BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

In the Matter of:

DOCKET NO. 20190015-EG
COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS (FLORIDA POWER & LIGHT COMPANY).
_____/

DOCKET NO. 20190016-EG
COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS (GULF POWER COMPANY).
_____/

DOCKET NO. 20190017-EG
COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS (FLORIDA PUBLIC UTILITIES COMPANY).
_____/

DOCKET NO. 20190018-EG
COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS (DUKE ENERGY FLORIDA, LLC).
_____/

DOCKET NO. 20190019-EG
COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS (ORLANDO UTILITIES COMMISSION).
_____/

DOCKET NO. 20190020-EG
COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS (JEA).
_____/

DOCKET NO. 20190021-EG
COMMISSION REVIEW OF NUMERIC CONSERVATION GOALS (TAMPA ELECTRIC COMPANY).
_____/

VOLUME 5
PAGES 774 through 1023

PROCEEDINGS: HEARING
COMMISSIONERS PARTICIPATING: CHAIRMAN ART GRAHAM
COMMISSIONER JULIE I. BROWN
COMMISSIONER DONALD J. POLMANN
COMMISSIONER GARY F. CLARK
COMMISSIONER ANDREW GILES FAY

DATE: Tuesday, August 13th, 2019

TIME: Commenced: 2:00 p.m.
Concluded: 6:29 p.m.

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

REPORTED BY: DEBRA R. KRICK
Court Reporter

APPEARANCES: (As heretofore noted.)

PREMIER REPORTING
114 W. 5TH AVENUE
TALLAHASSEE, FLORIDA
(850) 894-0828

# I N D E X

## WITNESSES

EXHIBITS

| NUMBER: | | ID | ADMITTED |
|---|---|---|---|
| 336 | SACE POD 14, Utility Program EE budgets, Bates 1-11 | 783 | 786 |
| 337 | JEA response to SACE 3rd set of ROGS, No. 74 | 784 | 786 |
| 338 | JEA response to staff 1st ROG 114 excerpt of Nos. 5-7 | 784 | 786 |
| 339 | JEA response to staff 12th set of ROGs, Nos. 88-94 | 785 | 793 |
| 340 | JEA response to staff 3rd set of ROGS, Nos. 25-52 | 785 | |
| 341 | JEA response to SACE 5th set of ROGs, Nos. 98-100 & Nos. 102-106 | 785 | |
| 342 | JEA response to staff's 6th set of ROGs | 786 | |
| 53-59 | As identified on the comprehensive exhibit list | | 798 |
| 336-342 | As identified on the comprehensive exhibit list | | 799 |
| 343 | JEA response to SACE 1st set of ROGs Nos. 1-65, excerpt of No. 12 | 812 | 812 |
| 344 | JEA response to SACE 1st set of ROGs Nos. 1-65, excerpt of No. 2 | 812 | 812 |
| 60-62 | As identified in the comprehensive exhibit list | | 813 |
| 345 | SACE/TECO composite | 899 | 926 |
| 63 | As identified in the comprehensive exhibit list | | 926 |
| 64-83 | As identified in the comprehensive exhibit list | | 982 |
| 84-91 | As identified in the comprehensive exhibit list | | 1022 |

P R O C E E D I N G S

(Transcript follows in sequence from Volume 4.)

CHAIRMAN GRAHAM: All right: I got two o'clock on that clock back there, and I have three people at the diocese here, so I am ready to get started.

MR. COX: Chairman Graham, FPL asks to be heard for just a minute before we get started back, if that's okay.

CHAIRMAN GRAHAM: Okay.

MR. COX: So we were talking over lunch at FPL, and we have heard some common questions and themes from the Commissioners in terms of interest in NexGen initiatives for DSM in light of where we are with the goals and what the analyses are showing, and we would like an opportunity, if it was -- the Commission was inclined to grant it, to allow us to come back with a written proposal, you know, by the start of the hearing tomorrow morning basically outlining proposals that we would have for NexGen initiatives that would usher in sort of the next generation of demand-side management programs. And we would make our witnesses available. We would provide the information in

writing to all of the parties, again, by the start of the hearing tomorrow morning, or earlier if you would like us to, but we could safely do it by tomorrow morning, I think.

CHAIRMAN GRAHAM: I guess that question would go to my Commissioners that have been asking NexGen questions.

Commissioner Brown.

COMMISSIONER BROWN: That would be me who's asking the questions. It's an area of great interest. I would love to see what additional proposals -- proposal you have, and I would appreciate the parties' willingness to accept this as well so that we will all be given an opportunity to ask questions, review what is being proposed. But it is an area of great interest personally to me, so appreciate the offer.

MR. MARSHALL: SACE would, and LULAC, would certainly potentially -- I mean, I don't know what's being contemplated here, whether it's new testimony. So, I mean, without having seen this, we just want to reserve all of our rights to object depending on what this is.

CHAIRMAN GRAHAM: Trust me, you will have everything in world, because I have no idea what it

is.

MR. MARSHALL: Okay.

MR. BADDERS: Commissioner Graham --

CHAIRMAN GRAHAM: Yes.

MR. BADDERS: -- Chairman Graham, Russell Badders on behalf of Gulf Power.

We would also like to take the same opportunity. I think we can go back this afternoon and maybe put something together, put it in writing for the parties to have, and give them an opportunity to ask questions of our witness and, you know, of course take care of their due process rights. But we would like to be able to bring something to the Commission at least for your to consider.

CHAIRMAN GRAHAM: Mary Anne, what's your opinion on --

MS. HELTON: Mr. Chairman, you put me in a hot spot here, because you have got a commissioner sitting up there that obviously is very interested in this information.

I also am clueless with respect to what NexGen means as well with respect to this proceeding, this process. I think that Mr. Marshall is completely squared up with respect to reserving all rights to

take issue with anything that the IOUs might bring before you tomorrow. And maybe this is a conversation we need to be having in the morning when we -- when we see what it is that Gulf Power and Florida Power & Light plans to present.

My concern is that this is a long, one that starts really early, and we have a very detailed way that we go about it. There is a lot of planning that goes into it, and for the companies to come the second day of the hearing and offer this up and not have everyone have an opportunity to look at it, to think about it, to conduct discovery on it, I don't know if this is something that, on first look, someone can take it and intuitively know how to vet it before you.

So maybe -- maybe -- and I know time is of an issue, but maybe once Florida Power & Light and Gulf Power present it, if the parties can have an opportunity to look at it, to hold it in their hands and to see it for a period of time before we go forward and ask any questions about it, that might help some.

CHAIRMAN GRAHAM: I think we are pretty much of like mind. I don't fault the utilities because they are doing what they think is a good thing. I

don't fault Commissioner Brown for wanting the knowledge. My tendency is just to say no and not even open this door, but I think we should look at whatever you present tomorrow and make that determination then.

MR. COX: Thank you. We would appreciate that.

MR. BADDERS: As do we. Thank you.

MR. LAVIA: Chairman Graham, Jay Lavia on behalf of OUC.

I haven't talked to my client about this, but we would like to reserve the right to do it too, if there is something we can present to you and that would be helpful.

CHAIRMAN GRAHAM: Once again, and there may be a very good chance tomorrow we just say thank you, but let's talk about that another day.

MR. LAVIA: That's fine, but we want to have the opportunity.

CHAIRMAN GRAHAM: Okay.

MR. LAVIA: Thank you.

MR. PERKO: I guess I will just do a me-too, Mr. Chairman.

CHAIRMAN GRAHAM: Okay. SACE, you were questioning the witness.

MR. LEUBKEMANN: We were. But I would like to first report that we had a very productive conversation with our associates over at JEA.

CHAIRMAN GRAHAM: Another not bad guy, but you just got to ask him.

MR. LEUBKEMANN: Great guys.

We are going to stipulate to a few exhibits that we have --

CHAIRMAN GRAHAM: Let's do this. Let's do this. Let's go through and number them all, and then tell me the ones that were stipulated to so we don't have to do any of that stuff, but I would just like to number them for simplicity.

MR. LEUBKEMANN: Sure.

I have reordered the -- my pile based on the ones that are stipulated.

CHAIRMAN GRAHAM: Okay. We are with 336, and tell me what you want to label 336.

MR. LEUBKEMANN: 336 is going to be SACE POD 14, utility program EE budgets, Bates 1 through 11, tab TPS program categories.

(Whereupon, Exhibit No. 336 was marked for identification.)

CHAIRMAN GRAHAM: What's 337?

MR. LEUBKEMANN: 337 will be JEA's response to

SACE's third set of Interrogatories No. 74.

(Whereupon, Exhibit No. 337 was marked for identification.)

CHAIRMAN GRAHAM: 338?

MR. LEUBKEMANN: JEA's response to staff first ROG 114 excerpt of Nos. 5 through 7.

(Whereupon, Exhibit No. 338 was marked for identification.)

CHAIRMAN GRAHAM: Hold on. Hold on.

MR. LEUBKEMANN: I can repeat any of those.

CHAIRMAN GRAHAM: So 337 is JEA's response to staff's first ROG 1 through 14, is that correct?

MR. LEUBKEMANN: I believe that's --

CHAIRMAN GRAHAM: I am sorry, 338.

MR. LEUBKEMANN: Yes, Nos. 5 through 7.

CHAIRMAN GRAHAM: Yes.

Okay. What's 339?

MR. LEUBKEMANN: Okay. And just to clarify, those last three are the ones we are stipulating to.

CHAIRMAN GRAHAM: Okay. We will come back to that.

MR. LEUBKEMANN: Okay.

CHAIRMAN GRAHAM: What's 339?

MR. LEUBKEMANN: 339 will be JEA's response to staff's 12th set of interrogatories, Nos. 88 through 94, excerpt of 93.

(Whereupon, Exhibit No. 339 was marked for identification.)

CHAIRMAN GRAHAM: Okay.

MR. LEUBKEMANN: 340 will be excerpt number 34, Attachment 2, Residential Admin Costs from JEA's response to staff's third set of interrogatories to JEA Nos. 25 through 52.

(Whereupon, Exhibit No. 340 was marked for identification.)

CHAIRMAN GRAHAM: That's 240.

341?

MR. LEUBKEMANN: 341 will be JEA response to SACE's fifth set of ROGs Nos. 98, 99, 100, 102, 103, 104, 105, 106.

(Whereupon, Exhibit No. 341 was marked for identification.)

CHAIRMAN GRAHAM: And the last one, I take it, is 342?

MR. LEUBKEMANN: That is correct.

CHAIRMAN GRAHAM: Which is JEA's response to staff's sixth set of ROGs?

MR. LEUBKEMANN: Yes, Mr. Chairman.

(Whereupon, Exhibit No. 342 was marked for identification.)

CHAIRMAN GRAHAM: And JEA is stipulating 336, 337 and 338, is that correct?

MR. PERKO: That's correct.

CHAIRMAN GRAHAM: Okay.

(Whereupon, Exhibit Nos. 336-338 were received into evidence.)

CHAIRMAN GRAHAM: All right. So I take it you don't have anything else you need to add to either one of those three?

MR. LEUBKEMANN: Not on those three.

CHAIRMAN GRAHAM: Okay.

MR. LEUBKEMANN: Thank you very much, Mr. Chairman.

CHAIRMAN GRAHAM: Staff, did you get all those?

MS. WEISENFELD: Yes, we did. Thank you.

CHAIRMAN GRAHAM: Okay. Proceed.

MR. LEUBKEMANN: Thank you.

Whereupon,

DONALD P. WUCKER

was recalled as a witness, having been previously duly sworn to speak the truth, the whole truth, and nothing but the truth, was examined and testified as follows:

EXAMINATION (continued)

BY MR. LEUBKEMANN:

**Q Mr. Wucker, if I could direct your attention to staff ROG 34. I am sorry, that's Exhibit 340.**

A 340. Okay, I think you can hear me now. And you said it was Exhibit 340?

**Q Yes, that's right.**

A Yes.

**Q JEA received this document from Nexant as part of its study of energy efficiency potential for JEA?**

A That's correct.

**Q And this column marked Program Costs, I believe it's the far right column, represents the per unit administrative cost for each measure?**

A That's correct.

**Q Does JEA really contend that it would have spent 1,169 in administrative costs per solar pool heater as an administrative cost?**

A Well, JEA has never administered solar pool heaters, so I really don't know what those program costs would be.

**Q Does JEA really contend that it would have to spend $1,478 in administrative costs for a 21 SEER air source heat pump from base electric resistance heating installed?**

A It would be the same answer. We have never administered that particular measure, so I don't know.

**Q For the measure ceiling insulation R-12 through R-38, there is a 166-dollar administrative cost per home.**

A Where is that for the -- R-12 to R-38?

**Q Yes.**

A Right, I see that.

**Q So JEA agrees that in addition to the costs of the materials, labor, incentives, it would cost JEA $166 per home to administer a program to install that R-38 insulation in homes that currently have R-12 insulation?**

A It very well may.

**Q For the measure ceiling insulation R-2 through R-38, there are administrative costs ranging from $385 to $640 per home.**

A I see that.

**Q In this case, JEA agrees that the program to administer R-38 insulation would cost either $385, $397 or $640 per homes that currently have R-2 insulation?**

A Well, as was discussed earlier, these are values that Nexant derived. I don't -- I can't say that they would be that different, but they are equal to the energy saved. They have been distributed over, as I understand it, over the kilowatt hours saved.

**Q So would it be JEA's contention that one program to install R-38 insulation would not, in fact, cost four times as much to run as another to install the same insulation?**

A It may not.

**Q Thank you.**

A Can I add something to that response?

**Q Certainly.**

A So we do look at insulation, and sometimes we do have to qualify, especially in low income, and so time has to be spent to qualify which homes are most in need. So sometimes it does take more time to study that.

And we also -- a lot of JEA's programs are outsourced through implementation contractors. So where some of the other utilities may implement these things on their own, we look to implementation contractors, not just to implement them, but to help us understand the market and the market barriers to administer these programs.

**Q Thank you for that clarification.**

A Thank you.

**Q If I could direct your attention to Exhibit No. 341.**

A Okay.

**Q And do you sponsor the answers to Interrogatories Nos. 98 through 105?**

A I believe that's correct. I really don't have my -- let's see here, 98 through 105? Yes, I have. Yes.

**Q In Interrogatory 98, you answer that JEA's load forecast makes no explicit assumptions as to the adoption of any energy efficiency measures above baseline code and standards?**

A Correct.

**Q And JEA's load forecast does assume that some people may adopt above code energy efficiency measures even in the absence of a utility-sponsored DSM program?**

A It's -- I believe it's inherent in the forecast, yes.

**Q So JEA does not contend that the load forecast it provided to Nexant assumed its customers would adopt zero additional energy efficiency measures above baseline codes and standards during the next 10 years?**

A Say that again. I am sorry.

**Q JEA does not contend that the load forecast it provided Nexant assumed its customers would adopt zero additional energy efficiency measures above baseline codes and standards during the next 10 years?**

A I believe that's correct.

