of the most serious data integrity problems I observed with the study (note that some of these alone can constitute a fatal flaw):

- **Data is inconsistent** – Some states have three years of data, many have as little as only one year. Florida only has data for 2011. This is a glaring incompatibility.
- **Program portfolios are not comparable across states** – As Ms. Mims points out, *"FPL's residential HVAC program dominates the Company's energy efficiency portfolio..."* (page 29, lines 2-3). However, in the data from other states, *"Lighting rebate programs accounted for at least 44% of total residential lifetime savings with a savings-weighted average levelized CSE of $0.007/kWh. The residential CSE, when the lighting programs were removed, was $0.028/kWh."* (page xii). The costs and benefits associated with a residential HVAC program are dramatically different from those for a lighting program rendering any comparison meaningless. Please note that, as FPL witness Deason points out in his rebuttal testimony, Home Depot reports that some of the highest areas of energy-efficient lighting purchases in the nation are in FPL's service territory. FPL and its customers are thus getting the benefit of lighting efficiency without the need for any program expenses, but those benefits would not be reflected in a CSE evaluation of FPL's DSM portfolio.
- **Data is missing** – When data is missing, the authors implemented various patches which introduced error and uncertainty into the results. One such example of missing data: *"...program administrators reported lifetime savings for only about 44% of the programs years..."* and a patch protocol: *"For programs where we did not have lifetime savings or measure lifetime data, we*

calculated a program average measure lifetime for similar programs in the database and used that imputed value along with the program's first-year savings to calculate program lifetime savings." (pages 16-17)

These issues individually, and in the aggregate, represent major data integrity failures that render any results untrustworthy.

Q. Were the LBNL authors able to explain the large variations and differences among states, regions, etc. that resulted from their calculations?

A. No. They stated

"...we observe a wide range of values for the program administrator CSE from virtually every perspective—nationally, and across regions, states, portfolios, and sectors. Moreover, we find significant variability within the different types of programs. The inter-quartile range of CSE values (the "middle" 50% of programs) for the first-year CSE can vary by a factor of 10 or more within a program category." (page 44)

This is hardly surprising given the previously listed DSM benchmarking and study problems. The authors developed theories and conjecture as to causes (such as difference in climate). However, these were either not empirically tested or if evaluated statistically (with regression analysis) yielded correlations that were too weak to be of any significance. Aside from the documented primary data integrity problems, I believe the following statement correctly portrays the situation: *"We suspect that most or all of these factors influence the CSE values, interacting in ways that can be difficult to disentangle."* (page 44)

Q. Given the LBNL study's deficiencies, what are your conclusions regarding the validity of Ms. Mims' assertions?

A. It's clear that the LBNL study Ms. Mims provided as evidence does not have sufficient quality or rigor to support her assertions. Though FPL was unable to directly verify any of the calculations presented (due to lack of access to LBNL's primary data, etc.), it is apparent that the data suffered from enormous data integrity deficiencies which renders its results unreliable. Therefore, as a result, Ms. Mims' assertions are baseless.

Q. Sierra Club witness Woolf's testimony also makes a CSE-based comparison. Do the same, inherent CSE-related deficiencies apply to his comparison?

A. Yes. Mr. Woolf uses a CSE calculation on page 67 of his testimony to argue Florida utilities are more expensive than his calculated national average and to contrast the Florida utilities. At a minimum, the first two deficiencies which are inherent with CSE (omitting demand savings and ignoring lost revenues) apply equally to his information. I was unable to determine if there were any data-integrity issues with his calculations. While I suspect that there are data-integrity issues with his CSE calculation (because they are practically endemic to this form of analysis), even if there were not the effects of the first two deficiencies render his comparison meaningless.

Mr. Woolf also asserts that all of the FEECA utilities could provide DSM at the same cost as Duke Energy Florida and Tampa Electric Co. Setting aside whether his cost calculations are correct, this assertion cannot withstand scrutiny. Differences among the utilities' customer bases, whether each is summer or winter peaking, level of DSM Goals,

etc. all warrant different types of programs that will naturally have different cost structures.

Q. Do you have any other observations regarding FPL's DSM costs?

A. It's not clear whether Ms. Mims and Mr. Woolf are suggesting that FPL's DSM costs are high relative to the nature and scope of its programs, or just that FPL's programs have high CSEs. I have just shown that the latter is not a valid basis for comparison. If these witnesses are also asserting the former, then FPL emphatically disagrees.

FPL has a long track record of effectively controlling costs across the organization, including with respect to its DSM programs. The Commission's audit staff conducts extensive annual audits of DSM costs in conjunction with the annual Energy Conservation Cost Recovery (ECCR) clause proceedings. The most recently completed audit (2012) had no findings. The 2013 audit is on-going and at this point FPL has no reason to expect findings in it either. The Commission reviews FPL's costs as part of approving FPL's ECCR factors each year, and those costs have consistently been approved for recovery. In addition, in May 2013 the Commission's audit staff completed an "Administrative Efficiency" review of the DSM programs for the four largest FEECA utilities. For FPL, the review found that: (1) FPL's programs were properly focused on implementing the objectives of FEECA and meeting the PSC-established goals; (2) FPL continues to make substantial efforts to improve administrative efficiency; and (3) FPL's internal auditing process has assisted with improvements in program management and controls. While there were some modest process enhancement suggestions, this review also resulted in no findings.

III. UNFOUNDED TECHNICAL POTENTIAL ASSERTIONS

Q. Please comment on SACE witness Mims' and Sierra Club witness Woolf's assertions regarding the Technical Potential.

A. Ms. Mims expresses what can only be characterized as procedural quibbles concerning FPL's determination of the Technical Potential (TP). Some relate to the 2009 TP study and others concern the 2014 update process. At the Commission Staff's informal meeting on June 17, 2013, the parties agreed that the FEECA Utilities would perform an update to the 2009 TP study rather than generating a new, full TP study. This approach was confirmed in the August 2013 Order Establishing Procedure (Order No. PSC-13-0386-PCO-EU). An update was deemed to be reasonable because of the following:

- the relatively short time since the 2009 TP study had been prepared,
- the Commission's acceptance of that study in the 2009 DSM goals proceeding (Order No PSC-09-0855-FOF-EG characterizes the study on page 8 as "an adequate assessment of all available demand-side and supply-side conservation and efficiency measures, including demand-side renewable energy systems, pursuant to Section 366.82(3), F.S."), and
- the substantial time and expense required to perform a full, new study.

SACE participated actively in the process of determining how the TP was to be evaluated in this current proceeding. Despite SACE's participation in that process, on page 42 of her testimony, Ms. Mims tries to reopen debate on the acceptability of the 2009 TP study and by extension the 2014 update. Likewise, Mr. Woolf's testimony, on pages 46-48,

essentially rehashes assertions that were made by other intervenor witnesses back in 2009. However, because the 2009 TP study was thoroughly debated and then accepted by the Commission in 2009, there is no reason for the Commission to revisit them here.

Regarding the TP update, Ms. Mims recommends that: *"[T]he Utilities should...investigate measures for the technical potential instead of asking interested parties to provide granular details."* (page 51, lines 13-16) At the June 17, 2013 meeting with Staff, it was determined that any party could submit measures for evaluation in the FEECA utilities' update and that those parties were responsible for providing the data necessary for that evaluation. SACE sent a letter to Staff including a lengthy list of measures, but failed to provide any supporting data for them. The FEECA utilities can and did evaluate measures submitted by SACE when it did not need further information to do so, but requested additional supporting information from SACE on others. SACE never responded to that request.

In any event, as noted earlier Ms. Mims is really just quibbling. The reality is that the FEECA utilities conducted a robust and thorough update to the 2009 TP study, adding 25 new measures and carefully assessing the many impacts of Codes & Standards changes since 2009. This process is discussed at length in my direct testimony.

Q. Does this conclude your rebuttal testimony?

A. Yes.

BY MR. BUTLER:

Q Okay. Would you please present your summary of your rebuttal testimony at this time.

A Yes. Good morning, Commissioners. The three main points to my rebuttal summary or testimony. First, we know that the current solar pilots are not cost-effective by wide margins and represent a large cross-subsidy to the tiny fraction of customers who receive rebates from the vast majority who don't. Therefore, the solar pilot should expire as planned at the end of 2014.

We also know that the installed cost for large scale PV is much lower than distributed PV. However, other issues are not as well understood, such as the operational impact on FPL's electric grade on different forms of PV. So rather than continuing the current PV pilots as proposed by the Intervenor witnesses Fine, Woolf, Rábago, I describe FPL's proposal for a solar R&D project to better understand the system operational impacts as the next phase of solar research.

FPL believes this would be best assessed in the context of a particular proposal rather than doing so through an abstract or generic proceeding. FPL envisions it would cover a wide range of applications from demand-side PV on customer premises to larger

distributed PV and ultimately to central station. If the Commission wishes to pursue this concept, FPL would submit the scope and parameters for approval during the DSM plan phase after this goal setting proceeding.

My second rebuttal topic is the unfounded assertion made by SACE witnesses Mims and, to a lesser degree, Sierra Club witness Woolf that FPL's DSM costs are high compared to other utilities.

For my summary I will focus on Ms. Mims' assertions that are based on a single benchmarking study produced by the Lawrence Berkeley National Laboratory that uses as its primary comparative metric the so-called levelized cost saved of energy, or CSE. This metric presents an energy efficiency program's present value life cycle cost divided by its future estimated kWh savings.

At first blush, CSE appears to be a straightforward metric with a veneer of analytical rigor. However, there are three main deficiencies that render the results meaningless and unusable.

First, CSE omits demand savings; arguably the most important benefit of all DSM programs, including those of energy efficiency.

Second, it ignores the impact of unrecovered revenue requirements -- a vital consideration if the

Commission doesn't want DSM to drive rate increases for customers. And any truly representative metric must reflect all costs, including unrecovered revenue requirements. For these two reasons, CSE is not a complete or valid metric to gauge or compare DSM programs or portfolios.

The third deficiency is with LBNL's execution of the study itself, which suffers from many of the typical problems inherent in DSM benchmarking as well as major data integrity problems.

It's not clear whether Ms. Mims and Mr. Woolf are suggesting that FPL's costs are high in general or just that FPL's programs have high CSEs. However, the latter is not a valid metric, and FPL emphatically denies that it's the former. FPL has a long track record of effectively controlling costs, including those for DSM. In addition, the Commission routinely reviews the costs for FPL without any findings that would support such contentions of high costs.

My final topic concerns assertions by Ms. Mims and Mr. Woolf regarding the appropriateness and completeness of the utility's 2009 technical potential study and 2014 update. Ms. Mims' issues are essentially procedural quibbles mainly centered on the decisions that were made in last year's staff informal meeting and

later confirmed in the Order Establishing Procedure.

Ms. Mims tries to reopen debate on the acceptability of the 2009 study and, by extension, the 2014 update, a process which all parties agreed to in order to save substantial time and expense. And SACE was an active participant in that decision process.

Ms. Mims also tries to shirk the State's duty to provide data for the new measures submitted for consideration. SACE submitted a lengthy list of measures but without data.

The FEECA utilities evaluated the SACE provided measures when no further information was needed, but were unable to do so where SACE didn't provide the relevant information.

Mr. Woolf just rehashes assertions made by other Intervenor witnesses back in 2009. However, because the 2009 study was thoroughly debated and then accepted by the Commission, there's no reason for the Commission to revisit these assertions here.

The reality is that the FEECA utilities conducted a thorough update of the 2009 study, adding 25 new measures that were already -- to what was already an extensive list.

This concludes my summary. Thank you.

MR. BUTLER: Thank you, Mr. Koch.

I tender the witness for cross-examination.

CHAIRMAN GRAHAM: Okey-doke. OPC.

MR. SAYLER: No questions.

CHAIRMAN GRAHAM: Department of Agriculture.

MR. HALL: No questions.

CHAIRMAN GRAHAM: NAACP.

MR. DREW: No questions.

CHAIRMAN GRAHAM: FIPUG.

MR. MOYLE: We have a couple, Mr. Chairman.

EXAMINATION

BY MR. MOYLE:

Q Sir, I want to just kind of understand, make sure I'm clear with respect to FPL's position on solar. And I know you've said you don't think the current solar program is cost-effective; correct?

A That's correct.

Q Okay. And then in your summary you said that with respect to what FPL would propose, that you would anticipate that being filed in the upcoming DSM measures docket; is that right?

A It would be filed with the DSM program plans, which would be the programs that are to support the goals.

Q Okay.

A They're established by the Commission in this

part of the proceeding.

Q Right. That's kind of phase two of this process; is that right?

A Correct. That's right.

Q Okay. And then just so I'm clear you had, in your direct testimony you talked about FPL filing a petition for solar. Is that the same thing or something different?

A That's something different. That petition for solar was for the -- let me see if I can get this right -- the Voluntary Solar Community Participant Project. Sorry. I'm missing some of the acronyms for VSP. But, but that particular proposal was for a program where FPL would install community solar and it would be paid for by participants who wanted to voluntarily contribute towards it. And I think, if I'm remembering correctly, the staff rec for that is due at the end of this month, and next month you're taking it up at agenda. At least that's how it's scheduled.

Q Okay. So when I had asked you whether -- previously when we were talking about this I'd asked you had that petition been filed. I think you told me, no, it had not.

A That was a mistake if I said that.

Q Okay. All right. So two different things --

one is a petition that's in process, and the other is your anticipated plans on, on solar that would be part of this process; is that correct?

A That's correct. This, this one would be for an R&D project.

MR. MOYLE: Okay. Thank you. That's all I have?

CHAIRMAN GRAHAM: Sierra Club.

MS. CSANK: A few questions, Mr. Chairman.

CHAIRMAN GRAHAM: Sure.

EXAMINATION

BY MS. CSANK:

Q Hello below, Mr. Koch.

A Good morning.

Q How are you?

A Okay. How are you?

Q I have a few brief questions. We've talked a lot about low income communities within FPL's service territory.

Are you familiar with so-called gap customers? In other words, individuals who may be over the, the threshold as we define low income here in Florida but who may still be, you know, the working poor struggling to make ends meet?

A I'm not familiar with that terminology

particularly as it relates to DSM programs. But I would say that the definition of low income customers isn't something derived for Florida. It's something derived from the federal government, either 150 percent or 200 percent over the poverty limit.

Q So just to help us understand, in terms of FP&L's low income programs, do you use that federal criteria then for, for customers to qualify for that program?

A That's correct.

Q So if someone were just above that criteria, they wouldn't be eligible?

A When you say they wouldn't be eligible, all customers are eligible for every FPL program. But in the particular one program which we offer for low income weatherization, that's determined based on the guidelines that are provided through the weatherization assistance program agencies, and that's based upon their criteria which is established by DOE.

Q So, in other words, you don't have a program specifically targeting sort of the next tier of, of consumers who have a slightly higher income than what federal government defines as low income?

A Not specifically targeting them. But as I said, every program is available to every customer, and

even those who are identified by that criteria as being low income do participate in our other programs as well as the one that's particularly targeted to low income. And I would add I'm also not aware of other companies who target that segment, but that's just something I'm unfamiliar with. If there is, that's somewhere else in the country.

Q And would you agree that for that particular segment of your customers it would be more difficult to achieve? They might not have the financial resources to adopt energy efficiency programs or energy efficiency measures without some aid through programs?

A I would have no basis for knowing whether that particular group of customers as identified in your premise would have more or less ability to participate in FPL's programs. We have no information on that.

Q So you have no information on that?

A That's correct.

Q Thanks for the clarification.

So then going back to the two-year payback tool as a tool for screening out free ridership, do you consider, for instance, the kind of flip side of the coin, right, there's the free rider concept of people who would do it anyway, but then there's the so-called free drivers, right; the people who, as a result of

these programs, are then incented to do more energy efficiency measures?

MR. BUTLER: I'm going to object to this line of questions. I don't think it relates to Mr. Koch's rebuttal testimony.

MS. CSANK: Mr. Chairman, we just heard from Witness Deason that Witness Koch is the one who can help elucidate more the two-year payback tool and Commissioner Balbis's questions about it. And so I submit that it is relevant to this particular witness.

MR. BUTLER: All right.

CHAIRMAN GRAHAM: Continue.

MS. CSANK: Thank you.

THE WITNESS: Could you repeat the question?

BY MS. CSANK:

Q So to repeat the question -- yes, of course.

So this concept of a free driver, just to clearly define it, is an individual who, as a result of your company's program offerings, you know, gets more excited about energy efficiency, gains more information, and wants to do more energy efficiency measures specifically because you offer the program. Are you familiar with that concept?

A In general terms, yes.

Q And do you have any data or empirical analysis

that tries to valuate how much of that there is in the marketplace?

A No, we don't.

Q So there's no analysis to see, one, how many free riders you actually have and, two, how many free drivers you have who would offset that; is that correct?

A There's no specific analysis other than what we talked about when we were looking at the adoption curves the other day. But there's no specific Florida analysis where we are trying to further evaluate free riders or free drivers as you have defined it.

MS. CSANK: Thank you, Mr. Koch. That concludes my questions.

CHAIRMAN GRAHAM: Thank you.

SACE.

MS. TAUBER: No questions, Mr. Chairman.

CHAIRMAN GRAHAM: EDF.

EXAMINATION

BY MR. FINNIGAN:

Q Good morning, Mr. Koch.

A Good morning.

Q Mr. Koch, I have some questions about the recommendation you made in your rebuttal testimony about a solar research and development project.

A Okay.

Q And I'm not sure I understand the rate treatment that you would propose for that project. Are you recommending that this be part of the FEECA program for FP&L such that just like today there's a solar pilot that pays $2 as an incentive for the installed capacity -- this would change to a research and development project, but it would still be part of the FEECA program -- or are you recommending that it be something outside of the FEECA program?

A I think you're referring to whether -- so the answer, the short answer to your question is, yes, it would be part of FEECA or part of our DSM programs.

Q Okay.

A So that's the, that's the recommendation.

Q So would the same process apply then that just as for the current solar program the Commission established a goal for how much should be spent on the solar project, are you recommending that that continue and that for your research and development project the Commission also should establish the funding level as it did for the current program?

A That's not the nature of what we were proposing here exactly. What we were saying is that we would come back during the DSM plan phase and provide a, all the parameters associated with cost, the exact

nature of the R&D, exactly what would be studied, how it would be implemented, how many installations we were envisioning. Those types of details would all be part of that package at that point in time.

Q The way I understand this, the way the process works is that this is a two-stage type of process, and that in this stage of the process the Commission establishes the overall goals for the utilities' program. And then the next stage of the process we all come back at a later time and that's where the program details are developed and approved. Is that how you understand it, or is it some different process?

A Yes. That's, that's how I understand it.

Q Okay. So if this is the stage where the Commission would establish the overall goals for the program, the way I think about it is that they would establish a funding level like they did five years ago, and then in the second part of the proceeding is where we would come back and you would propose all these program details that you just mentioned. Is that how you conceive of it, or do you have a different thought?

A Not exactly. I would say that it's at the Commission's discretion if they are interested in the concept, if you are interested in the concept, then you would provide direction to the company as to exactly

what, what parameter you would like it to fall within. That may be a funding level. It could be, it could be anything. I think it's at the Commission's discretion.

Q Okay. So that would be part of this stage of the proceeding.

A If it was deemed necessary to be part of that. It may be a broader type of message to come back. I think I'm getting a little into the legal side of things, which I might not have direct expertise in.

Q Well, I know you said that if it's necessary, it'll be part of this proceeding. But I'm just talking about your recommendation. You recommended this R&D project, didn't you?

A Yes. And we recommend -- what we're recommending is the concept. That's what we're putting for Commission consideration. And if the Commission says, yes, proceed, proceed with the concept, then we would come back with a fully, fully designed proposal for the Commission's consideration at that point, which may result in modifications, it may result in approval of that, et cetera.

Q Okay. And I just want to ask some questions about the scope of the research and development project.

And would you please turn to page 3 of your rebuttal testimony. Is that where you describe some of

the parameters that could be considered for the R&D project?

A Are you referring me to a particular part of page 3? I mean, I could scan through it quickly.

Q Yes. You have some testimony there where you -- it begins -- and I apologize. I don't have the line number. I don't have that in front of me. But it size, "To ensure the full range of locations and types of locations are covered, FP&L expects that it would need to place several distributed PV systems of varying size throughout the service territory." Is that -- that's what I wanted to reference is some of those parameters. Is that --

A Uh-huh. Yes, that's correct.

Q Okay. And so when you say "full range of locations," why is it important to study a full range of locations and what do you mean by full range?

A What I mean by full range is that this would be distributed all the way up to utility scale, so we're talking about small distributed, large distributed, or larger distributed, I guess would be a better way to say it, up to a central station or large scale PV installations to observe what is the impact on the grid. That's the direct intention of this, the scope of this particular project is to discern the effects on the

grid.

Q Okay. And so I take it that if you're studying the impacts of solar on the grid, one reason you would need to consider a full range of locations is that you would need to examine things like what the amount of cloud cover is in a particular area, the amount of tree cover, the angle at which the panels are installed relative to the sun, the geographic location, you know, north, south, or what direction they're installed in. Do those all sound like reasonable parameters you would want to test for when you describe the full range of locations and types of locations?

A Actually not, so thanks for asking that question. What we're really talking about here, and let me give an illustration, is we've been doing field testing now, you know, quote, unquote, for almost four years with distributed PV through the pilot programs. We do have some central station in Florida; FPL has 110 megawatts, as you all know, of central station generation as well.

What we're looking at here is trying to examine, and I'll give a specific one, let's say voltage fluctuation. If you have a large concentration of PV on a circuit, you're going to have when the PV is on, voltage is up. When the PV is off, voltage is down. We

have electromagnet -- electromechanical equipment which today regulates that voltage: Regulators, capacitor banks, load changer taps, that kind of thing. And those are designed to operate a certain number of times over their life. Well, with the voltage fluctuations that has been seen elsewhere in places where there's concentrated, where solar is concentrated on a circuit, you'll see a lot more operations of that and it may even require a different mitigation strategy to regulate the voltage on the circuit so that reliability isn't negatively impacted. That's the type of thing that we're trying to study, not so much the installation of the PV and its affect on output from the PV. I think we've got a pretty healthy amount of information related to that right now.

Q Okay. And from this healthy amount of information you have right now, have you discerned whether distributed solar provides any benefits to the grid?

A Excuse me. I couldn't hear the last part of your question.

Q From this healthy amount of information that you say you have from testing it over the last four years, have you determined whether distributed solar provides any benefits to the grid?

A I would say at this point we haven't established -- could you give me an example maybe of the benefits you're referring to and then I could answer that more specifically.

Q Sure. I'll give you an example of a few that I've heard about, and one is avoided distribution, transmission and distribution system costs. For example, let's say that the company, the company's planning engineers determined that here's a distribution line or here's a substation that needs to be upgraded because we have increased load on this facility and here's the cost of doing this upgrade. However, if we looked at reducing the load on the distribution circuit through things like distributed solar or storage, things of that nature, then that would eliminate the necessity to upgrade the distribution system and it might even be less expensive. And so that deferred or avoided cost of upgrading the distribution system would be considered a benefit because it saved ratepayers money in terms of paying the higher cost of rebuilding the distribution circuit or the substation.

So that's an example of one type of benefit. I was wondering whether you had tried to measure any of that during the four years of extensive study that you just mentioned.

MR. BUTLER: I'm going to object to the form of the question. It's assuming a lot of facts not in evidence. But I don't have a problem with Mr. Koch answer it, if he can.

THE WITNESS: So what I would say is that those types of benefits, for the most part of what I understood them, are already accounted for in the cost-benefit analysis that we do. We have avoided transmission, we have avoided distribution assumptions. And so every one of these solar pilots when they're tested for cost-effectiveness, those costs are on the benefit side of the ledger. So I would say that those have already been factored into the programs as we've evaluated them at this point.

BY MR. FINNIGAN:

Q I understand that you made assumptions for those values, but I'm wondering if you had the benefit of a study that was done in your Florida service territory that did any kind of a rigorous measurement of actual installed locations of distributed solar at different points along your distribution circuits and different areas of your service territory where you could point us to some report that was the culmination of all that research that measured what those benefits are?

A I can't point to a specific report like that because we haven't done it. I would say that a number of these instances you're describing would be specific to a given circuit and not necessarily generically applicable to the network.

Q It may be generic to a circuit, but it would be applicable to the network because when you have to do a distribution circuit upgrade, that goes into all -- I'm asking, Mr. Koch, is that it would be generic to your whole service territory because if you can install distributed solar and it reduces the cost of the distribution circuit upgrade, that saves rates for everybody.

A I agree. And I said, and as I said, that's in the mix right now as far as the cost-effectiveness evaluation. There is avoided benefits for transmission and distribution included in the analysis.

Q I understand, and you mentioned that just a moment ago. But you said that those numbers that you used in your analysis do not derive from a study that you can point us to that studies the location of many different installations on many different distribution circuits throughout your territory. Or if you do have such a study, please refer us to it.

A So as I said, we don't have a specific study

that was location by location that demonstrated the installations customers made, did not necessarily avoid something at their specific household. We didn't shrink the size of the wire or anything of that nature. We didn't have something where we didn't upgrade that particular circuit. The -- but the fact that there is more generation available on the system, we applied using the budget for, a certain portion of the cost of the budget for doing upgrades was what was the basis of the T&D benefits which were assigned to every one of the, it was assigned in the cost-effectiveness analysis. Excuse me.

And, I mean, if you want to -- I'm not -- if you want to explore the exact details of those, I mean, Dr. Sim could speak to that. But, again, they're not going to be based upon a specific analysis of point A, point B. They're going to be based upon broader assumptions in terms of the costs for upgrading the system, and a certain portion of that being deferred or avoided, excuse me, by the installation of PV.

Q Mr. Koch, when you made your recommendation for an R&D study, did you try to investigate whether any such studies are underway in other states?

A The reason for focusing on this is that in some other places this is becoming a problem with a

higher concentration of PV. It's not something we're experiencing at the moment right now in Florida, but it's something that would be useful for being prepared for the future because we all expect that there's going to be more PV installations made by, by others as we go forward in time. And so this is getting us prepared for what that might be to make sure that we better understand what are the costs and benefits of solar. So that's the reason for it being a research proposal, an R&D proposal, to gather that information which is useful for all applications of, of PV.

Q I was just wondering when you made your recommendation to do this study here in Florida you investigated whether any such similar studies are underway in other states?

A I personally did not investigate if the studies were underway. The part of the FPL that examines reliability of the network is the ones who were -- who had identified this as a potential issue that FPL customers could face, and, therefore, that was the reason for, for bringing it forward. And, again, right now we're at the conceptual stage moving forward a complete design of the R&D program during the plan phase.

Q And I accept your statement that you did not

personally investigate whether any such studies are underway in other states, but did you receive any information that other studies are underway in other states?

A I understand that there's other studies underway in other states. There's also -- because of the experiences they're having, the issue here is that those lessons or that information may or may not be directly applicable to FPL's network. And so the information, the idea of the R&D project is to gain Florida-specific information as far as those impacts are concerned on the network as we're configured here.

Q Yes. I, I understand what you're saying there, that it's important to do a Florida-specific study. I, I understand that.

Now the way you have proposed the study is that the solar installations will be owned by the utility?

A That's correct.

Q Would they go into your rate base?

A They would be part -- the costs of the facilities would be part of the program that would be collected through the ECCR clause.

Q Okay. So none of this would go into rate base?

MR. BUTLER: I'm sorry. I'd ask -- excuse me -- EDF's attorney to clarify his question, what he's referring to as going into rate base.

MR. FINNIGAN: Sure.

BY MR. FINNIGAN:

Q The way I understand it is that the conventional treatment when you make a capital expenditure is that that goes into your rate base and then you earn an allowed return on it. Are you familiar with general ratemaking principles for that kind of treatment of capital expenditures?

A Yes, as far as base rates are concerned. The treatment of capital expenditures from an accounting standpoint is no different whether it's in -- the costs are collected through rate base or whether they're collected through the ECCR clause.

So the treatment from an accounting standpoint would be the same, so it'd be part of the assets of the company obviously, but the collection of the costs related to the revenue requirements would go through the clause in this case as opposed to going through base rates, if that's your question.

Q Do you earn any allowed return on your FEECA expenditures or is that just an expense?

A For the capital expenditures that are

collected through the ECCR clause there is a return. It's treated exactly the same way as any capital expenditure is for collection purposes.

Q What, what is an example of a capital expenditure that you currently have in your FEECA program that goes into your rate base?

A Again, I want to be clear that rate base in my mind has to do with base rates. It's part of our assets. But in terms of answering your question, a couple of illustrations. The transponders that we use for load management, those are capital expenditure items and are collected through the clause. And the revenue requirements are collected over, in this case, a period of five years. That's one example of the type of capital expenditures that we have that go through the clause today and have for, you know, many years.

Q So the utility's recovery of costs might occur over a different period of time than the way the programs are evaluated. For example, if the programs were evaluated using a two-year period, that may not coincide with the rate recovery of those items.

A I'm not sure I understand the question.

MR. BUTLER: I'm going to object to the form. I'm not sure what counsel is referring to as evaluated over a two-year period.

MR. FINNIGAN: I'll withdraw the question. Thank you.

BY MR. FINNIGAN:

Q So going back to your program design, you propose that the equipment should all be owned by the utility. Would it be possible to design this type of R&D program where you could continue to pay an incentive to the customer but, as a condition of that incentive, you would require the customer to make their solar unit available to the company for the research and development?

A If -- are you asking about -- excuse me. Are you asking about continue -- is your premise continuing the program, the rebate, a rebate type of program, and then just ask them to -- I'm not sure certain what "make available to the utility" means, but is that the premise you're questioning?

Q Yes, that's the basic premise. I wasn't suggesting that the incentive be kept at the same level. I think it needs to come down or be changed. But it's the same concept that you just described is exactly what I was trying to answer -- or to, to put to you as a question for you to answer.

A Okay. So I would say the answer to that is, no, that wouldn't make sense for a couple of reasons.

The first reason is that we've demonstrated that there's no level of incentive that can actually be cost-effectively paid to customers, and that's, that was in my direct testimony. So the program can't support anything as far as an incentive because there's just not enough benefits to support any level of rebate.

The second thing is that it kind of exacerbates the problem of the customers who are participants, the small handful of customers who are participants who really don't bear the fair share of fixed costs of the network by the nature of the way that they are, they are paid. That would continue on with these customers, and it's a cross-subsidy which would continue to exist. So we think that that cross-subsidy doesn't make sense to continue going forward, so it would be perpetuating that, that issue as well.

