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.

CERTIFICATE OF SERVICE
DOCKET NO. 130199-EI

I HEREBY CERTIFY that a true and correct copy of FPL's Rebuttal Testimony and Exhibits was served by electronic delivery this 10th day of June, 2014 to the following:

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