**Q And finally, JEA does contend that the load forecasts supplied to Nexant are accurate?**

A We believe that they are as accurate as -- we strive to be as accurate as possible would our load forecast. Yes.

**Q If I could direct your attention to Exhibit 342.**

A I am there.

**Q Okay. And for response 58, you sponsored this interrogatory answer?**

A Yes, I did.

**Q This interrogatory asks about how JEA has evaluated the success of its programs despite not using any evaluation measurement and verification methods such as customer surveys and historical trends -- historic trends; is that right?**

A I believe that's in regard to the payback period -- I am sorry, the -- let me reread this. Give me one minute.

I assume this is in regard to free-ridership.

**Q I believe this is asking in general about the success of existing programs and how they have incorporated --**

MR. PERKO: I am sorry, could we restate the question? I am not sure what question is pending

at this point.

MR. LEUBKEMANN: Sure, happy to do so.

BY MR. LEUBKEMANN:

**Q This interrogatory is simply asking how JEA has evaluated the success of its existing programs despite not using any evaluation measurement and verification methods such as customer surveys and historic trends.**

A Okay.

CHAIRMAN GRAHAM: Is that a statement or a question?

BY MR. LEUBKEMANN:

**Q I'm asking if that is what the question is about, sorry.**

A Yes, I believe it is. I mean, when I see the words spillover effects, I think free-ridership that, as I recall -- yes -- I mean, obviously, it says EMEV, so --

**Q Okay. And you write is that ideally -- quote, ideally a thoughtful program design can manage the amount of free riders, however, it may also be restrictive and limit participation?**

A Correct.

**Q In your answer, you do not contest that JEA has not used EMEV research methods to evaluate its**

**programs, including the efficacy of the two-year screen at estimating free-ridership?**

A Correct, we have not use.

**Q Okay. Thank you very much.**

A Can I add one thing to that response?

We have looked at other benchmarks and other studies, and it seems to me the best way to address it is proactively, like we mentioned in the program design, and the free-ridership seems to be the tried and true method. And from my experience, I met with customers that seem to understand the value of the quick payback, so --

**Q Thank you.**

**CHAIRMAN GRAHAM: Quick question for you. 339, was that one of the ones you agreed upon, or are you just not using that?**

MR. LEUBKEMANN: Yes, that's a good point. 339 is -- yes, we stipulating to 339 as well.

CHAIRMAN GRAHAM: Okay. I just want to make sure I had it correctly.

(Whereupon, Exhibit No. 339 were received into evidence.)

CHAIRMAN GRAHAM: The other thing is since -- as far as I know, you haven't been before us before. Usually the way it works with witnesses,

you will ask the question, you will allow him to answer yes or no and then explain the answer yes or no. You can let him editorialize as long as he wants. If you choose to just have him answer the question, then it's to his attorney to come back and answer the rest of it on redirect.

I mean, I just want you to know that that's the tool in your tool belt.

MR. LEUBKEMANN: I do appreciate that, Chairman.

CHAIRMAN GRAHAM: Okay. Staff.

MS. WEISENFELD: Thank you, Mr. Chairman. We only have a few questions.

EXAMINATION

BY MS. WEISENFELD:

**Q Good afternoon, Mr. Wucker.**

A Good afternoon.

**Q Ashley Weisenfeld with Commission staff. I have got a few questions about free-ridership for you.**

A Okay.

**Q And for these questions, I will be referring to an excerpt from Exhibit No. 218, which is JEA's response to staff's first set of interrogatories, specifically No. 5.**

A Okay.

**Q You should have a copy in the folder in front of you.**

A I am there.

**Q Got it. Okay, great.**

**And just to confirm, is it true JEA used a two-year payback screening to account for free riders in this proceeding?**

A Yes, that is correct.

**Q Did JEA consider using any alternative method such as surveys or historical data to account for free riders?**

A No, we didn't.

**Q Okay. Did JEA considering using a shorter or longer payback period for its screening of free riders?**

A We looked at it in the sensitivities, but we used the two-year payback.

**Q And can you please explain why JEA believes the two-year payback screening is the best method to address free-ridership?**

A Well, it's been said many times, and I would agree with what's been said, is it's reasonable. A 50 percent return is a very attractive return. I wish my retirement gave me that. And I think it's tried and true in Florida, so --

**Q Thank you so much.**

MS. WEISENFELD: Staff has no more questions.

CHAIRMAN GRAHAM: Commissioners, any questions of the witness?

Redirect?

MR. PERKO: Thank you, Mr. Chairman, very briefly.

FURTHER EXAMINATION

BY MR. PERKO:

**Q Just for the record, Mr. Wucker, you were asked a number of questions about Exhibit 340, excerpts from an attachment to Interrogatory No. 34 from staff. Do you recall those questions?**

A Exhibit 340, you said?

**Q 340.**

A Give me one minute to get there.

**Q It's Exhibit 340.**

A Right. They are not sequential, so I am searching. I am sorry.

Yes, I am sorry. It was the second sheet. I was going from the back. Yes.

**Q My friend from Earthjustice asked you a number of questions regarding the program costs for solar pool heater that's in the left-hands column at $1,100 and 69 -- $1,169.51, do you recall that?**

A Yes, I do.

**Q I just want to make sure the record is clear. Where did those numbers come from?**

A Those numbers came from Nexant based off their expertise.

**Q And do you know how they developed those numbers?**

A Yes. As Mr. Herndon has explained, they were distributed over energy. So they collected admin costs and used their best judgment and decided to distribute them evenly over measures based off of energy saved kilowatts.

**Q And you were asked some questions regarding the program costs for various ceiling insulation measures. Did those figures also come from Nexant?**

A Yes, they did.

**Q And was what is your understanding of how Nexant developed those costs?**

A Same method -- same methodology.

**Q Thank you.**

**And finally, in response to staff, a question regarding why didn't you -- or did you consider use of customer survey data. Do you recall those questions?**

A Yes, I do.

**Q Why didn't you look at customer survey data?**

A Well, in the past, we have looked at other

means of free-ridership, and we've hired -- we've hired consultants to help us make decisions with program design, but -- and I think FPL stated it earlier. I think the survey data can be complex. It can be contentious, and it can be costly. So it didn't seem the best approach. It seemed to be -- a better way was to be proactive in the design of the programs, was to manage the free-ridership piece.

MR. PERKO: Thank you, Mr. Chairman. I have nothing further.

CHAIRMAN GRAHAM: Exhibits.

MR. PERKO: Yes. Mr. Chairman, I would move Exhibit Nos. 53 through 59 into the record at this time.

CHAIRMAN GRAHAM: If there is no objections, we will enter Exhibits 53 through 59 into the record.

(Whereupon, Exhibit Nos. 53-59 were received into evidence.)

CHAIRMAN GRAHAM: SACE?

MR. LEUBKEMANN: SACE would move to enter Exhibit 336 through 342 into the record.

CHAIRMAN GRAHAM: No objections?

MR. PERKO: No objection.

CHAIRMAN GRAHAM: We will enter 336 through

342 into the record.

(Whereupon, Exhibit Nos. 336-342 were received into evidence.)

CHAIRMAN GRAHAM: Staff.

MS. WEISENFELD: None, thank you.

CHAIRMAN GRAHAM: You guys are good?

MS. WEISENFELD: Yes, we are good.

CHAIRMAN GRAHAM: Okay. Next witness.

Thank you, sir.

THE WITNESS: Thank you.

CHAIRMAN GRAHAM: Just FYI, Commissioner Clark had a family emergency during lunch and he is gone, and we do not expect him back today, but hopefully we will see him tomorrow morning.

Did Mr. Kushner leave?

MR. PERKO: I am sorry, Your Honor -- Mr. Chairman. I believe we reached an agreement, at least with SACE regarding Mr. Kushner, but I would call him to the stand at this time, I guess.

CHAIRMAN GRAHAM: Okay. I always like it when you guys come together and sing Kumbaya.

Whereupon,

BRADLEY E. KUSHNER

was called as a witness, having been first duly sworn to speak the truth, the whole truth, and nothing but the

truth, was examined and testified as follows:

MR. PERKO: I apologize, Mr. Chairman.

EXAMINATION

BY MR. PERKO:

**Q Mr. Kushner, were you sworn at the beginning of this hearing yesterday?**

A Yes, I was.

**Q Could you please state your name and business address?**

A Yes, Bradley Kushner, 2465 Southern Hills Court, Oviedo, Florida, 32765.

**Q And are you the same Bradley Kushner who just testified earlier this afternoon?**

A I am.

**Q And have you caused to be filed prefiled direct testimony consisting of six pages in Docket No. 20190020?**

A Yes.

**Q Do you have any changes or corrections to that testimony?**

A No.

**Q If I were to ask you the same questions today, would your answers be the same?**

A They would be.

MR. PERKO: At this time, Mr. Chairman, I

would ask that the prefiled direct testimony of Mr. Kushner be inserted into the record as though read.

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

(Whereupon, prefiled testimony was inserted.)

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DIRECT TESTIMONY OF BRADLEY E. KUSHNER

ON BEHALF OF

JEA

DOCKET NO. 20190020-EG

APRIL 12, 2019

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

A. My name is Bradley E. Kushner. My business address is 2465 Southern Hills Ct., Oviedo, Florida 32765.

**Q. By whom are you employed and in what capacity?**

A. I am employed by nFront Consulting LLC as an Executive Consultant.

**Q. What are your responsibilities in that position?**

A. My responsibilities include project management and project support for various projects for electric utility clients. These projects include integrated resource plans, power supply studies, power supply requests for proposals, demand-side management/conservation reports, and other regulatory filings.

**Q. Please describe nFront Consulting LLC.**

A. nFront Consulting is organized into two service practices – Energy and Transmission & Delivery. nFront Consulting's Energy Practice provides advisory services to support and optimize the assets, programs, systems, and business operations of our electric industry clients nFront Consulting assists in the areas of planning, implementing, and managing

resources, portfolios, and individual business unit operations. nFront Consulting interacts on behalf of our clients with regulatory, political, and environmental agencies; the financial community; and other professional service providers on national, state, and local levels to complete large-scale transactions, projects, or programs.

nFront Consulting's Transmission and Delivery Services Practice provides independent transmission consulting, analyses and advisory services to support project financing, acquisitions, development, transmission risk, curtailment and congestion assessments, transmission planning, resource integration, and open access, expert witness and regulatory services.

**Q. Please state your educational background and professional experience.**

A. I received my Bachelors of Science in Mechanical Engineering from the University of Missouri-Columbia in 2000 and my Masters of Business Administration from Emporia State University in 2013. I have nearly 20 years of experience in the engineering and consulting industry. I have experience in the development of integrated resource plans, ten-year-site plans, DSM plans, and other capacity planning studies for clients throughout the United States. Utilities in Florida for which I have worked include JEA, Florida Municipal Power Agency, Kissimmee Utility Authority, OUC, Lakeland Electric, Gainesville Regional Utilities (GRU), Reedy Creek Improvement District, Tampa Electric Company, and the City of Tallahassee. I have performed production cost modeling and economic analysis, and otherwise participated in six Need for Power Applications that have been filed on behalf of Florida utilities and approved by the Florida Public Service Commission (FPSC). I have also testified before the FPSC in Need for Power and Conservation Goal proceedings.

**Q. What is the purpose of your testimony in this proceeding?**

A. The purpose of my testimony in this proceeding is to discuss the methodology used to develop the avoided capacity costs that were provided to Nexant for use in their analyses of DSM measures for JEA. I will also discuss JEA's fuel forecasts used in the production cost modeling that formed the basis for the avoided energy costs provided to Nexant.

**Q. Are you sponsoring any exhibits to your testimony?**

A. Yes. Exhibit No. __ [BEK-1] is a copy of my resume. Exhibit No. ___ [BEK-2] summarizes the avoided unit costs. Exhibit No. __ [BEK-3] summarizes JEA's fuel price forecast.

**Q. How was the timing of avoidable capacity additions determined?**

A. Based on JEA's current load forecast over the next 20 years and its existing and planned future generating resources, JEA is anticipated to require additional capacity to maintain a 15 percent reserve margin over the 2020 through 2022 period, and again beginning in 2029. Given the timing and magnitude of the anticipated capacity requirements for the 2020 through 2022 period, it has been assumed that JEA would purchase capacity to maintain its reserve margin requirements. For the anticipated capacity requirements beginning in 2029, it has been assumed that JEA would install a new simple cycle F-class combustion turbine at the existing Greenland Energy Center (GEC). Following installation of the new simple cycle unit in 2029, additional capacity is projected to be required in 2039 to maintain reserve margin requirements, at which time a second new simple cycle F-class combustion turbine is assumed to be installed at GEC. JEA has made no commitments to any of these short-term purchases or simple cycle unit additions, and for purposes of this docket, each of these is considered avoidable capacity.

**Q. How were capital costs for these additions calculated?**

A. Capital costs for the 2020 through 2022 purchases were treated as demand costs associated with a power purchase agreement (PPA), and were based on short-term market alternatives available to JEA.

Capital costs for the new simple cycle F-class combustion turbines were based on estimates used by JEA for resource planning activities. Capital costs were escalated to the year the new units are assumed to be in-service (*i.e.*, 2029 and 2039) using a 2.0 percent annual escalation rate, and include costs for interest during construction to determine an estimated in-service year installed cost. Resulting installed costs were multiplied by a fixed charge rate to determine a levelized installed capital cost, which was divided by the output of the combustion turbine to develop a levelized installed capital cost per kW.

**Q. How were fixed operating and maintenance (O&M) costs for these additions calculated?**

A. Fixed O&M costs for the 2020 through 2022 purchases were included in the demand costs for the PPA discussed previously.

Fixed O&M costs for the new simple cycle F-class combustion turbines were based on estimates used by JEA for resource planning activities. The fixed O&M cost estimates, in $/kW-yr., were escalated to nominal dollars at a 2.0 percent escalation rate.
In addition to the fixed O&M costs, a natural gas pipeline usage charge of $0.28/MMBtu was included for the new simple cycle F-class combustion turbines to reflect costs for

utilizing the existing natural gas lateral at GEC. This cost was converted to a fixed cost per kW-yr based on an assumed 5 percent capacity factor.

**Q. Please discuss how the total avoided costs per kW were calculated.**

A. Total avoided costs per kW were calculated by adding the avoided capital costs (or demand charges in the case of the PPA discussed previously) to the avoided fixed O&M costs and the natural gas pipeline usage charge. The resulting annual avoided costs per kW were determined by dividing by the total kW installed in each year. This approach was used in order to capture the difference in installed costs for the simple cycle combustion turbine added in 2039 as compared to the simple cycle added in 2029 due to escalation of the capital costs to in-service year dollars. The avoided costs per kW are presented in Exhibit No. ___ [BEK-2].