The third issue is that the key for, for getting, for evaluating these impacts, reliability impacts is that we get a concentration of solar on particular circuits for customers selecting -- they're not going, we're not going to be able to generate that level of concentration on a circuit. So that's the reason for the, another reason for the utility ownership is to make sure that we've got enough concentration so we can see the effects on the circuit, and we're not

going to get that just by customer-selected installations.

Q Well, you know, I just asked would it be possible to design a program. And let me just put this to you that let's say under your proposal where you've got a million dollars to spend -- this is a hypothetical -- you've got a million dollars to spend on a utility program, and the utility picks ten circuits where it wants to see the solar projects go in, and it's going to cost a million dollars and it's all utility owned. One alternative would be to design the program that the company would pay incentives to customers, but it would have to be customers that live on these ten circuits and the incentives would be for the same number of installations. And I'm just wondering would it be possible to design a program that way where it has the same level of spending that you have proposed for your utility-owned program, and the only difference would be that instead of utility ownership, you would pay out the money as incentives to customers at some amount of incentive, but that you would only pay it to customers that live in the same locations where you were otherwise going to test the equipment for your utility-owned program? And I'm just asking would it be possible to design a program along those lines and get similar

results in terms of being able to test the locations that you think are important tests?

A I think the answer is that it has to do with a cross-subsidy that is paid by the vast majority of the rest of us to kind of a select few who would be installing these. If they're utilizing the energy on their premise, then there's going to be a cross-subsidy that's occurring there because they aren't covering the fair share and it exacerbates that problem. And so that would be the reason why it makes sense for the utility ownership -- there will be some on customer premises, you know, definitely, but there would be some sort of, for lack of a better term, hosting fee amount, you know, that would be paid probably to them to encourage them to participate. Just like when we do R&D, we always pay something to somebody who participates in the R&D project for allowing us the ability to conduct the testing.

Q Okay. So let me see if I understand the difference then. So you're saying that in your program, the utility-owned, there are no subsidies. Even though all this money that's collected from customers on their bills for the FEECA program would go to the utility for paying for these solar installations, there would be no subsidization involved if the program were designed the

way you have recommended it.

A That's correct. There would be no, there would be no winners and losers between customers. All customers would bear the cost of the program. All customers would receive the benefit of, A, the learnings that came from it, and, B, obviously the reduced fuel expenses by virtue of the fact that the PV is generating that. So all customers share in that equally as opposed to some getting a disproportionate share.

Q But if -- the utility-owned program would benefit certain customers, wouldn't it? For example, if I owned a Best Buy store and as part of your utility design program, utility-owned program you put the solar panels on my store, that might benefit me in some way even though the energy would be wired to go back to the utility system. Just having the solar panels on my roof might be a benefit for my store, wouldn't it?

A I think you get the benefit commensurate with the fact that you're willing to host the PV facilities.

Q Okay. Now I want to change the subject a little bit and talk about the level of the incentive that's paid for the current program, the $2 a kW.

A Okay.

Q And is there anything written in stone that says the incentive has to be $2 a kW?

A Not written in stone. I mean, it's obviously part of the program standards. But that -- as the program is designed and then approved by the Commission.

Q Okay. And when you say program design, the utility plays a role in designing the program, doesn't it?

A Absolutely.

Q Okay. And since the program was initially approved a few years ago, at the start of the program what was the installed cost of solar per kW?

A If I use a residential example, I think it was, in 2011, about $5,400 per kW.

Q Okay. And what is it today?

A For residential, as of the end of 2013, it was $4,100 per kW.

Q During that timing has the company ever come back to the Commission or other stakeholders saying that we think it would be appropriate to redesign the incentive?

A No, because -- no, we have not.

Q Okay. And is part of your role in managing this program, do you look at best practices that are in place among other utilities across the country to understand what they might be doing well in their states that you might be able to apply to Florida?

A Yes.

Q And in so doing have you seen any innovative incentive programs to encourage more deployment of things like renewable energy and energy efficiency?

A Could you repeat the question?

Q Yes. Through your investigation of best practices by other utilities, have you come across any innovative incentive programs that allow for the same or more deployment of clean energy at a lower or redesigned or alternative kind of incentive payment?

MR. BUTLER: I'm going to object to the question -- I've let it go for a while -- but this really goes well beyond the scope of Mr. Koch's rebuttal testimony. He has two or three pages in his testimony proposing the outlines of a solar R&D project. He's been asked several questions about that, which was appropriate, but at the moment it doesn't seem to have anything to do with the solar R&D project.

MR. FINNIGAN: Your Honor, the only reason I'm asking these programs -- or these questions about the program is that Mr. Koch made a recommendation, and his recommendation is that the company adopt this R&D program. And the suggestion in his recommendation is that this is the only way they can do it. And I'm trying to explore, as part of his recommendation for

this R&D proposal, did he explore different incentives that might have been a better alternative than the R&D proposal?

CHAIRMAN GRAHAM: I'll allow the question.

THE WITNESS: The answer is, yes, we looked at different incentive levels. But the bottom line here is that zero incentive is supportable, and I think I actually have a table in my direct testimony that shows that it's underwater. And so there's no level of incentive that cost-effectiveness can support.

BY MR. FINNIGAN:

Q I understand that's true the way that you measure the benefits attributable to solar, but I'm wondering did you look at an incentive that could be paid out as an energy, a credit on the customer's energy charge as opposed to a capacity charge? This is a capacity incentive, isn't it?

A No, it's not.

Q Explain to me the $2 per kW. Is that considered a capacity incentive or an incentive based on capacity or energy?

A The incentive is based upon -- so let me answer it in two parts because I think you're confusing if the incentive is expressed in a dollars per kW, the answer is, yes, that is how the incentive is expressed.

However, the derivation of the incentive didn't have to do with just how many kW. It had to do with looking at the -- it looks at cost-effectiveness. So it includes both energy and demand impacts of solar.

Q I guess we're talking about two different things.

A I think we may be.

Q How it was calculated and how it was expressed. And if I'm a customer, the only thing I see is how it's expressed; right?

A You're going to see it in a per kW basis. That's correct.

Q Okay. And that's, that's what I want to ask you about in this line of questioning is how it's expressed to the customer.

A Okay.

Q So did you consider developing a different type of incentive that would be based on energy generated by the solar facility as opposed to a capacity type incentive?

A So my answer would be cost-effectiveness is cost-effectiveness. It doesn't matter the form of the incentive. If the incentive results in a dollar, it results in a dollar. If it results in $10, it results in $10. And I'm saying that zero dollars is supportable

regardless of the structure by which a customer would be the incentive.

Q I'm just -- I understand your testimony about cost-effectiveness. I think you've mentioned that more than once. I'm just asking whether you have examined the use of different incentives like the type I just described, one based on energy usage?

A We looked at different alternatives and incentives at the original time. This was the most readily understood by customers, readily measurable, capturable, that kind of stuff. And that is what we chose, which actually was the typical standard and, for the most part, remains the typical standard of how people are paid for PV under these types of programs, recognizing there's always differences in program design and structure. But this was the most straightforward approach, and that was the one we selected.

Q I understand that might have been the most straightforward approach, you know, four, five years ago when this program was developed. I'm just wondering whether now when the program is up for reconsideration you've taken another look at different kinds of incentives that could be paid.

A No, because, again, no incentive is cost justifiable, so it doesn't matter what the form would

be. So we did not spend time trying to come up with a different way to skin the dead cat, for lack of a better.

Q Well, I guess when this program was initially approved, as I understand it, the Commission concluded that there was not a demonstration of cost-effectiveness five years ago, yet the Commission was cognizant of the Legislature's goals to promote renewable energy and approved the program anyway; right?

A Without attributing too much of my thinking onto what the Commission might have been thinking, yes, it was well understood that these programs were not cost-effective at the time. They were set up as pilots I think specifically for that reason, to see -- because there was some discussion at that point that the costs would come down and maybe things would improve and it might make sense to encourage it, as well as the fact that there was the recently modified legislation at that moment. However, at this point we've confirmed, not only from studies but from actual practice, what the real situation is. And so that's why it was my testimony that as the programs were designed to expire, we've learned what we were going to learn from them, and there's really no reason to continue perpetuating, perpetuating the cross-subsidization from the general

body of customers to, you know, the select few who actually receive the benefits.

Q Did, did costs come down and did conditions continue to improve in that regard?

A Costs did come down, but it's not specific to Florida that the costs came down. We came down the exact same amount everybody else did. So it's improved, but it's not even remotely close to where it would have to be.

Q And are you able to say that if Florida was taken out of the market, that the costs would have come down the same amount nationally without any participation from Florida or -- let me, let me strike that.

So the fact that whatever happened in Florida regarding deployment of solar had no impact on the national decline in prices for distributed solar.

A I would say this, a couple of points. First of all, there were lots of -- there was almost the same amount of solar was being installed before these programs were instituted, as is, as continued through the pendency of the programs. So there was some bump up in the number of installations, the costs did come down, but it's, it's exactly the national trend. I don't believe that Florida's installations affected the

national outcome. You know, we've seen largely, widely publicized information on Chinese panel pricing, et cetera, et cetera. These are the impacts that affected things. So -- and we definitely believe that after the sunsetting of these programs you're still going to see the program -- excuse me -- PV installed. Clearly, customers are installing it for reasons other than financial. So they did before, a number of them are doing it now, and, you know, they'll do so in the future, and that is perfectly fine.

The real question is who's going to pay for it? Should the general body of customers be on the hook for that, or should we just let the market dictate with people installing as they would based upon, you know, the costs that they bear, or should it be subsidized by the, you know, 4.7 million of us to, you know, a few hundred? That's really the question, I think. And the answer is that we did not affect that outcome by virtue of paying these rebates.

Q Okay. And have you seen any reports about the projected trend for cost of distributed solar?

A Yeah. We expect the cost of distributed -- well, all forms of solar to continue to decline.

Q Okay. And at some point would it be reasonable to assume that the cost of distributed solar

may come into parity with the company's rates?

A There is, I guess, a possibility that that could happen, but that would probably be many years into the future.

Q How many years?

A I, I don't know.

Q I'm sorry. I thought you just said that you looked into those kinds of projections about declining solar costs.

A Okay. So maybe I should answer it this way. In order for some -- for it to pass RIM -- I may have even -- let me see if I did that calculation. It's probably going to have to decline, you know, more than 50 percent from where it is today. If you want to bear with me, if I can see if I actually calculated that, provided that.

Right. So what we were saying here is even just based on the Participant test it would have to drop by more than 50 percent today in order to just pass the Participant test, let alone the RIM test.

Q And some of the witnesses have described that the costs are declining at the rate of about 20 percent per year.

A I would totally disagree with that. We saw a 25 percent decline from 2011 to today. That's not

20 percent per year.

Q Okay. Well, I guess the numbers will speak for themselves. But if it's 20 percent per year or 20 percent over a couple of years, that's a pretty rapid rate of decline, isn't it?

A I don't accept your premise. It's, clearly it's a rapid rate of decline, but it has nothing to do with the price of PV.

Q Okay. Well, that's what we're talking about, isn't it, the --

A Yeah. But you made up the statistic. The decline has not been 20 percent in, nationally nor in the State of Florida per year.

Q What has it been?

A 6 percent roughly.

Q What was the cost of the residential distributed solar at the beginning of the program?

A $5,400.

Q Okay. What is it today?

A $4,100.

Q Okay. And that's a 6 percent decline?

A Per annum. You asked me per year. I said it's 25 percent over the pendency of the program, which has been three years.

Q Okay.

A So, in essence, 25 divided by three is where I came up with the six.

Q Okay. But do you accept that there have been some other estimates and, in fact, other utilities have reported steeper --

A Let me correct that thing because I see Commissioner Balbis saying good job of math in your head. Okay. But it was slightly less than 25 percent, but, yes, maybe more closer to eight. I think our forward projections for FPL are more in the six range. Sorry. I should have corrected that.

Q Okay. So anyway, getting back to the incentives and you said that you have studied best practices that other companies use in other states for incentive design. That's something you've investigated?

A I would characterize it as differences. I wouldn't characterize it per se as a best practice. If somebody is doing something different doesn't mean it's a best practice just because it's different.

Q Okay. Are you aware of a program that's available in Georgia called the Advanced Solar Initiative where Georgia Power pays out 13 cents a kilowatt hour to customers who install solar and participate in the program?

A I'm not personally aware of the details of

that program. It sounds like a standard feed-in tariff based upon the way you've described it. But what I would say here is what matters is what makes sense in the State of Florida, what is cost-effective based on the conditions of our system, the costs of our system, and not what happens in some other state where there would be many other conditions that could impact it. It could be something where there's a regulated reason why they, they set a goal for something to happen. There could be higher costs, there could be avoidance of other things, there could be a difference in all sorts of assumptions that go into it. But based upon the numbers that relate to FPL directly, you know, no level of incentive makes any sense.

Q Okay.

A And certainly nothing of the nature you described.

Q Okay. But just so we're clear, you say that without having the benefit of the study done on your Florida territory that measures the benefits that distributed solar would provide by studying all -- a number of different locations on a number of different circuits and evaluating what those benefits might be in a report that you could share with us.

A I would say I agree that there's no report,

but I disagree with the premise of your question.

MR. FINNIGAN: That's all I have. Thank you, Mr. Koch.

THE WITNESS: Thank you.

CHAIRMAN GRAHAM: Staff.

MR. MURPHY: No questions.

CHAIRMAN GRAHAM: Commissioners.

Redirect.

MR. BUTLER: Thank you. Just very briefly.

EXAMINATION

BY MR. BUTLER:

Q Mr. Koch, you were asked by Ms. Csank about the, some questions about low income customers and programs available for low income customers. Do you recall that?

A Yes.

Q Do you have any information on the level of participation by low income customers in FPL's existing demand-side management programs?

A The low income customers participate roughly at the same level in most of the programs that the remainder of the customers who are not classified as low income do. And regarding load management, they're kind of even a higher share in the load management program. I think we spoke about that during my direct testimony.

Q Thank you. And would you please comment briefly on what FPL does in the way of making information on those programs available to low income customers?

A Sure. Obviously one of the ways is the home energy survey. We deliver that either in person or over the phone or online. That includes many low cost, no cost types of activities that could be engaged in, as well as obviously promoting FPL's programs. We have things that are outside of DSM such as participation in LIHEAP where we provide assistance for electric customers. I think it's about 180,000 of those over the past couple of years where we've, where we have assisted with paying the electric, electric service.

Obviously we have the one program that is directly targeted at low income customers which deals with air and filtration measures and air conditioning measures to make those more efficient for customers. And then we've also gone and done sort of neighborhood sweep type of programs as well where we'll go in and offer to kind of run through the house and, and install many sort of low cost type of measures for that, that in addition.

Q Thank you. Turning to the questions that Mr. Finnigan had for you regarding the proposed solar

R&D project, when FPL -- or if FPL is asked to and comes back in the plan phase of this proceeding to propose a specific R&D proposal, what is your understanding about the level of cost for that per year to customers compared to the existing solar pilot projects?

A The level of cost would be, you know, no more than the existing pilot projects.

MR. BUTLER: Thank you. That's all the redirect that I have.

CHAIRMAN GRAHAM: Okay. And I don't believe we have any exhibits, so I guess we're done, Mr. Koch. Thank you very much.

THE WITNESS: Thank you.

MR. BUTLER: Thank you.

CHAIRMAN GRAHAM: We are right dead on our two-hour mark for our court reporter, so let's take a couple of minute break. By my clock back there, let's come back at 11:35, which is about seven minutes. Thank you.

(Recess taken.)

My clock says it's about two minutes past where I said. And I do have a quorum, so let's move on to the next witness.

Florida Power & Light.

MR. BUTLER: Before we do, Mr. Chairman, may I

just confirm that Mr. Koch is excused?

CHAIRMAN GRAHAM: Yes.

MR. BUTLER: Thank you.

MS. CANO: FPL calls Dr. Steven Sim.

Whereupon,

STEVEN SIM

was called as a witness on behalf of Florida Power & Light Company and, having first been duly sworn, testified as follows:

EXAMINATION

BY MS. CANO:

Q And you were previously sworn for this proceeding; correct?

A Yes.

Q Okay. Did you prepare and cause to be filed 93 pages of prefiled rebuttal testimony in this proceeding on June 10th, 2014?

A Yes.

Q Do you have any changes or revisions to your prefiled rebuttal testimony?

A Yes. I have a revision on one page. On page 30, line 16, the second column labeled RIM, the number 504 appears. That number should be 508.

Q Thank you. With that correction, if I were to ask you the same questions today contained in your

prefiled rebuttal, would your answers be the same?

A Yes, they would.

MS. CANO: Chairman Graham, we ask that the prefiled rebuttal testimony be inserted into the record as though read.

CHAIRMAN GRAHAM: We will insert Dr. Sim's prefiled rebuttal testimony into the record as though read.

BY MS. CANO:

Q Did you also sponsor exhibits to your rebuttal testimony?

A Yes.

Q And those consist of Exhibits SRS-17 through SRS-24?

A Yes.

Q Okay. I'd note that those have been premarked for identification on the Comprehensive Exhibit List as Exhibits 142 through 149.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

FLORIDA POWER & LIGHT COMPANY

REBUTTAL TESTIMONY OF DR. STEVEN R. SIM

DOCKET NO. 130199 - EI

JUNE 10, 2014

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 eight exhibits that are attached to my rebuttal testimony:

Exhibit SRS – 17: Benefits (Only) Calculation Comparison: Minnesota VOS vs. Florida Screening Tests;

Exhibit SRS – 18: Incorrect and/or Misleading Statements Made in the Testimonies of Witnesses Woolf and Mims;

Exhibit SRS – 19: A Look at a Typical Screening Curve Analysis: A Generation Option;

Exhibit SRS – 20: A Look at a Typical Screening Curve Analysis: A DSM Option;

Exhibit SRS – 21: ACEEE's LCOE Formula;

Exhibit SRS – 22: Table from NREL's Economic Evaluation Document;

Exhibit SRS – 23: SACE 1% GWh Goal Analysis: A Look at Resulting Electric Rates and Customer Bills; and,

Exhibit SRS – 24: Sierra Club 1% GWh Goal Analysis: A Look at Resulting Electric Rates and Customer Bills.

Q. What is the purpose of your rebuttal testimony?

A. My rebuttal testimony discusses and/or responds to a number of statements and recommendations made by the four intervenor witnesses who filed testimony in this docket: Dr. Fine (EDF), Mr. Rábago (SACE), Ms. Mims (SACE), and Mr. Woolf (Sierra Club) from a resource planning perspective.

Q. How is your rebuttal testimony structured?

A. My rebuttal testimony is divided into three main parts. In the first part, I will briefly discuss DSM solar-related comments, particularly concerning the testimonies of Dr. Fine and Mr. Rábago. This discussion begins on page 5. In the second part of the testimony I will address the testimonies of Ms. Mims and Mr. Woolf. My discussion of their testimonies is organized into four sections and begins on page 26. The third part is my conclusion that begins on page 89.

Q. Please provide a summary of what you will discuss in this rebuttal testimony.

A. Regarding the DSM solar-related comments, mostly found in the testimonies of Dr. Fine and Mr. Rábago, that are discussed in Part I, I find no fault in the fact that none of the witnesses have objected to FPL's recommendation that the solar water heating DSM Pilot programs be allowed to expire as scheduled

at the end of this year. I do disagree with their recommendation that the DSM photovoltaics (PV) Pilot programs be allowed to continue despite the fact that the programs have never been cost-effective for FPL's customers and are not cost-effective today. I point out some misconceptions each witness has regarding FPL's integrated resource planning (IRP) analysis process. I disagree with their recommendation that Florida's time-tested DSM evaluation approach be suddenly thrown out and replaced with a brand new evaluation approach based on the Minnesota Value of Solar (VOS) approach. The reasons for my disagreement with this recommendation are that: (i) this VOS approach is not a cost-effectiveness test, (ii) it ignores well known system cost impacts thus overstating DSM PV benefits, and (iii) it takes a one-sided view of DSM PV. In addition, I discuss that PV applications other than DSM PV would allow FPL's customers to receive both substantially more MW of installed PV, and more PV-generated MWh, for the same expenditure that is being made for FPL's solar Pilot programs.

In Part II, I first point out that the testimonies of Ms. Mims and Mr. Woolf attempt to avoid the obvious facts that: (i) DSM is less cost-effective now than in previous years, and (ii) the increased impact of energy efficiency codes and standards has diminished the market potential for utility DSM. Second, I discuss the fact that the testimonies of Ms. Mims and Mr. Woolf are riddled with inaccurate and/or misleading statements. Through these statements they demonstrate that they clearly do not understand FPL's IRP process. Third, I

evaluate the DSM goals recommended by these two witnesses. In doing so I respond to the over-simplistic mantra that DSM is cheaper than supply-side resources by explaining why a Levelized Cost of Energy (LCOE) analysis is meaningless for the purpose of making resource decisions. I also demonstrate the significant cost impacts to FPL's customers that do not participate in utility DSM programs that would result from the witnesses' 1% reduction in retail sales GWh goal recommendations. My conclusion is that, due to the vast number of problems in their testimonies, and the fact that their recommended goals are both extreme and unsupported, their testimonies do not warrant serious consideration.

In Part III, I explain that adhering to sound resource planning principles for setting DSM goals in the past has assisted FPL in its ability to serve its customers with a high level of generating efficiency, low emission rates, and low electric rates. The intervenor witnesses do not (and cannot) challenge these results. By again using these sound principles in the 2014 goals-setting, Florida and FPL may be described as "out of touch" with what "leading" states are now doing in regard to DSM. However, if being "out of touch" results in a high level of generating efficiency, low emission rates, and low electric rates, then we should be delighted with this description. Florida and FPL should be proud to continue down the path of using sound resource planning principles it has used over most of the last two decades and ignore

the "go along to get along" entreaties from other parties who ask Florida to radically change course.

Part I: DSM Solar Testimony

Q. Please briefly describe the testimonies of Dr. Fine and Mr. Rábago.

A. Both testimonies focus solely on PV applications of solar energy and address the Florida utilities' DSM PV Pilot programs. The messages in each of the two testimonies are similar and can be summarized as follows: (i) FPL and the other utilities should continue their DSM PV Pilot programs after their scheduled expiration at year-end 2014, and (ii) the DSM PV Pilot programs should be evaluated using "value of solar" (VOS) calculations. The recent Minnesota VOS calculation approach is repeatedly pointed to by these witnesses as a model for the type of VOS calculation approach that Florida should use.

Q. Did Mr. Woolf also provide testimony on the topic of the utilities' DSM PV Pilot programs?

A. Yes. Mr. Woolf also recommends that FPL's DSM PV Pilot programs be continued, with modifications, and that the Commission open a separate docket to investigate appropriate demand-side renewable goals and address the role of utility-owned solar PV systems. While my rebuttal is tailored toward responding to Dr. Fine and Mr. Rábago, much of the discussion is applicable to the recommendations of Mr. Woolf as well.

Q. Did any of these witnesses recommend continuation of FPL's solar water heating Pilot programs?

A. No. None of them recommended that the solar water heating Pilot programs be continued. This is consistent with FPL's view that these non-cost-effective programs should be allowed to expire at the end of 2014 as scheduled.

Q. In regard to FPL's PV Pilot programs, are these programs appropriately evaluated as DSM programs?

A. Yes. To understand why, it is helpful to look at the three basic types of PV applications:

1) Central Station PV: Large-scale (MW) PV facilities at one specific location in which 100% of the output is fed into the utility grid. FPL's DeSoto (25 MW) and Brevard County (10 MW) PV facilities are examples of this type of PV application.

2) Distributed Generation (DG) PV: Medium-scale (MW or kW) PV facilities at multiple locations located nearer to load centers (than with central station PV) in which 100% of the output is fed into the utility grid. FPL's C&I Solar Partnership Program that is under development and that was described in FPL's 2014 Site Plan is an example of this type of PV application.

3) DSM PV: Small-scale (kW) PV installation at a home or business premise that is primarily intended to serve all or part of the customer's load (as any DSM measure does) and the remaining portion, if any, of the PV output is fed into the utility grid. FPL's DSM PV Pilot programs are examples of this type of PV application.

Because a substantial majority, if not all, of the PV output serves to lower the customer's load, DSM PV programs such as FPL's PV Pilot programs impact FPL system similarly to other DSM programs.

Q. Were FPL's PV Pilot programs and DSM PV measures evaluated in the same manner as all other DSM measures during the IRP analyses performed for this docket?

A. Yes.

Q. What were the results of those analyses?

A. All of the DSM PV Pilot programs and DSM PV measures, as well as the DSM Solar Water Heating Pilot Programs and DSM solar water heating measures, failed both the RIM and TRC preliminary screening tests.

Q. Were these results in the 2014 analyses similar to the results from earlier cost-effectiveness analyses performed in 2010, when the Pilot programs were introduced, and in the years between 2010 and 2014?

A. Yes. The 2014 result is consistent with the 2010 analyses and with every annual cost-effectiveness analysis that has been performed since then. In other words, the 'initial' analyses of the DSM PV programs that were conducted in

2010 showed that the Pilot programs were not cost-effective. Five years later, the programs are still not cost-effective. This consistent result of being non-cost-effective in each of these five years is not surprising when considering that, these programs started off as non-cost-effective, and there has been a trend over the same time frame of steadily decreasing cost-effectiveness for DSM measures in general.

And, as Mr. Rábago indicates in his testimony, a trend such as this one is important:

> *"The Companies should focus not just on numbers of systems, dollars, kilowatts, and kilowatt hours. For a pilot program that should translate into a full program, it is the direction that the numbers are moving that is most important..."* (Page 11, lines 15 – 17, emphasis added)

In regard to the DSM PV Pilot programs, the outcomes of analyses performed over the last five years have consistently shown the Pilot programs are not cost-effective. Thus, in Mr. Rábago's terms, the "direction" is definitely unfavorable for the PV Pilot programs.

Q. Is that why FPL is recommending that the DSM PV Pilot programs be allowed to expire at the end of their current program terms?

A. Yes. There is more than enough evidence to conclude that the PV Pilot programs are not in the best interests of FPL's customers. The general body of

FPL's customers is harmed by DSM programs that are not cost-effective and continuing the DSM PV Pilot programs would only result in continuing to harm FPL's customers. FPL believes that its customers can be better served by pursuing PV through other applications. I will return to the idea of pursuing other PV applications shortly.

Q. Do Dr. Fine and Mr. Rábago claim that FPL's IRP analyses somehow short-changed DSM PV, compared to other DSM measures, in the cost-effectiveness evaluations?

A. Yes. One such claim was based on a misconception of the period of time over which FPL analyzed the DSM PV Pilot programs. Dr. Fine states in his testimony:

> *"The utilities used a two-year payback period to determine the cost-effectiveness of the distributed solar PV program."* (Page 22, lines 4 & 5)

and,

> *"I recommend that the utilities use a longer payback period to measure the program's cost-effectiveness that better aligns with the useful life of the distributed solar PV investment." (Page 22, lines 13 & 14)*

FPL did use a two-year payback in the last step of its preliminary economic screening process. However, all of the PV-based DSM measures failed to

survive earlier screening steps and never even made it to the two-year payback screening step. All of the earlier screening steps assumed at least a 30-year life for the PV equipment, not two years as Dr. Fine apparently believes. In addition, the payback screen works in the opposite manner suggested by Dr. Fine – the longer the term of the payback criterion, the fewer the number of DSM measures that survive this screening step.

Mr. Rábago makes another unfounded time-related claim:

> *"...they did not value transmission and distribution cost avoidance during the entire 30+ years that a distributed solar PV system is likely to operate."* (Page 7, line 25 through Page 8, line 2)

Again, this is incorrect. FPL's preliminary screening analyses of all DSM measures, including DSM PV measures, appropriately accounted for projected transmission and distribution cost savings for at least 30 years (with the exact number of years varying depending upon when the DSM installation was assumed to occur).

Q. Do Dr. Fine and Mr. Rábago agree that DSM PV should be evaluated in a consistent manner with other DSM measures?

A. No. In addition to the "input- or assumption-based" misconceptions that DSM PV was short-changed in FPL's analyses, the two witnesses take issue with the entire analytical approach that FPL and the state of Florida have used to

evaluate DSM for several decades. What these two witnesses want is to toss out this time-tested evaluation approach and replace it with a brand new evaluation approach.

Both witnesses are in basic agreement regarding what this brand new approach should look like. As Dr. Fine states:

> *"I recommend that the Commission generally use as a starting point the Minnesota VOS protocol..."* (Page 25, lines 19 & 20)

Q. Have you examined the Minnesota Value of Solar approach and, if so, what was your view of it?

A. Yes. I have examined the calculation approach as described in the document Minnesota Value of Solar: Methodology, Prepared for Minnesota Department of Commerce, Division of Energy Resources, January 31, 2014. The description of the approach, and how it will be applied, lacked detail in certain areas. In addition, it will probably take a few years to see how it actually works in practice in Minnesota. However, I believe the description that was provided gives a pretty good idea of how it was designed to work.

Based on that description, I have two primary observations about this calculation approach. First, it is not a true cost-effectiveness test. Second, it is an incomplete and one-sided compilation of supposed benefits.

Q. Please explain what you mean by your statement that it "is not a true cost-effectiveness test."

A. The objective of a true DSM cost-effectiveness test is to examine the projected system benefits of implementing a DSM measure as well as the costs and cost impacts from implementing the DSM measure. Then, using the benefits and costs information, the utility can determine if it is in the best interests of all of its customers to implement the DSM measure by examining projected "directional" impacts on electric rates and costs. In other words, are electric rates projected to increase or decrease as a consequence of adopting a particular DSM measure?

The Minnesota VOS approach does not meet this standard. It examines only the benefit side of the ledger. For example, it does not appear to account for a utility's administrative costs of implementing a DSM PV program and/or tariff. Nor does it provide projections on what direction(s) electric rates and costs will be driven by implementation of the DSM PV measure.

Instead, the objective of the Minnesota VOS approach is to provide a projection of annual payments that will be made, presumably by the utilities' customers, to DSM PV participants over a 25-year period (with the understanding that new VOS calculations will be performed each year). In other words, it is a "what will a participant be paid" calculation. Thus this VOS calculation is somewhat similar in basic concept to a Standard Offer

Contract calculation. Neither of these calculations is a true cost-effectiveness test calculation.

Q. In what ways is the Minnesota VOS approach an incomplete and one-sided compilation of supposed benefits?

A. There are two major problems with the Minnesota VOS approach that make it incomplete and one-sided. The first relates to the categories of system cost impacts from DSM that appear to be accounted for as benefits in the Minnesota VOS calculation compared to the system cost impacts that are accounted for as benefits in the RIM and TRC screening tests used in Florida. Exhibit SRS – 17 provides a benefits (only) comparison of the two approaches. In other words, this exhibit examines only categories of system benefits and does not address DSM PV-related program costs.

Column (1) lists 10 categories of system cost impacts that, at a minimum, should be accounted for on the benefits side of the ledger in a DSM cost-effectiveness test analysis. As columns (2) and (3) indicate, the first six of these benefits categories are accounted for both in the Minnesota VOS calculation and in the Florida screening tests. The remaining four benefits categories are accounted for in the Florida screening tests, but are not accounted for in the Minnesota VOS calculation.

Among these four categories, there are two pairs of system cost impacts. One pair accounts for fuel-related system cost impacts and the other pair accounts

for emission-related system cost impacts. For either pair, the net impact of the two components is typically a net penalty to the DSM measure being evaluated.

Q. Would you please explain why the net impact of these pairs of system cost categories is typically a penalty for DSM measures?

A. Yes. Mr. Rábago's testimony reflects a lack of understanding of this concept when he states:

> *"FPL takes the position of assessing a penalty against distributed solar PV based on 'avoiding fuel-efficient new generation,' though the basis for this approach is not explained in testimony or response."* (Page 9, lines 23 – 25)

Let me first state that these system cost impacts apply to all DSM and generation options, not just to DSM PV, when a new generator is avoided. I'll explain this using a system fuel cost perspective (the system environmental cost perspective works in an identical fashion). When a DSM option with a non-zero kW reduction is implemented on a utility system (thus getting credit for avoiding or deferring a new generation unit), there are three impacts that occur to the utility system:

1) The kW reduction avoids the new generation unit. Thus the kW reduction avoids the fuel cost that would have been incurred to operate the new generating unit. This is a benefit for DSM.

2) However, without the addition of the new generating unit, the existing generating units on the utility system must operate more hours to deliver the GWh that would have been supplied by the avoided unit. Because a new generating unit is typically more fuel-efficient than most existing generating units on the utility system, the operation of the existing generating units will result in additional fuel costs that are higher than the cost of fuel that would have been needed to operate a new generating unit. This represents a naturally occurring fuel "penalty" for DSM that is also driven by the kW reduction of DSM. When taken together, the net effect of (1) and (2) is a system fuel "penalty" for DSM; i.e., a reduction in projected DSM benefits.

3) The kWh reduction aspect of DSM serves to lower sales and to lower system fuel costs from the marginal unit on the system, thus offsetting, at least to a degree, the net fuel penalty that occurs from the impacts (1) and (2) described above.

All three of these system fuel (and environmental) cost impacts must be accounted for in order to develop a complete and accurate determination of system cost impacts, or benefits, for any DSM measure that has a kW component that is given credit for avoiding or deferring new generation additions. The Minnesota VOS approach to avoided fuel costs appears to be based solely on avoiding fuel that is burned by the marginal unit on the system. This is analogous to only the third, kWh-driven step described above. Because the Minnesota VOS calculation does not address all three of these cost impacts, it provides only an incomplete and inaccurate accounting of cost impacts for DSM PV.

Q. Is accounting for a "fuel (or environmental) penalty" something that has only recently been introduced in regard to DSM analyses in Florida?

A. No. This "net fuel penalty" calculation to analyze DSM impacts on utility systems has been used in Florida by the FPSC Staff and Florida utilities for at least 30 years. This is both appropriate and necessary to account for all of the impacts on utility customers. Furthermore, all of the commercially available production costing and optimization models that FPL has used in the last 20 years account for this impact in analyses of both DSM and Supply options when a new generating unit is avoided by another resource option.

Q. Does the Minnesota VOS calculation properly include all categories of costs associated with DSM PV?

A. No. It fails to take into account some of the costs that DSM PV would impose on the system as described above. This is shown in columns (4) and (5) of

Exhibit SRS – 17. In these columns, the projected system cost impacts on the benefit side of ledger for all 10 system cost categories are provided based on values derived from an analysis of FPL's Residential DSM PV Pilot program that has been previously provided in this docket in response to discovery. The Minnesota VOS calculation does not account for the 7th through the 10th system cost categories and thus would project total benefits that are 12% too high simply by virtue of not taking all system costs associated with DSM PV into account.

Q. What is the second reason why you view the Minnesota VOS approach as "an incomplete and one-sided compilation of supposed benefits"?

A. This has to do with how the Minnesota VOS calculation and the Florida screening tests differ in regard to addressing system environmental costs. In Florida, if environmental costs are used in an analysis, then projected environmental compliance costs are typically used because these are reasonably ascertainable and will directly impact the costs that the utility incurs and its customers pay through electric rates. Also, compliance costs typically represent the lowest cost alternative that will avoid the environmental impacts. However, in the Minnesota VOS calculation, externalities are used instead. As the term implies, externalities refer to impacts that are external to those incurred in the market being examined (e.g., impacts external to electric utility costs and electric rates paid by utility customers in this docket). Therefore, the perceived costs of these externalities are not typically recovered from the utility's customers (unless a calculation,

such as the Minnesota VOS approach, attempts to internalize these costs so that utility customers are paying for them).

Because externalities are less well defined than projected compliance costs, and the magnitude of externality cost values may be limited only by one's imagination, their use in the Minnesota VOS calculation will likely result in supposed environmental benefits for DSM PV that far exceed the projected compliance costs that are typically used in Florida.

For example, the document states that "the federal social cost of CO_2 emissions" is used (page 39, emphasis added). The document states that this social cost value for the year 2020 is $51.22 per ton which is much higher than the environmental compliance cost projections FPL has seen and utilized in recent years. Thus the use of externalities, rather than environmental compliance costs, will result in an even greater overstatement of projected benefits for DSM PV than is shown in Exhibit SRS – 17.

Furthermore, the Minnesota VOS calculation does not appear to account for externalities and/or other factors (property tax revenues for the municipality the generator would be located in, for example) that would favor the generating unit that is projected to be avoided by DSM PV. In this regard, the Minnesota VOS approach is clearly one-sided in its perspective.

FPL witness Deason's rebuttal testimony also addresses problems regarding the use of externalities in analyzing resource options. These problems include giving credit for avoiding costs that are not considered in setting a utility's electric rates and which are arguably beyond the FPSC's jurisdiction. Accounting for such costs will typically increase electric rates. For all of these reasons, the Commission has never approved the inclusion of externalities for the purpose of assessing DSM or other resource options.

Q. Based on these shortcomings in the Minnesota VOS approach, would you recommend that Florida adopt this approach to evaluating DSM PV?

A. No. Using the Minnesota VOS approach may be fine for someone who wishes to promote any type of PV use regardless of whether it is cost-effective for a utility's customers. However, the use of this VOS calculation would not be a good thing for FPL's customers because it could lead to paying for PV applications that either cannot deliver the value that has been attributed to them or are a more expensive way of delivering value than customers need to bear.

The Florida DSM screening test approach, in particular the use of the RIM test, is a far better way to perform initial evaluations of DSM options such as DSM PV. The RIM test evaluates projected benefits, costs, and cost impacts that will impact electric rates with which all of FPL's customers will be served. Thus the RIM test meets the objective of a true cost-effectiveness test to help determine whether a resource option should be implemented based on

what direction electric rates and costs are projected to go. The Minnesota VOS calculation was simply not designed to meet this objective. It was designed to calculate a cost value that would be paid to DSM PV participants.

Q. Do Dr. Fine and Mr. Rábago discuss other, non-DSM approaches to utilizing PV?

A. Yes. Mr. Rábago's testimony contains the following passage in which he supports a non-DSM PV approach:

> *"Q. What recommendations do you offer regarding community solar programs discussed by the companies?*
> *A. I believe that community solar programs offer an important opportunity to make participation in the benefits of distributed solar an option for more customers and in more areas of a utility service territory."* (Page 33, lines 18-22)

Dr. Fine's testimony supports another non-DSM PV approach:

> *"I also recommend that the Commission consider implementing a utility-owned commercial rooftop PV program."* (Page 19, lines 12-14)

Other statements in his testimony offer additional support for the idea of utility-owned PV installations. For example:

"The total installed cost for distributed installations fell 12 percent in 2012 and has fallen 33 percent over the past three years. The cost decline is even greater for utility installations." (Page 15, lines 9 – 12)

In addition, he states in a table on page 17 of his testimony that in 2013 the reported average installed cost for FPL's residential DSM PV Pilot program was *$4.10/watt*. By comparison, FPL's current estimates for the cost of installing utility-scale PV are significantly lower.

These statements suggest two things. First, if the objective is to promote and utilize PV in a more efficient and economic manner than the demonstrably non-cost-effective DSM PV approach, significantly more MW of PV can be installed right now with utility-owned, utility-scale PV for the same amount of money than with a continuation of the DSM PV. Second, if the trend of greater cost declines for utility installations compared to non-utility installations continues, then this economic advantage for utility-owned, utility-scale PV will only increase in the future.

Note also that this advantage refers only to how many MW of PV can be installed for the same expenditure amount between utility and non-utility installations. In addition, the first year capacity factor of FPL's DSM PV Pilot programs has been approximately 17% to 20%. The current projection for utility-scale PV facilities' first year capacity factor is approximately 20% to

25%. Consequently, not only will a given expenditure amount result in more MW of PV capacity being installed with utility versus non-utility installations, more MWh of energy will also be produced from each installed MW in utility versus non-utility installations.

Based on these considerations, it is clear that Florida and FPL's customers would get more value per dollar spent on PV if those expenditures were made for utility-scale PV than with a continuation of the DSM PV Pilots which have never been cost-effective. Any consideration of PV should focus on the relative economics of the different PV applications. If PV is to be promoted as a matter of public policy, FPL believes that the PV application(s) most economic for FPL's customers should be pursued.

Q. Is FPL proposing an alternative to the uneconomic solar rebate pilot programs?

A. Yes. FPL witness Koch presents in his rebuttal testimony the framework for a research and development (R&D) program that FPL believes could be substituted for the ineffectual and non-cost-effective solar pilot programs that FPL is currently funding.

Q. Does Dr. Fine's testimony address a program that is similar to what FPL proposes?

A. Yes. Dr. Fine's testimony contains a discussion involving a recent Duke Energy Carolinas petition to the North Carolina Utilities Commission for approval of a utility-owned distributed PV program. He quoted passages from the Duke Carolinas witness (Owen Smith) in that docket in which the witness

discussed the benefits of their PV petition. In addition to helping Duke Carolinas meet a state RPS requirement, the following benefits were mentioned by the witness:

> *"The Program will enable the Company to understand the impact of distributed generation on its system...* [and] *...The Program will enable the Company to develop and enhance competencies as owners and operators of renewable generation facilities."* (Dr. Fine testimony, page 26, lines 21 – 29).

This description indicates that the Duke Carolinas program is, at least in part, an R&D effort. An R&D-based PV effort in Florida that addressed all three types of PV applications would be more valuable to FPL's customers than an extension of the DSM PV application used in the DSM PV Pilot programs.

Q. In summary, what do you recommend in regard to the DSM PV Pilot programs and the witnesses' view that the Minnesota VOS approach be used to evaluate DSM PV programs?

A. I recommend the following:

1) Allow proven cost-ineffective DSM solar water heating and DSM PV Pilot programs to expire as scheduled at the end of 2014. They have not been cost-effective since their inception and they are not cost-effective today. In lieu of these pilot programs, FPL and other Florida IOUs could use the money spent on those programs more

productively by conducting R&D that helps gather information on the system impacts of both DSM and non-DSM PV applications.

2) Encourage FPL and the other utilities to look at alternate PV applications that deliver more PV MW and MWh per dollar than the DSM PV Pilot programs, even if these more promising PV applications are non-DSM applications.

3) Disregard the suggestion to throw away a DSM cost-effectiveness analysis approach that has served Florida well for decades, and to replace it with an unproven framework from a non-Florida jurisdiction with distinctly non-Florida circumstances, to evaluate DSM PV. The Minnesota VOS calculation is not a cost-effectiveness test and clearly overstates the projected system cost savings value. In addition, it will be interesting to see what the Minnesota experience with this approach will actually be in practice over the next few years. A prudent course for Florida will be to observe to see if the problems apparent in the calculations are addressed.

Q. Are there any other aspects of either of these testimonies that you would like to address?

A. Yes. There is one other item I would like to address from Dr. Fine's testimony that concerns projected CO_2 emissions for the state of Florida. He states:

"*Recent emissions trends suggest that the state is going in the wrong direction as emissions are rising*". (Page 10, lines 5 & 6)

This statement appears to be based on 2008 and 2010 data and projections for the Florida economy as a whole, its power sector, and its transportation sector. However, a more recent projection specifically for FPL's utility system was provided in Exhibit SRS – 15 of my direct testimony. This projection shows that FPL's annual system CO_2 emissions are projected to decrease by approximately 13% over the 2015 to 2025 time frame despite significant growth in customer load.

This projection is a direct result of FPL's successful on-going efforts to improve the efficiency, and lower costs, in generating electricity using clean natural gas and in increasing the portion of its total electricity generation that comes from emission-free nuclear power. Not only have these efforts resulted in low emissions, but in low costs and low electric rates as well. These are great results for FPL's customers. However, lower emissions, costs, and electric rates for the FPL system also serve to explain why the trend of declining DSM cost-effectiveness seen across the U.S. is heightened for FPL.

Part II: Ms. Mims' and Mr. Woolf's Testimonies

Q. How is your discussion of Ms. Mims' and Mr. Woolf's testimonies organized?

A. My discussion is organized into four general areas for which I will use the following headings:

1) Ignoring the Obvious;

2) Failure to Understand FPL's IRP Process and Analyses;

3) An Evaluation of the Recommended Alternate Goals and Impacts on FPL's Customers; and,

4) Other Comments.

I will generally refer to these two witnesses collectively as "these witnesses." However, when discussing specific statements in testimony, I will specify which witness made the statement being discussed.

1) Ignoring the Obvious

Q. FPL's direct testimony pointed out that there were two primary reasons for FPL's proposed goals being lower than in years past: (1) DSM is less cost-effective than it has been in the past; and (2) the increased impact of energy efficiency codes and standards has lowered the potential market for utility DSM by addressing many energy efficiency opportunities that

otherwise could have been addressed by utility DSM. Did these witnesses acknowledge that these two factors will logically result in a reduced role for utility DSM?

A. No. These witnesses generally failed to acknowledge that DSM is less cost-effective than in previous years and that energy efficiency codes & standards are eliminating the potential market for specific equipment that otherwise would exist as an opportunity for utility DSM. Not surprisingly, instead of acknowledging these realities, they attempted to avoid these two facts as much as possible.

However, perhaps recognizing that they could not avoid these two key facts entirely, Mr. Woolf offered the following passage:

> *"These proposed DSM goals are not low because the DSM opportunities are not available or are not cost-effective – as the Utilities claims. The proposed goals are also not low because...new building codes and standards are going to eliminate DSM opportunities – as the Utilities claim".* (Page 4, line 18 through page 5, line 2)

In this statement, Mr. Woolf is widening the scope of the topic to make it appear that FPL is dismissing all utility DSM opportunities. In regard to the first sentence, FPL has not claimed that there are no available DSM opportunities that are cost-effective. In fact, FPL is proposing 337 MW of

DSM – the equivalent of avoiding a new 400 MW power plant – as cost-effective for its system. The point is that DSM measures in general are less cost-effective now than they were in previous years. This means that fewer DSM measures pass preliminary economic screening than was the case in previous years. In addition, it means that for those measures that do pass this screening, the maximum incentive level that can be paid for those measures is generally lower than in previous years. Both of these outcomes result in lower Achievable Potential for DSM.

However, Mr. Woolf eventually does make one statement that shows he recognizes the obvious fact that DSM cost-effectiveness is declining:

"...avoided costs are less than they were in the past." (Page 78, line 13)

In regard to his second statement, FPL has not said that new building codes and standards are going to eliminate all DSM opportunities. What FPL has said, and what is obviously true, is that if codes and standards now require a certain level of energy efficiency for electrical equipment, the potential for utility DSM to have obtained that exact same efficiency gain from that equipment has been eliminated. For example, if codes and standards previously allowed the sale of an air conditioner with a SEER level of 14, but now require a minimum SEER of 15, the potential for utility DSM to 'move' a

customer from selecting a 14 SEER air conditioner to a 15 SEER model has been eliminated. These are simple, indisputable facts.

Again, in regard to the impact of codes and standards' impact on utility DSM, Mr. Woolf eventually does admit the obvious:

> *"It is true that increasing building codes and standards will make it more difficult to achieve DSM savings over time."* (Page 78, lines 26 & 27)

Q. Would you please provide an example that demonstrates that DSM is less cost-effective than it was in previous years?

A. Yes. I will present two examples, one for a single DSM measure and one that addresses the entire projected Achievable Potential. First, let's compare the RIM and TRC cost-effectiveness results for a single DSM measure (code number RSF150 which is a residential R-0 to R-19 ceiling insulation measure), assuming no change in the kW, kWh, life of measure, administrative costs, or incentive costs, from the 2009 goals-setting analyses and the 2014 analyses. The same RIM and TRC preliminary screening tests are used in these calculations. The respective benefit-to-cost ratios are:

	RIM	TRC
2009	1.21	3.16
2014	1.03	2.30

The cost-effectiveness ratios under both preliminary screening tests are clearly lower now than in 2009 which indicate that the measure is less cost-effective now than it was in 2009. From this example it is obvious that other measures that were closer to a 1.01 ratio in 2009 would now fall below that threshold value in 2014 and be eliminated in the preliminary economic screening steps.

Moving from a comparison of a single individual DSM measure to all of the individual DSM measures, we now compare the Achievable Potential results from 2009 and 2014. The list of total DSM measures analyzed, and the screening process itself, remained essentially the same between the two years. The 2014 results shown include CO_2 costs to further ensure the comparison is a valid one. The respective Achievable Potential MW values are:

	RIM	TRC
2009	949	1,153
2014	~~504~~ 508	577

The decrease in the Achievable Potential MW from 2009 to 2014 is approximately 50% under either of the preliminary screening tests. Because Achievable Potential addresses all DSM measures identified initially in the Technical Potential step which have survived the preliminary economic screening process, these results indicate that there has been a significant decrease in DSM cost-effectiveness in general across all DSM measures.

Q. Does the projection of higher impacts of codes and standards also contribute to the current lowering of Achievable Potential results?

A. Yes. In 2009, the projected Summer MW impact from codes and standards over the 10-year goals-setting period was projected to be 1,255 MW. The current projection of this impact over the present 10-year goals-setting period is projected to be 1,823 MW. Thus the projected impact has increased by almost 50%. After accounting for FPL's 20% reserve margin criterion, the 1,823 MW of energy efficiency is equivalent to avoiding more than five additional new power plants of 400 MW each. Therefore, this increase in energy efficiency delivered by codes and standards is significant – and is benefiting all FPL customers because customers do not fund these efficiency gains through the Energy Conservation Cost Recovery Clause. It also, however, clearly contributes to the current lower Achievable Potential DSM MW values.

Q. Is the dramatic lowering of DSM cost-effectiveness something only being seen in Florida?

A. No. I have the privilege of representing FPL in biannual meetings of the Southeast Electric Exchange's IRP Task Force. The group consists of representatives of a number of utilities that range geographically from Oklahoma to Ohio to Florida. This group includes utilities who operate under traditional regulatory structures as well as ones who operate in so-called deregulated regulatory structures and/or power pools. At each of these

meetings, resource planning issues and trends are discussed in a roundtable format.

A recurring issue in these information sharing meetings in recent years is the trend of steadily decreasing cost-effectiveness of DSM. (I note that this trend is of particular concern to utilities for whom excessively high DSM goals have been set and/or who are operating under DSM-linked reward-and-penalty structures.) Because many, if not all, of the utilities in the Task Force are seeing this trend, the issue of decreasing cost-effectiveness of DSM is definitely not unique to Florida.

Q. Is there anything special about FPL's utility system which is contributing even more to this trend of decreasing DSM cost-effectiveness?

A. Yes. Efficiency is not something unique to DSM resources; efficiency applies to generation resources as well. Since 2001, FPL's fossil-fueled generation system has seen a 20% improvement in its efficiency. This means that FPL now can generate the same amount of electricity using 20% less fossil fuel – a fact SACE and Sierra Club should appreciate but which they are understandably silent about when these generation efficiency improvements are discussed in regard to contributing to declining cost-effectiveness of DSM for FPL's system. These generation efficiency gains result in lower fuel costs to produce each kWh of electricity. In regard to DSM, it means that the kWh reduction aspect of DSM options now provides lower benefits than in previous years, making DSM options less cost-effective. Furthermore, FPL's

system is projected to become even more efficient, and to lower fuel costs even more, with the completion of the Port Everglades modernization project and the planned addition of the Turkey Point 6 & 7 nuclear units. Both Ms. Mims and Mr. Woolf have chosen to ignore the important role that utility system efficiency and lowered costs play in DSM cost-effectiveness analyses.

Q. Despite their attempts to avoid seriously discussing the obvious fact of decreasing cost-effectiveness of DSM, did these witnesses' testimonies suggest to you that they are actually concerned about this?

A. Yes. There were two aspects of their testimonies that suggest to me that they really do recognize the trend of decreasing cost-effectiveness of DSM and, rather than accept that fact, they are trying to avoid that reality by changing the rules of the game in Florida. They attempt to do so through two discussions or suggestions.

The first "change the rules of the game" discussion/suggestion is that Florida is not using the Utility Cost Test (UCT) in its preliminary screening of DSM measures. Regarding this topic, Mr. Woolf states:

> *"...the Utilities ignore one of the most useful screening tests available: the Utility Cost test."* (Page 20, lines 21 & 22)

It is not surprising that Sierra Club would prefer that Florida use the UCT in its preliminary screening of DSM measures. Use of the UCT will result in

even higher benefit-to-cost ratios for DSM measures than the already "low hurdle" TRC test. To demonstrate that, let's return to our previous example of the RIM and TRC benefit-to-cost ratios in 2014 for a single DSM measure. When we now add the UCT benefit-to-cost ratio for that measure, we have the following:

	RIM	TRC	UCT
2014	1.03	2.30	3.71

As shown above, the UCT represents an even lower hurdle for DSM than the already low-hurdle TRC test. In addition, the UCT shares a fundamental flaw inherent in the TRC test: neither the UCT nor TRC test accounts for the important impacts on electric rates from DSM. In previous DSM goals dockets in Florida, the UCT was rarely, if ever mentioned. The TRC test was ardently endorsed by intervenors desiring the highest possible DSM goals as the only correct cost-effectiveness test to use. However, in 2014, with the cost-effectiveness of DSM having significantly declined to the point where a significant number of DSM measures are no longer passing even the TRC test, it is not surprising that the UCT is now being discussed. This is an attempt to change the rules in Florida so that the bar for DSM resource options is lowered.

Q. What is the other "change the rules" suggestion that is offered in these testimonies?

A. That suggestion is to include additional "non-energy benefits" on the DSM side of the ledger in the preliminary economic screening of DSM measures. Both of these witnesses believe this would be a really good thing to do. First, Ms. Mims states:

> *"The Utilities do not appear to take into account non-energy benefits, also known as Other Program Impacts (OPI)."* (Page 47, lines 20 & 21)

Perhaps to avoid the interpretation of OPI as an impact to "Other People's Income," Ms. Mims immediately provides some examples of OPIs which include: *"improved health and safety, increased comfort."* (Page 48, lines 1 & 2) I will return to these non-energy benefit examples in a moment.

Mr. Woolf also gets into this act by stating that:

> *"DSM goals should reflect DSM benefits beyond those that accrue to the utility system. To do so, non-energy benefits should be included in DSM screening."* (Page 36, lines 13-15);

And, in regard to accounting for non-energy benefits, Mr. Woolf states:

"... I recommend that the Commission require the Utilities do apply the following...adders: 50 percent for low-income customer programs; 25% for residential non-low-income customer programs; and 10% for commercial and industrial customer programs." (Page 38, lines 6-9)

The potential impact of including such non-energy benefits in DSM preliminary screening analyses is demonstrated in Ms. Mims' Figure 10 that is presented on page 49 of her testimony. This figure shows that use of such benefits in Massachusetts can change the TRC test's beuefit-to-cost ratio many times over. For example, in regard to the Residential Retrofit program, the TRC benefit-to-cost ratio increases from what appears on her chart to be roughly a 1.1 ratio to a ratio of roughly 5.5 solely by applying non-energy benefits.

In other words, the use of non-energy benefits in DSM analyses is a miracle cure for the indisputable ailment of decreasing DSM cost-effectiveness.

Q. Would inclusion of non-energy benefits in DSM analyses in Florida be a good idea?

A. No. There are numerous reasons why this is a bad idea and I'll mention a few of them. First, inclusion of non-energy benefits is an obvious attempt to artificially make the cost-effectiveness of DSM appear better than it really is. Second, making non-cost-effective DSM appear to be cost-effective through

the inclusion of non-energy benefits will result in unnecessary increases in electric rates if the non-cost-effective DSM measures are implemented.

Third, even if one wanted to try to account for non-energy benefits, it would be impossible to place an accurate cost value on such benefits. Even Mr. Woolf admits as much when he states:

> *"...there is some uncertainty regarding the magnitude of some participant non-energy benefits"* (Page 37, lines 16 & 17).

His attempt to heavily qualify this statement does not hide the fact that any cost values attributed to non-energy benefits are, at best, highly uncertain. He reveals as much regarding his 10% to 50% recommended "adders" to TRC benefits in the following statement:

> *"These recommended values are based on my extensive review of non-energy benefits in other states, and are conservative relative to some of the quantified values of non-energy benefits that I am aware of."* (Page 38, lines 10-12)

In plain English, these estimates vary all over the place.

Fourth, once one starts down the path of trying to identify what impact to society will count as a "non-energy benefit", it will be impossible to know where the correct place is to draw the line and say "stop, we won't count any more impacts."

Fifth, use of non-energy benefits as adders to DSM benefits appears to be entirely one-sided with various benefits counting only on the DSM side of the ledger. Common sense would tell one that there have to be non-energy benefits on the supply side of the ledger as well. Examples might include: employment impacts, property tax impacts, economic development benefits from lower electric rates, etc. And, returning to Ms. Mims' examples of 'non-energy benefits' that include *"improved health and safety, increased comfort,"* lower electric rates that result from not implementing high levels of non-cost-effective DSM will certainly assist FPL's customers in these two considerations.

In regard to the issue of one-sidedness, it is interesting that Mr. Woolf's testimony points out that analysis of resource options should not be one-sided, as inclusion of non-energy benefits only on the DSM side of the ledger would be, when he discusses the guiding principles of the National Efficiency Screening Project (NESP). The NESP principle that is relevant to this discussion is:

"Applicability to all resources. In general, these principles should be applied to all types of electric and gas utility resources; both demand-side and supply-side resources." (Page 13, lines 17-19)

Yet the incredible increase in the TRC benefit-to-cost ratios in Massachusetts when 'non-energy benefits' are added as shown in Figure 10 of Ms. Mims' testimony suggests that the *"applicability to all resources"* principle may not have actually been put in practice. To see five-fold (or more) increases in benefit-to-cost ratios for DSM when non-energy benefits are incorporated strongly suggests that either these "benefits" are only incorporated on the DSM side of the ledger, or that benefits on the supply-side of the ledger were not pursued as diligently or imaginatively.

For at least all of these reasons discussed above, the notion that Florida should suddenly begin to account for non-energy benefits is a very bad idea. In addition, FPL witness Deason discusses in his rebuttal testimony why inclusion of non-energy benefits would be contrary to established practice and good regulatory policy.

Q. Please summarize this section of your rebuttal testimony.

A. The testimonies of Ms. Mims and Mr. Woolf attempt to ignore the obvious fact that DSM is less cost-effective now than in previous years. A simple comparison of the cost-effectiveness of a single DSM measure in 2009 and 2014, and of the Achievable Potential MW in 2009 and 2014, clearly shows

that DSM cost-effectiveness has diminished. This is not a phenomenon specific to Florida and to how Florida utilities analyze DSM, though it is exacerbated by the increasingly high efficiency of FPL's generation system. This is a very good thing for FPL's customers, but it also lowers the benefits that DSM can provide.

The testimonies of these two witnesses also attempt to ignore the obvious regarding another issue: an almost 50% increase in the projected impact of codes and standards in 2014 compared to 2009 will definitely reduce the potential for utility DSM to address the specific efficiency gains that are now addressed by the codes and standards.

Nonetheless, their testimonies also suggest that they are aware that utility DSM is now less cost-effective. Their testimonies recommend that Florida should "change the rules" to protect DSM resources. They suggest that Florida should implement the UCT which presents a significantly lower hurdle for DSM in screening analyses, thus giving the appearance that DSM is more cost-effective than it actually is. In addition, they recommend that Florida now incorporate a set of "adders" to boost DSM benefits by up to 50% despite the fact that these adders are based on highly uncertain, speculative values that are completely one-sided in their application.

These suggestions/recommendations are an attempt to deny the current reality for DSM: DSM is less cost-effective now than in previous years, particularly for FPL, and the growing impact of energy efficient codes and standards is reducing the potential for utility DSM efficiency improvements that have already been addressed by the codes and standards. As a result, a reduced role for utility DSM, as seen in FPL's proposed DSM goals, is now warranted. The FPSC should not seriously consider these witnesses' calls to change the rules in Florida to shield one type of resource option (i.e., DSM) from reality.

2) Failure to Understand FPL's IRP Process and Analyses

Q. The testimonies of Ms. Mims and Mr. Woolf contained statements that were critical of FPL's IRP process and analyses. Were you surprised by this?

A. Not at all. In my approximately 35 years of performing resource analyses for FPL, I have come to the conclusion that some organizations are almost fanatical in how fervently they hold onto the belief that DSM resources must always be better than all other resource options. Consequently, when faced with analyses that show that DSM should play a smaller role in FPL's resource plans than in previous years, it was expected that the analyses, assumptions, motives, etc. might be criticized.