**Q. Please discuss the base case fuel forecast.**

A. Exhibit No. __ [BEK-3] provides a summary of JEA's fuel price projections for natural gas, coal (including a blend of coal/natural gas/petroleum coke for JEA's Northside solid fuel units), and diesel fuel. These projections were developed utilizing information obtained from sources routinely utilized in the utility industry, including the New York Mercantile Exchange (NYMEX) and the U.S. Energy Information Administration.

**Q. Did JEA consider high and low fuel price sensitivities?**

A. Yes. In addition to the base case fuel price forecasts, JEA considered high and low fuel price sensitivities. The high and low fuel price projections provide a band of plus/minus 25 percent around the base case fuel price projections. This high and low band is

consistent with what JEA used in the previous FEECA goal-setting process. *See* Docket No. 130203-EM, Direct Testimony of Vento and Wucker, p. 10, l. 5-8 (Apr. 2, 2014).

**Q. How were energy costs for each of the cases previously identified in your testimony developed?**

A. Under my direction and supervision, JEA utilized ProSym, an industry accepted production cost model, to perform production cost modeling of its electric generating system, taking into account existing and planned future generating resources, the avoided units, its load forecast, and the base fuel price projections discussed previously in my testimony.

The resulting energy costs were taken from the ProSym output and include fuel as well as non-fuel variable O&M costs associated with dispatch of JEA's resources to meet forecast system demand requirements. The ProSym output was provided to Nexant for use in the economic analysis.

**Q. Were energy costs developed for each of the fuel price cases discussed previously in your testimony?**

A. Yes. The energy costs developed using the base case fuel price projections were increased by 25 percent for the high fuel price sensitivity and decreased by 25 percent for the low fuel price sensitivity.

**Q. Does this conclude your testimony?**

A. Yes it does.

BY MR. PERKO:

**Q And Mr. Kushner, are you also sponsoring exhibits preliminarily labeled BEK-1 through 3 --**

A Yes.

**Q -- attached to your testimony?**

A Yes. I am sorry.

**Q Do you have any --**

MR. PERKO: And for the record, Mr. Chairman, those are marked as Exhibits 60 through 61, I believe.

CHAIRMAN GRAHAM: Duly noted.

BY MR. PERKO:

**Q Do you have any changes or corrections to those exhibits, Mr. Kushner?**

A No.

**Q Have you prepared a summary of your testimony?**

A Yes, I have.

**Q And would you please present that to the Commission at this time?**

A My name is Bradley Kushner. I am an executive consultant with nFront Consulting LLC, and I am testifying on behalf of JEA.

My testimony addresses the avoided costs and fuel and energy -- fuel price and energy cost projections reflected in JEA's cost-effectiveness

evaluations performed by Nexant as part of this docket. The JEA anticipates requiring additional capacity over the 2020 through 2022 period and again beginning in 2029 for the anticipated capacity requirements from 2020 through 2022, it has been assumed that JEA with purchase capacity. For subsequent capacity requirements, it has been assumed that JEA would install new simple cycle F-Class combustion turbines at the existing Greenland Energy Center site.

JEA has made no commitment to any of the short-term purchases or simple cycle unit additions, but for purposes of the cost-effectiveness evaluations in this docket, these capacity resources are being considered JEA's avoided units. The capital costs and fixed operating and maintenance costs for the avoided units were provided to and used by Nexant in its cost-effectiveness evaluations.

The overall approach to develop energy costs used in this docket is appropriate as JEA has relied on industry accepted production cost model and reputable and recognized industry sources for fuel price projections.

JEA used a combination of New York Mercantile Exchange, or NYMEX, futures prices for natural gas as well as information included in the U.S. Energy

Information Administration's annual energy outlook, or AEO.

JEA's projected coal prices are based on NYMEX futures prices, historical transportation costs and AEO projections. JEA's petroleum coke price projections are based on historical ratios of petroleum coke prices to coal prices.

Under my supervision and direction, JEA's energy costs were using -- were developed using the pros and production cost model. JEA developed sensitivity cases that reflect energy costs that are 25 percent higher and 25 percent lower than those associated with the base case fuel price projections. And Nexant performed sensitivity analyses using these sensitivities.

Thank you.

**Q Does that complete your summary, Mr. Kushner?**

A Yes.

MR. PERKO: At this time, Mr. Chairman, I would tender the witness for cross-examination.

CHAIRMAN GRAHAM: Okay. OPC.

MS. FALL-FRY: No questions.

MS. WYNN: No questions.

EXAMINATION

BY MS. CORBARI:

**Q Good morning, Mr. Kushner. I just have hopefully a quick -- quick question.**

**Although the Commission does not set rates for municipal utilities such as JEA and OUC, municipals are required to go to the Commission for an affirmative need determination for any expansion in steam electrical generation or solar generation of 75 megawatts or less; is that your understanding?**

A Yes.

**Q And you have testified in need determinations before the Commission?**

A I have.

**Q In a need determination proceeding, do you know if one factor the Commission considers is whether demand-side management would avoid the need for the additional generation?**

A I think that's one factor. I think it could mitigate or delay the need for the proposed unit, yes.

**Q Could zero DSM goals speed up the time period for a utility to add generation?**

A I don't know that zero DSM goals would specific to JEA and OUC. The timing of that need would be based on DSM accomplishments in part, and other considerations, but not directly associated with DSM goals.

**Q Thank you.**

A You are welcome.

CHAIRMAN GRAHAM: SACE?

MR. LEUBKEMANN: After conferring with my pal, Mr. Perko, we are going to forego our cross of Mr. Kushner and, instead, stipulate into the record two exhibits on the weighted average cost of capital and future gas price errors.

CHAIRMAN GRAHAM: You are going to have to give me the description.

MR. LEUBKEMANN: Yes. The first is JEA response to SACE first set of ROGs Nos. 1 through 65, excerpt of No. 12.

CHAIRMAN GRAHAM: We'll call that 343.

(Whereupon, Exhibit No. 343 was marked for identification.)

MR. LEUBKEMANN: And for 344, we have JEA response to staff's first set of ROGs, excerpt No. 2.

(Whereupon, Exhibit No. 344 was marked for identification.)

CHAIRMAN GRAHAM: And JEA stipulates those two?

MR. PERKO: That's correct, Mr. Chairman.

(Whereupon, Exhibit Nos. 343 & 344 were

received in evidence.)

CHAIRMAN GRAHAM: Okay. Did you have any other questions of this witness?

MR. LEUBKEMANN: No, I do not.

CHAIRMAN GRAHAM: Staff?

MS. WEISENFELD: Staff has no questions.

CHAIRMAN GRAHAM: Commissioners?

Redirect.

MR. PERKO: No redirect.

CHAIRMAN GRAHAM: Exhibits?

MR. PERKO: Yes, Mr. Chairman, I believe I misspoke earlier. We would move Mr. Kushner's Exhibits No. 60 through 62 into the record at this time.

CHAIRMAN GRAHAM: If there is no objections, we will move Exhibits 60, 61, 62 into the record.

(Whereupon, Exhibit Nos. 60-62 were received in evidence.)

CHAIRMAN GRAHAM: SACE, we will -- I think we have already entered yours, 343 and 344 into the record.

MR. LEUBKEMANN: Yes. Thank you.

CHAIRMAN GRAHAM: Did I hear something? Okay. I think we are done with this witness.

Thank you, sir.

THE WITNESS: Thank you.

(Witness excused.)

CHAIRMAN GRAHAM: TECO.

MR. MEANS: Good afternoon, Commissioners. My name is Malcolm Means, and I am with the Ausley McMullen law firm here in Tallahassee, representing Tampa Electric, and we call Mark Roche.

CHAIRMAN GRAHAM: SACE, do you have the same scenario going on with the TECO witness?

MR. MARSHALL: There might be a couple of exhibits we could stipulate to, but we haven't had a chance to confer.

CHAIRMAN GRAHAM: Let's take a 10-minute break until a quarter till. I will let the two of you guys go over that stack.

MR. MARSHALL: Okay.

CHAIRMAN GRAHAM: So we will be back here at a quarter to 3:00.

(Brief recess.)

CHAIRMAN GRAHAM: Okay. TECO, your witness.

MR. MEANS: Mr. Chairman, just to follow up, we had a brief discussion during the break, and we are willing to stipulate that these documents are what they purport to be, and we would have no objection to their authenticity or admissibility.

CHAIRMAN GRAHAM: Okay. Well, let's take care of that when we get back to SACE.

Have we entered the witness, you have done your three-minute summary?

MR. MEANS: Not yet, Mr. Chairman.

THE WITNESS: I have not.

CHAIRMAN GRAHAM: Okay. Darn-it.

Whereupon,

MARK ROBERT ROCHE

was called as a witness, having been previously duly sworn to speak the truth, the whole truth, and nothing but the truth, was examined and testified as follows:

EXAMINATION

BY MR. MEANS:

**Q Good afternoon, Mr. Roche. Can you please state your full name for the record, please?**

A Yeah. My name is Mark Robert Roche.

**Q And, Mr. Roche, were you previously sworn?**

A Yes, I was.

**Q By whom are you currently employed, and what is your position?**

A I am employed by Tampa Electric and Peoples Gas System. I cover DSM programs for both companies, as well as storm hardening for Tampa Electric.

**Q And can you please provide your business**

**addresses, please?**

A Yes. It's 702 North Franklin Street, Tampa, Florida, 33602.

**Q And did you prepare and cause to be filed in Docket No. 20190021-EG on April 12th, 2019, prepared direct testimony consisting of 77 pages?**

A Yes, I did.

**Q And did you also cause to be filed errata to that testimony on August 5th, 2019?**

A Yes, I did.

**Q Other than the changes in the errata, do you have any other changes to your testimony?**

A No, I don't.

**Q With those changes, if I were to ask you the questions contained in your filed direct testimony today, would your answers be the same?**

A Yes, they would.

MR. MEANS: Mr. Chairman, we ask that the prepared direct testimony of Mr. Mark Roche with the described corrections be inserted into the record as though read.

CHAIRMAN GRAHAM: We will insert Mr. Roche's direct testimony into the record with the corrections as though read.

(Whereupon, prefiled testimony was inserted.)

Winter – Economic Potential (RIM Portfolio)

| Original filed April 12, 2019 | Modified due to Summation Error |
|---|---|
| 3,256 MW | 3,754 MW |

Winter – Economic Potential (TRC Portfolio)

| Original filed April 12, 2019 | Modified due to Summation Error |
|---|---|
| 2,488 MW | 2,986 MW |

Winter – Post Free-ridership Economic Potential (RIM Portfolio)

| Original filed April 12, 2019 | Modified due to Summation Error |
|---|---|
| 2,409 MW | 2,907 MW |

Winter – Post Free-ridership Economic Potential (TRC Portfolio)

| Original filed April 12, 2019 | Modified due to Summation Error |
|---|---|
| 2,326 MW | 2,824 MW |

Again, the above corrections have no effect on the company's Achievable Potential or proposed Demand Side Management goals.

Attached herewith for filing in this docket are revised Bates stamp ("Bates") pages from Tampa Electric's testimony and exhibits in this proceeding which reflect the changes indicated to correct the effects of the incorrect summation. We would appreciate your circulating the following revised Bates pages to the recipients of the April 12 filing so that they may be substituted in place of the originals:

| **Bates Page#** | **Line #** | **Change** |
|---|---|---|
| 40 | 19 | 2,318 to 2,816 |
| 45 | 3 | 3,256 to 3,754 |
| 45 | 9 | 2,488 to 2,986 |
| 51 | 17 | 2,409 to 2,907 |
| 52 | 12 | 2,326 to 2,824 |
| 92 | Table 1-2 | 673 to 1,171 |
| 92 | Table 1-2 | 2,318 to 2,816 |
| 126 | Table 5-2 | 673 to 1,171 |
| 126 | Table 5-2 | 2,318 to 2,816 |

**INTRODUCTION:**

**Q.** Please state your name, address, occupation and employer.

**A.** My name is Mark R. Roche. My business address is 702 North Franklin Street, Tampa, Florida 33602. I am employed by Tampa Electric Company ("Tampa Electric" or "the company") as Manager, Regulatory Rates in the Regulatory Affairs Department.

**Q.** Please provide a brief outline of your educational background and business experience.

**A.** I graduated from Thomas Edison State College in 1994 with a Bachelor of Science degree in Nuclear Engineering Technology and from Colorado State University in 2009 with a Master's degree in Business Administration. My work experience includes twelve years with the US Navy in nuclear operations as well as twenty-one years of electric and gas utility experience. My utility work has included various positions in Marketing and Sales, Customer Service, Distributed Resources, Load Management, Power Quality, Distribution Control Center Operations, Meter Department, Meter Field Operations, Service Delivery, Revenue Assurance, Commercial and Industrial

Energy Management Services, and Electric and Gas Demand Side Management ("DSM") Planning and Forecasting. In my current position, I am responsible for Tampa Electric's Energy Conservation Cost Recovery ("ECCR") Clause and Storm Hardening, and Peoples Gas System's Natural Gas Conservation Cost Recovery ("NGCCR") Clause.

**Q.** What is the purpose of your testimony in this proceeding?

**A.** The purpose of my testimony is to present, for Commission review and approval, Tampa Electric's proposed numerical DSM goals for 2020–2029. Tampa Electric's proposed goals are based upon the analytical work performed by the company and Nexant. Nexant is a consulting and analysis services firm with an exclusive focus on energy in providing support to clients in the areas of demand management, demand response, grid management and renewables as well as offering a comprehensive suite of software designed to support these areas. Nexant has over 18 years of experience in the field of DSM evaluations and was chosen through a rigorous request for proposal vetting process. The goals are separated into summer demand, winter demand and annual energy components for both the residential and commercial/industrial sectors. In support of the proposed DSM goals, my

testimony will demonstrate that the process Tampa Electric utilized to establish its reasonably achievable, cost-effective goals complies with the requirements of Rule 25-17.0021, Florida Administrative Code ("F.A.C.").

In addition, my testimony complies with the requirements asked of the Florida Energy Efficiency and Conservation Act ("FEECA") utilities by Commission Staff on June 20, 2018 and the Order Establishing Procedure within this proceeding by addressing the following components within my testimony:

- Provide the process used by Tampa Electric to develop the DSM Technical, Economic and Achievable Potentials.
- Provide the complete measure list that was evaluated and identify measures that were eliminated or added as compared to the 2013 technical potential study.
- Provide the number of measures that were screened out during free-ridership consideration and the list of measures that remained cost-effective at the achievable potential.
- Provide the impact from energy efficiency that is occurring in Tampa Electric's service area

stemming from Energy Efficiency and Appliance Standards.

- Provide the economic and achievable potential for residential and commercial/industrial winter and summer demand and annual energy savings for a Base Case that includes the effects of free-ridership but does not include costs associated with carbon dioxide emissions, for both a Rate Impact Measure ("RIM") test-based evaluation and a Total Resource Cost ("TRC") test-based evaluation.
- Provide an estimate of the average residential customer bill impact for each evaluation.
- Provide a detailed description of how the Base Case was developed, including forecasts for generation resources, customer winter and summer demand and annual energy for load, and fuel prices.
- Provide the economic potential for residential and commercial/industrial winter and summer demand and annual energy savings for the following sensitivities, for both a RIM and TRC based evaluation:
    - o Higher fuel prices;
    - o Lower fuel prices;

- Shorter free-ridership exclusion periods and;
- longer free-ridership exclusion periods.

- Provide a detailed description of how the sensitivities were developed and compare them to the Base Case, including forecasts for fuel prices.
- Provide a discussion of how supply-side efficiencies are incorporated in the utility's planning process and how supply-side efficiencies impact demand-side management programs.
- Provide a discussion of how the utility's proposed goals encourage the development of demand-side renewable energy systems.
- Provide a discussion of the utility's current demand-side management programs that includes historical participation rates, cumulative kilowatt ("kW") and kilowatt hour ("kWh") savings, measures included in each program, and program impacts related to building code and appliance efficiency standards.
- Provide an explanation of how free-ridership was addressed in the development of the goals and include any analysis performed.

- Provide explanations of what were the primary drivers that significantly influenced the achievable potential's results.
- Provide an explanation for potential fuel cost changes and include any analysis performed.

**Q.** Have you prepared any exhibits in support of your testimony?

**A.** Yes. I have prepared an exhibit entitled, "Exhibit of Mark R. Roche." It consists of 17 documents and has been identified as Exhibit No. MRR-1, which contains the following documents:

- Document No. 1 contains Tampa Electric's proposed DSM goals at the generator for 2020-2029.
- Document No. 2 provides the overall process used to develop the company's proposed DSM goals for 2020-2029.
- Document No. 3 provides the process used to develop the Technical Potential and the Market Potential Study of Demand Side Management in Tampa Electric Company's Service Territory Report.
- Document No. 4 provides the comprehensive DSM measure list utilized in this proceeding.
- Document No. 5 provides the DSM measures that were

either added or removed to the 2018 comprehensive measures list as compared to the 2013 technical potential study.

- Document No. 6 provides Tampa Electric's DSM Technical Potential for Energy Efficiency, Demand Response and Distributed Energy Resources.
- Document No. 7 provides the process used to develop the Economic Potential.
- Document No. 8 contains Tampa Electric's avoided unit cost data used for cost-effectiveness evaluations.
- Document No. 9 contains all the assumptions used for the performance of cost-effectiveness.
- Document No. 10 provides Tampa Electric's 2020-2029 DSM Economic Potential for the RIM and TRC cost-effectiveness tests.
- Document No. 11 provides the DSM Economic Potential cost-effectiveness sensitivity analyses.
- Document No. 12 provides the process used to develop the Achievable Potential.
- Document No. 13 provides the 2020-2029 estimated annual DSM Achievable Potential for the RIM and TRC cost-effectiveness tests.
- Document No. 14 provides the list of DSM measures that make up the RIM and TRC DSM Achievable

Potentials.

- Document No. 15 provides a summary of the overall potentials.
- Document No. 16 provides the projected residential annual bill impacts for the RIM and TRC 2020-2029 DSM portfolios.
- Document No. 17 provides Tampa Electric's current DSM programs and achievements.

**Q.** Is Nexant providing direct testimony?

**A.** Yes, Jim Herndon, Nexant's Vice President, Strategy and Planning, will be filing direct testimony that will support the goals Tampa Electric is proposing for the 2020-2029 DSM goals period.

**TAMPA ELECTRIC'S PROPOSED DSM GOALS:**

**Q.** What are Tampa Electric's cumulative DSM goals that are appropriate and reasonably achievable for the period 2020-2029?

**A.** The appropriate and reasonable cumulative DSM goals at the generator for Tampa Electric for the period 2020-2029 are as follows:

Residential

Summer Demand: 54.0 MW

Winter Demand: 25.5 MW

Annual Energy: 103.6 GWh

Commercial/Industrial

Summer Demand: 25.8 MW

Winter Demand: 17.8 MW

Annual Energy: 61.4 GWh

Combined

Summer Demand: 79.7 MW

Winter Demand: 43.3 MW

Annual Energy: 165.0 GWh

**Q.** What cost-effectiveness methodology did Tampa Electric utilize to derive these proposed DSM goals?

**A.** The cost-effectiveness methodology that Tampa Electric utilized for these proposed goals is the RIM test in conjunction with the Participant Cost Test ("PCT"). The RIM test, when used in tandem with the PCT, provides a cost-effective, fair, reasonable and equitable determination of DSM expenditures for both the DSM program participants and non-participants. The RIM test puts the least amount of upward pressure on rates while allowing for significant accomplishments of DSM measure

deployment. Furthermore, the RIM test does not promote cross-subsidization among participants and non-participants. Finally, history indicates that this Commission's longstanding decisions in the past to approve a utility's DSM goals based on the RIM test have not hindered the DSM performance of the Florida utilities relative to other utilities in the industry. Based on these results and the fairness of the methodology, Tampa Electric believes its DSM goals for the 2020-2029 period should be established on the RIM test basis.

**Q.** What is the annual portion of these proposed goals for each segment on an annual basis for the upcoming period of 2020-2029?

**A.** The annual portion for these proposed goals for each segment (Residential, Commercial/Industrial and Combined) for the upcoming period of 2020-2029 are included in my Exhibit No. MRR-1, Document No. 1 which details the incremental annual and cumulative amounts that comprise these goals.

**Q.** How do Tampa Electric's proposed DSM goals for the upcoming period of 2020-2029 compare to the company's proposed DSM goals for the 2015–2024 period?

**A.** Tampa Electric's proposed cumulative DSM goals for the upcoming period of 2020-2029 as compared to the company's proposed DSM goals for the 2015-2024 period show a slight decrease in overall demand reduction and an increase in the annual energy ("AE"). Here is the comparison of the proposed cumulative combined DSM goals for the upcoming period of 2020-2029 as compared to the company's proposed DSM goals for the 2015-2024 period proposed goals at the generator:

| | 2020-2029 | 2015-2024 |
|---|---|---|
| Summer Demand: | 79.7 MW | 56.3 MW |
| Winter Demand: | 43.3 MW | 78.3 MW |
| Annual Energy: | 165.0 GWh | 144.3 GWh |

**Q.** What are the major drivers that established Tampa Electric's overall proposed 2020-2029 DSM goals for demand to be at a slightly lower level than what the company proposed during the last DSM goals setting process?

**A.** There are several factors that influenced the slight overall reduction in the company's current proposed DSM goals for demand from those proposed five years ago. These factors include:

- In addition to the continued decline of average electricity usage per customer, the overall annual customer growth for the company's service area is projected to slightly decrease, thereby deferring the in-service date of the next generating unit in the company's expansion plan used for DSM evaluations.
- The base year avoided and fixed O&M costs for Tampa Electric's next avoided unit has decreased.
- The avoided generating unit fuel cost has decreased with a lower fuel escalation rate.
- Florida building codes have become more stringent from previous levels, thus placing more downward pressure on customer usage.
- Various Federal energy efficiency and appliance standards have been enacted affecting several baseline measures used for the evaluation of potential DSM measures.

**Q.** What is Tampa Electric's average electricity usage per month for a typical residential customer and how does this compare to the usage of five years ago?

**A.** In 2018, a typical Tampa Electric residential customer used a weather adjusted kWh amount of 1,107 kWh on a

monthly basis. Five years ago, the typical Tampa Electric residential customer used a weather adjusted kWh amount of 1,173 kWh on a monthly basis.

**Q.** What is the proposed avoided unit and associated costs that Tampa Electric utilized in the preparation of these proposed DSM goals?

**A.** The proposed avoided unit is a 7FA.05 Combustion Turbine that has a winter capacity rating of 245 MW and a summer capacity rating of 229 MW. The proposed unit would be placed into service in January of 2023. The cost of the unit has a base year avoided generating cost of $526.30 per kW and a fixed O&M cost of $5.83 per kW per year.

**Q.** How do these avoided unit costs compare to the avoided unit that was used five years ago?

**A.** The avoided unit cost five years ago had a base year avoided generating cost of $650.64 per kW and a fixed O&M cost of $11.95 per kW per year.

**Q.** How did the avoided generating unit fuel cost and fuel escalation rate used in the new goal setting compare to the avoided generating unit that was used five years ago?

**A.** The current avoided generating fuel cost is 3.75 cents per kilowatt-hour ("kWh") with a fuel escalation rate of 4.54 percent. The avoided generating fuel cost five years ago was 4.70 cents per kWh and the fuel escalation rate was 5.21 percent.

**Q.** For the 2020-2029 DSM goals setting period, what is the company's projected energy and demand impacts due to energy efficiency and appliance standards improvements?

**A.** The company's estimate for the energy and demand impacts due to more stringent energy efficiency and appliance standards over the 2020-2029 DSM goals period is an overall reduction of customer energy usage of 5.79 GWh, a reduction in overall summer demand of 158 MW and a reduction in overall winter demand of 163 MW.

**Q.** Were there any drivers that put upward pressure on Tampa Electric's proposed 2020-2029 DSM demand goals to be set at a higher level than what the company proposed during the last DSM goals setting process?

**A.** Yes, while the combination of all drivers caused the overall proposed demand goals to be lower, there were several drivers that caused the overall decrease to be a

lessor amount than it would have been absent of those factors. Those factors include:

- K-Factor increase;
- Decreased customer equipment escalation rate;
- Decreased utility discount rate;
- Increased base year avoided transmission cost; and
- Increased base year avoided distribution cost.

**Q.** Would you explain why the proposed 2020-2029 DSM goals for summer demand and annual energy went up, while the winter demand goal went down as compared to 2015-2024 DSM goals setting period?

**A.** Yes, the main driver causing the summer demand to go up is the increased weighting of the value of the next avoided unit for the summer peaking period. This increase in summer weighting causes technologies that impact summer demand to be more cost-effective while at the same time decreasing the cost-effectiveness of technologies that impact winter demand. The increase in the proposed 2020-2029 annual energy savings goals is attributed to more residential technologies having a summer demand impact achieving cost-effectiveness coupled with more summer months and cooling hours thus increasing the

overall combined annual energy goal slightly as compared to the 2015-2024 DSM goals proceeding.

**Q.** Regardless of the results of the RIM cost-effectiveness analysis, do you believe that DSM goals should always be set higher than previously set goals?

**A.** No, I do not. Setting goals too high just for the sake of having higher goals can lead to costly, unfair and imprudent results for Tampa Electric's customers. DSM goals should be set with a clear focus on the costs the utility would have to incur to serve the load that the conservation efforts are reasonably projected to avoid. In addition, the conservation measures selected should minimize rate impacts and avoid cross-subsidization between customers. The Commission has been able to accomplish these objectives in the past through the primary use of the RIM test (to minimize rate impacts and avoid cross-subsidization), the two-year payback screen to minimize free ridership and a process that focuses on the utility's most recently projected resource needs.

**Q.** How do Tampa Electric's DSM goals accomplishments compare to other utilities in the nation?

**A.** Tampa Electric's accomplishments are significantly greater than most other utilities in the United States. Tampa Electric began its DSM efforts in the late 1970s prior to the 1980 legislative enactment FEECA. Since then, the company has aggressively sought Commission approval for numerous DSM programs designed to promote energy efficient technologies and to change customer behavioral patterns such that energy savings occur with minimal effect on customer comfort. Additionally, the company has modified existing DSM programs over time to promote evolving technologies and to maintain program cost-effectiveness.

From the inception of Tampa Electric's Commission approved programs through the end of 2018, the company has achieved the following savings:

| | |
|---|---|
| Summer Demand: | 729.7 MW |
| Winter Demand: | 1,236.0 MW |
| Annual Energy: | 1,560.5 GWh |

These peak load achievements have eliminated the need for nearly seven 180 MW power plants.

The magnitude of these continuing efforts by Tampa

Electric, as well as other utilities in Florida, are clearly demonstrated by Florida's ranking in the United States Energy Information Administration's recent analyses. With respect to "Total Energy Consumed per Capita, 2016", Florida ranks 46th (of 51 States). With respect to "Total Energy Expenditures per Capita, 2016", Florida ranks 50th. Finally, with respect to "Average Retail Price of Electricity to the Residential Sector, December 2018", Florida ranks 26th. This last ranking is particularly noteworthy with Florida's average Residential Retail price of 11.86 cents per kWh which is 10.8 percent below the national average and substantially lower than other States such as Massachusetts with a residential retail price of 21.99 cents per kWh, New York at 17.34 cents per kWh and California at 19.44 cents per kWh. This residential retail price deserves merit with the fact that Tampa Electric has achieved its level of DSM reduction impacts within stringent regulatory rules and statutory requirements by offering a portfolio of DSM programs that reduce rates for all customers, both DSM participants and non-participants alike. It is also worth noting that Tampa Electric's current Residential Retail Price of 10.36 cents per kWh is significantly lower than the Florida average.

**OVERALL PROCESS TO DEVELOP DSM GOALS:**

**Q.** Would you describe the overall process that Tampa Electric utilized to develop the proposed DSM goals in this proceeding?

**A.** Yes, the overall process first starts with the development of a technical potential study which is the theoretical maximum amount of energy and capacity that could be displaced by energy efficiency, demand response and distributed energy resources regardless of cost, acceptability to customers and other barriers that may prevent the installation or adoption of an energy efficiency measure. The technical potential is only constrained by factors such as technical feasibility and the applicability of measures.

Once the technical potential is developed, the company determines the economic potential. The economic potential is determined by evaluating each of the measures cost-effectiveness under the RIM and TRC cost effectiveness tests. The economic potential is the amount of energy and capacity that could be reduced by those energy efficiency, demand response and distributed energy resource measures that pass cost-effectiveness.

For the RIM economic potential, lost revenue is the only cost component that is introduced. For the TRC economic potential, the full incremental cost of the measure is the only cost component introduced.

Once the economic potential is achieved, the company removes programs that have a negative PCT, runs the sensitivity analyses for low and high fuel, and then performs the consideration of free-ridership at this point. After these sensitivity analyses are performed, the company introduces program administration costs, evaluates adoption rates and participation rates based upon incentives, and then develops the achievable potential which become the company's proposed DSM goals. This overall process is included in my Exhibit No. MRR-1, Document No. 2.

**Q.** Did Tampa Electric develop its own Technical Potential Study?

**A.** No, Tampa Electric, in collaboration with the other FEECA utilities (Florida Power and Light, Duke Energy Florida, Gulf Power Corporation, Orlando Utilities Commission, Jacksonville Electric Authority and Florida Public Utilities) utilized a vendor to develop the technical

potential study.

**Q.** Did the vendor develop a technical potential study for all the FEECA utilities to use or a technical potential study specific for each utility including Tampa Electric?