Q. Did these testimonies include "summary" statements regarding FPL's IRP process and analyses?

A. Yes. I believe the following two statements, one from each of these two witnesses, sum up the view they have of FPL's IRP process and analyses:

> *"FPL lacks transparency and analytical rigor in its resource planning...."* (Mims, Page 7, line 24);

and,

> *"It is also clear that if the Utilities were to adopt significantly higher DSM goals, then customer bills would be reduced significantly. This is the basic conclusion from a straightforward comparison of the costs of supply-side and demand-side resources; unencumbered by opaque, unduly complex and constraining resource planning practices."* (Woolf, Page 72, lines 9-12)

I will come back to their descriptions of *"lacks...analytical rigor"* and *"unduly complex"* later in my testimony. For the moment, let me just state that I believe part of the reason for these summary statements is that these witnesses simply do not understand FPL's IRP process and analyses. This is clear from the number of inaccurate and/or misleading statements that are present throughout their testimonies.

Q. Please discuss these incorrect and/or misleading statements.

A. Exhibit SRS – 18 provides a listing of at least some of the statements from their testimonies that are inaccurate and/or misleading. The exhibit's 10 pages provide several dozen examples of inaccurate and/or misleading statements. This partial listing of such statements also includes the correct information for the topic they have addressed. Many of these statements are about FPL's IRP process and analyses.

From both the number and breadth of these inaccurate and/or misleading statements, it is obvious that Ms. Mims and Mr. Woolf do not understand the resource planning process and analyses that they have chosen to attack.

Q. Are there other problematic statements in their testimonies that you did not include in Exhibit SRS – 18?

A. Yes. I'll discuss two of them. The first is the following statement from Mr. Woolf in which he attempts to argue that the RIM test overstates the lost revenue component of the RIM test:

> *"The Utilities estimate lost revenues on the basis of a projection of total electricity prices...This is not the correct methodology for estimating lost revenues that will impact rates. The correct methodology is to use a projection of fixed components of rates, not the fixed plus variable components of rates."* (Page 25, lines 21-25)

I disagree. Let me illustrate using fuel costs, which is the predominant component of variable costs. An analyst starts with a projection of electric rates that includes a projection of the fuel component of the rates. Thus the analyst has a projection of the fuel-based revenues that are expected to be recovered. However, once a DSM option is added to the system, there are several fuel cost impacts that will occur as previously discussed in Part I of my testimony. Some impacts will lower the utility system's fuel costs and some will increase the utility system's fuel costs. In the RIM test, the net effect of these fuel cost impacts from DSM is compared to the forecasted fuel-based revenues. The net effect of DSM on fuel costs is accounted for on the benefit side of the ledger and the reduction in fuel-based revenues is accounted for on the cost side of the ledger as part of lost revenues.

This comparison appropriately captures whether the fuel component of electric rates will increase, decrease, or remain unchanged due to DSM impacts. To exclude the fuel-based revenues on the cost side of the ledger, and include the net fuel impacts on the system on the benefit side of the ledger, would incorrectly understate the impact of DSM on electric rates. (It would also artificially inflate the benefit-to-cost ratios of the RIM test which is in keeping with Mr. Woolf's recommendation to add non-energy benefits to the DSM side of the ledger.)

Q. What is the other problematic statement you would like to discuss that is not included in Exhibit SRS – 18?

A. This is actually a series of statements that is made in Mr. Woolf's testimony and it refers to the concept of "bills." The following two statements provide good examples:

> *"Higher DSM goals would result in reduced costs, and therefore reduced bills."* (Page 9, line 1, emphasis added);

and,

> *"Maintaining low utility system costs, and therefore low customer bills on average...."* (Page 22, line 18 & 19, emphasis added)

I do not believe that Mr. Woolf's testimony ever explains what he is actually referring to when he uses the terms "bills" and "customer bill."

In statements in which he uses the phrase *"reduced bills,"* he is giving the misleading impression that bills for all customers will be reduced by high levels of DSM. He provides cover for himself by occasionally making slightly revised statements such as *"low customer bills on average,"*

Mr. Woolf is simply referring to total costs as "bills." Because total costs do decrease with DSM additions, he claims that the utility's total "bill" to all customers will, on average, decrease. This is just a verbal construct that ignores the fact that high levels of DSM increase electric rates, resulting in actual bill increases for many actual customers. His use of the term "bills" in this fashion is an attempt to ignore the fact that non-cost-effective DSM will inevitably lead to unnecessary cross-subsidization between DSM participants and non-participants in which the non-participants will be harmed. In other words, in the context of DSM, there is no one "bill" impact, or even an "average bill." There are participants and there are non-participants, and non-participants' bills will go up if electric rates go up.

Q. Do these witnesses acknowledge the flexibility of DSM to be increased or decreased as resource needs and cost-effectiveness warrant?

A. No. In fact, these two witnesses are strongly resisting the Florida utilities' conclusion, based on months of analyses performed by each individual utility, that the appropriate course of action at this time is to reduce utility DSM goals.

My involvement in utility DSM efforts began in 1979 and has continued through today. Utility DSM was in its infancy in 1979. One of the initial big selling points regarding DSM was the flexibility it offered to utilities. It could be ramped up quickly if load growth accelerated. Likewise, it could be ramped down quickly if load growth stalled or the cost-effectiveness of DSM began to

decline. This flexibility attribute of DSM still exists today. However, some organizations such as SACE and Sierra Club now see the flexibility attribute of DSM as something that can only work in one direction: ever upwards.

FPL has utilized DSM's inherent flexibility. In 2004, FPL's DSM goals were set at approximately 88 MW (Summer) per year. After experiencing very high peak loads in 2005, FPL voluntarily increased its DSM implementation quickly to its current level of approximately 120 MW per year. However, by the time the 2009 DSM goals docket rolled around, both FPL's rate of load growth, and DSM cost-effectiveness, had decreased. Therefore, FPL sought to utilize the inherent flexibility of DSM and reduce DSM implementation in its 2009 DSM goals filing. Accordingly, FPL proposed goals of approximately 66 MW per year.

However, FPL's goals were significantly increased to an average of about 150 MW per year in the 2009 docket. Yet soon thereafter, recognizing the rate impacts that would occur from implementing such a high level of DSM, FPL was instructed to return to its then current DSM levels, which averaged about 120 MW per year. In 2014, DSM cost-effectiveness has significantly decreased even more than in 2009. Furthermore, energy efficiency codes and standards have diminished some of the market potential for utility DSM, particularly in regard to air conditioning equipment.

Consequently, FPL is attempting to again utilize the inherent flexibility of DSM to reduce its goals to a proper level that utilizes those utility DSM options that remain cost-effective. However, rather than accept the current reality of declining DSM cost-effectiveness, and embracing the ability of DSM to be quickly ramped down or up as a fundamental strength of DSM, the testimonies of these two witnesses argue fiercely against FPL's planned reduction in DSM levels.

Q. Why do you believe these witnesses are so resistant to reduced levels of DSM?

A. I believe much of their resistance stems from the business motives of the organizations they represent. DSM has become a fair sized industry in the U.S. and organizations like Mr. Woolf's employer, Synapse Energy Economics (Synapse), have now been in business for over a decade. Synapse, and other such organizations, consistently push for ever higher levels of DSM regardless of changing load forecasts, changing fuel cost forecasts, etc. This is not surprising because DSM is their business. Therefore, these organizations have a vested interest in attempting to convince as many utilities, regulators, and legislators as possible to commit to DSM at ever increasing levels.

In this regard, organizations such as Synapse and SACE are simply special interests attempting to sway decision makers to decide in favor of their product (DSM) as often as possible instead of presenting impartial, analytically-based recommendations. It is good for their individual businesses

to do so and I don't fault them for attempting to get favorable decisions that will enable them to stay in business. But I believe viewing these testimonies as coming from special interest organizations helps explain the extreme and unsupported recommendations for DSM goals that I will discuss next in my rebuttal testimony.

3) An Evaluation of The Recommended Alternate Goals and Impacts on FPL's Customers

The Alternate Recommended Goals & Their Development

Q. In regard to the DSM goals recommended by Ms. Mims and Mr. Woolf for FPL, were they based on FPL-specific economic analyses?

A. No.

Q. Were their goals at least based on Florida-specific economic analyses?

A. No.

Q. Were their goals based on any economic analyses at all?

A. No.

Q. Please describe their recommended goals.

A. The primary DSM goal for both witnesses is for GWh reduction. Both recommend a 1% reduction in retail sales (but differ slightly in regard to what year that goal should be reached). In regard to MW reduction, Ms. Mims appears not to have any such goal in mind. Mr. Woolf recommends that FPL's

2013 ratio of MW-reduction-to-MWh-reduction be used and then multiplied by the GWh goal. The resulting product is his recommended MW goal.

Q. Please describe how their recommended goals were developed?

A. Because they offer no description of how they arrived at their recommended goals, it appears that the GWh goal was developed by simply pulling an arbitrary percentage value out of the air. Then the MW goal recommended by Mr. Woolf appears to have been developed by selecting an arbitrary ratio value from an arbitrarily selected year, then multiplying the arbitrary ratio by the arbitrary GWh value.

Q. What justification did they give for their GWh and MW goals?

A. In regard to the GWh goal, both witnesses essentially said that it was selected because (paraphrasing) "other people are doing it." In regard to Mr. Woolf's MW goal, he really gave little or no justification as to why he selected this approach. Mr. Woolf does admit that his MW-reduction-to-MWh-reduction ratio is a *"...simplistic assumption...."* (Page 85, line 23)

Q. In regard to FPL's analyses that led to the identification of its proposed goals, how long did it take to complete those analyses?

A. These analyses took at least five months of continuous work to complete.

Q. How long do you estimate it took for these witnesses to develop their reecommended goals?

A. Selecting an arbitrary number for the GWh goal would have been quick. However, an arbitrary year had to be selected, and then a ratio had to be calculated, for the MW goal. Taking all of this into account, I cannot imagine

why it would take more than five minutes in total to develop their goals recommendations.

Q. Their "select an arbitrary number" approach certainly wasn't *"unduly complex,"* but didn't one of these witnesses also state that FPL's IRP process *"lacked... analytic rigor"*?

A. Ironically, yes.

A Discussion of Their LCOE-based "Justification"

Q. In the absence of actual economic analyses, did these witnesses attempt to offer anything that could serve as an economic justification?

A. Yes. However, just as certain intervenors attempted to do in the 2009 Goals docket, these witnesses chose a levelized cost of electricity (LCOE) approach to serve as their economic "justification." This was an unfortunate choice.

Q. Why is an LCOE approach an unfortunate choice?

A. It is an unfortunate choice because the results of an LCOE comparison are meaningless if the objective is to make a final decision regarding two competing resource options, such as a generation option and a DSM option.

Q. Didn't you discuss this previously in the 2009 DSM docket?

A. Yes. In the 2009 DSM Goals docket, my rebuttal testimony included a detailed 15-page explanation regarding why a cents/kWh LCOE comparison of dissimilar resource options, such as generation and DSM options, could not provide a meaningful answer to the question of which resource option should

be selected for a utility. This explanation was also subsequently repeated in my rebuttal testimonies in the 2009 and 2010 nuclear cost recovery dockets (Docket Nos. 090009-EI and 100009-EI).

Q. Is that explanation still valid today?

A. Yes.

Q. Please summarize the explanation.

A. A typical LCOE calculation looks at the projected $/MWh, or cents/kWh, cost of an individual resource option to either generate electricity or to reduce electricity use. However, the perspective taken is solely of the individual resource option itself and assumes that the resource option is completely unconnected to a utility system. In other words, an LCOE calculation is based on a starting point assumption that the generator or DSM option is "placed in a field by itself" with no connection to a utility system. The LCOE calculation then develops a cost of operating the resource option by itself.

However, this starting point assumption is clearly unrealistic because any resource option will be connected to the utility system. As a result, the addition of the resource option will have a number of impacts on the operation of other existing resources on the utility system. These are termed "system impacts" and are accounted for in IRP analyses, but not in LCOE calculations.

For example, assume that a LCOE calculation is performed for a new combined cycle (CC) generating unit. The LCOE calculation will account for

the annual cost of fuel used to run the CC unit. For simplicity's sake, let's assume that annual cost of fuel in a particular year is $100 million. However, the new CC unit would not operate on the utility system unless it was less expensive to run the new CC unit than it was to run existing generating units on the system.

Therefore, for each hour the new CC unit operates and incurs fuel cost, the operation of more expensive existing generating units will be reduced. The result is that the system fuel savings will be greater than the cost of fuel to operate the CC unit. For example, assume the annual fuel savings from reduced operation of the existing generating units is $110 million. Then the true annual fuel cost for the utility system from operating the new CC unit is a net fuel savings of $10 million (= $110 million saved from existing units - $100 million spent to operate the new CC unit).

Because an LCOE calculation accounts only for the fuel cost to operate the new CC unit, an LCOE calculation fails to account for the fuel savings from reduced operation of the more expensive existing generating units on the system. Thus an LCOE calculation only accounts for the $100 million fuel cost for the new CC unit and fails to end up with the correct result of a $10 million net fuel savings from placing the new CC unit on the utility system. (Note that this problem with LCOE calculations is identical to the problem earlier discussed in regard to the Minnesota VOS calculation.)

As this example shows, an LCOE calculation can be wildly inaccurate regarding the true cost of placing a resource option on a utility system because it fails to account for a number of system impacts similar to this net fuel impact. Thus LCOE calculations provide incomplete, and thus inaccurate, results regarding the true costs of resource options.

LCOE calculations (also commonly called "screening curve" analyses) may be useful only in screening applications where similar resources are being compared. In fact, LCOE calculations can only provide meaningful screening results when the resources in question are identical, or nearly identical, in regard to at least four characteristics:

(1) resource capacity (MW);
(2) annual capacity factor;
(3) the percentage of the resource's capacity (MW) that is firm capacity; and,
(4) the projected life of the resource.

If at least all of these four characteristics of competing resources are identical, or nearly identical, the system impacts of the individual resources will be similar and can be ignored in a simple screening among these similar resources.

However, DSM and generation options are very dissimilar resource options and typically share none of these four characteristics. Therefore, use of an LCOE calculation to compare these very dissimilar resource options cannot give meaningful results. Most importantly, because an LCOE calculation fails to account for a number of system cost impacts that must be known before a complete cost picture of competing resource options is known, LCOE calculations should never be used to make a final resource decision for a utility.

Q. Since the time of the 2009 DSM Goals docket, have you further examined the LCOE approach that SACE and the Sierra Club are still advocating in these two testimonies?

A. Yes. On at least three occasions I have had the opportunity to further consider the LCOE approach and perform additional examinations. These three examinations can be summarized as follows:

1) Using current forecasts and assumptions, updated LCOE calculations for a combined cycle (CC) unit were performed. Similar to the analysis presented in rebuttal testimony in 2009, this examination looked at how the projected LCOE value for the CC unit will change if even one of a number of system impacts is accounted for.
2) A fairly recent American Council for an Energy-Efficient Economy (ACEEE) publication that used projected low LCOE

values for DSM options, and higher LCOE values for generation options, to recommend implementation of large amounts of DSM was examined. The second examination took a critical look at both the LCOE formula used by ACEEE and the assumptions used in LCOE calculations. This examination concluded by performing a series of LCOE calculations for one DSM option. In these calculations, changes to various assumptions were sequentially made, one at a time, to make these assumptions more reflective of real world DSM. These more realistic assumptions result, not unexpectedly, in increases in projected LCOE costs for DSM.

3) The third examination returned to the specific LCOE formula used by ACEEE to see if their application of the formula followed guidelines for evaluating energy efficiency and renewable energy options that were specified in a publication by the U.S. Department of Energy's National Renewable Energy Laboratory (NREL). In short, ACEEE's attempted application of this specific LCOE formula to decide between competing DSM and Supply options is not recommended by NREL's guidelines.

These three examinations demonstrate two things about LCOE calculations. First, by failing to account for system impacts that accompany the choice of every resource option, LCOE calculations can only provide inaccurate information and should never be used to make a final resource decision.

Second, in regard to the values produced in an LCOE calculation, one can significantly change (or manipulate) what the resulting values will be through the choice of inputs to the calculation.

Q. Would you please discuss the first of these three examinations?

A. Yes. Similar to the LCOE calculation presented in the 2009 rebuttal testimony, a new LCOE calculation for a 2019 CC unit was performed. This calculation used the same CC unit cost and performance assumptions, and the same forecasts for fuel costs, etc., that were used in the DSM goals analyses performed for this docket. FPL then performed a second, modified LCOE calculation in which only one set of system impacts was accounted for. This second LCOE calculation assumed that there would be a 10% net savings for the FPL system in regard to system fuel costs and system environmental compliance costs. This 10% net savings assumption is representative of the net impact that FPL typically sees in more detailed analyses. These projected system net savings are incorporated in the second LCOE calculation.

For example, the first LCOE calculation shows that the cost of fuel to operate the new CC unit in the first year of operation was $422 million. In the second, modified LCOE calculation, it was assumed that the system fuel cost avoided by operating the new unit (which reduces the operating hours of existing, more expensive-to-operate generating units) would be $464 million (= $422 x 1.10). The end result for the first year is that the net fuel impact for the entire FPL system would be a net savings of $42 million.

Both of the LCOE calculations were performed using FPL's levelized cost of electricity calculation spreadsheet. The results of this examination are provided in Exhibit SRS – 19 which consists of three pages. Page 1 of 3 presents the results of the two calculations and pages 2 of 3 and 3 of 3 present the two LCOE calculations.

The result of the 1st calculation is a projected LCOE cost of $95/MWh, or 9.5 cents/kWh, for the CC unit assuming a 90% capacity factor (which is a representative capacity factor value for a new CC unit on FPL's system). This projected LCOE cost for a CC unit is similar to those regularly seen in LCOE-based reports presented by organizations such as SACE and Sierra Club in dockets like this one.

However, the result of the 2nd calculation, an LCOE calculation modified to account for just system fuel cost and environmental cost impacts, is a projected LCOE cost of $23/MWh, or 2.3 cents/kWh, for the same 90% capacity factor assumption.

Accounting for just this one set of system impacts only begins to move a typical LCOE calculation towards the desired outcome of any resource analysis: to fully account for all cost impacts to a utility system from the addition of a resource option. Yet accounting for only this one set of system impacts lowers the original LCOE projected value of 9.5 cents/kWh by a

factor of more than 4 to 2.3 cents/kWh. (Needless to say, the LCOE-based reports favored by SACE and the Sierra Club do not discuss the results of more accurate modified LCOE calculations such as this one.)

The results of this examination are consistent with the results of prior analyses that were discussed in my rebuttal testimony in 2009. And these results show how misleading the results of a typical LCOE calculation are and why one should never make a final resource decision based on LCOE calculations. Fortunately, neither any Florida utility nor the state of Florida makes final resource decisions based on such a flawed method of comparing resource options.

Q. Please discuss the second examination you made which involves an LCOE calculation formula and associated assumptions.

A. The second examination looked at two aspects of LCOE calculations used in the ACEEE's September 2009 report Saving Energy Cost-Effectively: A National Review of the Cost of Energy Saved Through Utility-Sector Energy Efficiency Programs. Those two aspects that were examined are: (i) assumptions used in their LCOE calculation; and (ii) the formula actually used to calculate the LCOE values.

In regard to the assumptions, the ACEEE's report did not provide much readily available information regarding specific assumptions. However, the report did state that a real discount rate of 5% was used in their LCOE

calculations and that values in the 2009 document were present valued back to the year 2007. FPL noted that the discount rate selected by ACEEE for their calculation is substantially different than the approximate 7%-to-8% range of discount rates that FPL has recently used in its IRP analyses, which results in a lower cents/kWh projected result for DSM.

With that in mind, FPL performed a series of LCOE calculations for a representative DSM option again using the same FPL LCOE spreadsheet that was used in the LCOE projections for a CC unit discussed above. The initial LCOE calculation for this DSM option used a particular set of economic assumptions/inputs. Then, these assumptions/inputs were varied one at a time in additional LCOE calculations.

The DSM option was assumed to have the following characteristics: 1 kW of demand reduction, 1,752 kWh reduction (i.e., an equivalent capacity factor of 20%), and a 10-year measure life. These assumptions remained unchanged throughout the LCOE calculations. The starting point economic assumptions/inputs were: (i) a 5% discount rate, (ii) a 2019 installation (the same year as the avoided unit would have gone in service as was assumed in the LCOE calculations for the CC unit discussed above), and (iii) an accounting of administration and incentive costs needed to initially sign up DSM participants.

Then, the following sequential changes to the economic assumptions/inputs were made:

- The discount rate was changed from 5% to 7.54% (to match the discount rate used in the CC LCOE calculation);
- The DSM installation year was changed from 2019 to 2014 (to reflect the reality that DSM implementation must occur a number of years prior to when a generating unit would go in-service in order to sign up enough DSM MW to avoid that unit);
- The fact that the DSM option has only a 10-year life, but the CC unit it is seeking to avoid has a 30-year life, is addressed by assuming that the DSM option (or its equivalent) is "re-signed up" in the 11th year and again in the 21st year with escalation of the administration costs; and,
- The impact of unrecovered revenue requirements is also accounted for.

An LCOE calculation was made for each of these five cases. The results are presented in Exhibit SRS – 20. This exhibit consists of 6 pages. Page 1 of 6 summarizes the results. Pages 2 of 6 through 6 of 6 present the calculation for each of the five cases.

As shown on page 1 of 6, the initial LCOE value is 3.5 cents/kWh. This projected LCOE value is within the 2 to 4 cents/kWh range typically reported for DSM in LCOE-based reports favored by organizations such as SACE and the Sierra Club.

However, the calculated LCOE values for the other four cases steadily increase as economic assumptions/inputs are changed. It is important to note that each of these changes resulted in adjustments that: (i) used identical assumptions (discount rate and number of years of costs addressed in the calculations) to those used in Exhibit SRS – 19 which calculated an LCOE value for a CC unit, and/or (ii) used more realistic assumptions regarding when DSM is implemented to avoid a generating unit; and/or (iii) accounted for additional costs that would need to be incurred to maintain the kW and kWh reductions for the 30-year life of the generator that DSM seeks to avoid; and/or (iv) accounted for the unrecovered revenue requirement impact of DSM on electric rates.

The revised LCOE calculations showed the projected cents/kWh cost of the DSM option increasing steadily from 3.5 cents/kWh to 4.8 cents/kWh in the first three revised cases, then jumping significantly to 17.6 cents/kWh when the impact of unrecovered revenue requirements is incorporated.

Q. Do you draw any new conclusions from these LCOE calculations?

A. Yes. I have already discussed the fact that a final resource decision should never be made based on an LCOE calculation because this type of calculation fails to account for very significant system impacts that occur if a resource option is added to a utility system. This makes an LCOE calculation meaningless in regard to resource decisions.

The new conclusion I draw from these five LCOE calculations is that an LCOE value for a single DSM option can vary over a wide range depending upon what assumptions or inputs are selected for use in the calculation. Therefore, attempting to present LCOE projected values for resource options in support of a type of resource option, without also presenting the key assumptions/inputs used in the calculation, makes an LCOE-based argument even more meaningless (if such a thing is possible).

Q. You mentioned earlier that you also took a look at the ACEEE's LCOE calculation formula. Please discuss what you found.

A. In regard to their LCOE calculation, ACEEE used a formula instead of a spreadsheet approach. The LCOE formula they used is presented in Exhibit SRS – 21. This one-page exhibit presents both the formula itself and a simple calculation using that formula.

As the top half of the exhibit shows, the formula is based on a "Capital Recovery Factor." This makes it an odd choice for use in attempting to calculate LCOE values for DSM options because the vast majority of DSM options have no utility-incurred capital costs associated with them. (Only a relatively few DSM options, such as load management options, have capital costs.) This raises the question of how applicable a "Capital Recovery Factor"-based formula is when applied to non-capital costs.

This question is underscored by the calculation shown in the bottom-half of the exhibit. A very simple DSM option was selected for this calculation. The DSM option is assumed to cost $50, reduce 1,000 kWh, and have a one-year life. The LCOE calculation using this formula appears to produce a value of 5.4 cents/kWh. This is disturbing because simple math shows that is the wrong answer. $50, or 5,000 cents divided by 1,000 kWh results in a 5.0 cents/kWh answer.

Therefore, not only is the applicability of a capital cost-based formula to non-capital costs questionable, at least in this one example this specific capital cost-based formula appears to provide the wrong answer.

Q. Would you please now discuss the third examination you made regarding whether the LCOE calculation approach is appropriate when attempting to compare DSM and Supply options?

A. Yes. While puzzling over the ACEEE's use of a capital cost-based formula for calculations of non-capital costs, and the fundamental problems inherent in attempting to use an LCOE calculation to compare very dissimilar resource options, I ran across an interesting document. The document is A Manual for the Economic Evaluation of Energy Efficiency and Renewable Energy Technologies. The document was released by the United States Department of Energy's National Renewable Energy Laboratory (NREL) in 1995. As a national laboratory, one would expect NREL to have taken an impartial view of how best to analyze energy efficiency and renewable energy technologies.

The document's introductory chapter begins by stating the document's objective:

> *"This manual is a guide for analyzing the economics of energy efficiency and renewable energy (EE) technologies and projects. It is intended (1) to help analysts determine the appropriate approach or type of analysis and the appropriate level of detail and (2) to assist EE analysts in completing consistent analyses using standard assumptions and bases, when appropriate."* (Page 1, 1st paragraph)

To that end, the document examines a number of methods of performing economic analyses (or *"economic measures"* as they are referred to in the document) including, but not limited to: net present value (NPV), revenue requirements (RR), internal rate of return (IRR), etc. Among the methods analyzed is LCOE and the LCOE formula discussed is identical to the previously discussed formula used by ACEEE.

In the document's third chapter, a Table 3-1 is presented. The table is described in the document's text as follows:

> *"Table 3-1 is a quick reference for identifying the appropriate economic measure for different investment features and decision criteria. Letters in the table indicate whether the measure is recommended, generally not*

recommended, or commonly used. A blank cell signifies that the measure is acceptable. An 'R' signifies that the measure is recommended. However, this does not mean that the other economic measures are inappropriate. On the other hand, an 'N' means that the measure is not generally recommended and may yield incorrect results and conclusions."
(Page 36, full page, emphasis added)

Exhibit SRS – 22 provides a reproduction of Table 3-1 from the NREL document. Shading has been added to the table to highlight the table's conclusions regarding LCOE. Specifically, the table states that the use of an LCOE calculation to select from mutually exclusive alternatives is "N" (Not recommended). DSM and generation options are typically considered as mutually exclusive alternatives, and they are certainly mutually exclusive alternatives in a DSM goals analysis in which DSM seeks to avoid the addition of generation units in FPL's resource plans.

NREL's recommendation to avoid using LCOE calculations to select from mutually exclusive alternatives is entirely consistent with FPL's view that final resource decisions should never be made based on LCOE calculations. However, the witnesses' use of LCOE calculation to justify high levels of DSM rather than generation additions is completely inconsistent with NREL's recommendation.

Q. Please summarize your view of SACE's/Sierra Club's use of LCOE calculation results to justify their recommendation for higher DSM goals.

A. I have three comments regarding this topic. First, for all of the reasons discussed above, it is clear that LCOE calculations are meaningless if the objective is to make final resource decisions between dissimilar, competing options. Because DSM and generation options are about as dissimilar as resource options can be, LCOE calculations are definitely meaningless in regard to this docket. The FPSC should base its DSM goals decision on comprehensive system analyses that utilize current assumptions and projections of resource needs. The IRP analyses FPL performed for this docket is such an analysis.

Second, it is disappointing that, five years after the fundamental flaws in attempting to justify resource decisions based on LCOE calculations had been explained in detail in Florida's 2009 goals docket, and in two Florida nuclear cost recovery dockets, these witnesses continue to use LCOE calculations as part of their testimonies in a new Florida docket. Although it is disappointing, it is not surprising.

The LCOE spiel appears to be a staple in organizations such as SACE's "DSM is always better" playbook. Their LCOE argument sounds good superficially, especially for an audience that either does not already understand the fundamental flaws inherent in attempting to use LCOE

calculations to compare resource options, or which does not then take a critical look at this calculation approach. Because such organizations have little else they can use in attempting to make an economic justification for high levels of DSM, I suspect the LCOE spiel will remain in their playbook. These organizations will have to hope that LCOE's superficial appeal will be enough to get by with audiences who are not curious enough to examine their claims.

Third, these witnesses' use of LCOE calculations again in the 2014 docket has allowed the results of additional critical examinations of LCOE to be presented to the FPSC. These additional examinations, discussed above, only serve to further point out how fundamentally flawed an attempt to justify resource decisions on LCOE calculations is. In this regard, their testimonies have afforded FPL the opportunity to add these new critical examinations of LCOE into the record for the FPSC and other interested parties.

Impact of Intervenors' Proposed Goals on FPL's Customers

Q. Both of these witnesses focus on a recommended goal of a 1% reduction in GWh sales. Did either of these two witnesses provide any analyses regarding the magnitude of impacts to electric rates and corresponding bill impacts to DSM non-participants that would result from their recommended goal?

A. No. They offer no such analyses. However, Mr. Woolf offered the following opinion:

> *"The rate impacts of the Sierra Club goals will not be much higher than those of the Utilities' goals."* (Page 87, lines 2 & 3)

He offers no analyses to back this statement up.

Q. Could these two witnesses have offered an analysis to demonstrate the impacts of their recommendations?

A. Yes. Such an analysis was possible using a few of the exhibits that were presented in my direct testimony and a response to a discovery request.

Q. Did FPL perform such an analysis?

A. Yes. Because both witnesses recommend a "1% reduction of retail sales" goal, the analysis focused on the impacts this GWh goal would have.

Q. Please discuss how the analysis was structured.

A. Because the timing (i.e., the year) of when the full 1% goal was to be met differed between SACE and the Sierra Club's recommendations, two analyses were performed. One analysis was performed using SACE's 1% GWh goal timing and the other analysis was performed using the Sierra Club's 1% GWh goal timing. The analysis was structured as follows:

- The levelized system average electric rate sheet for the TRC 576 MW resource plan was the starting point. This sheet provides information for the TRC 576 MW resource plan that was equivalent to the information provided for the RIM 337 MW resource plan in Exhibit SRS – 12 of my direct testimony. An electronic version of the sheet for the TRC 576 MW resource plan was provided to all parties in response to SACE's 2nd set of discovery, POD # 2.
- Because this sheet utilizes the projected total GWh sales value, and the 1% reduction goal applies only to the retail sales portion of total sales, FPL developed annual modifiers to address the additional impact of the GWh goal on total GWh sales. These annual modifiers were then multiplied by the previously projected net annual GWh sales to derive reduced annual total sales projections in line with the GWh goal.
- Because the "1% reduction in retail sales" goal would reduce projected variable costs, the same annual modifiers were multiplied by the previously projected variable costs to derive reduced annual variable costs.

- In order to achieve such an extreme level of GWh reduction, projected DSM expenditures would have to increase. The GWh associated with 1% of FPL's retail sales is approximately 10 times the GWh associated with the TRC 576 plan. FPL very conservatively assumed that the currently projected DSM costs for the TRC 576 MW resource plan would double.

The projected impacts of their recommended GWh goal on electric rates and customer bills were then determined and the results were presented in several ways for each analysis:

- The levelized system average electric rate was developed and compared to the levelized system average electric rates for the five resource plans previously analyzed. This information is presented in the same formats used in Exhibits SRS – 11 and SRS – 12 of my direct testimony.
- The one-time additional cost that would be needed to make the levelized system average electric rate of the RIM 337 MW resource plan equal to the levelized system average electric rate associated with the recommended goal was determined. This information is presented in the same format used in Exhibit SRS – 13 of my direct testimony.
- The projected annual system average electric rates for the years 2015 through 2025 were determined.

- The projected bills for a customer with a 1,200 kWh usage over the years 2015 through 2025; i.e., a non-participant in utility DSM, based on the annual electric rates developed were developed and compared to the equivalent projections for the five resource plans previously analyzed. The projected electric rate and customer bill information is presented in the same format used in Exhibit SRS – 14 of my direct testimouy. In addition, a cumulative 10-year bill impact for 2015 through 2025 for such a customer was also developed.

Q. What were the results of these analyses?

A. The results of these analyses are presented in Exhibit SRS – 23 (SACE) and Exhibit SRS – 24 (Sierra Club). Each exhibit consists of four pages. I'll summarize these results as follows:

- Page 1 of 4 of the two exhibits shows that the levelized system average electric rate is projected to be 12.1728 cents/kWh for the Sierra Club's 1% GWh goals recommendation and 12.2368 cents/kWh for SACE's 1% GWh goals recommendation.
- Page 2 of 4 compares the respective levelized electric rates for the 1% GWh goal analysis to the comparable levelized electric rate for the other five resource plans previously analyzed. In both analyses, the levelized system average electric rates for the 1% GWh goals analysis are significantly higher than the levelized rates for the other five resource plans (including the supply-only resource plan). In addition,

this page also shows that the 1% GWh goals recommendations will not avoid cross-subsidization of customer groups. In fact, it will increase cross-subsidization by a significant amount.

- Page 3 of 4 begins to put into perspective the magnitude of how much higher the 1% GWh goal's levelized system average electric rate is compared to those of the other five resource plans.

Exhibit SRS – 13 of my direct testimony showed that to increase the levelized system average rate of the RIM 337 MW plan to the higher levelized electric rate of the TRC 337 MW plan, a one-time additional cost of $630 million in 2024 would be needed. Page 3 of 4 of Exhibit SRS – 23 now shows that the one-time additional cost in 2024 of approximately $18,680 million, or $18.7 billion, would be needed to bring the RIM 337 MW resource plan's levelized system average electric rate to the much higher levelized system average electric rate with SACE's 1% GWh goal. In addition, Page 3 of 4 of Exhibit SRS – 24 shows that the one-time additional cost in 2024 of approximately $16,266 million, or $16.3 billion would be needed to bring the RIM 337 MW resource plan's levelized system average electric rate to the much higher levelized system average electric rate with the Sierra Club's 1% GWh goal.

- Page 4 of 4 continues to put the magnitude of the impacts of the 1% sensitivity case on electric rates and individual customer bills into perspective. There are two tiers of information on the page. The top tier shows the projected annual values for electric rates and customer bills based on 1,200 kWh usage. An examination of these values shows that these values with the two 1% GWh goals are significantly higher than for any of the five resource plans.

The bottom tier presents the projections in two ways. First, the differentials in customer bills based on 1,200 kWh usage (i.e., a monthly bill) for the four "with DSM" resource plans, and with the 1% GWh goals, compared to the Supply Only resource plan. The projected bill increases with the 1% GWh goals analysis are enormous compared to that of the RIM 337 plan as shown by the projected monthly impacts for selected years shown below:

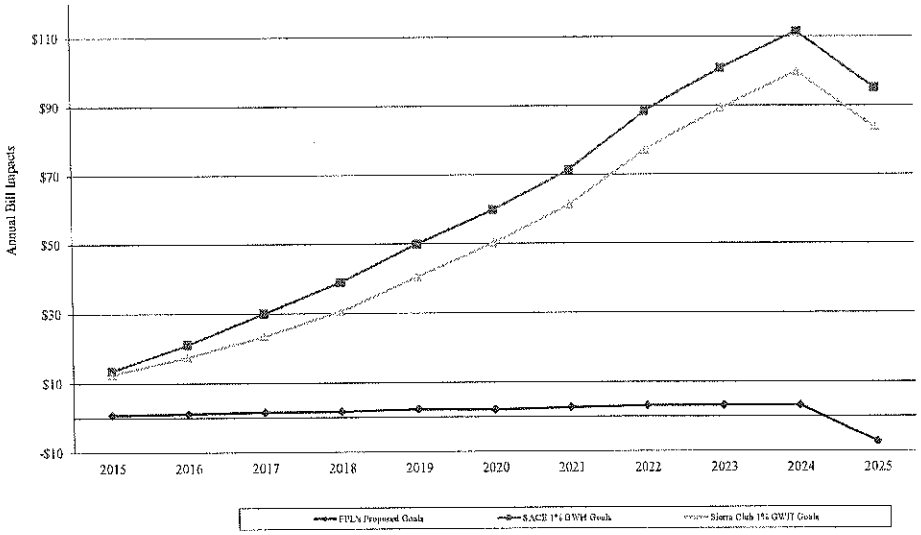
Projected 1,200 kWh Bill Impact Compared to the Supply Only Plan

	RIM 337 MW Plan	SACE 1% GWh	Sierra Club 1% GWh
2015	$0.07	$1.13	$1.04
2019	$0.20	$4.17	$3.38
2024	$0.28	$9.30	$8.32
2025	($0.60)	$7.94	$6.99

The bottom tier of Exhibits SRS – 23 and SRS – 24 also presents the customer bill information in a second way. This shows both the annual customer bill impacts, and the cumulative customer bill impacts for the years 2015 through 2025, for the RIM 337 plan, and with the respective 1% GWh goals, versus the Supply Only resource plan. The corresponding annual customer bill differential values for all years from 2015 through 2025 are presented graphically in Figure 1 below:

Figure 1

Projection of Annual Customer Bill Impacts of SACE's & Sierra Club 1% GWH Goals, and FPL's Proposed Goals vs Supply Only Plan (for 1,200 kWh Monthly Usage)



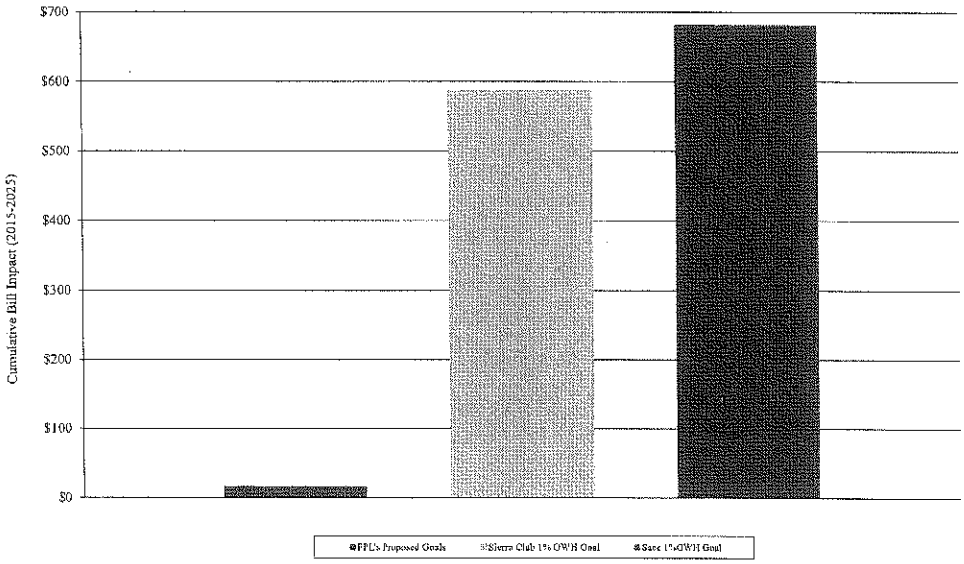
Both of the 1% GWh goals recommendations are projected to result in higher, and generally increasingly higher, annual customer bills for a customer whose 1,200 kWh usage remains unchanged compared to either the Supply Only plan or the RIM 337 MW plan.

In regard to the cumulative bill impact for such a customer over the 2015-2025 time period, the RIM 337 MW plan is projected to result in approximately a $15 cumulative increase in the customer's total bill (and shows a bill savings beginning in 2025) versus the Supply only plan over the 2015-2025 period. Conversely, the Sierra Club 1% GWh goal recommendation is projected to result in a cumulative increase of approximately $586 in the customer's bills over the same time period. The SACE 1% GWh goal recommendation is projected to result in a cumulative increase of approximately $681 in the customer's bills over the same period.

Figure 2 illustrates these enormous differentials in cumulative bill impacts over this time period for a customer with 1,200 kWh usage between the RIM 337 MW plan and the two 1% GWH goal recommendations.

Figure 2

Projection of Cumulative Customer Bill Impacts of SACE's & Sierra Club's 1% GWH Goals, and FPL's Proposed Goals vs Supply Only Plan (for 1,200 kWh Monthly Usage)



Therefore, the 1% GWh goal recommendations of either Sierra Club or SACE are clearly projected to result in significantly higher annual and cumulative bills for individual customers who do not participate in utility DSM and whose usage remains at a 1,200 kWh level. The higher bill impacts are projected to begin immediately and steadily increase throughout the goals-setting period.

Q. What conclusion can be drawn from these analyses of projected impacts to electric rates and individual customer bills from the 1% GWh reduction of retail sales goals recommended by SACE and the Sierra Club?

A. Three conclusions can be drawn. First, Figures 1 and 2 clearly show that the individual customer bill impacts that will result from the witnesses' recommended GWh goals are significantly different from the *"...will not be much higher than those of the Utilities' goals"* claim of Mr. Woolf in regard to electric rate increases. The projected bill impacts for individual customers who are non-participants in utility DSM programs from either of the 1% GWh goal recommendations would definitely be significant from the beginning.

Second, the projected bill impacts from the SACE 1% GWh recommendation are even worse than the Sierra Club's 1% GWh recommendation. This is due to the fact that SACE's recommendation is for the 1% GWh reduction level to be reached in 2016 while the Sierra Club's 1% GWh recommendation is for this reduction level to be reached three years later in 2019. Therefore, the longer such an extreme GWh goals recommendation is delayed, the better. Obviously, the best solution for FPL's customers is to never implement such a recommendation.

Third, it is important to keep in mind that the usage level used in these projections, 1,200 kWh, is the usage level of a residential customer. For

commercial and industrial non-participants whose usage levels are much higher, their annual and cumulative bill impacts would be much greater.

Q. There appear to be two factors driving these projected increases in electric rates and non-participating customer bills that would result from the 1% GWh goals recommendations: recovery of costs over fewer GWh and higher DSM expenditures. Which of the two factors is the bigger driver?

A. In these analyses, the biggest driver by far is the fact that costs will be recovered over fewer GWh. However, there should be little question that DSM expenditures would have to increase to meet higher goals. Mr. Woolf expressed this in the following statement:

> *"...DSM program goals and budgets can be set in a way to increase customer participation. Energy efficiency program goals and budgets could be increased to grow the number of customers that experience bill reductions."* (Page 31, lines 10-12)

In order to test the sensitivity of the individual customer bill impacts discussed above to DSM expenditure levels, FPL ran a separate analysis, labeled "SACE 1% GWh (2)," in which the projected DSM expenditure increase was cut in half. The results of that analysis in regard to individual non-participating customer monthly bills with a 1,200 kWh usage are shown on the right-most column in the table below:

	Projected 1,200 kWh Bill Impact Compared to the Supply Only Plan		
	RIM 337 MW Plan	SACE 1% GWh	SACE 1% GWh (2)
2015	$0.07	$1.13	$0.83
2019	$0.20	$4.17	$3.78
2024	$0.28	$9.30	$8.82
2025	($0.60)	$7.94	$7.68

Thus the DSM expenditure assumption has relatively little impact on the much higher monthly bills resulting from a 1% GWh reduction goal.

In regard to cumulative bill impacts for such a customer over this time frame, this assumption of a 50% reduction in the increase in DSM expenditures also only decreases the projected impact a relatively small amount. The original projection for the SACE 1% GWh goal of approximately $681 is only decreased by a relatively small amount to approximately $631.

These results show that the projected increase in customer bills from a 1% GWh goal would be driven almost completely by the reduction in GWh over which costs would be recovered; i.e., by an increase in electric rates.

Q. Is there a simple explanation for why a 1% GWh reduction goal results in such significant increases in electric rates and customer bills whose usage does not change?

A. Yes. A 1% reduction in retail sales goal may seem relatively innocuous at first glance. However, one must keep in mind that this goal calls for reducing retail sales each year by another 1%. The impact from the reduction in the first year remains in place during the second year when another 1% reduction is piled on top of the first year's impact, and so forth. Thus there is an additive effect that continues as long as the 1% GWh goal stays in place. At the end of the 10-year period, this would mean approximately a 10% decrease in total retail sales for FPL. Recovering fixed costs – costs that are not impacted by an energy only goal – over 10% fewer retail sales GWh will result in a significant increase in electric rates and a significant increase in bills for individual customers who cannot change, or who choose not to change, their electric usage.

4) Other Comments

Q. What will you address in this section of your rebuttal testimony?

A. I will address a few comments in these witnesses' testimonies related to topics that have not yet been addressed.

Q. What is the first of those comments?

A. The first such comment is one made by Mr. Woolf in his testimony:

"...one of the key challenges in setting DSM goals is striking the appropriate balance between reduced costs and increased rates...." (Page 87, lines 11 & 12)

Q. What is your reaction to that statement?

A. I have a couple of reactions. First, in IRP analyses of resource options one should not start with an objective of looking for "an appropriate balance between costs and rates." Instead, the first issue to be considered is system reliability in terms of when does the utility have resource needs and what are the magnitudes of those resource needs. Only then does one begin analyses that examine how best to meet the specific annual resource needs of the utility.

FPL's IRP analyses are based on determining how to meet resource needs at the lowest electric rate impact. This is because electric rate levels affect all of FPL's customers.

However, if one wanted to "strike a balance between costs and electric rates" in their decision-making, I can envision a two-column checklist. One column would have "Lowers Costs?" as its heading. The other column would have "Lowers Electric Rates?" as its heading. In FPL's IRP analyses for this docket, all of the With DSM resource plans are projected to lower costs compared to the Supply Only resource plan. However, only one of the With

DSM resource plans, the RIM 337 MW plan, will also result in lower electric rates compared to the Supply Only plan.

Consequently, the table just discussed would look as follows:

Resource Plan	Lowers Costs?	Lowers Electric Rates?
RIM 337 MW	**Yes**	**Yes**
TRC 337 MW	Yes	No
RIM 526 MW	Yes	No
TRC 576 MW	Yes	No

Recall that FPL's IRP analyses start with a blank slate in regard to incremental DSM. One possibility that was examined was to add no incremental DSM. That possibility is represented by the Supply Only resource plan. The four With DSM resource plans incorporate different levels and/or types of incremental DSM. If one's objective is to determine if any of the With DSM resource plans accomplish both "objectives" of lowering costs and lowering electric rates compared to the Supply Only plan (i.e., thus striking a "balance" between costs and electric rates), only the RIM 337 MW resource plan accomplishes both objectives. Thus the RIM 337 MW resource plan is the best choice if the objective is find the best balance between the issues of cost and electric rates.

However, these witnesses are not interested in an actual balance along these lines. Instead, their definition of balance appears to be: lower costs as much as possible and try to ignore the resulting higher electric rates.

Q. Do they offer a "fix" for the problem of higher electric rates caused by inappropriately high levels of DSM?

A. Not really. They first try to ignore it as seen in the statement of Mr. Woolf's that was earlier discussed in which he stated that electric rates with very high DSM goals *"will not be much higher than those of the Utilities' goals."* We've seen how incorrect that statement was.

Perhaps to cover themselves if anybody checked the accuracy of that statement, Mr. Woolf offers the following "fix":

> *"Utilities should be able to serve a large portion of customers with efficiency programs, thereby offsetting any increases in rates that might occur."* (Page 87, lines 6 & 7)

In other words, Mr. Woolf's suggested "fix" is do a lot more of the same thing that caused the high electrical rates problem in the first place. Non-participants will be harmed from electric rate increases that are driven by any level of non-cost-effective DSM. It should be obvious that non-participants will be harmed even more if one were to try to solve their problem by

implementing even more non-cost-effective DSM that further increases electric rates.

The testimonies of these witnesses lead me to believe that the witnesses have a very dismissive, almost cavalier attitude toward the problem of high electric rates that their recommended goals would result in.

Q. Please explain.

A. These witnesses first attempt, with a few "trust me" statements, to give the impression that their recommended goals will result in little to no electric rate increases. They offer no analysis specific to FPL or Florida to support their claims. Then, still in full "trust me" mode, they claim that any increased electric rate problems and non-participant bill problems can be magically solved by just implementing even more DSM. They again offer nothing to support this second claim. Their testimonies suggest that the witnesses simply will not even consider that increasing electric rates will be harmful for a portion, and perhaps a large portion, of FPL's customers who will be non-participants in voluntary utility DSM programs. I view this attitude as both dismissive and cavalier.

Perhaps this is to be expected. The main, if not sole, objective of these witnesses is to reduce electric consumption. Higher electric rates typically encourage customers to reduce usage. If these witnesses can unnecessarily increase electric rates through high levels of utility DSM, then these witnesses

have the best of both worlds for their objective. They get energy reduction directly from high levels of DSM, and they get more energy reduction indirectly due to increasing electric rates caused by the high levels of DSM.

This is quite a business model for organizations such as SACE and Synapse. However, it ignores the obvious fact that all customers who either cannot participate, or choose not to participate, in voluntary utility DSM programs will be harmed by higher electric rates. These non-participants, as well as DSM participants, are all FPL's customers. FPL cannot ignore the fact that unnecessarily high electric rates, such as those that would occur as a result of arbitrarily high DSM levels, will harm a substantial portion of its customers. This is one of the primary reasons why FPL is proposing DSM goals of 337 MW. FPL's proposed goals result in lower electric rates for all of FPL's customers.

Q. **Were there any specific comments in either of these two witnesses' testimonies that you would like to point out because you are in agreement with the comment?**

A. Yes. I have already mentioned two such statement earlier in my testimony in which Mr. Woolf stated that *"...avoided costs are less than they were in the past"* and that *"It is true that increasing building codes and standards will make it more difficult to achieve DSM savings over time."*

In addition, there are four other statements in Mr. Woolf's testimony that I would like to point out because they are also important points to make in this docket and I also agree with these statements. The first of these statements is actually a quote from the FPSC Order in the 2009 DSM goals docket:

> *"Those who do not or cannot participate in an incentive program will not see their monthly utility bill go down unless they directly decrease their consumption of electricity. If that is not possible, non-participants could actually see an increase in their monthly utility bill. Since participation in DSM programs is voluntary and this Commission is unable to control the amount of electricity each household consumes, we should ensure the lowest possible overall rates to meet the needs of all customers."* (Page 18, lines 19-25, emphasis added)

FPL agrees with this key principle espoused by the Commission.

The second statement in Mr. Woolf's testimony that I agree with is the following:

> *"Applying the RIM test to screen efficiency programs...may lead to the lowest rates...."* (Page 22, lines 14 & 15)

FPL agrees and utilized the RIM screening test to help ensure that its proposed DSM goals are projected to deliver the lowest possible electric rates of any of the With DSM resource plans.

The third statement of his that I am in agreement with is:

> *"...it is important to avoid cross-subsidies where possible...."* (Page 23, line 13)

Unnecessary cross-subsidization that results from selection of inappropriate levels of DSM is an excellent example of the type of cross-subsidies that can and should be avoided.

The fourth statement of Mr. Woolf's that I agree with is the following:

> *"As explained in DEF's and FPL's testimony, the number of payback years influence consumer decisions for adopting energy efficiency measures...."* (Page 101, lines 3 & 4)

FPL again agrees and uses this consideration to address free-riders.

Part III: Conclusion

Q. Based on your experience, do you believe that an IRP analysis approach is the best approach to use when making resource decisions?

A. Yes. An IRP approach, such as the IRP process that FPL utilizes, is by far the best approach to use when making resource decisions for a utility's customers. It requires analysis of the timing and magnitude of resource needs, plus analysis of the capacity and energy impacts that competing resource options will have on the utility system from both an economic and non-economic perspective.

Q. For how long has FPL's generation analyses utilized FPL's IRP process?

A. FPL has used its IRP process to analyze generation options since at least 1991 which was the year I joined FPL's Resource Assessment & Planning department, then named the System Planning department.

Q. For how long has FPL's DSM analyses utilized FPL's IRP process?

A. FPL also has used its IRP process to analyze DSM options since at least 1991.

Q. Did the analyses that developed FPL's proposed DSM goals in this docket utilize FPL's IRP process?

A. Yes.

Q. Why is FPL proposing DSM goals based on IRP analyses?

A. FPL is doing so because it believes that an IRP analysis approach will result in the best resource decisions for FPL's customers.

Q. Are the intervenor witnesses recommending alternate goals based on IRP analyses and, if not, why not?

A. No. Their testimonies do not explain why they choose not to utilize IRP principles and analyses. Instead, they choose to base their alternate goals recommendations on arbitrarily selected numbers which, if accepted by the FPSC, would result in those witnesses' objective of ever-increasing amounts of DSM, and ever-increasing electric rates, being realized. Their objective of ever-increasing amounts of DSM also appears to be based, at least in part, on the fact that such an objective is economically beneficial to organizations such as SACE and Synapse.

Q. Intervenors recommend DSM goals of a 1% reduction in retail sales. FPL has sought approval of a RIM 337 MW portfolio. Would a good middle ground be the extension of the current DSM goals levels?

A. No. To better understand why this is so, one needs to return to the 2009 docket. Even at that time, utility DSM cost-effectiveness overall was declining and the impact of energy efficiency codes and standards was becoming more widely recognized. As a result, FPL proposed a reduction in the 2009 docket from its set-in-2004 DSM goals of approximately 88 MW/year down to 66 MW/year.

Thus the eventual decision to instruct FPL to continue to implement DSM at an average level of 120 MW/year meant that the 120 MW/year DSM implementation level was already not cost-effective in 2009. Since that time,

DSM cost-effectiveness has further declined and the impact of energy efficiency codes and standards has increased. This means that DSM implementation at a 120 MW/year level is even more non-cost-effective and less supportable today than it was in 2009.

Q. What is your reaction to the perceived-dramatic decrease of DSM if FPL's proposed goals are adopted by the FPSC?

A. If FPL's proposed goals are adopted by the FPSC, then the decrease in goals from 120 MW/year to 34 MW/year will appear to be dramatic and may be deemed by some as questionable. I have two reactions to that.

First, as discussed in direct testimony, the FPL system is in a very desirable situation for FPL's customers in regard to fuel efficiency, low emissions, and low electric rates. With the approval of the FPSC, FPL was able to accomplish this by adhering to sound IRP principles and basing its decisions on rigorous IRP analyses. FPL's proposed goals are based on the utilization of these same sound IRP principles and analyses. Consequently, it should be made clear that FPL's proposed goals are based on a proven and logical approach that has shown to deliver very desirable results for FPL's customers.

Second, it is important to remember – with perfect 20-20 hindsight from a resource planning perspective – that the proposed decrease from 120 MW/year to 34 MW/year was not supposed to have happened in that manner. Recall that in 2004 FPL's goals were set at 88 MW/year. By 2009 it was clear

to FPL that DSM cost-effectiveness was steadily declining and that energy efficiency codes and standards were delivering significant amounts of energy efficiency that could, therefore, no longer be delivered by utility DSM. Based on these facts, FPL proposed lowering its goals in 2009 from 88 MW/year to 66 MW/year. Both trends of declining cost-effectiveness of DSM and increasing energy efficiency from codes and standards have continued since 2009. As a result, FPL is now proposing that its DSM goals be lowered to 34 MW/year.

Thus, from a resource planner's perfect 20-20 hindsight view, what "should" have happened was a logical and step-wise decrease in DSM goal levels from 88 MW/year in 2004, to 66 MW/year in 2009, to the proposed 34 MW/year level in 2014. This decrease would have been consistent with trends of declining DSM cost-effectiveness and increasing impacts from energy efficiency codes and standards over that time period.

Q. What is your reaction to the implications by the intervenor witnesses that FPL, and the state of Florida, have "outdated" views and are "not following [so called] leading states and utilities"?

A. If someone wants to describe adhering to sound IRP principles and analyses in how a utility plans to meet its system needs as an "outdated" method, so be it. In my opinion such a statement simply reveals a lack of understanding regardiug how traditionally regulated utility systems operate and should be planned for. The IRP approach is the best way to perform such planning.

In regard to the notion of so called "leading" utilities and states, that view is in the eye of the beholder. Taking a lemming-like approach and following someone else to avoid criticism is behavior that should have been left behind when one ends their high school days. Doing the correct thing, regardless of any name calling or criticism that may ensue, is the very definition of what being a "leader" means. FPL is doing the correct thing for all of its customers by utilizing IRP principles and analyses to determine its proposed DSM goals. Thus I view FPL as a leader in how DSM analyses should be conducted. I hope that the 2014 docket decision will be a "leader" result, not a "lemming" result.

Q. In summary, what would be the best decision in this docket for all of FPL's customers?

A. FPL's proposed goals are based on sound IRP principles and analyses. Therefore, I believe that the best decision for all of FPL's customers is to adopt FPL's proposed goals.

Q. Does this conclude your rebuttal testimony?

A. Yes.

BY MS. CANO:

Q Would you please provide a summary of your rebuttal testimony to the Commission?

A Yes, I'll be glad to.

Good morning, Chairman Graham and Commissioners. My rebuttal testimony addresses aspects of the testimonies from all four Intervenor witnesses.

First, regarding testimony about FPL's solar pilot programs. FPL's solar water heating and PV pilot programs were not cost-effective in 2009 and have remained non-cost-effective every year since then. No witness recommends extending FPL's solar water heater pilot programs. However, Dr. Fine and Mr. Rábago do recommend extending FPL's DSM PV pilot program, despite the fact that doing so will continue to harm FPL's general body of customers.

They offer no FPL or Florida-specific analysis that supports their recommendation. Instead, they recommend that Florida disregard its time tested DSM cost-effectiveness test and substitute a brand new evaluation approach similar to the Minnesota Value of Solar calculation. However, the Minnesota Value of Solar calculation is, one, not a cost-effectiveness test and, two, clearly overstates utility system benefits. Therefore, it should not be adopted for use in Florida.

Therefore, FPL's solar water heating and DSM PV pilot program should be allowed to expire on schedule at the end of this year. There are more economical applications of PV in Florida such as utility scale solar that can be pursued instead.

Second, regarding the testimonies of Witnesses Mims and Woolf, these witnesses' testimonies can be summarized in two main points. Number one, they do not like FPL's and Florida's approach to analyzing DSM, and, number two, they recommend an arbitrary 1 percent of retail sales gigawatt hour reduction DSM goal. However, the witnesses make numerous incorrect and/or misleading statements about FPL's IRP analysis process, thus clearly demonstrating that they don't understand FPL's process or analyses.

The witnesses offer no FPL-specific or Florida-specific analysis supporting their arbitrary 1 percent gigawatt hour reduction goal except for statements which I'll paraphrase as other people are doing it.

FPL's analysis show that their arbitrary 1 percent of gigawatt hour goal will not only increase electric bills but will significantly increase annual electric bills for all DSM non-participants.

For example, for residential customers only

with a 1200-kilowatt-hour-a-month usage who are DSM non-participants, these customers are projected to pay from roughly $580 to $680 more over the ten-year period with a 1 percent goal. The increase in bills for higher usage non-participant, non-participating customers including commercial and industrial customers will be even greater. For these reasons, their arbitrary 1 percent gigawatt hour reduction goal recommendation should not be given serious consideration.

In conclusion, two obvious facts provide a foundation for this DSM goals docket. Number one, DSM in general is less cost-effective than it has been in the past, and, number two, energy efficiency codes and standards have further diminished DSM potential. FPL should avoid the Intervenors' pleas to avoid these obvious facts and to make DSM appear more cost-effective than it is by using arbitrary adders for DSM benefits or switching to new lower hurdle for DSM evaluation approaches. Instead, Florida should continue its well considered approach for setting DSM goals on sound planning principles and analyses, and FPL's proposed DSM goals are based on just such an approach and will benefit all of FPL's customers. Therefore, I recommend that FPL's proposed goals be adopted. Thank you.

MS. CANO: The witness is available for

cross-examination.

CHAIRMAN GRAHAM: Thank you. OPC.

MR. SAYLER: No questions.

CHAIRMAN GRAHAM: Department of Agriculture.

MR. HALL: No questions.

CHAIRMAN GRAHAM: NAACP.

MR. DREW: No questions.

CHAIRMAN GRAHAM: FIPUG.

MR. MOYLE: Just a short line of questioning, Mr. Chairman.

CHAIRMAN GRAHAM: What's your definition of short line?

(Laughter.)

Continue, Mr. Moyle.

MR. MOYLE: Less than five minutes. How's that?

EXAMINATION

BY MR. MOYLE:

Q Let me refer you to page 4 of your rebuttal testimony, lines 4 through 7. And you made reference to this in your summary too. You state on those lines, quote, I also demonstrate that significant cost impacts to FPL customers that do not participate in utility DSM programs will result from the witnesses' 1 percent reduction in the retail gigawatt hour goal

recommendations.

Have you -- you quantified what you believe to be significant cost as it relates to residential, is that right, in your testimony?

A In regard to the recommended 1 percent gigawatt hour sales goal?

Q Yes, sir.

A Yes. We quantified it, quantified both representative electric rate impacts as well as non-participant bill impacts.

Q Okay. And then in your summary you talked about there would also be cost impacts, and you put together commercial and industrial; correct? You looped them together and said not only will residential see an increase, and you set some dollar figures out, but you said commercial and industrial will see an increase as well if you went with this 1 percent approach.