**A.** The vendor developed a technical potential study that was specific for each utility, including Tampa Electric.

**Q.** Why did Tampa Electric have a new technical potential study developed?

**A.** Tampa Electric, in collaboration with the other FEECA utilities, made the decision to have a new technical potential study developed because the prior technical potential study that was used in the previous numeric goals proceeding was a refreshed technical potential study that was developed from the Itron technical potential study performed ten years ago in 2009.

**Q.** Did Tampa Electric develop its own economic potential?

**A.** Yes.

**Q.** Did Tampa Electric perform its own fuel sensitivity

analyses and free-ridership considerations?

**A.** Yes.

**Q.** Did Tampa Electric perform its own achievable potential?

**A.** Yes.

**PROCESS TO DEVELOP THE TECHNICAL POTENTIAL:**

**Q.** Please discuss the process that Tampa Electric utilized to develop the technical potential that would be used to develop the company's proposed DSM goals?

**A.** Tampa Electric started the process of developing the proposed goals by collaborating with the other FEECA utilities in making the decision to have a new technical potential study developed. I have included an overview of the process to develop the technical potential in my Exhibit No. MRR-1, Document No. 3. I have also included the Market Potential Study Report from Nexant, within my Exhibit No. MRR-1, Document No. 3, that was developed specifically for Tampa Electric which includes the process that was utilized to develop Tampa Electric's technical potential.

To support the development of the new technical potential study, the FEECA utilities initiated the process, starting in early 2016, to discuss the timing and deliverables needed. Starting on June 13, 2017, the FEECA utilities participated in ongoing weekly conference calls to support the development of the technical potential study. In July 2017, the FEECA utilities initiated a request for proposal to seek vendors that were capable of performing a technical potential study. From August 2017 through September 2017, the FEECA utilities screened and evaluated the responses to the request for proposals. The proposals were screened based upon several criteria which included prior experience, quality of experience, ability to achieve deliverables and deadlines, methodology, data sources and uses, engineering methods, alternative approaches, discovery thoroughness, other supporting documentation, price and price controls. In addition to screening the request for proposals on what was submitted, every vendor that submitted a request for proposal supplied utility names and points of contact to which at least two of these sourced utilities were called and interviewed to discuss the working relationship, project management effectiveness, study quality, witness performance, overall outcome, other DSM related engagements and

overall impression. After the screening was completed, the FEECA utilities invited the top two vendors to a final selection presentation in addition to a question and answer meeting that was held on October 2, 2017. At the conclusion of this meeting, the FEECA utilities met and selected the vendor Nexant to perform the technical potential study.

**Q.** After the FEECA utilities selected Nexant to perform the technical potential study, how did Nexant gather the necessary data to be able to conduct a technical potential study specific to Tampa Electric?

**A.** Shortly after the FEECA utility meeting on October 2, 2017, Nexant provided the company with a sheet that outlined the comprehensive information needed that was specific to Tampa Electric. This data sheet included Tampa Electric's peak load and energy sales forecasts for 2018-2028, details used for developing the company's 10-year load forecast, customer premise forecasts for 2018-2028, customer characteristics and billing data, any load research data for 2015 and 2016, prior utility potential studies, historical program and measure information, preliminary technical potential measure lists, and hourly utility system load data for 2012 through 2016.

**Q.** Did Tampa Electric provide all the data that was requested by Nexant for the performance of the technical potential study?

**A.** No, there were some items that Tampa Electric did not have. These items included having all of Tampa Electric business customers segmented by their NAICS or SIC code, availability of Advanced Metering Infrastructure ("AMI") and the associated 15-minute interval data and customer end use load shapes, recent end-use survey and baseline study data, studies of thermostat control and conjoined studies regarding customer preferences for program or rate design.

**Q.** Is the technical potential study that was performed by Nexant specific for Tampa Electric, less accurate due to these data items that were missing?

**A.** No, one of the main benefits of doing a technical potential study in a collaborative fashion with the other neighboring FEECA utilities and Nexant is to be able to use proxy data to fill in these sources of data when the data requested does not exist. Even if these data pieces could not have been fulfilled by proxy, I am confident that the technical potential developed by Nexant specific

for Tampa Electric would have been accurate.

**Q.** How did the FEECA utilities evaluate which measures would be included in the process of developing the technical potential study?

**A.** Nexant and all the FEECA utilities provided input into which measures would be included in the process of developing the technical potential study. Each of the provided measures was reviewed for its technical feasibility and applicability and had to meet the following two additional criteria:

1) The measure must be commercially available in the Florida marketplace.
2) The measure cannot be considered a behavioral savings.

**Q.** Did the FEECA utilities seek any other input for which measures would be included in the process of developing the technical potential study?

**A.** Yes, the FEECA utilities asked for and received a list of proposed measures from the Southern Alliance for Clean Energy ("SACE").

**Q.** Did the FEECA utilities add any of the measures that SACE provided in their measures list that the FEECA utilities used as the final measures list, and if no, why?

**A.** No, when the FEECA utilities reviewed the list of proposed measures from SACE, the majority of those proposed measures were already included in the utility developed measures list. The remaining measures were chosen not to be used because they were either a behavioral measure or would not be considered a measure. An example of this is a duct seal with a blower door. Duct sealing is a measure and it is included in the measure list, but the blower door is not a measure, it would be considered to be a piece of test equipment.

**Q.** Did Tampa Electric meet with SACE after the measure list was developed?

**A.** Yes, the company chose to meet with SACE in a series of conference calls between December 19, 2018, and January 25, 2019.

**Q.** What was the purpose of the conference calls with SACE?

**A.** The main purpose was to allow SACE an opportunity to

critique and provide feedback on the draft technical potential studies that the company was receiving from Nexant.

**Q.** What feedback did SACE provide?

**A.** First, I thought their feedback was very constructive to Tampa Electric. SACE provided the following recommendations:

- Adjust the line loss factor within the company's cost effectiveness model to account for line losses during only the peak hour.
- Adjust the life of measures for building envelope type measures to greater than a 20-year life.
- Adjust the baseline for certain measures to quantify the savings from what is actually installed in the field versus a minimum building code or federal appliance standard.
- Adjust the applicability of wall insulation.
- Adjust the free-ridership screen.

**Q.** Did Tampa Electric implement any of these recommendations from SACE?

**A.** Yes, the company changed the appropriate residential and

commercial building envelope measure lives to cap them at the company's DSM study period of 25 years. The following building envelope items: windows, doors, ceiling insulation, wall insulation and the home or building structure all have industry rated lives of well over 25 years. The company also agreed to examine the line loss factor at the peak hour at some time in the future, currently the company utilizes a weighted average to develop the transmission and distribution line loss factors which has consistently been used for all of the company's prior DSM goal setting proceedings.

**Q.** Why did the company not adopt the other three recommendations by SACE?

**A.** The company does not agree with using an adjusted baseline for certain measures to quantify the energy savings from what is actually installed in the field versus a minimum building code or federal appliance standard. The additional measurement and verification costs for a potential participant would make the DSM program very difficult to pass cost effectiveness due to having a heavy burden in overall utility costs such as labor, equipment and other internal costs as compared to the incentive that could be provided to the customer.

The company does not agree with the assessment of the applicability factor for homes in Florida for wall insulation since most single-family homes will be of block construction. Finally, the company does not view a need for a change in the way free-ridership is taken into consideration for the company's proposed DSM goals and programs.

**Q.** Were there any measures, beyond behavioral or ones that would be considered test equipment, chosen not to be used as a DSM measure?

**A.** Yes, being consistent with prior DSM goal setting periods, the company did not include any supply side efficiency measures as potential measures for this DSM goals setting proceeding.

**Q.** Please identify how many DSM measures were evaluated that support this 2020-2029 DSM goals setting proceeding?

**A.** Tampa Electric's comprehensive DSM measure list developed was comprised of the following:

Residential Energy Efficiency Measures: 91

Commercial Energy Efficiency Measures: 127

Industrial Energy Efficiency Measures: 30

| | | |
|---|---|---|
| | Demand Response Measures: | 21 |
| | Distributed Energy Resource Measures: | 9 |
| | Combined Total DSM Measures: | 278 |

**Q.** How does this measure list compare to the prior DSM goal setting proceeding that occurred in 2014?

**A.** In the prior DSM goal setting proceeding that occurred in 2014, Tampa Electric at that time had 274 total DSM measures that were evaluated.

**Q.** How did Tampa Electric ensure that the DSM measure list was complete and accurate?

**A.** Tampa Electric in collaboration with the other FEECA utilities and Nexant conducted weekly phones calls beginning in October of 2017 through the beginning of 2019 to ensure the DSM measure list and the associated demand and energy savings impacts from each measure were accurate.

**Q.** Beyond the measure list categories listed above, did the measures have further segmentation?

**A.** Yes, each of the energy efficiency, demand response and

distribute energy resources categories for residential, commercial and industrial sectors were further segmented.

Residential energy efficiency and demand response was segmented into:

- Single family homes
- Multi-family homes
- Manufactured homes

Residential distributed energy resources was segmented into:

- Single family homes
- Multi-family homes

Commercial energy efficiency was segmented into:

- Assembly
- College and University
- Grocery
- Healthcare
- Hospitals
- Institutional
- Lodging/Hospitality
- Miscellaneous
- Restaurants
- Retail
- School K-12
- Warehouse

Commercial demand response was segmented into customers using the following energy usages:

- 0 – 15,000 kWh
- 15,0001 – 25,000 kWh
- 25,001 – 50,000 kWh
- ≥ 50,001 kWh

Commercial distributed energy resources was segmented into the following:

Battery storage:

- 0 - 15 MWh
- >15 MWh - 25 MWh
- >25 - 50 MWh
- >50 MWh

Photovoltaics:

- Assembly
- College and University
- Grocery
- Healthcare
- Hospitals
- Institutional
- Lodging/Hospitality
- Miscellaneous
- Restaurants
- Retail
- School K-12

- Warehouse

Combined Heat and Power:

- 5,500 kW Steam Turbine-Biomass
- 3,500 kW Steam Turbine-Biomass
- 3,500 kW Gas Turbine
- 3,000 kW Gas Turbine
- 2,500 kW Gas Turbine
- 4,500 kW Reciprocating Engine
- 1,500 kW Steam Turbine-Biomass
- 3,000 kW Reciprocating Engine
- 1,125 kW Fuel Cell
- 800 kW Fuel Cell-Biogas
- 1,250 kW Reciprocating Engine
- 1,250 kW Reciprocating Engine-Biogas
- 500 kW Fuel Cell
- 350 kW Reciprocating Engine
- 175 kW Fuel Cell
- 200 kW Micro Turbine
- 150 kW Reciprocating Engine
- 100 kW Micro Turbine
- 100 kW Micro Turbine- Biogas
- 50 kW Micro Turbine

Industrial energy efficiency was segmented into:

- Agriculture and Assembly
- Chemicals and Plastics

- Construction
- Electrical and Electronic Equipment
- Lumber/Furniture/Pulp/Paper
- Metal Products and Machinery
- Miscellaneous Manufacturing
- Primary Resource Industries
- Stone/Clay/Glass/Concrete
- Textiles and Leather
- Transportation Equipment
- Water and Wastewater

Large Commercial and Industrial demand response was segmented into customers using the following demand usages:

- 0 – 50 kW
- 51 – 300 kW
- 301 – 500 kW
- ≥ 501 kW

**Q.** How do these residential, commercial and industrial segments affect the measure list?

**A.** The segmentation means that when we look at an individual measure from the measure list, it will be examined from a multiple of ways for cost-effectiveness. For example, a residential smart thermostat is one measure and will be

analyzed six ways. It will be analyzed if it was installed in a new or existing single-family home, new or existing multi-family residence, and a new or existing manufactured home. These additional analyses are called permutations. The residential, commercial and industrial segmentation provided above required 4,317 individual permutations of the measure list to be performed for cost-effectiveness.

**Q.** Were there any commercial or industrial segments that were excluded from the technical potential?

**A.** No, the technical potential was based upon the load forecast of Tampa Electric, so all customers and market segments were included in the technical potential analysis.

**Q.** Does the measure list contain demand-side renewable energy systems?

**A.** Yes, the Distributed Energy Resource measures contains residential and commercial photovoltaic systems.

**Q.** Do you have a list of all the DSM measures you provide the count for above?

**A.** Yes, the comprehensive list of all the DSM measures the company utilized in the development of the company's proposed 2020-2029 DSM goals is included in my Exhibit No. MRR-1, Document No. 4.

**Q.** Do you have a list of all the DSM measures that were eliminated or added as compared to the 2013 technical potential study?

**A.** Yes, the comprehensive list of all the DSM measures the company utilized in the development of the company's proposed 2015-2024 DSM goals and a list providing those measures that were added or removed in the newly developed comprehensive measure list is included in my Exhibit No. MRR-1, Document No. 5.

**Q.** Did the collaborative process among the FEECA utilities bring value to the overall DSM goals setting process?

**A.** Yes, the process provided many benefits including economic benefits from sharing in the total costs, provided an open platform to thoroughly vet differences which has provided consistency, established accurate baselines to begin the new period of setting DSM goals.

**TAMPA ELECTRIC'S TECHNICAL POTENTIAL:**

**Q.** What is Tampa Electric's technical potential?

**A.** The company's technical potential is made up of estimates for energy efficiency, demand response and distributed energy resources. The technical potential estimates from these categories are not additive due to the interactive effect of certain measures on end uses. With this backdrop, Tampa Electric's technical potential for energy efficiency is:

| | |
|---|---|
| Summer Demand: | 1,138 MW |
| Winter Demand: | 583 MW |
| Annual Energy: | 4,483 GWh |

Tampa Electric's technical potential for demand response is:

| | |
|---|---|
| Summer Demand: | 2,399 MW |
| Winter Demand: | 2,816 MW |
| Annual Energy: | 0 GWh |

Tampa Electric's technical potential for distributed energy resources is:

| | |
|---|---|
| Summer Demand: | 2,215 MW |
| Winter Demand: | 619 MW |

Annual Energy: 12,266 GWh

The full detail of these values is included in the company's Market Potential Study Report from Nexant in my Exhibit MRR-1, Document No. 3. I have also included a comparison of Tampa Electric's 2014 Technical Potential in my Exhibit MRR-1, Document No. 6.

**PROCESS USED TO DEVELOP THE ECONOMIC POTENTIAL:**

**Q.** Please describe the process Tampa Electric utilized to develop the company's economic potential?

**A.** The process to develop the economic potential began in the beginning of 2017 by meeting with the company's Load Research and Forecasting and Resource Planning Departments to make them aware of the data that will be needed to be able to support the development of the technical potential but also the information that will support the analysis for the economic potential. The company's Load Research and Forecasting Department was asked to prepare a load forecast specifically for the DSM goals setting 2020-2029 period. The company's Resource Planning Department was asked to utilize the DSM goals setting 2020-2029 load forecast and perform an updated

integrated resource planning ("IRP") process to determine the timing and costs of the next avoided unit and fuel costs.

The process then determined the remaining cost-effectiveness inputs by taking the current 2019 values and escalating them into the year 2020.