A Yes. The analysis we did was based on a 1200-kilowatt-hour-per-month non-participating customers, and in my summary I said that the impact would be even greater for higher use customers, including commercial and industrial.

Q Okay. And have you made any effort to, to quantify what those numbers would look like the way you did with respect to the residential?

A No, we haven't, we haven't done a specific analysis on that, but the effect would be reasonably linear.

Q Okay. And I don't know if you have information, but do you -- commercial customers, like Mr. Wright represents Wal-Mart, they typically use a lot more than a residential at 1200 megawatt; right?

A Yes.

Q And the same with industrials?

A Yes.

Q All right. But there's nowhere in your testimony or any exhibits you have that would, that tries to put a dollar figure on that; correct?

A We have not tried to specific quantify it, although it would be higher than what our analysis for 1200 kilowatt hours shows.

Q There was one other phrase or reference in your testimony I wanted to ask you about, if I could. This is on, on page 36, line 15 to 16. I'm looking up for the lights. I think I'm still okay.

Fifteen, you say, "In other words, the use of non-energy benefits in DSM analyses is a miracle cure for the indisputable ailment of decreasing DSM cost-effectiveness." I'm not sure exactly what you -- what are you trying -- what references -- the non-energy

benefits, what are you referencing in that respect?

MS. CSANK: Mr. Chairman, I'm going to launch an objection as this seems to be friendly cross.

MR. MOYLE: Well, a couple of points. One, you know, I'm not going to go through this in -- other than this question, this is my last line of questioning.

And, two, you know, just because a position may be aligned, I don't know that it forecloses your right to ask clarifying questions about, about testimony.

Three, while I think FIPUG's position is aligned in some respects with some of the utilities, it's not, it's not lined up in a way that makes it, you know, a wholly aligned entity, so.

And, four, I think the record would be benefited by a little explanation of what he means by non-energy benefits.

CHAIRMAN GRAHAM: I will allow it to continue, seeing that you're getting, getting to a point eventually.

BY MR. MOYLE:

Q Would you, would you go ahead and answer the question with respect to non-energy benefits, what you're referencing?

A Yes. The Intervenor testimonies referred in a

couple of places to non-energy benefits that they believe should be included when considering the cost-effectiveness of DSM. And these were such items that are not typically included in the calculation of an electric rate such as health impacts, safety impacts, et cetera. And I believe in Ms. Mims' testimony she showed where those were included on the benefits side of the ledger for DSM, and it jumped the projected benefit cost ratio, I believe, in her chart for at least one or two of the measures from something like a 1.1 benefit-to-cost ratio to 5.5 benefit-to-cost ratio by including those items that are not addressed in utility costs and ratemaking.

And my comment here is simply that, as we have stated many times, the cost-effectiveness of DSM is decreasing across the country due to lower fuel prices, more efficient generation options, and in FPL it's decreasing even more so because of the rather incredible strides we have made in increasing the efficiency with which we generate electricity. So that's what I was referring to.

Q Okay. And just to get to the point, something yesterday a witness talked about, you know, rising ocean levels, health benefits, rising ocean levels, those are things that are very difficult to measure for this

Commission today in terms of quantifying the impact; correct?

MR. CAVROS: Commissioner, I'm going to lodge an objection again about friendly cross. I think he's bolstering the witness here.

CHAIRMAN GRAHAM: Mr. Moyle, I understand -- I guess I'm trying to understand where you're trying to get to your point of not having information, enough information to decide if you're having a two- or three-year. Let's get to that point.

MR. MOYLE: Okay.

BY MR. MOYLE:

Q The -- you would agree, sir, that to the extent that you use a one-year screen, a two-year screen, or a three-year screen, that is a mathematical calculation that you, you make and there's a pretty hard line in or out; correct?

A Yes.

Q Okay. And you would also agree that these non-energy benefits are arguably maybe not the converse but are not like that where you can make judgments based on the input of data and come out with a, with an answer that's of, kind of like mathematical precision; correct?

A I believe I would agree with that statement. I would say they are extremely difficult to quantify,

and I would say to the extent that they exist on the demand-side of the ledger, there are also offsetting benefits, let's say, on the generation side of the ledger that are perhaps difficult to quantify as well. And I believe in the years that I have been doing resource planning for FPL and before this Commission, I believe that's one of the primary reasons why the Commission has chosen not to include, and I believe prudently, such imprecise calculations in the cost-effectiveness analysis of resource options.

MR. MOYLE: Okay. That's all you have I have. Thank you.

CHAIRMAN GRAHAM: Thank you.

Sierra Club.

MS. CSANK: Thank you, Mr. Chairman.

EXAMINATION

BY MS. CSANK:

Q Hello, Dr. Sim.

A Good morning.

Q How are you?

A Fine, thank you.

Q Great. You began working on demand-side management around 1979; right?

A Yes.

Q DSM was in its infancy then.

A This sounds familiar. Yes?

Q One of DSM's initial selling points was its flexibility?

A Yes.

Q In other words, DSM can be ramped up quickly.

A It can be ramped up and ramped down quickly. Yes.

Q In other words, your company, FP&L, can grow DSM programs and savings quickly.

A Yes. And we have demonstrated that back in the middle 2000s.

Q I'll get to that example in a second.

So, in other words, it's not as though you can just flip a switch and DSM programs turn on. There's, there's a process by which FP&L develops them and rules them out; yes? And that takes time?

A It takes time. But one can ramp up DSM and put it on your system faster than one can do generally a new generating unit.

Q Thank you for that clarification.

So let's go to the example from the last decade. So in 2004, the Commission set FPL's DSM goals, you say, to approximately 88 megawatts of summer demand per year?

A I believe that's correct. Yes.

Q And so in 2005, FP&L experienced high peak loads; right?

A Yes. We experienced a very high peak load in the summer of 2005.

Q And so you subsequently increased your DSM implementation.

A We did, yes. We did that in conjunction with a number of power purchase agreements that we signed quickly to ensure the reliability of our system in the, in the short run.

Q How long did that take you to, to reach your current level, which you say is approximately 120 summer megawatts per year?

A Yes. I don't recall how many months, but it was roughly within a year, two tops, that we got to about that level.

Q From what level?

A From the 88 or so per year that we were tasked with as our goals.

Q So it's safe to say that it took you roughly a year to increase by 30 megawatts of summer demand.

A Roughly.

Q And you sought regulatory approval for that increase?

A Yes.

Q Okay. How long would it take to go three times as much? So let's say 100 megawatts, how many years do you anticipate that would take you? And let's be specific about in terms of summer megawatts.

A I think it would take a good bit longer now, and the question of whether it is cost-effective would have to enter into the picture. We, we increased them at, right after the high peak of summer 2005 because we were looking at higher resource needs, we were looking at fairly high fossil fuel costs, and DSM was very cost-effective. So it was -- those factors entered into whether or not we could get regulatory approval for it and how fast we could move.

Today with codes and standards taking away the opportunity for a sizable amount of DSM that otherwise would be achievable at least potentially through DSM programs and with certainly declining cost-effectiveness, it would be, it would take considerably longer and it would have considerably more negative effects on electric rates and on participant bills than it did back in 2005.

Q All right. But let's go back to my question. So in terms of the feasibility, and many factors, as you've mentioned some, go into the cost-effectiveness and what actually the company ultimately and the

Commission ultimately decides the company should do, but in terms of the feasibility of advancing and boosting DSM programs and savings, do you have a, kind of a maximum level in mind of how much the company could achieve with any particular year? And we can stick with my example of summer megawatt savings.

A I do not. I believe Mr. Koch would have been the more appropriate witness to address that simply because he is the witness who is most familiar with DSM programs and the constraints, both administratively dealing with contractors, et cetera, that one needs to consider to, in regard to ramping up or ramping down programs.

Q But if I'm not mistaken, you're, you're significantly involved in the company's integrated resource planning and are aware of these types of factors that can go into the company's resource plans, right, in terms of how quickly a particular resource can be relied upon and ramped up to the point where it helps meet the system's needs?

A I would agree with a lot of that statement. But I don't deal with how fast one can ramp up DSM. I'm familiar with how long it takes to build a power plant. I'm familiar with in general how long it takes to do a power purchase agreement. But in terms of ramping up

DSM programs to arbitrary levels, no, Mr. Koch would be the one who could, who could respond to that accurately.

Q Okay. But then let's go back to your rebuttal testimony. At page 47, I believe, you were describing the inherent flexibility of DSM as one factor the Commission should consider in setting goals, and that these can, these are resources that can be ramped up and ramped down quickly. So what's the basis of your statement if you're not the one who thinks about how quickly these resources can, in fact, be ramped up?

A I believe if you go back to page 46 and look at the start of this discussion, I was discussing that DSM was in its infancy in 1979 when I started. And one of the points of discussion was, in regard to DSM, was this is a resource that in theory can be ramped up relatively quickly, ramped down relatively quickly when cost-effectiveness and/or need declined, and it should be approached that way. That was one of the -- in not so many words -- a selling point for utilities to do DSM so that it had this flexibility to go and go down.

I wasn't referring to you can do this in X number of years. It was simply it's a decision that once you decide to participate in DSM, you're not stuck with that decision as you might be with, say, a long-term power purchase that if you decided five years

later was no longer cost effective but yet you'd signed a contract for ten years, it would have been difficult to undo that. With DSM, if the need is no longer there, if the cost-effectiveness is not there, it would make sense to simply throttle back. And, in essence, that's what we are asking in, in this docket.

We're essentially at a point, as we are every five years, where we've reached a reset. The data, especially the cost data on which goals were set in 2009, is now five years old. I think the intent of five years of, every five years a DSM goal hearing recognizes that fact, and that's the point we are. Costs have declined significantly, and we're asking for a reset.

Q All right. So let's go back to, to my question about how quickly FP&L and the Commission and your customers could, in fact, rely on DSM programs as the need arises. So let's go through the steps. We're here at this goal setting but, in fact, the companies thinking about what the goal should be started over a year ago; is that correct?

A Probably not quite a year. But around October of last year, I would say, we began to freeze assumptions and begin to, to perform analyses.

Q Fair enough. So we can say that it takes about a year, this goal setting phase of thinking about

and, thinking about DSM resources?

A It probably will take at least a year before we get a, a final decision in the docket. But I'll accept a year for discussion purposes.

Q Okay. That works for me. And then next comes the plan approval stage, and that takes about a year at least; right?

A Probably not quite a year. More like a half a year, I would think.

Q So give and take, a year and a half to two is how much time it takes us from the company beginning to freeze assumptions and think about what the appropriate level of DSM programs would be in its system, on its system to the point where those have regulatory approval by this Commission.

A Roughly, yes.

Q Okay. And then it takes some time to actually implement the programs; right? It's not as though then the following day you turn those programs on. It takes some time; right?

A That's correct.

Q And what are some of the things that take time in terms of implementation?

A Again, I'm not the right witness for that. Mr. Koch, who operates those programs and plans those

programs, would be the right one to respond to that line of questioning.

Q All right. But you must need to know approximately the implementation time frames in order to fit them into this bigger bulwark of resource planning that you oversee; right?

A I take as inputs what Mr. Koch and his department provide us. But the exact question as to how long it takes to implement to reach certain levels, I don't believe there's a set answer for that. I believe it would depend upon what the goals are, it would depend upon how different the programs would need to be, what types of contractors you'd need to line up, what tariffs or administrative changes you'd need to make in the program standards. I mean, all of that has to be taken into consideration. I just don't have a good handle on that.

Q Thank you. That's actually exactly what I was looking for is for you to identify those inputs and the fact that those inputs take some amount of time to, to secure in order to achieve implementation. Is that right?

A They do take some time. But, again, it's faster and more flexible than locking one's self into a power purchase agreement, and it certainly takes less

time than it would be to permit and construct a power plant; hence, the flexibility of DSM to both ramp up and ramp down.

Q Okay. So switching gears a little bit, and thank you for that answer, let's turn to your participation in the Southeast Electric Exchange's Integrated Resource Planning Task Force. Are you familiar with that task force, Dr. Sim?

A Yes. I'm a member.

Q You represent FPL at the task force's biannual meetings; right?

A That's correct.

Q And the task force consists of representatives of utilities that range geographically from Oklahoma to Ohio to Florida?

A Yes.

Q And at those biannual meetings you discuss resource planning issues and trends; yes?

A Among other things, yes.

Q You discuss trends regarding energy efficiency?

A On occasion. We don't have a set agenda, but we typically at those meetings have round tables where topics that one utility wishes to discuss or ask questions of other utilities come up. And in the last

few years, the general trend of decreasing cost-effectiveness of DSM has come up several times.

Q And you discuss the -- have you discussed energy efficiency resource standards? Are you familiar with that term?

A Yes, I'm familiar with the term. I don't recall that specifically being discussed.

Q Okay. But so going back to the term, it's a mandatory energy savings target for various DSM programs. Is that a fair definition?

A I believe so. I think of it in terms as the energy efficiency equivalent of a renewable portfolio standard.

Q Absolutely. So in some states targets like those are fairly new; is that fair to say?

A I couldn't answer in regard to when they went in in various states. And I don't know which states have them, with, with only a few exceptions.

Q That's fine. And so what I'm driving at is that, that in these other states that are newer to adopting energy savings programs, they too use a ramp-up period to thoughtfully and carefully implement DSM programs, or at least that would be ideal to have ramp-up periods. You see ramp-up periods in other states for DSM programs?

A I'm not aware of them, but it would seem to be logical they would consider that.

Q Why would that be logical?

A Because one would need to know what is practical to do for a given utility in a given state for a given target.

Q All right. And ramp-up periods also help regulators and utilities evaluate DSM resources as they go; right?

A Can you clarify your question, please, as to --

Q Sure. So instead of going from zero to 200 megawatts of summer savings in a single year as the goal, phasing that in in smaller increments gives the utility, for example, time to develop internal expertise regarding those programs, relationships with trade allies and so on, so that they can calibrate and refine and improve upon their delivery and their implementation of the programs so that they are truly efficient and cost-effective and seek out the most creative solutions for providing those services to their customers. Does that all make sense?

MS. CANO: I object to the form of that question. It assumed a lot of facts not in evidence.

THE WITNESS: It was a long question. I'm not

sure I under -- I remember the start of the question.

BY MS. CSANK:

Q Let me try again. So in terms of the logic behind these ramp-up periods, and we've established that they are not only present here in Florida in terms of the history of DSM program implementation but also you generally admit they, they occur elsewhere too.

A I would in principle there is a ramp up associated with DSM programs.

Q And now I'm trying to get at the logic of having a ramp-up period be more gradual to allow the utility and regulators to really think about what is the optimal implementation of higher levels of DSM on a utility system.

A I'm sorry. Is there a question?

Q Yeah. So is -- a ramp-up period allows for that.

A A ramp-up period would -- again, is a practical constraint that one, or consideration that one should take into account when assuming DSM targets.

Q All right. Let's switch gears a little bit. So going back to your specific job responsibilities at FP&L, you are the Senior Manager in FP&L's Integrated Resource Planning -- Resource Assessment and Planning Department; is that right?

A Yes.

Q And you're good at your job. You've been at FP&L for a few years now.

A Yes.

Q And you've worked in various capacity at the company and supervise and coordinate currently analyses designed to determine the magnitude and timing of FP&L's resource needs; right?

A Yes.

Q And you also developed the integrated resource plan with which FP&L will meet those resource needs.

A In conjunction with others in our department, yes.

Q Okay. But FP&L is holding you out as the, the expert that I get to question about these issues.

A It would appear so, yes.

Q So your work requires familiarity with existing and proposed DSM-related regulations; is that fair to say based on your resumé?

A To some, to some degree, yes.

Q And you are, in fact, familiar with DSM-related state and federal regulations; right? You mentioned some in your testimony.

A Can you give me an example, please?

Q Building codes.

A I'm not specifically familiar with what the building codes are. However, I know of the impact on building codes from discussions with Mr. Koch and his staff as well as our load forecasting group, which has taken the building code impact for both megawatts and gigawatt hours into account. And those efficiency standards are projected to result in truly significant reductions in gigawatt hours as well as substantial decreases in megawatt peak loads.

Q Thank you. And you work with your, in conjunction with your FP&L colleagues who track and analyze DSM-related state and federal regulations; right?

A I work at FPL and deal with departments and individuals whose responsibility that is, yes.

Q And you are familiar with the U.S. Environmental Protection Agency's June 2nd proposal to set mandatory carbon emission limits on existing power plants, including Florida plants?

A Yes, I'm generally familiar with it.

Q And you testified on Monday evening that FP&L has done some studies and thought about compliance options for the company vis-a-vis that regulation.

A In part, yes. I believe what I testified to is we've taken a preliminary look at the EPA proposed

regulations in conjunction with where we believe we will be with CO2 emission rates with our current resource plan with no changes to it. So we've not really looked at options because our -- but we will, because our projection is that our current resource plan by 2030 rather easily gets us under the 2030 target that EPA has proposed.

Q Okay. And help me understand the relevance of that regulation regarding clean power to DSM programs in FPL's system.

A I'm sorry. Can you clarify the question, please?

Q Sure. So this EPA proposal, does it, does it identify energy efficiency in any way? Does it relate to energy efficiency?

A In the following sense: What the EPA proposed regulations state is in regard to setting targets, the EPA looked at each state and considered four building blocks. Energy efficiency was one of those building blocks that was used to set targets. Targets were set for the State of Florida. However, the proposed regulations state that if a, if a utility or state needs to take action in order to meet those targets, they are free to choose virtually any approach that they deem to be prudent in order to meet those targets. So they are

not requiring -- my reading of the regulations -- any particular approach, be it renewable energy, be it lowering heat rates for existing fossil fuel generators, or energy efficiency. That's left to the states to address.

Q Thank you. So in that description one thing we heard was that energy efficiency is an option that Florida and FP&L could exercise towards meeting this regulation.

A It certainly is one of many options that the State of Florida, FPL, could take.

Q And this proceeding, this proceeding is about the amount of energy efficiency resource we will have in Florida over the next ten years; right?

A Yes. From utility programs, yes.

Q And EPA's proposal --

MR. MOYLE: Mr. Chairman, can I register an objection? FIPUG has taken a position that what's relevant and pertinent is the existing regulations that are in place today. And I think these regulations have been proposed, I think there's been some testimony or comments that there's a process that has to be undertaken, possible litigation. I've allowed a lot of questions about the flavor of the regulations, but I think that to the extent we're going to spend a lot of

time talking about regulations that are being developed that are subject to comments, that potentially may be litigated, that it, it really puts the witness in a position of having to speculate on a lot of things and assumes a lot of facts that aren't in evidence. That's the basis for the objection.

MS. CSANK: Mr. Chairman, Commissioners have asked questions about the relevance of the Clean Power Plan, and it certainly is a regulation that relates to clean power and the resources that are being contemplated today by the Commission. And surely there is some uncertainty regarding when and how exactly that regulation will be implemented and its impacts in Florida; however, I don't think that Mr. Moyle can dispute the relevance of that plan. And we are goal setting and thinking about the future; that's what planning is. So I, I would submit that this line of questioning is absolutely relevant and will help complete the record.

MS. CANO: Mr. Chairman, at this point I'll just add that it's also outside the scope of this witness's rebuttal testimony.

MS. CSANK: Mr. Chairman, may I please respond to that?

CHAIRMAN GRAHAM: Sure.

MS. CSANK: Dr. Sim, in explaining FP&L's proposal, explains why the company has opted to put before the Commission goals that are actually lower than the company's achievable potential that they've calculated and explains that based on the needs that they have anticipated through their resource planning.

And my line of questioning is trying to solicit and understand -- to the extent that they haven't put into, put information before this Commission to factor in the Clean Power Plan -- I'm trying to understand how much the company in its resource planning is thinking about that, that set of regulations. And I'm trying to show that there is, in fact, now in proposal at least a compliance schedule that absolutely overlaps with this goals settings time frame. I'm trying to understand what that means for the Commission in making its decisions regarding how quickly the inherent flexibility of DSM can be used today, three years from now, or five years from now. So I think the relevancy is beyond dispute.

CHAIRMAN GRAHAM: I think there's relevancy -- I think there is relevancy there as far as mentioning the EPA proposal. I think we're getting too deep into the weeds on something that is still extremely dynamic. Once again, it is just a proposal that's in front of us.

There's many opportunities for this thing to be, for lack of a better term, tweaked. So I don't think that we need to get as deep into it. I mean, I think you can ask him some broader questions on the proposal that's out there and some of the things you may have thought of, but I don't think we need to get as deep into the weeds as you have been.

MS. CSANK: Fair enough. I'll keep my questions at a high level.

CHAIRMAN GRAHAM: Thank you.

MS. CSANK: And relatively short.

BY MS. CSANK:

Q Dr. Sim, going back then to EPA's Clean Power Plan and what the company has thought about, so when you testified on Monday evening that without any changes to the current FP&L Ten-Year Site Plan -- is that, was that what you were saying -- let me just clarify the question.

When you said that without any changes you anticipate being on track to meet the regulation as proposed, give or take a couple of percents, a couple of percentage points, by 2020 and certainly by 2030, can you clarify what you're basing that on?

A I'm basing it on the resource plan, the RIM 337 megawatt resource plan that we have discussed in

this docket.

Q So, in other words, you're also basing that on new gas-fired generation within the next ten, 15 years?

A As needed, as well as on Turkey Point 6 and 7 nuclear units.

Q And can you remind us, please, when those are expected to come online?

A For our resource planning purposes for this docket, when we froze assumptions it was 2022 and 2023. And the in-service dates for those units will be discussed subsequently in the NCRC docket, I believe, in two weeks -- or hearing.

Q And just for our purposes here today, there is some uncertainty, right, about the in-service dates of those two units at Turkey Point. They may come in later, as you discussed at your deposition with Mr. Cavros; right?

A As --

MS. CANO: I'm going to object at this point. Now we're getting pretty far outside the scope of his testimony for this docket.

CHAIRMAN GRAHAM: I agree on that one.

MS. CSANK: Strike that question then.

BY MS. CSANK:

Q So let the record show then that your

statement on Monday evening regarding FP&L's initial take on the Clean Power Plan is that through the proposed DSM goals and new gas-fired generation and nuclear units, that's what will get you to where you need to be in terms of mandatory carbon pollution standards that EPA has proposed?

A That's correct. The resource plan that is based on the RIM 337 megawatt proposed goals in this docket.

Q And in terms of cost-effectiveness, are you also familiar with the EPA's conclusion that one of the most cost-effective resources to meet the proposed requirements is energy efficiency?

MS. CANO: I object to the form of that question. Assumes facts not in evidence.

BY MS. CSANK:

Q Let me try it this way. If I were to say to you, and we're going to -- I just want to understand how the company would plan for this regulation given a certain scenario. So let's say for, for our purposes here that EPA identified that energy efficiency would cost between $16 to $24 per metric ton of carbon dioxide and that the redispatch to natural gas would cost $30 per metric ton of CO2. So given that dynamic of price range, would the company's thinking around the

cost-effectiveness of the supply-side option versus the demand-side option potentially change?

MR. MOYLE: Mr. Chairman, I think we're back into the EPA regulations where she's delving into the regulations that we just had talked about that are not, not final, that are subject to rulemaking process, and --

MS. CSANK: Mr. Chairman, may I proffer -- let's put the Clean Power Plan aside.

BY MS. CSANK:

Q Let's say that in the future there's a regulation with a compliance period that overlaps with this goal setting, and that regulation identifies that energy efficiency costs almost half as much as supply-side alternatives. Wouldn't that indicate that the cost-effectiveness of those demand-side measures should be further investigated?

A First of all, I disagree with the premise of that question because the analysis we've done, as I discussed at some length in my rebuttal testimony, does not show that DSM comes in at half the price of power plants. In fact, exactly the opposite is the evidence in this docket.

Going back to 2009, we've seen that using the exact same screening of DSM measures that we used in

2009, at that point we had, for -- under the RIM path, for example, we had roughly 950 megawatts and 1800 gigawatt hours that were cost-effective at least preliminarily through the screening. But yet this year the exact same analysis with updated fuel costs, updated CO2 costs, more efficient power plants, et cetera, we're seeing it's dropped to, from 950 to 526. We've seen 1800 gigawatt hours drop down to approximately 500. So I don't accept the premise of the question that DSM is, is half the price of generation. We're seeing exactly the opposite. It's moving in the opposite direction.

Q And let me ask you this. In terms of how you conduct your resource planning, is it that you allow any amount of DSM, whatever the model -- and remind me, do you just Strategist?

A We use Strategist for one specific calculation of the supply-only plan in this process.

Q Okay. So more broadly, your resource planning where you optimize for various resource options that the company has, you -- do you allow the model to take as an input any amount of DSM and optimize that DSM, or do you input a particular level of DSM to compete with that, with the various supply-side options?

A We did both in this docket. We took everything that came through the achievable potential,

plugged it into a resource plan, analyzed it fully, and then we looked at what our resource needs actually were, optimized the DSM measures that met that resource need, and constructed a resource plan around it, and ran that through all of the same economic and non-economic analyses.

Q So -- and just for clarification, that achievable potential already had the three-year payback screen and a variety of other screens that had cut down from technical potential and an economic potential to a smaller subset that you were then considering and plugging into the model; is that fair to say?

A Yes. We went through the technical potential down to the achievable potential by looking at measures both through the RIM screening path and the TRC screening path.

MS. CSANK: Thank you, Dr. Sim. No further questions.

CHAIRMAN GRAHAM: SACE.

MR. CAVROS: Chairman, SACE has questions.

EXAMINATION

BY MR. CAVROS:

Q Dr. Sim, please turn to page 69 of your testimony.

A I'm sorry. Which page?

Q Page 69, please.

MS. CANO: And just to clarify, that's rebuttal?

MR. CAVROS: Correct.

MS. CANO: Thank you.

BY MR. CAVROS:

Q And on line 19 the question is asked, "Did FPL perform such an analysis?" And the answer is, "Yes." And that's referring to an analysis of both the SACE and the Sierra 1 percent goals plan generally; is that correct?

A Yes.

Q Okay. And then on the following page, on page 70, on line 11 you also state that this is equivalent to the information provided for the company's RIM 337 megawatt resource plan; is that correct?

A We're referring here to the levelized system average electric rate sheet, yes.

Q Okay. And do you stand by the accuracy of the data in both those analyses?

A To my knowledge, it is accurately calculated and intended to provide a representative impact of what 1 percent gigawatt hour goals on retail sales would be.

Q Okay. Great. Let's take a look at those. I'd like to enter a -- well, actually I'm going to, I'd

like to pass out a demonstrative exhibit. These are already in Dr. Sim's testimonies.

CHAIRMAN GRAHAM: Okay.

THE WITNESS: Okay.

MR. CAVROS: Great.

BY MR. CAVROS:

Q So just for the record there are two attachments there that are connected by paperclip, and one of them is Exhibit SRS-23, page 1 of 4, which is an analysis of SACE's 1 percent gigawatt hour goal, and column 5 is highlighted. And the other one is an example of levelized system average electric rate calculations for one resource plan, RIM 337 megawatts, and that is Exhibit SRS-12, page 1 of 1. And we're going to do a little comparison here, and the best way I believe to do this is simply to put the tables side by side and go through them by year. And these are, this is actually quite a fascinating table as, as we go through it.

Table 5 for both is the system revenue requirement, all the columns -- is that correct? Is that what Table 5 represents, Dr. Sim?

A You're referring to column 5?

Q I'm sorry. Column 5, yes.

A Yes, sir.

Q Okay. Great. Let's start with year 2015, and I'm going to -- as I go through this, I'm going to go, I'm going to start with the system revenue requirement of the plan that FP&L has put forward, and then I'm going to go to the system revenue requirement of the analysis of the SACE 1 percent gigawatt hour goal.

So if we start in 2015, we see that for FP&L it's 10,242, and I'm going to stop at the second comma just for simplicity's sake. And when we go to the SACE plan, we see it's 10,314. So you would agree there that the system revenue requirement for the SACE plan is little bit higher than for the FP&L plan; is that correct?

A Yes.

Q Okay. Now as we go to 2016, we see that the -- and I'm, just for, for administrative efficiency I'm going to call one the FPL plan and one the SACE plan. As we go to 2016, we see that in the, for the FPL plan the value is 10,754, and we see in the SACE plan it is 10,796. So, again, in 2016 the, the value in the SACE plan is a bit higher; is that correct?

A Yes.

Q Okay. As we move to 2017, in the FP&L plan we have a value of 11,234 and for the SACE plan we have a value of 11,251. So, again, the SACE plan is a tad

higher in 2017; is that correct?

A Yes.

Q Okay. Then we go to 2018. The FPL -- under the FPL plan the system revenue requirement is 12,210 and under the SACE plan it's 12,177. So you would agree that the 2018 value in the SACE plan is lower; correct?

A That's correct.

Q Okay. And as we go through 2019, we see that the FPL system revenue requirement is 12,705 and the SACE plan is 12,636; correct?

A Yes.

Q Okay. And as we go to 2020, the SACE, the value in the FPL plan is 13,205 and the value in the SACE plan is 13,092. Again you would agree that the value in the SACE plan is lower; is that correct?

A Yes.

Q Okay. As we go to 2021, the value is 13,536 for the FPL plan and 13,377 for the SACE plan. You would agree that the value in the SACE plan is lower?

A Yes. And in an effort to try to anticipate where you may be going, I'm happy to state that the revenue requirements will be lower under the SACE plan than under the FPL plan for virtually every year after the first few. However, as shown in the analysis, the

electric rate impact and the costs or the bills for non-participants will be significantly higher under the SACE plan.

Q So then, Dr. Sim, you agree, you would agree overall that the system revenue requirement for the SACE plan is lower than that of the FPL plan.

A So you're referring, for example, to CPVRR, the total over the entire time period here?

Q I'm, I'm talking -- I'm looking at column 5, I'm referring to the system revenue requirement, the comparison of the two plans. And no need to go through, through every year if, if you're willing to accept that, in fact, the system revenue requirement for the SACE 1 percent gigawatt hour goal plan is lower than the, the goals that FPL has proposed here.

A Yes. I would agree the SACE plan is lower in total cost or revenue requirements and considerably higher in electric rates and non-participant bills.

MR. CAVROS: I have no further questions. Thank you.

CHAIRMAN GRAHAM: Thank you.

EDF.

MR. FINNIGAN: No questions, Your Honor.

CHAIRMAN GRAHAM: Staff.

MR. MURPHY: No questions.