The process then took the comprehensive list of all DSM measures contained in the technical potential that were spread across the various categories and building types and developed the economic potential by utilizing the Commission's approved cost-effectiveness tests, namely, the RIM and TRC tests. When calculating the RIM test, only lost revenues were considered on the cost side of the equation. For the TRC test, only the customer's full incremental equipment cost was considered on the cost side of the equation. For both the RIM and TRC tests, the benefits were comprised of avoided supply side costs that included the generator, transmission and distribution, and fuel costs. This process to develop the economic potential is included in my Exhibit No. MRR-1, Document No. 7.

**Q.** Is the load forecast that was generated to support the

2020-2029 DSM goals setting period the same as Tampa Electric's typical annual forecast used to develop the company's Ten-Year Site Plan?

**A.** No, the load forecast that is developed specifically for the DSM goals setting 2020-2029 period uses the same methodology as the company's typical annual forecast used to develop the company's Ten-Year Site Plan with the exception that it assumes that all DSM activities stop as of December 31, 2019.

**Q.** Is the IRP process used with this modified load forecast to support the 2020-2029 DSM goals setting period the same as Tampa Electric's typical annual process used to develop the company's Ten-Year Site Plan?

**A.** Yes, it is identical.

**Q.** Is the IRP process used to support the 2020-2029 DSM goals setting period the same process that Tampa Electric used in prior DSM goals setting periods?

**A.** Yes, the IRP process that Tampa Electric used has been utilized and approved in all previous DSM goals setting proceedings and is clearly delineated in the company's

annual Ten-Year Site Plan filing.

**Q.** Do you have a list that details the information of Tampa Electric's avoided unit, including fuel costs, that was determined in the IRP process that was performed?

**A.** Yes, in my Exhibit No. MRR-1, Document No. 8 details the information of Tampa Electric's avoided unit and fuel costs that were determined in the IRP process that was performed.

**Q.** Do you have a list that identifies all input assumptions that were used in the RIM and TRC cost-effectiveness tests to develop the economic potential?

**A.** Yes, in my Exhibit No. MRR-1, Document No. 9 identifies all the input assumptions that were used in the cost-effectiveness RIM and TRC tests to develop the economic potential.

**TAMPA ELECTRIC'S ECONOMIC POTENTIAL:**

**Q.** What is Tampa Electric's economic potential?

**A.** Under the RIM cost-effectiveness test evaluation, the

economic potential resulted in the following savings:

| | |
|---|---|
| Summer Demand: | 4,928 MW |
| Winter Demand: | 3,754 MW |
| Annual Energy: | 12,669 GWh |

Under the TRC cost-effectiveness test evaluation, this economic potential resulted in the following savings:

| | |
|---|---|
| Summer Demand: | 2,656 MW |
| Winter Demand: | 2,986 MW |
| Annual Energy: | 1,785 GWh |

The details of these values are included in my Exhibit MRR-1, Document No. 10.

**TAMPA ELECTRIC'S ECONOMIC POTENTIAL SENSITIVITIES:**

**Q.** Please describe what economic potential sensitivities Tampa Electric conducted to be compliant with the Commission's Order Establishing Procedures in this proceeding?

**A.** Tampa Electric's economic potential sensitivity analyses were conducted based upon the RIM and TRC economic potentials with regard to the following factors:

1) Lower fuel costs;

2) Higher fuel costs;
3) Shorter free-ridership consideration;
4) Longer free-ridership consideration; and
5) Consideration of the cost of carbon.

**Q.** How did the company perform the sensitivity for lower and higher fuel costs?

**A.** The sensitivity for lower and higher fuel costs was performed by varying the fuel cost in a similar manner as Tampa Electric's sensitivity conducted in the company's annual fuel docket when the company conducted fuel hedging.

**Q.** How did the company perform the sensitivity for shorter and longer free-ridership consideration?

**A.** The sensitivity for shorter and longer free-ridership consideration was performed by changing the requirement from a two-year simple payback to a one-year simple payback (shorter) and a three-year simple payback (longer).

**Q.** Did the company perform the sensitivity for the consideration of the cost of carbon?

**A.** No, Tampa Electric did not include the cost of carbon dioxide ("CO2" or "Carbon") in the process of establishing the economic potential.

**Q.** Why did Tampa Electric not consider the cost of carbon?

**A.** Tampa Electric has two reasons for not considering the cost of carbon. The first is that Tampa Electric does not include the cost of carbon in the IRP process that was used to establish the costs and fuel costs of the next avoided unit for this 2020-2029 DSM goals setting proceeding and the company does not include the cost of carbon in the IRP process that is used to develop the annual Ten-Year Site Plan. The second is the cost of carbon in the state of Florida is not imposed by any State or Federal regulations on the emissions of carbon nor have any laws for the emission of greenhouse gases like carbon currently been enacted at the Federal or State levels.

**Q.** Has the company ever considered the cost of carbon in a DSM goals setting proceeding?

**A.** Yes, it has been used only one time. It was used in the 2005-2014 DSM goals setting proceeding where Tampa

Electric followed the Commission Staff's request to perform carbon sensitivities on Tampa Electric's economic potential.

**Q.** Please describe the results of the sensitivity analyses that were performed when applied to Tampa Electric's 2020-2029 RIM and TRC DSM economic potentials?

**A.** Tampa Electric's sensitivity analyses results on the 2020-2029 RIM and TRC DSM economic potentials were modest at best. From a RIM perspective, the greater variation occurred with summer demand and annual energy relative to fuel costs and annual energy due to payback duration. From a TRC perspective, the greater variation occurred with annual energy relative to fuel costs and payback duration. The processes to perform the sensitivity analyses are included in my Exhibit MRR-1, Document No. 11.

**Q.** Do you have a summary showing the results of the sensitivity analyses?

**A.** Yes, my Exhibit No. MRR-1, Document No. 15 provides a summary showing the results of the sensitivity analyses.

**Q.** Should the results of these sensitivity analyses be used in any manner to influence or establish Tampa Electric's DSM goals for the 2020-2029 period?

**A.** No, Tampa Electric believes the sensitivity analyses simply provides a relative indication as to how cost-effectiveness evaluations may be affected by changes in assumptions. There is no basis to conclude that assumption changes modeled by the company for this sensitivity exercise will in some manner become more plausible than the actual assumptions utilized.

**TAMPA ELECTRIC'S CONSIDERATION OF FREE-RIDERS:**

**Q.** Please provide the process that Tampa Electric utilized to consider free-riders used to develop the proposed DSM goals in this proceeding?

**A.** Tampa Electric accomplished the free-ridership consideration requirement through the application of a longstanding Commission recognized practice, initially approved in the 1994 DSM goals proceeding. There, the Commission approved the use of a participant payback of two years or less without a utility incentive. The free-ridership consideration is performed by removing those

measures from the RIM and TRC achievable potential consideration that have a simple payback equal to or less than two years. The execution of this consideration for free-ridership required not only the use of the RIM and TRC cost-effectiveness tests, but also the PCT in conjunction with each.

**Q.** What does the term "free-ridership" mean to Tampa Electric?

**A.** The term "free-ridership" describes a situation where a customer willingly accepts a rebate or other type of incentive to purchase goods or services that the customer would have purchased anyway, without the rebate or other incentive, because of the cost-effectiveness of the goods or services purchased.

**Q.** Does Tampa Electric support the two-year or less simple payback screen as an appropriate way to consider for free-riders?

**A.** Yes, the two-year or less period of time is sufficient motivation for a customer's natural, self-serving adoption of the DSM measure. Simplistically, Tampa Electric, and ultimately its customers, should not pay

specific customers to do what they would do on their own without an incentive. Because of this and Rule 25-17.0021, F.A.C., which requires the minimization of free riders in the setting of DSM goals, the two-year simple payback criterion is the appropriate means to apply to minimize free ridership as required by Rule.

**Q.** How many measures remained qualified and the associated summer demand, winter demand and annual energy savings of these measures after consideration of free-ridership under the RIM and PCT evaluation?

**A.** After consideration of free-ridership, 1,100 individual measure permutations remained qualified under the RIM and PCT evaluation and resulted in the following savings:

| | |
|---|---|
| Summer Demand: | 2,557 MW |
| Winter Demand: | 2,907 MW |
| Annual Energy: | 747 GWh |

**Q.** How many measures were removed due to having a simple payback of two-years or less after consideration of free-ridership under the RIM and PCT evaluation?

**A.** After consideration of free-ridership, the two-year payback removed 779 individual measure permutations under

the RIM and PCT evaluation.

**Q.** How many measures remained qualified and the associated summer demand, winter demand and annual energy savings of these measures after consideration of free-ridership under the TRC and PCT evaluation?

**A.** After consideration of free-ridership, 944 individual measure permutations remained qualified under the TRC and PCT evaluation and resulted in the following savings:

Summer Demand: 2,465 MW
Winter Demand: 2,824 MW
Annual Energy: 686 GWh

**Q.** How many measures were removed due to having a simple payback of two-years after consideration of free-ridership under the TRC and PCT evaluation?

**A.** After consideration of free-ridership, the two-year payback removed 1,005 individual measure permutations under the TRC and PCT evaluation.

**Q.** Did Tampa Electric comply with Staff's request and the Order Establishing Procedure by performing a sensitivity analyses utilizing the consideration of free-ridership?

**A.** Yes, as described earlier Tampa Electric complied with Staff's request and the Order Establishing Procedure by performing a sensitivity analyses utilizing the consideration of free-ridership of a one-year and three-year period for the simple payback.

**Q.** How many individual measure permutations were removed due to having a simple payback of one-year and three-year period for the free-ridership sensitivity as compared to the two-year free-ridership consideration under the RIM and PCT, and the TRC and PCT evaluation?

**A.** The amount of measure permutations that were removed under the RIM and PCT, and the TRC and PCT evaluation after consideration of free-ridership and the free-ridership sensitivity analyses are below:

Measure permutations removed under RIM and PCT:
One-year Free-Ridership Sensitivity: 427
Two-year Free-Ridership Consideration: 779
Three-year Free-Ridership Sensitivity: 1,065

Measure permutations removed under TRC and PCT:
One-year Free-Ridership Sensitivity: 523
Two-year Free-Ridership Consideration: 1,005

Three-year Free-Ridership Sensitivity: 1,301

**Q.** Do you have a summary showing the free-ridership consideration in addition to the results of the free-ridership sensitivities?

**A.** Yes, my Exhibit No. MRR-1, Document No. 15 provides a summary showing the results of the free-ridership consideration and sensitivity analyses.

**PROCESS TO DEVELOP THE ACHIEVABLE POTENTIAL:**

**Q.** Would you describe the overall process that Tampa Electric utilized to develop the achievable potential in this proceeding?

**A.** Yes, the process to develop the achievable potential study takes all the measures that successfully passed cost-effectiveness and the free-ridership consideration at the economic potential and to now perform both RIM and TRC cost-effectiveness by first including program administration costs without any incentives or rebates. The measures that pass this level of RIM and TRC cost-effectiveness are then analyzed to see if an incentive or a rebate can be provided. In this process, for the RIM

test the rebate is set at either the maximum level to drive the RIM cost-effectiveness score to be 1.01 or to the level that places the measure simple payback of two years. For the TRC cost-effectiveness test, the rebate is set at the level that places the measures simple payback of two years. Once the incentive levels have been determined that will maximize participation, the company used Bass Models, Adoption Curves and its experience with current programs and incentives to estimate and project the activity over the 2020-2029 DSM goals setting period within each of the cost-effective measures. The individual measures annual energy (in kWh) and summer and winter demand (in kW) are determined for their contributions in each of the 2020-2029 DSM goals period years. All the residential and commercial/industrial contributions are summed by year for these sectors and totaled to become the annual and cumulative DSM achievable potential. This process to develop the achievable potential is included in my Exhibit MRR-1, Document No 12.

**Q.** How did Tampa Electric develop the administrative costs utilized in the development of the achievable potential?

**A.** Tampa Electric has significant experience running

effective DSM programs and utilized the administrative cost estimated based on its experience with the same or similar measures contained in the company's existing DSM programs.

**TAMPA ELECTRIC'S ACHIEVABLE POTENTIAL:**

**Q.** What is Tampa Electric's total achievable potential?

**A.** Under the RIM cost-effectiveness test evaluation, the achievable potential resulted in 78 individual evaluations remaining with the following savings:

Summer Demand: 74.4 MW
Winter Demand: 40.4 MW
Annual Energy: 156.5 GWh

Under the TRC cost-effectiveness test evaluation, this achievable potential resulted in 68 individual evaluations remaining with the following savings:

Summer Demand: 154.7 MW
Winter Demand: 75.6 MW
Annual Energy: 392.9 GWh

These values are stated at the meter level and are also included in my Exhibit MRR-1, Document No. 13.

**Q.** Do these DSM achievable potentials include demand response and distributed energy resources?

**A.** Yes, in addition to energy efficiency, these DSM achievable potentials include demand response and consideration of distributed energy resources. No measures within distributed energy resources remained cost-effective.

**Q.** Will you provide a list of the RIM-based cost-effective measures and TRC-based cost-effective measures that made the contributions to the achievable potential?

**A.** Yes, the list of measures that supported the RIM-based and TRC-based achievable potential are included in my Exhibit No. MRR-1, Document No. 14.

**Q.** Is the achievable potential the same as what the company is proposing as the DSM goals for the 2020-2029 goals setting period in this proceeding?

**A.** The RIM-based achievable potential is the amount of cost-effective annual energy (in kWh) and summer and winter demand (in kW) given the current economic conditions that Tampa Electric is seeing for its next avoided unit at the

meter. To obtain the DSM goals for the 2020-2029 goals setting period, these annual energy and summer and winter demand savings will be adjusted so that amount of savings is provided at the generator level, which are the proposed company's 2020-2029 DSM goals.

**Q.** What is Tampa Electric's total achievable potential after being adjusted to savings at the generator?

**A.** Under the RIM cost-effectiveness test evaluation, the achievable potential at the generator resulted in the following savings:

| | |
|---|---|
| Summer Demand: | 79.7 MW |
| Winter Demand: | 43.3 MW |
| Annual Energy: | 165.0 GWh |

Under the TRC cost-effectiveness test evaluation, the achievable potential at the generator resulted in the following savings:

| | |
|---|---|
| Summer Demand: | 165.9 MW |
| Winter Demand: | 81.1 MW |
| Annual Energy: | 414.6 GWh |

These values are also included in my Exhibit MRR-1, Document No. 13.

**Q.** Would you provide the DSM achievable potentials at the generator for energy efficiency and demand response separately?

**A.** Yes, for energy efficiency under the RIM cost-effectiveness test evaluation, the achievable potential at the generator resulted in the following savings:

Summer Demand: 51.7 MW
Winter Demand: 26.3 MW
Annual Energy: 165.0 GWh

For demand response under the RIM cost-effectiveness test evaluation, the achievable potential at the generator resulted in the following savings:

Summer Demand: 28.0 MW
Winter Demand: 17.1 MW
Annual Energy: 0.0 GWh

For energy efficiency under the TRC cost-effectiveness test evaluation, the achievable potential at the generator resulted in the following savings:

Summer Demand: 122.1 MW
Winter Demand: 54.1 MW
Annual Energy: 414.6 GWh

For demand response under the TRC cost-effectiveness test evaluation, the achievable potential at the generator resulted in the following savings:

| | |
|---|---|
| Summer Demand: | 43.8 MW |
| Winter Demand: | 26.9 MW |
| Annual Energy: | 0.0 GWh |

**Q.** From the RIM-based achievable potential, will the measures that remained cost-effective become the new DSM programs Tampa Electric will submit within the DSM Plan once the goals are approved?

**A.** Not necessarily, the data obtained from the process to develop the achievable potential will be used, but the process to develop DSM goals is to determine the amount of cost-effective annual energy (in kWh) and summer and winter demand (in kW) given the current economic conditions that Tampa Electric is seeing for its next avoided unit at this time. It is a combination of theoretical, mathematical and realistic inputs for each individual measure as they stand alone. Designing a DSM program that would be used to support obtaining the Commission's annual and cumulative DSM goals may use a single measure or any combination of measures to develop a cost-effective program. Tampa Electric is not limited

to using any measures that could be utilized in a cost-effective DSM Program. For example, the company is planning to retain its current weatherization and energy education programs that include energy-efficiency kits which are made up of both cost-effective and not cost-effective measures which focus on gaining participation of low-income customers in the company's DSM programs portfolio.

**Q.** What residential summer and winter Megawatt (MW) and annual Gigawatt-hour (GWh) goals should be established for the period 2020-2029 at the generator?

**A.** Tampa Electric's reasonably achievable generator level combined RIM-based Residential DSM goals for the 2020-2029 period are:

Summer Demand: 54.0 MW
Winter Demand: 25.5 MW
Annual Energy: 103.6 GWh

**Q.** What commercial/industrial summer and winter Megawatt (MW) and annual Gigawatt hour (GWh) goals should be established for the period 2020-2029 at the generator?

**A.** Tampa Electric's reasonably achievable generator level

combined RIM-based Commercial/Industrial DSM goals for the 2020-2029 period are:

Summer Demand: 25.8 MW
Winter Demand: 17.8 MW
Annual Energy: 61.4 GWh

**Q.** Do you have a summary of each of the potentials from the technical potential through the economic, including sensitivities and ending with the achievable potential?

**A.** Yes, my Exhibit No. MRR-1, Document No. 15 provides a summary of each of the potentials developed that include the impacts of the sensitivities.

**ADHERENCE TO F.A.C. RULES AND STATUTORY REQUIREMENTS:**

**Q.** Has Tampa Electric provided an adequate assessment of the achievable potential of all available demand-side conservation and efficiency measures, including demand response and distributed energy resources?

**A.** Yes, Tampa Electric has conducted an adequate assessment of the full technical, economic and achievable potentials of all available demand-side conservation and efficiency measures including demand response and distributed energy

resources. The company employed a reasonable approach to identifying administrative costs and incentives for the measures and evaluated the measures against the appropriate supply-side avoided cost data.

**Q.** Does the evaluation process utilized by Tampa Electric to establish its proposed DSM goals for the 2020-2029 period address the requirements of Rule 25-17.0021, F.A.C.?

**A.** Yes, the Rule requires a utility to:

1) Project its proposed DSM goals in both the residential and commercial/industrial sectors.
2) Give consideration to measures applicable for new and existing construction.
3) Ensure that major end-use categories specified in the Rule be assessed.
4) Consider such things as overlapping measures, appliance efficiency standards, interactions with building codes, free-riders, rebound effects and the utility's latest monitoring and evaluation data.

The comprehensive DSM measure list developed by the FEECA utilities and Nexant for Electric Energy and Peak Demand savings for Tampa Electric, and the company's overall evaluation process for its technical potential to its

proposed DSM goals for the 2020-2029 period fully meet the requirements of Rule 25-17.0021, F.A.C.

**Q.** Has Tampa Electric provided an adequate assessment of the full technical potential of all available demand-side conservation and efficiency measures, demand response and demand-side renewable energy systems?

**A.** Yes, Tampa Electric, in conjunction with the other FEECA utilities, developed a comprehensive DSM measure list. Subsequently, the company conducted an adequate assessment of the full technical potential of all available demand-side conservation and efficiency measures, demand response and distributed energy resources which included renewable energy systems. A total of 301 measures, including energy efficiency, demand response and distributed energy resources measures were identified and evaluated by the company. These 301 measures and the additional residential and commercial segmentation required over 70,000 cost-effectiveness evaluations.

**Q.** How has Tampa Electric incorporated supply-side efficiencies into its planning process?

**A.** Supply-side efficiencies include improvements in generation, transmission and distribution. Therefore, Tampa Electric's motivation to deliver electric service to its customers in the most economical and efficient manner possible makes executing supply-side efficiencies a naturally occurring result. A review of Tampa Electric's plans for supply-side endeavors is an inherent element of the company's annual Ten-Year Site Plan which is routinely reviewed by this Commission. Furthermore, both supply-side efficiency and conservation resources are analyzed in every need determination for new sources of generation. When Tampa Electric selects its avoided supply-side costs for utilization in DSM cost-effectiveness evaluations, it is selecting resources that have previously been reviewed and determined to be efficient. Of further note is the fact that while efficiency improvements in supply-side resources are important, these improvements have a tendency to reduce potential savings available through DSM activity.

**Q.** Does Tampa Electric's proposed DSM goals adequately reflect the costs and benefits to customers who will participate in programs developed to promote DSM measures?

**A.** Yes, through Tampa Electric's, the other FEECA utilities and Nexant's work to develop the technical potential study with updated baselines and incremental equipment costs, the company's proposed RIM-based DSM goals adequately reflect the costs and benefits to customers who will participate in programs developed to promote DSM measures.

**Q.** Does Tampa Electric's proposed DSM goals adequately reflect the costs and benefits to the general body of ratepayers as a whole, including utility incentives and participant contributions?

**A.** Yes, the surest way to adequately reflect the costs and benefits to the general body of ratepayers as a whole without subsidization within or across rate classes is to employ the continued use of the RIM cost-effective test for DSM goals setting and program approval. Since the inception of DSM in Florida, this Commission has a longstanding practice of utilizing the RIM test to provide fair, equitable and reasonable treatment for all ratepayers while minimizing overall rate impacts of DSM expenditures. Tampa Electric strongly encourages the Commission to continue this practice so as to establish meaningful DSM goals while minimizing overall rate

impacts.

**PROJECTED 2020-2029 RESIDENTIAL BILL IMPACTS:**

**Q.** For Tampa Electric, what are the 2020-2029 annual bill impacts on residential customers using 1,200 kWh/month for the projected RIM-based achievable portfolio and the projected TRC-based achievable portfolio?

**A.** To make the determination of the 1,200 kWh/month annual residential bill impact for the 2020-2029 period relative to the RIM-based and TRC-based achievable portfolios, Tampa Electric's approach was to provide the total impact of each of these portfolios and also include the current ongoing costs of maintaining existing DSM on the company's system. These current ongoing costs principally included load management costs associated with maintaining the existing level of load management on the system, the costs to perform energy audits as required by Rule 25-17.003, F.A.C., projected research and development, supporting advertising for DSM programs, energy education and supporting administration activities. The results of these analyses for the 2020-2029 period are contained in my Exhibit No. MRR-1, Document No. 16 which provides the estimated ten-year

total cost for a 1,200 kWh/month bill would be $356.78 for the RIM-based achievable portfolios and $516.13 for the TRC-based achievable portfolio.

It is important to realize the dollar amounts for the RIM and TRC achievable portfolios are estimates for only one customer's electric bill. A more realistic view is gained by looking at the impact across the company's entire system and thus its entire customer base. The estimated ECCR clause cost to deliver the RIM-based achievable portfolio for the 2020-2029 period is projected to be $396.4 million. The estimated ECCR clause cost to deliver the TRC-based achievable portfolio for the 2020-2029 period is projected to be $573.5 million. Therefore, the TRC-based achievable portfolio is a $177.1 million greater burden for customers. Furthermore, the RIM-based achievable portfolio, by definition of the RIM test, is cost-effective for both participating and non-participating customers; therefore, there are no losers. However, the TRC-based achievable portfolio is cost-effective for program participants but not for non-participants. Under the TRC-based achievable portfolio, non-participants will actually be subsidizing the program participants for their DSM efforts. Therefore, the RIM-based achievable portfolio is the more

cost-effective, less expensive, more reasonable and equitable approach to take in order to provide another resource to assist the company in meeting future system needs.

**OTHER INFORMATION REQUESTED BY THE COMMISSION'S ORDER ESTABLISHING PROCEDURE:**

**Q.** Does your testimony include the company's current DSM programs, that includes the historical participation rates, cumulative kW and kWh savings, measures included in each program and program impacts related to building code and appliance efficiency standards?

**A.** Yes, in addition to the historical savings and impacts from appliance efficiency standards as previously discussed earlier, I am including descriptions of Tampa Electric's current portfolio of Commission approved DSM programs and the most recent annual and cumulative DSM achievements from the company's DSM programs in my Exhibit MRR-1, Document No. 17.

**Q.** What goals, if any, should be established for increasing the development of demand-side renewable energy systems, pursuant to Section 366.82(2), F.S.?

**A.** Currently, there are a few key reasons why there is not a need for having a goal or incentives for the development of demand-side renewable energy systems. The company gained a lot of information when it offered incentives under the renewable energy systems initiative pilot program that was offered during the 2010 through 2015 DSM goals period and the company is continuing to see the price of solar renewable energy systems decrease. The residential renewable energy systems still are not cost-effective in all three cost-effectiveness tests (TRC, RIM and PCT). The commercial renewable energy systems passed under the RIM cost-effectiveness test but significantly failed the other two cost-effectiveness tests (TRC and PCT). The residential and commercial renewable energy systems were both screened out without any program administration or incentive costs so they will not pass cost-effectiveness as a DSM program over the foreseeable horizon. Another main reason for not having a goal or incentives for renewable energy systems is the current market, even with these systems being not cost-effective, many residential and commercial customers are making the choice to install these systems on their own or leasing these systems. Since the renewable energy systems initiative pilot closed, the company has seen the following new customer interconnections of renewable

energy systems at the end of each of these years:

2016: 286

2017: 740

2018: 1,259

**Q.** If the renewable energy systems passed cost-effectiveness, would Tampa Electric offer a DSM program that had goals and incentives for these systems?

**A.** Yes, if the renewable energy systems passed cost-effectiveness and the other screening that is performed, Tampa Electric would design a DSM program to offer and incentivize the installation of renewable energy systems.

**Q.** Does Tampa Electric support renewable energy system installations?

**A.** Yes, the company supports both customer and utility installed renewable energy system installations. When customers install a renewable energy system, the interconnection process they go through is very customer friendly and we have many solar experts that will assist the customer with any questions. From a utility perspective, in 2017, Tampa Electric committed to add 600 MW of solar renewable energy systems and is committed to

making its generation fleet cleaner and greener.

**Q.** Does Tampa Electric see any need for a different type of program to increase the development of demand-side renewable energy systems?

**A.** Tampa Electric believes there is a need for more energy education surrounding all of the potential options that a customer can choose if they want their energy needs to come from a renewable energy system. With the increase in home systems ownership, leasing opportunities, participation in a renewable block program, participation in a community shared solar program, or some of the other mechanisms that we see around the United States today. More education around these options is still needed.

**CONCLUSIONS:**

**Q.** What overall DSM goals are reasonably achievable for Tampa Electric for the 2020-2029 period?

**A.** Based on the thorough and rigorous analysis performed by Nexant and Tampa Electric for this current DSM goals setting process, the company's reasonably achievable generator level combined RIM-based DSM goals for the

2020-2029 period are:

Summer Demand: 79.7 MW

Winter Demand: 43.3 MW

Annual Energy: 165.0 GWh

These amounts are detailed on an annual basis for both the residential and commercial/industrial sectors in my Exhibit No. MRR-1, Document No. 1.

By accomplishing these DSM goals, Tampa Electric will increase overall energy efficiency in its service area and lower electric rates for all customers. The company is quite aware that keeping electric rates as low as possible while advancing broad scale efforts of overall conservation is important to its customers and therefore the company.

**Q.** Does the methodology used by Tampa Electric to set DSM goals for the 2020-2029 period comply with statutory and F.A.C. requirements?

**A.** Yes. Tampa Electric began its evaluation with having a technical potential study developed that utilized a comprehensive and up to date list of potential DSM measures for residential and commercial and industrial

sectors. These measures were applied over multiple construction and building types and considered several aspects of measure interaction as well as free-ridership consideration. Tampa Electric adhered to statutory requirements by developing estimated economic and achievable potentials while properly reflecting cost and benefits to all customers. Additionally, Tampa Electric utilized a sound, proven approach that has been used and approved in principle by this Commission in past DSM goals setting proceedings.

**Q.** Does Tampa Electric's proposed DSM goals provide a cost-effective means for all ratepayers to help meet the need for additional generation through 2029?

**A.** Yes, through the continued use of the RIM cost-effectiveness test, Tampa Electric has assured its ratepayers that the most cost-effective resources will be used to meet future capacity needs.

**Q.** Should Tampa Electric's proposed 2020-2029 DSM goals be approved?

**A.** Yes. Tampa Electric's proposed 2020-2029 DSM goals meet rule and statutory requirements, are cost-effective for

participants and non-participants, help to minimize the rate impact for future capacity needs, addresses the desires and needs of its customers, and are reasonably achievable.

**Q.** Are the Company's proposed goals based on an adequate assessment of the full technical potential 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.?

**A.** Yes.

**Q.** Does the Company's proposed goals adequately reflect the costs and benefits to customers participating in the measure, pursuant to Section 366.82(3)(a), F.S.?

**A.** Yes.

**Q.** The Company's proposed goals adequately reflect the costs and benefits to the general body of ratepayers as a whole, including utility incentives and participant contributions, pursuant to Section 366.82(3)(b), F.S.?

**A.** Yes.

**Q.** Does the Company's proposed goals adequately reflect the need for incentives to promote both customer-owned and utility-owned energy efficiency and demand-side renewable energy systems, pursuant to Section 366.82(3)(c), F.S.?

**A.** Yes.

**Q.** Does the Company's proposed goals adequately reflect the costs imposed by state and federal regulations on the emission of greenhouse gases, pursuant to Section 366.82(3)(d), F.S.?

**A.** Yes.

**Q.** What cost-effectiveness test or tests should the Commission use to set goals, pursuant to Section 366.82, F.S.?

**A.** The RIM-based cost-effectiveness test.

**Q.** Does the Company's proposed goals appropriately reflect consideration of free riders?

**A.** Yes.

**Q.** What residential summer and winter Megawatt (MW) and annual Gigawatt-hour (GWh) goals should be established for the period 2020-2029?