CHAIRMAN GRAHAM: Commissioners. Commissioner Balbis.

COMMISSIONER BALBIS: Thank you, Mr. Chairman. I just wanted to clarify because I was the one that brought up the proposed EPA 111(d) rule and questioned several witnesses about that rule. And my -- what I wanted to clarify is that we have expert sworn testimony that indicates that less than a 1% reduction is cost-effective, and we also have expert sworn testimony from parties that Dr. Sim's indicated consistently push for DSM, propose a 1 percent goal, and yet the EPA has proposed a 10 percent goal. So I just wanted to question the difference between those numbers, and I received what I feel is a plausible answer, is that the EPA didn't go through this rigorous process that we go through today. So that's kind of why we went down that path. That's all I had.

CHAIRMAN GRAHAM: Was that a question?

COMMISSIONER BALBIS: No.

CHAIRMAN GRAHAM: Commissioner Brisé, do you have a question?

COMMISSIONER BRISÉ: Yeah, I have maybe a few.

CHAIRMAN GRAHAM: Thank you.

COMMISSIONER BRISÉ: Thank you, Dr. Sim, for being here today.

THE WITNESS: Yes, sir.

COMMISSIONER BRISÉ: So I want to pursue the line of question that SACE was going down with you in terms of -- if you've been here, sort of my focus has been on rate impact for consumers, particularly non-participants and so forth. So if we can pursue that, that same line of thought for each one of those years that we talked about, so if we can start with '14 through, through maybe '20 or even when the -- yeah, '14 through about '20, as to the impact on the whole body of ratepayers and then the non-participants in terms of rate impact.

THE WITNESS: Yes, sir.

COMMISSIONER BRISÉ: So if you can go through that, please.

THE WITNESS: Perhaps the best place to look at that would be -- one moment, please.

COMMISSIONER BRISÉ: Sure.

THE WITNESS: Are we talking the SACE proposal or will the Sierra Club proposal do or --

COMMISSIONER BRISÉ: If we can do all three so I, so we can get sort of a side by side in our minds.

THE WITNESS: Yes, sir. If I could direct you, please, to, in my rebuttal testimony, Exhibit SRS-23, page 4 of 4. This compares the year-by-year

rates, projected rates and the year-by-year bill impacts of a variety of plans. It addresses it on the top -- there are like two rows of tables. On the top we're looking at, we start with a supply only resource plan moving from left to right, the RIM 337, then the TRC 337, the RIM 526, the TRC 576, and then the SACE 1 percent gigawatt hour goal.

So what we're projecting, if -- let's take the last two columns up there. We're looking at the projected electric rate, and then to the right of it the projected customer bill for a non-participant with 1200 kilowatt hour usage under the SACE gigawatt hour goal. So that can be compared back to any of the other five plans that I have discussed in direct testimony. And then the bill differentials are shown on the bottom row of tables down below.

And perhaps the, I guess the best summation is shown at the bottom right where there are three columns. We show there the RIM 337 plan. The annual bill impact for the RIM 337 compared to the supply only plan would about 90 cents for RIM 337 and $13.54 for SACE. So we are seeing -- going down the column one can see the annual impact for each, for those two resource plans head to head.

And then down below, the total shows that for

the RIM 337 plan it is about $15 total impact above a supply only plan for those ten years, where SACE's impact compared to a supply only plan is a little over $681.

COMMISSIONER BRISÉ: Okay. So some of the Intervenor witnesses in their testimony, as I read through some of it, have expressed that the benefits that they would receive ultimately would wash that figure. And I think you make an argument against that. Can you sort of expound on that argument?

THE WITNESS: Yes, sir. I believe what the Intervenors have attempted to do in, in, I'd say kind of in lockstep with what Mr. Cavros was discussing is, is the total cost, the total revenue requirement for the system will drop under the SACE plan. However, there are two groups of customers: participants and non-participants. What we're trying to show here is although the participants will certainly benefit the more DSM you do, if DSM is done improperly and at too high amounts, the non-participants will bear the brunt of it in terms of higher electric rates and higher bills.

So I would say FPL's position, if you had to summarize it quickly, is in general the more DSM you do, the more you lower costs, but the more you raise

electric rates and the more you penalize non-participants.

COMMISSIONER BRISÉ: Okay. One other area, I think on SRS-17 you have a chart describing the Minnesota VOS model and the Florida screen test. If you could sort of walk me through why you feel that the Florida screening tests are better from the company's perspective than the Minnesota Value of Solar instrument that is used there.

THE WITNESS: Yes, sir. I believe there are at least two reasons why we think the Florida approach is better. Number one, whenever one installs DSM on a system that has any sort of kW reduction, it tends -- well, the purpose is to avoid or defer new generating capacity. And in light of that, there are three impacts that that DSM program has on fuel. If you avoid the unit, you avoid burning any fuel in that unit. That's a benefit to DSM, and it's driven by the kW reduction.

However, if you avoid the unit, all else equal, the rest of the system has to generate the amount of energy that that new avoided unit would have generated, and it is generally higher cost energy because the avoided unit is more fuel efficient than the average of the units on your system. So that number is a higher number.

So, for example, if you saved 100 -- if you were going to burn $100 million in fuel in a generating unit and you avoided it, you'd save $100 million from DSM. But in supplying the same amount of energy without building that unit, you would incur higher fuel costs. Let's say it would be 110 million you would save by not running your less efficient generators to make up that energy. So the net impact of those would be 100 saved versus now 110 incurred, so you'd have a net fuel penalty of 10 million from DSM avoiding that unit.

Now there's a third component and the third component is reduced energy from kilowatt hours. And that can be anything from a very small impact for a load management program to a larger impact from energy efficiency. The Florida approach correctly captures all three of those components. The Minnesota Value of Solar approach, from what I have read from the manual on it, only accounts for the third of those three components, only the gigawatt hour output of solar or, in this case, what would be the kilowatt hour reduction of DSM. It does not account for either of the first two components. Therefore, it's giving you an inaccurate and overstated look at fuel benefits. So that's one of the reasons why the Florida approach, because it's an accurate depiction and a complete depiction, is much better than the Value

of Solar Minnesota approach.

The second reason I think the Florida approach is better is it's been Florida's practice to, when we look at environmental costs, we look at environmental compliance costs. We don't look at what the Minnesota Value of Solar calculation does, which is projected societal costs. And they use a very high cost; I think it's a little over $51 per ton of CO2. But the Florida view is one that I agree with. For example, if it takes $10 to comply and avoid $100 of, of cost that would otherwise incur, the rational approach would be I'll spend the $10 to avoid the hundred. Florida's approach looks at compliance costs; it would calculate the rational $10 and not assume the $100 in total cost, which the Minnesota study does. So it overstates the savings for environmental impacts.

COMMISSIONER BRISÉ: Okay. So I'm going to switch gears a little bit here. In your testimony you talk about the three solar programs that FPL is, in essence, looking at. One is the large scale that sort of is in place so far, then we have the medium scale, and, and then the pilot.

What is FPL ultimately trying to get to in terms of solar, and how does it intend to get there so that it's beneficial and cost-effective for Florida

consumers, considering that there's obviously an interest in, in moving in that direction in the state?

THE WITNESS: Yes, sir. Let me try to address it this way. I'll compare utility scale solar to the PV pilot programs and, for good measure, I'll throw in a combined cycle unit to try to give you a relative goodness of these, these projects.

Currently, the combined cycle is the more cost-effective of the three to put on our system. But we're seeing utility scale solar certainly becoming a lot more competitive than it has in the past and it's nearing parity with combined cycle.

At the far end of the scale are the PV pilot programs. They're not cost-effective under any of the tests. For the same amount of money spent on them they provide significantly less megawatts of installed PV capacity. And what's more, due to the capacity factor differences between utility scale and rooftop -- or we call it the PV pilot programs -- there's significant differences. The capacity factor is ball park 23 percent for utility scale versus about 16 or 17 percent for rooftop. And the reason for that is that a rooftop installation such as the pilot programs has to take into account the orientation of the house. It may be oriented not due south, it may have tree shading, it

may have angles to the roof that one has to deal with. With utility scale you can level a field, place the, place the panels on the exact orientation, tilt, et cetera, to get the maximum output out of the units and the difference is considerable. Just those relatively small sounding difference in capacity factor, 23 versus, say, 17 percent or 16 percent, that's a 40 percent difference in output of the units.

So for utility scale you get more megawatts per dollar spent, and for each megawatt you put in, you get 40 percent more output of the unit. So clearly it is more economical to go with utility scale than it is in regard to the PV pilot programs.

And I think there are other advantages. The utility scale installation will be maintained by utility personnel. On a rooftop for a homeowner, as much as they might like to maintain it and do their best to maintain it, it's more difficult than it is for a utility power plant that's manned by individuals whose job it is to maintain it.

In terms of sturdiness or reliability, I would think it would be, again, advantage utility scale to build it in a way to withstand high winds rather than bolting it in the air to a roof.

So for a variety of reasons, FPL believes that

the best way to approach solar would be to go utility scale.

COMMISSIONER BRISÉ: So, so with that in mind, wouldn't it make sense to, as some of the Intervenors have suggested, to maybe have a, a proceeding specifically to look at those possibilities?

THE WITNESS: In regard to a proceeding, it wasn't clear to me as to what they were recommending those proceedings would actually try to address.

COMMISSIONER BRISÉ: Okay. I suppose it would be the potential and so forth, but that is a bridge that we would probably have to cross at a different time.

THE WITNESS: Well, sir, if I may.

COMMISSIONER BRISÉ: Sure.

THE WITNESS: There were certain questions regarding is an analysis needed that's Florida specific, for example? We have been doing analyses -- well, let me back up just a second.

We have looked at a number of studies: The Duke Carolina study on solar integration, transmission, and distribution; we've looked at similar studies from Nevada; we have done a good bit of work looking at the Hawaiian Islands where they are seeing real problems with, on the distribution system with massive penetrations of rooftop PV. In fact, we have even

modeled the Hawaiian systems in order to get a better understanding of solar as well as for other reasons.

In addition, I believe it was within the last two weeks we had representatives from NREL down. They met with a group of us from our resource planning group, our system operations group, our transmission group, our distribution group, our project development group, and we had asked them to come down and share with us the preliminary results of a study they've undertaken which looks at the entire eastern interconnection, which includes Florida. And what they're looking at are a variety of impacts that PV, both central station and rooftop, would have for various penetration levels. And they came down and shared with us what that piece for Florida was. And we have agreed to continue discussions along those lines with NREL. So we're doing a lot along those lines to try to get the answers, frankly, to prevent Florida from being in a situation that the Island of Oahu in Hawaii finds itself in.

COMMISSIONER BRISÉ: Okay. I think that's all I have for now, Mr. Chairman.

MS. TAUBER: Mr. Chairman, I just have a quick questions. I had neglected to ask for Mr. Rábago to be excused when he was up here testifying. And in light of the questions from Commissioner Brisé, I just wanted to

offer to the Commission that Mr. Rábago is here and would relish the opportunity to respond to any questions that the Commissioner just raised concerning the value of solar methodology or any of the other issues that were just asked.

CHAIRMAN GRAHAM: Thank you.

Any other Commissioners with questions for Dr. Sim?

Redirect.

MS. CANO: No redirect.

CHAIRMAN GRAHAM: Exhibits.

MS. CANO: FPL moves Exhibits 142 to 149.

CHAIRMAN GRAHAM: We will enter Exhibits 142 through 149 into the record.

(Exhibits 142 through 149 admitted into the record.)

Dr. Sim, thank you very much for your testimony.

THE WITNESS: Thank you, sir.

MS. CANO: And is this witness excused from the rest of the proceeding?

CHAIRMAN GRAHAM: Dr. Sim is excused for the rest of the meeting. Thank you.

MS. CANO: Thank you.

CHAIRMAN GRAHAM: Travel safe, sir.

Okay. We are to Duke.

MS. TRIPLETT: Duke Energy calls Benjamin Borsch. Mr. Chairman, he was -- has not been sworn.

Whereupon,

BENJAMIN M. H. BORSCH

was called as a witness on behalf of Duke Energy Florida and, having first been duly sworn, testified as follows:

EXAMINATION

BY MS. TRIPLETT:

Q Will please introduce yourself to the Commission and provide your address.

A Yes. My name is Benjamin Borsch. My work address is 299 1st Avenue North, St. Petersburg.

Q And who do you work for and what is your position?

A I work for Duke Energy. I am the Director of Integrated Resource Planning and Analytics, and I'm responsible for DEF planning.

Q And have you filed rebuttal testimony in this proceeding?

A Yes.

Q Do you have your prefiled rebuttal testimony with you today?

A Yes.

Q Do you have any changes to make to that

testimony?

A No.

Q And if I asked you the same questions in your prefiled rebuttal testimony today, would you give the same answers that are in your prefiled testimony with the corrections that have already been filed with the Commission?

A Yes.

MS. TRIPLETT: We request that the prefiled testimony of, rebuttal testimony be entered into the record as though read here today.

CHAIRMAN GRAHAM: We will enter his prefiled direct -- rebuttal - I'm sorry -- prefiled rebuttal testimony into the record as though read.

MS. TRIPLETT: Thank you, sir.

IN RE: COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS (DUKE ENERGY FLORIDA, INC.)

FPSC DOCKET NO. 130200-EI

REBUTTAL TESTIMONY OF BENJAMIN M. H. BORSCH

I. INTRODUCTION AND QUALIFICATIONS.

Q. Please state your name, employer, and business address.

A. My name is Benjamin M. H. Borsch and I am employed by Duke Energy Corporation. My business address is 299 1st Avenue North, St. Petersburg, Florida.

Q. Please tell us your position with Duke Energy and describe your duties and responsibilities in that position.

A. I am the Director, IRP & Analytics – Florida. In this role, I am responsible for resource planning for Duke Energy Florida, Inc. ("DEF" or the "Company"). I am responsible for directing the resource planning process in an integrated approach to finding the most cost-effective alternatives to meet the Company's obligation to serve its customers in Florida. As a result, we examine both supply-side and demand-side resources available and potentially available to the Company over its planning horizon, relative to the Company's load forecasts, and prepare and present the annual Duke Energy Florida Ten-Year Site Plan ("TYSP") documents that are filed with the Florida Public Service Commission ("FPSC" or the "Commission"), in accordance with the applicable statutory and regulatory requirements. In my capacity as the Director, IRP & Analytics –Florida, I oversaw the completion of the Company's most recent TYSP document filed in April 2014 and the Company's 2013 TYSP. I was

also responsible for development of the base resource plan used in the Company's analysis of cost-effective DSM goals in support of the goals proceeding.

Q. Please summarize your educational background and employment experience.

A. I received a Bachelor's of Science and Engineering degree in Chemical Engineering from Princeton University in 1984. I joined Progress Energy in 2008 supporting the project management and construction department in the development of power plant projects. In 2009, I became Manager of Generation Resource Planning for Progress Energy Florida, Inc. and, following the 2012 merger with Duke Energy, I accepted my current position with the Company. Prior to joining Progress Energy, I was employed for more than five years by Calpine Corporation where I was Manager (later Director) of Environmental Health and Safety for Calpine's Southeastern Region. In this capacity, I supported development and operations and oversaw permitting and compliance for several gas-fired power plant projects in nine states. I was also employed for more than eight years as an environmental consultant with projects including development, permitting, and compliance of power plants and transmission facilities. I am a professional engineer licensed in Florida and North Carolina.

II. SUMMARY OF TESTIMONY.

Q. Please summarize of your rebuttal testimony.

A. The purpose of my rebuttal testimony is to address the Direct Testimony of SACE witness Natalie Mims, Sierra Club witness Tom Woolf, and Environmental Defense Fund witness James Fine. The focus of my rebuttal testimony is the resource

planning process utilized by DEF for purposes of evaluating the cost-effectiveness of proposed DSM measures, as well as the assumed carbon cost forecast used in those evaluations. Specifically, I refute three points made by the intervener witnesses with respect to DEF's Integrated Resource Planning ("IRP") process: (1) DEF manipulates or skews the analysis to yield a given result; (2) the IRP process is flawed in general and does not comport with industry standard; and (3) DEF has used unrealistic carbon assumptions in the model.

With respect to the first point, the DEF planning process provides an optimal portfolio of supply side resources against which DSM measures are tested for cost effectiveness. DEF allows DSM measures to be tested for cost effectiveness against all potential units other than those near term units committed to an imminent need. Interveners' second assertion is incorrect. DEF utilizes industry standard modeling techniques that have been reviewed and approved by the Commission and have been refined and updated over a period of more than 20 years. Finally, DEF has properly included an appropriate level of carbon cost, particularly when considering the uncertain future of environmental regulations. DEF has provided a price proxy for the potential costs of carbon regulation that might be borne by DEF customers through rates as an appropriate cost measure against which DSM benefits can be evaluated.

Q. Are you sponsoring any exhibits to your testimony?

A. No.

III. REBUTTAL TESTIMONY.

1. DEF's IRP Process is Principled and not Subject to Manipulation or Skewing

Q. Please explain DEF's Resource Planning process in regard to this docket.

A. DEF uses a process for analyzing and incorporating DSM measures into the resource plan that is performed in three major steps. In the first step, DEF creates a new load forecast with no incremental DSM from the first analysis year and uses the Strategist model to create an optimized resource plan incorporating a portfolio of supply side resources that would be required to serve the full load in the absence of new or continuing DSM measures. With few exceptions, the units making up this portfolio are the avoidable units. In the second step, measures identified through the technical potential process are evaluated against the avoidable units in the portfolio to determine which measures are cost effective. In this step, the benefits of individual DSM measures in terms of avoided capacity and energy are calculated (again by the Strategist model) and compared to the program costs. Measures identified as cost effective, using Commission approved screening criteria, are then aggregated to form the proposed goals. At this point, which is where we stand today, the Company seeks Commission approval of the goals. Following approval, the final step of the process is to re-optimize the resource plan incorporating the anticipated changes to the load and energy forecast resulting from implementation of the approved measures.

Q. Did you perform such a planning analysis for this proceeding?

A. Yes, I am responsible for the group that completes the first and third steps in these analyses. The detailed description of this analysis contained on pages 24-29 of DEF's Direct Testimony is accurate and I incorporate it into this testimony.

Q. Do you agree with Ms. Mims' statement that "the Strategist model was so constrained as to apparently give DEF the 'answer' it wants rather than offering anything approaching an objective result"?

A. No. As detailed in DEF's Direct Testimony and in the summary above, DEF followed the Commission-approved process in evaluating energy efficiency measures. During the first phase of the analysis, constructing portfolios of units to be avoided, DEF constrains the model only to identify units which are already committed. To determine whether a unit is committed for these purposes, DEF looks at two main criteria: (1) whether there are project execution and need constraints requiring that a particular need be met with a generating unit; and (2) whether the Company has started to engage in a process to commit itself or counter-parties to a particular generating option.

To explain the first criteria, in some instances the system planning model may generate a unit to meet a specific need, and that unit may be of such size and imminence that it must be fulfilled with an actual steel in the ground generating unit, rather than DSM measures. Prudent resource planning requires consideration of the actual nature of the need in question. No prudent utility can assume that a particular unit could be avoided by DSM measures, without first considering the particular nature of that need and whether there is sufficient time and likelihood that energy efficiency measures could provide all the necessary reductions in demand and energy in the timeframe at issue. This becomes particularly important when considering the lead times associated with specific near term needs and generating units. DEF does not have the luxury of waiting to see if

DSM programs produce some expected result. We must ensure that adequate resources are available when our customers need them.

When determining whether a unit is committed or avoided, DEF also considers a second factor, whether DEF has committed itself or counter-parties to a particular generating unit option. Through its load forecasting process and the ongoing evaluation of current fleet conditions and availability, DEF regularly evaluates the amount of future need, including the achievement of approved DSM measures, and through its planning model identifies the most cost-effective manner in which to meet that need. Once DEF has identified a particular need and selected either a self-build option to meet that need or has issued a request for proposals ("RFP") to invite counter-parties to bid an alternative resource to meet DEF's need, it no longer considers that unit or Power purchase avoidable. To reliably meet the need, there comes a point in time when DEF needs project certainty to ensure there is time to either self-build or negotiate an appropriate arrangement with a counter-party. This is analogous to the process set forth in Rule 25-17.250, F.A.C. to determine when the avoided unit upon which a standard offer contract is based should no longer be used as the avoided unit.

Q. Please explain why the chillers, the two CT's, and the 2018 Citrus CC units noted in Ms. Mims' testimony could not be avoided by DSM measures and therefore are not appropriate to be used as the avoided unit for DSM evaluation purposes.

A. Each of the units Ms. Mims references is properly considered committed for the reasons explained above. I will first explain why the chillers and the two 2016 CTs meet the

criteria outlined above. I consider these two resources to have the same rationale because they were evaluated together to meet a need that starts in the summer of 2016. Starting with the first criteria, DEF identified a need of 280 MW that begins in the summer of 2016 and grows to over 470 MW in the summer of 2017. Given the size of the capacity need, DEF determined that no DSM programs could be developed, approved, and implemented in time to avoid the need for the 2016 CTs. In addition, bringing the 2016 CTs online will allow older units on DEF's system to retire without additional impact on the transmission system. Similarly, the chillers will bring approximately 200MW of capacity to DEF's system in the summer of 2017. DEF does not believe that any DSM measures could be implemented in time to meet that additional need.

The chillers and the CTs are also committed under the second criteria. DEF began evaluating how to fill the need for 2016 beginning in the fall of 2013. At that time DEF asked counter-parties to refresh previous bids and provide indicative bids to meet the 2016 need. DEF also began work on its self-build alternative (i.e. the CTs and the chillers) so that it could select the most cost-effective option to meet the need. As explained above, because DEF had begun the process of committing to a generating option, it was not reasonable to stop that process to determine whether DSM programs could avoid the particular unit.

With respect to the 2018 Citrus CC, DEF also considered this unit to be committed under the same two criteria. First, there are several operational constraints as to why the unit must be considered committed. The Citrus CC is a 1,640MW combined cycle unit that will be placed into service near DEF's existing Crystal River Units 1 and 2 ("CR1" and "CR2"). The Citrus CC will be brought into service at the same time CR1

and CR2 will be retired to comply with environmental regulations. DEF, and the Florida Reliability Coordinating Council, determined that if there was not continuous operation of generation near CR1 and CR2, there would be significant transmission grid reliability issues. By bringing the Citrus CC unit online concurrent with the retirement of CR1 and CR2, DEF will avoid expensive and substantial transmission projects, and maintain grid reliability. The need for these transmission projects would result in a substantial additional cost to any alternative project, either demand side or supply side to the Citrus CC. In addition, DSM programs of such a scale necessary to defer this large block of capacity (1,640MW) could not be developed, approved, and implemented in time to avoid the need for the 2018 CC.

The Citrus County CC is also committed under the second criteria, because DEF issued an RFP on October 8, 2013, soliciting proposals for other generation capacity resources that might prove superior as a supply-side alternative to the Citrus County CC. At that time, DEF had begun the formal process of soliciting and considering options to meet the 2018 need. As explained above, it does not make sense to stop and start such a process once it has begun. Accordingly, DEF considered it to be committed for purposes of evaluating the avoided unit for use in evaluating DSM options.

Q. Did DEF "hardwire" resources into the Strategist model such that DEF's analysis was biased against DSM?

A. No. With the exception of properly excluding the committed resources discussed above, DEF did not "hardwire" any of the Strategist selections. This question demonstrates a misunderstanding of the evaluation process. Ms. Mims' assertion that DEF "hardwired"

or otherwise tinkered with the Strategist model to bias the results against DSM is an unsupported claim. DEF employed an analysis that is based on a familiar, Commission-approved resource planning methodology to consider all resources, including cost-effective DSM resources. In the first stage of the process in which Strategist identifies resources, this optimization is being performed against a load forecast which incorporates no incremental DSM. This part of the process develops the resource plan against which the DSM measures are evaluated. The resource plan selected for use in the cost benefit evaluation of DSM measures is the lowest cost plan on a Cumulative Present Value Revenue Requirements ("CPVRR") basis utilizing reasonably available supply side resources. As such, it is not biased with regard to DSM, but produces a low cost supply side portfolio of resources against which the DSM measures compete. DEF's forecasted need, driven by upcoming unit retirements and load growth, drives the selection of resources in that period.

Q. What is your response to Mr. Woolf's assertion that DEF's resource planning process does not allow DSM measures the full opportunity to defer new supply-side resources?

A. I believe Mr. Woolf is combining elements of the DEF and FPL methods in a way that confuses each individual process. As described above, DEF produces a supply side only plan and then screens DSM measures for their cost effectiveness against that plan. Assuming approval of the cost effective measures by the Commission, DEF incorporates those measures into the plan and then adjusts the supply side resources around the new load and energy projections including those approved measures. There is no "second

screen" in which DEF reduces or eliminates measures based on expectations of supply side units.

Q. Please respond to Ms. Mims' assertion that the avoided unit CT (2018) is lower in cost than the 2016 CT.

A. Ms. Mims raises this point because she is suggesting that we are improperly assuming a lower price for the 2018 avoided unit to jeopardize the cost-effectiveness of the DSM measures. First, it appears that she is comparing the capital costs of the two units without comparing the total cost of each project. Because the 2018 CT is a generic CT, it has associated fixed gas transportation charges assumed which will result in a higher production cost than the 2016 CTs which have been planned to utilize the existing transportation portfolio. The reason that the 2018 CT has a lower capital cost in the model than the 2016 CT is due to the way that DEF plans CTs. DEF endeavors in its planning to make a realistic representation of the way in which actual units would be planned and sited. Typically DEF does not site single CTs on separate greenfield sites. As such, DEF models CTs in sequences of 2 – 4 CTs. When a CT is needed, the model can determine if the next CT should be a "greenfield" or "brownfield" unit. Greenfield units have a higher cost because the cost includes costs for initial site development. Brownfield units have lower costs. In this case, the 2018 unit is a brownfield unit following the development of the 2016 units.

2. DEF's IRP Process is not Flawed and Comports with Industry Standards

Q. Do you agree with Mr. Woolf's claim that DEF's "resource planning process is inconsistent with standard industry practice for integrated resource planning"?

A. No. DEF's Resource Planning process is an integrated process in which the Company seeks to optimize its supply-side options along with its demand-side options into a final, integrated plan, designed to deliver reliable, cost-effective power to DEF's customers. We evaluate the relationship of demand and supply against the Company's reliability criteria to determine if additional capacity is needed during the planning period. We utilize a computer model called Strategist to evaluate future generating unit options. Strategist is an electric utility industry standard resource optimization program. Strategist models DEF's system and determines combinations of future resource additions that meet system reliability criteria while satisfying system constraints at the most cost-effective total production cost for DEF's system, measured by CPVRR.

The most cost-effective supply-side resource or combinations of resources are evaluated and the various generation plans are ranked by system revenue requirements, or the CPVRR results. Strategist considers many tens or hundreds of thousands of resource combinations. Each of these resource combinations is ranked based on cost performance over the selected planning period and the study period which includes end effects. After using Strategist to identify the lowest cost plan candidates, DEF uses the Planning and Risk module of the Energy Portfolio Manager ("EPM") software to further evaluate the production cost results. EPM is a detailed production cost model which models system behavior at an hourly level and allows for the input of a greater detail of operating constraints. DEF combines the production cost results of EPM with the fixed cost outputs from Strategist to create its final rankings. While other utilities use a range of other modeling tools, the general steps in evaluating cost effective resource plans

including option identification and screening, capacity resource optimization and detailed production cost modeling are common to resource planning processes across many utilities. I would note that Mr. Woolf's only support for his assertion that DEF's process is not industry standard is that DEF does not use the minimization of CPVRR to select resource plans. This statement is incorrect. Minimization of CPVRR is one of the key objectives in the DEF process and is an explicit result in all of DEF's planning results.

Q. How do you respond to Mr. Woolf's statement that DEF's resource screening practices are "opaque, convoluted, and misguided"?

A. DEF has consistently explained our resource planning practices before the Commission in a wide variety of dockets, and we have consistently and clearly explained the processes and procedures. Specifically, DEF and its predecessor companies have used the same resource planning processes including the use of Strategist and its predecessor models since the mid-1990's. Accordingly, those processes have been used in several proceedings during that time period, including the annual TYSP filing, need determination proceedings, nuclear feasibility dockets, and avoided cost proceedings. The Commission, and intervener parties, have asked multiple interrogatories, requests for production, and data requests related to our resource planning model in these various proceedings. Indeed, in this DSM proceeding, I have assisted with answering multiple discovery questions from the interveners with respect to our planning model. To cite just one example, I provided multiple input and output files related to the relevant Strategist and EPM runs for this docket. The process is clear, logical, and consistent with how planning decisions have been made in Florida for more than 20 years.

Q. Do you agree with Mr. Woolf's recommendation that the utilities should "analyze numerous plans to optimize the combination of demand-side and supply-side resources"?

A. As discussed earlier in this testimony, DEF does analyze numerous plans to establish an optimal mix of supply side resources given a set of assumptions regarding available DSM resources. DEF analyzes hundreds of demand side measures to identify the portfolio of cost effective measures which minimizes the total cost from that optimal plan. Following the establishment of the cost effective DSM programs DEF will further optimize the supply side plan to reflect the projected changes resulting from the implementation of demand side resources. Since each step optimizes to identify the lowest cost supply side portfolio that meets DEF's reliability criteria, further iterations "mixing and matching" DSM measures with supply side resources would not yield any lower cost solutions.

Q. Does DEF use rate impacts as the primary criterion for resource planning and choosing among resource options?

A. No. DEF's primary criterion for choosing among resource options is CPVRR, i.e. total system cost. CPVRR is a metric designed to measure the total forward looking cost of a system portfolio.

Q. Do you agree with Mr. Woolf that DEF's resource planning results suffer from so many fundamental flaws that they cannot be used for setting DSM goals?

A. No. As explained above, DEF's resource planning process is consistent with Commission approved practices and provides an objective measure of costs and benefits of specific alternatives for both DSM and supply side resources.

Q. What is your response to Ms. Mims' conclusion that DEF uses a flawed resource planning process that does not appropriately estimate its avoided costs?

A. Ms. Mims' comments focus primarily on the assertion that DEF over constrains the model to produce specific results, "hardwiring" the model as she refers to it. As explained previously in the testimony, DEF does not engage in any improper "hardwiring" of its planning model.

Q. Do you agree with the interveners that Florida lacks comprehensive energy planning?

A. No, I do not. First, these arguments about the Florida planning process appear to be beyond the scope of this proceeding because, as I explain below, the planning process is mandated by statute. However I will explain further why I disagree with these arguments. Ms. Mims acknowledges that Florida's planning process consists of three components: the Ten Year Site Plan ("TYSP"), the FEECA proceeding (i.e. this docket), and need determination proceedings for proposed power plants. These three components make up a comprehensive planning process, one that considers all relevant factors to planning and appropriately balances all interests (e.g. reliability, cost-effectiveness, environmental, etc.). These processes are set out by statutes, and by implementing these statutes, the

FPSC has engaged all stakeholders in thoughtful and meaningful planning with all stakeholders.

Ms. Mims is incorrect regarding the robustness and transparency of the TYSP review process. Each year the Commission expounds multiple data requests upon DEF and other utilities to test the information contained in each utility's TYSP. The Commission also accepts comments from interested parties, a process that SACE and the Sierra Club have both utilized in recent years. The Commission also has a public hearing to discuss the TYSP filings, at which time the Florida Reliability Coordinating Council ("FRCC") presents the planning forecasts for all Florida utilities. Comments from the public are welcome, and again SACE and the Sierra Club have provided comments in previous TYSP proceedings.

Florida's planning process, while it may be completed in separate pieces and stages, does have all the relevant components of an effective planning process. Contrary to Ms. Mims' argument, this Commission has been appropriately implementing a rigorous planning process, and by doing so it has ensured that DEF and all the electric utilities are pursuing least cost and least risk alternatives while maintaining system reliability.

Q. Ms. Mims argues that the reserve margin should be lower than the 20 percent that DEF currently utilizes. Do you agree with her argument?

A. No. First I would point out that this issue is well beyond the scope of this proceeding. Notwithstanding the relevance to this docket, DEF has been planning its resources to satisfy a minimum Reserve Margin criterion and a maximum Loss of Load Probability ("LOLP") criterion since the 1990s. This planning criterion has been reviewed, accepted,

and approved by the Commission each year in the TYSP process, as well as in various need proceedings for new generating plants (filed both by DEF's predecessor and other Florida utilities). The stipulation which established the 20% minimum reserve margin for the Investor Owned Utilities was based on consideration of many basic conditions of the Florida geography and electric system. At a high level, these include an acknowledgement that Florida, as a peninsula, has limited import capability from other states, and thus must have sufficient reliability to stand alone, that the existing Florida transmission system has significant constraints to transfer among the utilities, and that the Florida generation system includes numerous small entities which choose not to fully supply reserves and rely, in part, on the ability of the investor owned utilities to supply reserve generation during periods of system upset.

3. DEF Utilized Appropriate Carbon Cost Assumptions

Q. Did DEF consider the future potential cost of carbon regulation in its analysis of the cost-effectiveness of DSM measures and programs?

A. Yes, as explained in the Direct Testimony filed April 2, 2014 (see pages 39-41), DEF performed a sensitivity including the impact of a monetized cost for Greenhouse Gas emissions compliance. This sensitivity did not show a significant increase in the number of programs that the utility could offer meeting the cost effectiveness test. In the Order Establishing Procedure, the FPSC required that utilities analyze cost effectiveness in the absence of a price for GHG emissions as the base case. DEF's sensitivity showed that including the projected GHG did not materially impact the results. Given this result, and the lack of immediacy of a carbon market within this goal setting period combined with

the lack of certainty that the EPA regulations currently under development will translate into an external cost for CO2 emissions like the one we model here, DEF did not propose goals assuming a cost for carbon. At this time, the specifics of EPA's rule making is currently uncertain and the timeline for implementation is likely to extend over the duration of this goal setting.

Q. How do you respond to Mr. Woolf's arguments with respect to the cost of greenhouse gas regulations?

A. I would first note that, while he generally expounds on the need to include the cost of such regulations, he does not provide a specific compliance cost that DEF should have used. He also does not provide any information as to the impact of using this un-identified cost on the results in this proceeding (he does refer to the 2009 proceeding and the impact of including compliance costs on another utility's goals in that proceeding. Of course such a comparison is irrelevant to the facts and circumstances that face DEF in this proceeding.) In any event, I disagree with his assertion that DEF has not appropriately analyzed the compliance costs for environmental regulations. Indeed, we have done exactly what he claims we should have done: "apply the best estimate available of the likely costs of complying with state and federal requirements for controlling greenhouse gas pollution during the entire DSM cost-effectiveness study period."

Specifically, to determine the compliance cost for purposes of the sensitivity analysis, DEF reviewed the state of the environmental regulations. With respect to CO_2 prices, DEF did not consider a price for CO_2 in its base case given the lack of activity to enact federal climate change legislation that sets a price on CO_2 emissions, and the uncertain

prospects for such action in the future. At the time of this analysis, EPA action was pending and equally uncertain. For its sensitivity case, DEF used a CO_2 price trajectory that starts at $17.47 per ton (nominal dollars) in 2020, increasing at a rate of 8.44% per year. Given the lack of any specific policy proposals that would set a price on CO_2 emissions, these prices by necessity reflect considerable judgment on our part. DEF considers these CO_2 prices to be a reasonable trajectory given the uncertainty surrounding this issue.

The outcome of the legislative debate that occurred in 2009 and early 2010 is informative to the prices we are using today. As evidenced by the 2009 debate over the Waxman-Markey legislation, there are many strongly held differences of opinion within the Democratic and Republican caucuses and between members of Congress representing different regions of the country regarding climate change legislation. It is not simply a Democrat versus Republican issue. For example, members of both parties from states with farm- and industrial-based economies expressed concerns about the impact of climate change legislation on manufacturing and energy prices; coal state members expressed concerns that climate change legislation would hurt the mining economy; and members from states that have historically relied on coal-fired generation expressed significant concerns over increased electric costs to consumers.

DEF believes a primary reason for the failure of climate change legislation in 2009 was concern that the legislation would lead to higher energy prices that would have had an adverse impact on the economy. It is reasonable to assume that this same concern will be present during any future debate over federal climate change legislation or proposed regulation. In addition, regional differences, more than those between the political

parties, could have a great bearing on the outcome of any future debate in Congress over climate change policy.

USEPA issued proposed guidelines in June 2014 that will start a multi-year process to regulate CO_2 emissions from existing fossil-fueled power plants. The outcome of EPA's upcoming CO_2 regulation for existing EGUs is highly uncertain, both in terms of its fate in the courts and in the fashion of its implementation by EPA and the states and DEF cannot predict the outcome. As our projection was necessarily determined in the fall of 2013, DEF did not factor this upcoming rulemaking in its consideration of the CO_2 prices to use in this docket.

The Florida Public Service Commission staff directed utilities that were going to use a CO_2 price in this docket to agree on a single price trajectory. Only DEF and Florida Power and Light are using a CO_2 price. Based on the Staff's direction in this regard, DEF and Florida Power and Light decided to derive a single price trajectory by averaging each company's annual CO_2 prices.

Q. What do you say to Dr. Fine's argument that the utilities should use the carbon compliance cost presented in the "Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis"?

A. I disagree with Dr. Fine. The referenced document ("Technical Update") does not imply or state what the cost of compliance for a particular company is now or will be in the future. Rather, it attempts to estimate the full societal or social cost of carbon emissions given a particular set of assumptions. In fact, it states that the "purpose of the 'social cost of carbon' (SCC) estimates presented here is to allow agencies to incorporate the social

benefits of reducing carbon dioxide (CO_2) emissions into cost-benefit analyses of regulatory actions that impact cumulative global emissions." (See p. 2 of Technical Update). In other words, the Technical Update includes the cost of global environmental externalities, such as "changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of the ecosystem services due to climate change." (See p. 2 of Technical Update). It is inappropriate in this proceeding to use these global social cost estimates for purposes of evaluating the cost-effectiveness of DEF's DSM programs. The only relevant carbon cost assumption for use in this proceeding is an estimate of DEF's implemented cost of compliance for any future set of reasonable environmental regulations. DEF's assumptions regarding its expected future cost of compliance are explained above. Because there is no reasonable expectation that any future regulation would require DEF to pay the costs of global climate change, like costs incurred due to sea changes or temperature changes in Eastern Europe, the social costs included in the Technical Update are not reasonable carbon compliance costs for this proceeding.

Q. Does this conclude your testimony?

A. Yes, it does.

BY MS. TRIPLETT:

Q Mr. Borsch, do you have a summary of your rebuttal testimony.

A I do.

Q Could you provide it, please?

A Yes. Good day, Commissioners. I am the Director of Integrated Resource Planning and Analytics Florida. In this role I'm responsible for the resource planning for Duke Energy Florida.

The purpose of my rebuttal testimony is to address the direct testimony of SACE witness Natalie Mims, Sierra Club witness Tom Woolf, and the Environmental Defense Fund witness James Fine.

The focus of my rebuttal testimony is the resource planning process utilized by DEF for the purpose of evaluating the cost-effectiveness of proposed DSM measures, as well as the assumed carbon, carbon cost forecast used in those evaluations.

The DEF planning process provides an optimal portfolio of supply-side resources against which DSM measures are tested for cost-effectiveness. DEF allows DSM measures to be tested for cost-effectiveness against all potential units other than those near-term units committed to an imminent need.

DEF utilizes industry standard modeling

techniques that have been reviewed and approved by the Commission and have been refined and updated over a period of more than 20 years.

Finally, DEF has properly included an appropriate level of carbon costs, particularly when considering the uncertain future of environmental regulations. DEF has provided a price proxy for the potential costs of carbon regulation that might be borne by DEF customers through rates as an appropriate cost measure against which DSM benefits can be measured.

This concludes the summary of my rebuttal testimony, and I'm happy to answer any questions that you have.

MS. TRIPLETT: We would tender the witness for cross. Thank you.

CHAIRMAN GRAHAM: Thank you very much.

OPC.

MR. SAYLER: No questions.

CHAIRMAN GRAHAM: Department of Agriculture.

MR. HALL: No questions.

CHAIRMAN GRAHAM: NAACP.

MR. DREW: No questions.

CHAIRMAN GRAHAM: PCS.

MR. BREW: No questions.

CHAIRMAN GRAHAM: FIPUG.

MR. MOYLE: We have questions.

EXAMINATION

BY MR. MOYLE:

Q Sir, good afternoon. How are you? Jon Moyle on behalf of FIPUG.

I want to ask you a couple of questions just about the carbon cost assumptions.

A Sure.

Q Okay. You did that as a sensitivity analysis; correct?

A Yes, we did. In the Order Establishing Procedure, the staff asked us to use a no carbon cost evaluation as the base case. And we --

CHAIRMAN GRAHAM: Sir, could I get you to pull that microphone down a little bit so we can hear you clearly.

THE WITNESS: Oh. I'm a little, little away from it. Sorry. I sounded loud to myself the first time.

In the Order Establishing Procedure, the staff requested that we perform the no carbon cost, that is to say zero dollars for carbon emissions, analysis as the base case, and a, and gave us the opportunity to provide data on a case with carbon costs as a sensitivity, and that's what we did.

BY MR. MOYLE:

Q Okay. So, so when you add the carbon costs, that has the result of adding cost to ratepayers in the analysis; is that right?

A Yes.

Q And as we sit here today, are there any Florida laws that impose a carbon cost on you?

A Not today.

Q Same question with respect to the federal government?

A Not today.

Q And you're responsible for resource planning for the company; is that right?

A Yes.

Q Okay. I don't want to open a door, but I think the door may have been opened a little bit already, but with respect to federal rulemaking, the federal government proposes rules and then people have a chance to comment and challenge and it's a process that takes place; correct?

A Yes.

Q Yeah. Were you familiar with, during your responsibilities, with the federal government's proposal of a regulation related to Numeric Nutrient Criteria in Florida in Florida waters?

A At a high level, yes.

Q Okay. And you're aware that the federal government proposed certain regulations, and ultimately the regulations that they proposed were, were not adopted as proposed; correct?

A Yes, in that case. And frequently proposed regulations are significantly modified before they're final and implemented.

Q Okay. And the same thing could happen with the proposed carbon regulations that the federal government has proposed; correct?

A It is very early days in that proposal, so it's, I would say, a matter of speculation to say how they will get finally implemented.

MR. MOYLE: That's all I have. Thank you.

CHAIRMAN GRAHAM: Thank you, sir.

MR. GUEST: Mr. Chairman, I have a question about that I would like to add as a new issue. We did the Numeric Nutrients case and what he said isn't true, so we'd like to follow up on that.

CHAIRMAN GRAHAM: I misunderstood. What's that question?

MR. GUEST: What I'm saying, the question he asked him is what ultimately happened with the federal nutrients case. That was our case and what he said

isn't true, and I would like to examine him on that issue. It's a new issue.

CHAIRMAN GRAHAM: I think what, the issue he was trying to get to was the fact that sometimes if EPA proposals come out, and just because of the way they're proposed doesn't mean the way they're -- the way they're proposed or the way they're implemented. That's what I believe, unless I'm misunderstanding.

MR. GUEST: I understood him as saying that it ended up not ultimately being adopted and something else happened, so we shouldn't count on what happened in the federal regulations. And my questions would show that actually that representation about the nutrients rule actually is not true. And that so to the extent that one could use the Numeric Nutrients case to establish that federal regulations do not ultimately have the effect that you should count on, I would show on, on cross that the opposite is actually shown by that case.

CHAIRMAN GRAHAM: Mary Anne.

MS. HELTON: I was afraid you were going to ask me. Can you hold on one second?

CHAIRMAN GRAHAM: Sure.

MR. MOYLE: And, Mr. Chairman, maybe to try to short circuit a little bit, to your question, I mean,

the point that was trying to be made was simply that federal regulations are subject to change. I mean, I used that as an example, but it could be an airline regulation or a host of other regulations.

CHAIRMAN GRAHAM: That's the way I anticipated it. But not being the attorney, I can use the reasonable man standard, but I want to make sure I'm not making any mistakes here. That's why I went to my, my knowledge base.

MS. HELTON: Mr. Chairman, Mr. Guest hasn't asked a question yet, so I think until he asks a question and we see where he's going with the question, that might be an appropriate time to look at the appropriateness of the question. I don't think he's had his turn yet. I think Mr. Moyle, if my memory serves me correctly, goes before him in the, in the process that you're using. So until we get to Mr. Guest's turn, I would suggest that we withhold any judgment.

CHAIRMAN GRAHAM: So we'll table this until we get to SACE.

MR. GUEST: Thank you, Mr. Chairman.

CHAIRMAN GRAHAM: Sierra Club.

MS. CSANK: Thank you, Mr. Chairman.

EXAMINATION

BY MS. CSANK:

Q Hello, Mr. Borsch. How are you?

A Fine, thanks.

Q You are Director of Integrated Resource Planning and Analytics for DEF; right?

A Yes.

Q You provide analysis and recommendations related to Florida generation resource plans.

A Yes.

Q You also oversee demand-side resources including DSM dockets like this one.

A This is the first DSM docket in which I have appeared.

Q Right. My question was you oversee generally demand-side resources including dockets like this one.

A No, I would not say that. I provide analysis which contributes to DEF's decision-making and recommendation process around DSM dockets. It's probably more fair to say that Mr. Duff oversees the process.

Q All right. But for -- but it's fair to say that you participate and are knowledgeable about these types of demand-side resource decisions.

A I would say that I participate in some aspects of the process and that I am knowledgeable in those

areas.

Q Concerning demand-side resources.

A Concerning demand-side resources.

Q And you work with a variety of colleagues on DEF's regulatory strategy, including consideration of demand-side resources.

A Yes.

Q And regulatory conditions help inform DEF's resource planning which you oversee or contribute to.

A Yes.

Q And DEF plans for future conditions; right? That's what planning does?

A To the best of our ability.

Q And factors that are relevant to DEF's electric system such as forecasted fuel prices, demand growth, those are the types of things you think about; right?

A Yes.

Q And you also in your planning address state regulations that impact your Florida system.

A Yes.

Q And you also address federal regulations that impact your Florida system.

A Yes.

Q And so, for example, we've been discussing

here today the Clean Power Plan. Are you familiar with that federal regulation?

A In a general way, yes. I have not read all thousand pages of it.

Q It's a little less than a thousand, but fair enough. In terms of what you do know about the proposal, it identifies energy efficiency as a part of the regulation; right?

A It identifies energy efficiency as one of the available building blocks to achieve compliance.

Q Okay. So energy efficiency is relevant to that federal regulation.

A I would say that remains to be seen. Certainly in its proposal the EPA has identified energy efficiency as one of the potential opportunities to reach compliance with its targets. I think that depending on the way the state -- well, first of all, depending on the way the rule is finalized, but perhaps more importantly depending on the way the state chooses to implement the rule, the importance of energy efficiency as a contributor to that compliance will be determined, you know, later on.

Q So certainly there's some uncertainty there, and certainly there are a variety of options. But in terms of those four building blocks that EPA's

regulation is premised on, energy efficiency is one of those four building blocks; right?

A Yes, it is.

Q So it's relevant to the regulation in that regard.

A Yes.

Q Okay. And this proceeding, it relates to energy efficiency; right?

A Yes.

Q It determines energy efficiency resources that will be on DEF's system for the next ten years; right?

A It sets the targets for those resources.

Q Right. And so that's between 2015 and 2024; right?

A Yes.

Q And EPA's proposal, are you familiar with the target finalization date for that, for that regulation?

A Yes.

Q It's June of 2015, isn't it?

A Yeah. Next year. Yeah.

Q And the President of the United States committed to that deadline last summer in 2013, right, per a memorandum to EPA?

A I believe that's true.

Q Great. So -- and the following year, right,

next, the summer of 2016 is when Florida's implementation plan is due under that presidential memorandum and the proposed rule?

A Yes, although obviously there remains a substantial uncertainty about whether those deadlines would be met.

Q Reasonable minds can have differences of opinion of how much uncertainty there is. But anyhow, 2016 is now the deadline.

A I'll say it this way. I'll agree that 2016 is the proposed deadline.

Q Fair enough. And so 2016 is within this goal setting ten-year period; right?

A Yes.

Q And 2020 is the proposed first year in which those requirements that are proposed would take effect; right?

A Uh-huh.

Q And 2020 is also within this 2015 to 2024 goal setting period; right?

A Uh-huh.

Q And were you here earlier when I talked to Dr. Sim about the way energy efficiency programs are implemented and the amount of time they take to roll out and ramp up?

A Yes.

Q So is it fair to say that your company also seeks regulatory approval for your energy efficiency and demand-side management programs that you end up implementing?

A Yes.

Q And it takes about a year, give or take, to get through this goal setting proceeding.

A I think we're on a similar schedule.

Q And so then it's also true that it takes a little under a year to get through the program approval stage.

A I guess that will depend a lot on how many people disagree with the way we decide to roll out the programs. Some years -- in principle it should take that long.

Q Okay. So I'm looking for a yes or no answer. So generally is it around a year -- in your experience in the history of DEF's participation in that docket it takes an additional year or so for programs to be approved.

A Well, I guess I'll say this. My history of participation in these proceedings or even, you know, real involvement in how DEF is moving in these proceedings is really limited to the 2009 proceeding and

this proceeding. And I would say that it took us more than a year to get to the programs in the 2009 proceeding.

Q Thank you. That will do. So it sounds like to, to increase energy efficiency -- let's say that's what our goal was, we wanted to increase energy efficiency -- it'll take at least two years and more to conceive of the idea that we want to increase energy efficiency programs and actually get to the point where we're implementing expanded programs, right, with regulatory approval?

A If they were passed through this process, yes.

Q Thank you. And so if we go back, we just said that Florida's plan is due two years from now; right?

A That's the proposed date.

Q So if an energy efficiency is relevant to that plan potentially, it's been identified by EPA as one of the relevant considerations for states?

A It's been identified, EPA, as one of the applicable tools to reach the compliance.

Q And it is your testimony that the company's proposed goals do not factor in compliance requirements under the proposal by EPA.

A They do not. They were developed before the proposal came out.

Q And I understand that there is a comment period open for, that this Public Service Commission has opened for Clean Power Plan related comment. Does your company plan to file comments?

MS. TRIPLETT: Mr. Chairman, I'm just going to object to the, to the relevance of that question.

MS. CSANK: Mr. Chairman, may I?

CHAIRMAN GRAHAM: Please.

MS. CSANK: We've been talking with Mr. Borsch about the, the relevant time frames. And to the extent that this is the energy efficiency docket and we've established that energy efficiency is relevant to that proposal and this Commission is taking comment, the Sierra Club submits that these are all steps towards understanding relevant information and how the company came to its goals and building a complete record.

CHAIRMAN GRAHAM: I'll let you continue with your questioning.

MS. CSANK: Thank you.

CHAIRMAN GRAHAM: Let's stay at the peaks, not down in the valleys.

MS. CSANK: Indeed.

THE WITNESS: I am not directly responsible or even directly participating in the development of whatever comments we may make to either, you know, in

the environmental docket for the Commission or the set of questions that the Commission has asked, although I am aware of them, nor am I involved directly in the development of comments to EPA under the rule.

So, you know, it would seem reasonable to believe that we will comment, but I don't know directly what those comments will be.

BY MS. CSANK:

Q All right. And in terms of your company's thinking though, whether or not you ultimately decide to comment here, you are thinking about compliance options for the proposal; right?

A Again, it's very early days in this proposal. We are evaluating different understandings of how the proposal might, should be interpreted and what those might apply to as far as compliance options. I would say that we are not anywhere near the stage of actually developing even a preliminary plan around the compliance.

Q I see. But so help me understand better the kind of thinking that you're doing at this point. So you, you said earlier that when you're thinking about regulatory strategy, that typically includes demand-side resources. And we've identified that energy efficiency is relevant to this particular regulation; right? But

energy efficiency generally is a way to minimize carbon emissions from the power sector?

MS. TRIPLETT: Mr. Chairman, I'm sorry. I was just going to object. I think this has been asked and answered. He's answered the preliminary, the company has done preliminary analysis on a rule that's not even final. And in addition, I'm not sure -- I think this is beyond the scope of this witness's expertise in terms of analyzing compliance options for a rule like the EPA rule.

CHAIRMAN GRAHAM: I agree with the objection. I think we've explored a little bit and the witness has said more than once that this is not his area and he doesn't know. So I think let's move on to some other line of questioning.

MS. CSANK: Will do, Mr. Chairman.

BY MS. CSANK:

Q So as DEF thinks about resource planning and plans for the future and the possibility of state or federal requirements concerning carbon emissions, have you done any studies to identify, besides the sensitivity analyses that you've offered here, any additional studies to understand how various resource options will be cost-effective in a scenario where there is a regulation of carbon?

A I guess the answer to that question is no. We have based our carbon cost studies around the analyses, the sensitivity that's presented here with regard to DSM alternatives. We are not at the stage yet -- I mean, you've referenced the Clean Power Plan, and we are not at the stage yet of performing similar analyses under scenarios that would result from different interpretations of how the Clean Power Plan might be implemented. So the short answer to your question is no.

Q Thank you.

MS. CSANK: May I have a second?

CHAIRMAN GRAHAM: Sure.

BY MS. CSANK:

Q Just one final line of questions then.

In terms of when you do develop more information about the cost-effectiveness of various resources to meet carbon regulations, could you please explain to the Commission how you would model and have those various resources compete?

A Well, in a general way we will understand what kinds of potential targets might be determined or, you know, established by the plan. And, you know, I think at this point because the rule is so undeveloped we're going to have to create a number of scenarios around

ways that the state might choose to implement the plan. And, you know, from there we would presumably establish, as we always do, a range of alternative resources, including both DSM resources as well as supply-side resources, that would be available to us to construct a new portfolio that would comply with, you know, a given interpretation of how the plan would be promulgated. And then, you know, we'll take those alternatives, develop costs around them, and see what the analysis tells us about the lowest total cost.

Q And based on what you know today about, let's start with supply-side options, what, what might some of those supply-side options be?

MS. TRIPLETT: Mr. Chairman, I'm sorry. I was going to say this perhaps calls for speculation. Again you're talking about what we may do with a rule that hasn't been proposed. But if he can answer it, I suppose -- I mean, that would be okay, but.

MS. CSANK: Mr. Chairman, would you like me to rephrase my question?

CHAIRMAN GRAHAM: No. She said it's okay to answer the question.

THE WITNESS: Well, I mean, I think we'll, you know, continue to evaluate the range of technical options that we see available. I mean, one of the

things that we do regularly is refresh the technologies that are available to us, including both renewable technologies as well as conventional fossil fuel-fired technologies. We, you know, we look regularly at the option of building new nuclear generation. So, you know, we will put all of those options, you know, back on the table, as we do every year, frankly, as supply-side options, and then view them through the lens of what we think the new regulation may look like.

BY MS. CSANK:

Q And in terms of your current plans, you are proposing to this Commission a certain amount of new natural gas burning power; right?

A Yes.

Q Can you tell us a little bit more about what that looks like?

A We have proposed to the Commission that we are considering the construction of two natural gas-fired peakers in 2016, the addition of inlet chilling to enhance the summer capacity of our Hines combined cycle units.

Q May I just interrupt you there? Do you have a measure of how many, what the cost of those particular facilities are in a cents-per-kilowatt-hour basis or whatever metric you may be able to readily offer?

A I don't have those numbers off the top of my head, but they are filed in our docket.

Q Fair enough. So you -- please continue. So you were, you were explaining the natural gas facilities.

A Right. So the two combustion turbines in 2016, inlet chilling for our Hines combined cycle unit in 2017, and a new combined cycle facility in 2018.

Q Thank you. And in terms of -- so that's, those are, those are all facilities that would come online during this goal setting period.

A Yeah.

Q And when you think about future resources and, and in the next ten years how demand-side resources can contribute to your portfolio, could you please remind us of that process by which you optimize and weigh the resource -- sorry -- the demand-side and supply-side resources? In other words, how do you, how do you plug the demand-side resources into your, your model?

A Well, I think this is covered in my testimony. But at a high level, what we do first is to -- and as we have done in this proceeding -- is to essentially zero out the assumption of future demand-side contributions from the first forward year of the analysis. So in this case 2015. And then we create a portfolio of

supply-side resources that would fill the need resulting from our expected load growth without any additional demand-side contribution. And then --

Q May I just interrupt to make sure I understand. When you zero out future DSM, do you still take into consideration naturally occurring DSM that would happen during that relevant time horizon?

A Yes.

Q Okay.

A We're talking, when I say zero, we're talking about zero out utility-sponsored programs.

Q Thank you.

A So from that point once we have a portfolio of supply-side units that we would utilize to fill that need, we then establish a cost for the capital and operation associated with those units. And then Mr. Duff's team takes that information and does a cost-benefit analysis of individual measures that have been identified under the potential study and establishes what is the cost-effectiveness for each one of those measures and, you know, rolls them up into a goal level. And that's represented in our proposed goals in this docket.

Q All right. And just a couple of clarifying points. So when you're putting, when Mr. Duff's team is

plugging in those measures, those don't include the ones that have been screened out as you get closer and closer from technical potential to achievable potential; is that right?

A I don't really know at what stage they do that relative to their cost-effectiveness analysis. You'd have to ask him that.

Q Well, but, but you, you contribute and are generally familiar with how resource -- you oversee resource planning in DEF's service territory, so you have some familiarity with what that, what that looks like, what the inputs are and what the outputs are; right?

A Only at a very high level. Truthfully we -- my group supplies the initial resource plan, as we refer to it, the no new DSM resource plan. And then the screening exercise for the individual measures is conducted by Mr. Duff's group, and I generally don't get involved with that part of the exercise and end up looking at the results of that exercise, you know, at a high level or a summary level that would impact our, you know, resource plan from a supply-side viewpoint. So the question of which measures are screened or otherwise excluded following the potential study, I'm not actually familiar with that.

Q That's fair. So it's in the record and the record will be clear that, that DEF does, in fact, use measures that have passed, or actually part of the achievable potential to do that, that modeling against supply-side resources. And so, in other words, those measures don't include the two-year payback measures, as we've been defining it here, those measures that are the cheapest and the low-hanging fruit. So, in other words, when you're going supply-side versus demand-side, the demand-side measures that are the cheapest and most cost-effective are no longer, because of free ridership, part of the analysis; right?

MS. TRIPLETT: Mr. Chairman, I'm going to object to the characterization of the evidence. I don't think that's accurate.

CHAIRMAN GRAHAM: I agree with you. The thing that's eliminated is that two-year rule that kind of pulls it out. It's not necessarily the cheapest.

MS. CSANK: Right. It's those measures that, that pay back in two years. And so they generally are the ones that are so cost-effective that we worry about there being free riders; right?

CHAIRMAN GRAHAM: It's a two-year rule.

MS. CSANK: Right.

BY MS. CSANK:

Q So, but you agree that the two-year rule in your proposed goal and the way you do resource planning has eliminated those two-year rule measures.

A Again, I have -- I understand that from other people's testimony. It's not part of my work.

MS. CSANK: Thank you. May I have another second, please?

CHAIRMAN GRAHAM: Sure.

MS. CSANK: No further questions. Thank you, Mr. Borsch.

CHAIRMAN GRAHAM: Okay. I'm assuming you guys have more than about five minutes.

MR. GUEST: I believe so.

CHAIRMAN GRAHAM: Okay. Because we're right at the end where we said we were going to take lunch. And I don't want to cut you off in the middle of your questioning.

MR. GUEST: Thank you. I would like to just raise my procedural issue, which is that this new issue about the nutrients case that we poured thousands of hours into has come up. I would like to just ask him a handful of questions about that and let Ms. Tauber take the rest of it that doesn't relate to our case.

CHAIRMAN GRAHAM: I think we can all do that

in an hour.

MR. GUEST: Okay. Yeah. Thank you.

CHAIRMAN GRAHAM: Okay. So right now I've got 1:30. Let's get back here, and we're going off my clock back there, at 2:30. Thank you.

(Recess taken.)

(Transcript continues in sequence with Volume 7.)

STATE OF FLORIDA)
: CERTIFICATE OF REPORTER
COUNTY OF LEON)

I, LINDA BOLES, CRR, RPR, Official Commission Reporter, do hereby certify that the foregoing proceeding was heard at the time and place herein stated.

IT IS FURTHER CERTIFIED that I stenographically reported the said proceedings; that the same has been transcribed under my direct supervision; and that this transcript constitutes a true transcription of my notes of said proceedings.

I FURTHER CERTIFY that I am not a relative, employee, attorney or counsel of any of the parties, nor am I a relative or employee of any of the parties' attorney or counsel connected with the action, nor am I financially interested in the action.

DATED THIS 8th day of August, 2014.

LINDA BOLES, CRR, RPR
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