**A.** Tampa Electric's reasonably achievable generator level combined RIM-based Residential DSM goals for the 2020-2029 period are:

Summer Demand: 53.9 MW
Winter Demand: 25.5 MW
Annual Energy: 103.6 GWh

**Q.** What commercial/industrial summer and winter Megawatt (MW) and annual Gigawatt hour (GWh) goals should be established for the period 2020-2029?

**A.** Tampa Electric's reasonably achievable generator level combined RIM-based Commercial/Industrial DSM goals for the 2020-2029 period are:

Summer Demand: 25.8 MW
Winter Demand: 17.8 MW
Annual Energy: 61.4 GWh

**Q.** Does this conclude your testimony?

**A.** Yes.

BY MR. MEANS:

**Q Mr. Roche, did you also prepare and cause to be filed with your direct testimony an exhibit marked MRR-1 consisting of 17 documents?**

A Yes, I did.

MR. MEANS: And, Mr. Chairman, this exhibit is identified as Exhibit 63 on staff's comprehensive exhibit list.

CHAIRMAN GRAHAM: Duly noted.

BY MR. MEANS:

**Q And Mr. Roche, did you cause to be filed an errata to Exhibit MRR-1 on August 5th, 2019?**

A Yes, I did.

**Q Other than those changes, do you have any other changes to your exhibit?**

A No, I don't.

**Q Mr. Roche, did you prepare a summary of your direct testimony?**

A Yes, I did.

**Q Will you please read that summary?**

A Yes.

Good afternoon, Commissioners. My direct testimony describes the comprehensive, thorough and rigorous analysis used by Tampa Electric and Nexant to develop the full technical potential. I also support

the company's proposed DSM goals for the 2020 through 2029 period.

Our proposed goals before you are based upon Tampa Electric's most recent resource planning process. The goals are aggressive and, at the same time, are reasonably achievable and cost-effective for all customers.

The method employed by the company to establish these goals fully adheres Rule 25-17 of the Florida Administrative Code. It is consistent with approved practices established in previous goals hearings, and it specifically follows the Commission's order establishing procedure for this proceeding.

To develop the proposed goals, Tampa Electric followed the systematic and thorough process and documented each step to ensure transparency. Tampa Electric took two years to carry out this process to ensure the completeness of the technical potential and accuracy of the achievable potential.

The process required the cost-effective analysis of 278 individual measures across various customer segments in which no customer segment was left out. To analyze these measures accurately, the company performed over 70,000 cost-effective evaluations.

Tampa Electric's proposed goals were developed

utilizing the Rate Impact Measure test in conjunction with the Participant Cost test. This method assures compliance with the Florida Statutes, and then it recognizes the costs and benefits to participating customers and the costs and benefits to the general body of ratepayers as a whole, ensuring fairness for both participating and nonparticipating customers.

Tampa Electric believes the continued use of the Rate Impact Measure test in conjunction with the Participant Cost test remains the most appropriate cost-effective approach to establish DSM goals. The use of this combination ensures the DSM programs eventually approved will be beneficial to all customers, will place the least amount of upward pressure on rates, and will avoid creating cross-subsidies across or among the company's customers.

This goal development process and the rigorous analysis I just described have delivered significant success for Tampa Electric and its customers, and for the other Florida utilities and their customers as well.

Tampa Electric's proposed DSM goals were carefully developed in a manner fully compliant with FEECA and your implementing rules. The goals achieve the proper balance of aggressiveness in the pursuit of demand and energy savings, but at the same time being

cost-effective and free of cross-subsidization for all customers.

Based on these facts, and the other matters discussed in great detail in my testimony, Tampa Electric asks the Commission to approve the DSM goals that we have proposed for the company.

Thank you.

MR. MEANS: We tender the witness for cross.

CHAIRMAN GRAHAM: Thank you.

Mr. Roche, welcome.

THE WITNESS: Thank you, Chairman Graham.

CHAIRMAN GRAHAM: OPC.

EXAMINATION

BY MS. FALL-FRY:

**Q Good afternoon.**

A Good afternoon.

**Q According to your testimony, you only used RIM in conjunction with the PCT to set your DSM goals, correct?**

A Yes, to establish the proposed goals of the generator level at Tampa Electric, we used the Rate Impact Measure test and the Participant Cost test. And we also used the Total Resource Cost test in conjunction with the Participant Cost test just to kind of get a look at what we call achievable potential for TRC.

**Q Right. But when you set your actual goals, you didn't use -- you used the goals that were consistent -- you set your achievable potential based on the RIM test, though?**

A Yes, the goals we recommend for approval to the Commission is based upon the Rate Impact Measure test and the Participant Cost test.

**Q Okay, thank you.**

**And TECO has low income residential DSM programs, right?**

A That is correct. We have two.

**Q And your low income program includes programs that have not passed the Rate Impact Measure test?**

A As a whole, those programs typically do not pass cost-effectiveness because we pay for everything for those customers. You know, we recognize that customers, at times, may not have the financial wherewithal to actually, you know, I would say, you know, spend the dollars to actually participate in kind of an incentive or a rebate type program. And since those customers actually do chip into the energy conservation cost recovery clause, we think it's important that they have an opportunity to participate in programs as well, but --

**Q Thank you.**

**And some of those programs included less than a two-year payback, right?**

A Yes. Both programs actually include measures. There is five measures in the energy efficiency kit for energy education awareness and outreach program. And then there is 11 measures in our weatherization program.

Two of those measures in the 11 are cost-effective and actually are run as separate DSM programs. The other nine measures, you know, we typically, when we design the program, those are going to give us, you know, kind of a lot of energy savings. So when those are coupled together, it becomes a pretty effective program for those customers.

**Q Okay. And you are planning to retain those programs?**

A Yes. We will probably get rid of at least one measure that I -- I heard the, you know, proverbial water heater wrap, you know, all water heaters after 1996 are required to have insulation. So it's probably time that that is actually -- that portion is retired.

**Q And the megawatts associated with those programs that you retain, you agree that they should be included in your 2020 to 2029 DSM goals?**

A Yes. I agree and recommend that those contributions, that those achievements actually go

toward contributions to the DSM goals that we are finally approved by the Commission, yes.

**Q Okay, thank you.**

MS. FALL-FRY: No further questions.

CHAIRMAN GRAHAM: Okay. Ms. Wynn?

MS. WYNN: No.

CHAIRMAN GRAHAM: Kelley?

MS. CORBARI: No questions.

CHAIRMAN GRAHAM: SACE.

MR. MARSHALL: Thank you. We have a lot of exhibits that I believe have --

CHAIRMAN GRAHAM: Actually, what I propose, the next one we have is 345. Let's call this the SACE/TECO composite, and we are with 345.

MR. MARSHALL: Okay.

(Whereupon, Exhibit No. 345 was marked for identification.)

CHAIRMAN GRAHAM: And if you need to ask any questions about it, just tell us which ones.

MR. MARSHALL: All right, I will. And there are a few questions we have from the composite.

CHAIRMAN GRAHAM: Sure.

EXAMINATION

BY MR. MARSHALL:

**Q And the first one will be regarding the first**

**page of the composite, 345, where it's description excerpt from TECO 2018 DSM program accomplishments report.**

A Yes, I have it.

**Q And if I could direct your attention to the last page of that report.**

A I have it.

**Q And this reports the Tampa Electric Company's accomplishments for its neighborhood weatherization program for 2018?**

A Yes.

**Q And that is a low income program?**

A It is.

**Q And in 2018, Tampa Electric actually accomplished almost 10 gigawatt hours of energy reductions at the generator?**

A That is correct.

**Q And had over 7,000 participants?**

A Yes.

**Q Did you -- were you here when Mr. Koch from Florida Power & Light discussed their 34 gigawatt hour goal for low income programs over the next 10 years?**

A I was in the room, but I am not here to speak about Florida Power & Light.

**Q Well, is it fair to say that in 2018, Tampa**

**Electric accomplished more than 3.4 gigawatt hours of savings for their low income weatherization program?**

A I can tell you, on our report we achieved the 9.792 gigawatt hours.

**Q And that's more than 3.4?**

A Mathematically, yes.

**Q And Tampa Electric Company is a smaller utility than Florida Power & Light?**

A Yes, it is a smaller utility. Less customers, yes.

**Q If I could direct your attention next, we are going to go to the one that says TECO response to staff's first set of interrogatories No. 26. I think it's the very last one of the composite.**

A Oh, I thought you were going in order, my friend.

**Q I think this one might be out of order, but hopefully the rest will be close to order.**

A Excerpt from Exhibit No. 241?

**Q Yes.**

A Okay.

**Q Wait -- yeah, this is excerpt No. 26 from TECO's first set of interrogatories.**

A Interrogatory 38?

CHAIRMAN GRAHAM: No. The very last one in

your composite.

MR. MARSHALL: It should be Interrogatory No. 26.

CHAIRMAN GRAHAM: It says excerpt No. 26.

THE WITNESS: Got it, from staff's first set?

CHAIRMAN GRAHAM: Yes.

BY MR. MARSHALL:

**Q I am looking at the table attached. It provides the lost revenue for the, both the TRC and the RIM achievable potential?**

A That is correct.

**Q And looking down to 2029, the lost revenue value for the TRC achievable potential is lower than the RIM achievable potential?**

A Yes.

**Q And similarly, the basis point impact is also lower under the TRC achievable potential?**

A That is correct. That's just a function of math at that point.

**Q All right. Going back to sort of the front of the composite to the one that is described as TECO's response to SACE POD 3, Bates-stamped 198.**

A Yes, I have it.

**Q And this would -- this spreadsheet would include the residential energy efficiency achievable**

**potential for TECO?**

A This is the spreadsheet right before the measures actually get combined. When measures come from the technical potential, they are broken up by customer segments. You know, like our residential is going to be broken up into a single family home, multi-family, manufactured home.

So you have all these customer segments going from the technical potential to the economic potential, and then you keep running them down, but eventually you need to be able to combine them into one to run an achievable potential on that one program because you are not going to have, like, a ceiling insulation program just for single family. You would want a program that is designed to basically cover all of those customer segments.

**Q And in this spreadsheet, you have utility nonrecurring costs for each of those measures?**

A Yes.

**Q And that would represent the administrative costs?**

A Yeah. Those are our administrative costs, and we base those upon our light programs.

Currently, we have 36 conservation programs in our portfolio, 14 residential, 22 commercial. So we

have good experience with how much one of these programs should cost us, yes.

**Q And so, just to be clear, TECO did not use the Nexant administrative costs for the measures?**

A No. We developed our own economic and achievable potential.

**Q And so TECO only assigned $30 of administrative costs to the variable speed pool pump, for example?**

A That is correct.

**Q And for duct repair, only $18?**

A Yes.

**Q And for ceiling insulation, utility nonrecurring costs were $50?**

A That is correct.

**Q And the same administrative costs were assigned to ceiling insulation for both R-2 to R-38 and R-12 to R-38?**

A Right. There would be no difference in having an attic inspection before the actual work is done. Then the customer actually completes the work, notifies the utility. Then we have a requirement to go out and actually post verify at least one of every 10 installations to ensure it's in compliance with the program standards.

**Q Switching subjects, if I could direct your attention to your testimony. Do you have a copy of your testimony with you?**

A I do.

**Q To page 20.**

A Okay, I am there.

**Q And on this page, you cite a few different analyses from the Energy Information Administration ranking Florida in relation to other states.**

A That is correct. When I developed this, you know, Florida has a great history of doing demand-side management for almost four decades. So when you look at the cumulative amount of DSM that has been accomplished as well, at the same time, to keep customer rates lower than the national average, I think that's pretty commendable.

**Q And so for example, you look at the average retail price of electricity to the residential sector and find that Florida ranked 26?**

A Yes.

**Q If I could direct your attention to the next part of the composite exhibit, 2017 average residential monthly bill for EIA data.**

A I have it.

**Q And according to this, the average monthly**

**residential electricity bill is $126.44?**

A Let me catch up to you.

**Q Sure.**

A Yeah, that's for the state of Florida. Tampa Electric's average bill is around $104.

**Q And subject to check, Florida on here, that would be the eighth highest of in the nation for electricity bills?**

A Yeah, but we have a very, like, high heating load climate, so there is much more cooling hours in Florida. So comparing the total bill to what a customer uses -- I mean, I heard the discussion earlier with Washington, DC, their climate heating and cooling hours are much, much different than the state of Florida.

**Q But you don't dispute the numbers on this sheet?**

A No, I don't have any -- I mean, I like the Energy Information Administration, so --

**Q If I could direct your attention to the next part of the composite exhibit, TECO's response to SACE's POD 3 BS 186?**

A I have it.

**Q And we can take the next two as well at the same time I think, BS 188 and BS 195.**

A I have them.

**Q What are these documents?**

A Yeah. These are documents, when you get down to the achievable potential, when you are getting into the -- you know, you have calculated your maximum incentive that you can pay those customers, both on a RIM basis and on a TRC basis, we need to actually project their participation. So we will use Bass models and adoption curves to formulate how are customers going to adopt the technology so we can actually, you know, project an accurate customer participation rate.

We will look at, like, our historical participation in our programs just to validate whether or not we are actually seeing that same participation along the curve.

**Q And so what do you find when you compare it to your own internal surveys?**

A Yeah, customers don't really participate like adoption curves, because those are kind of like theoreticals, where they assume, hey, you know, everybody is kind of in the same boat. It's kind of like mashed potatoes, it's very lumpy at times.

**Q Turning your attention to TECO's load forecasting. TECO's load forecast does not assume that there would be no additional adoption by consumers of energy efficiency measures above the baseline codes and**

**standards over the next 10 years?**

A Can you repeat that question?

**Q Sure.**

**TECO's load forecast does not assume that there would be no additional adoption by its customers of energy efficiency measures above the baseline codes and standards?**

A Yeah, maybe it's better if I just answer it the way I understand our load forecast is done.

Our annual load forecast includes natural occurring demand-side management, which could be, you know, customers adopting technologies that are higher efficiency. Could be such as doing maintenance on an existing peace of equipment to make it last longer than the manufacturer's rated life. Could be, you know, as simple as, you know, some behavioral change that a customer is doing out of an energy audit that our load forecasting folks will actually see. You know, it could be, you know, removing the second refrigerator out of the, you know, the garage.

And we don't really know what's kind of happening in that sector, so that natural occurring is projected, as well as we know the impact from building code and appliance standards.

**Q And so TECO, in its load forecasting, assumes**

**that the energy consumption trends will continue in a similar manner to the past?**

A I think we are going to -- well, we forecasted a little bit slower customer growth, so it won't really rise as rapidly as we have kind of seen in the past. It's kind of still increasing, just at a diminishing rate.

**Q What I guess I am trying to get at, though, is that in its load forecasting, it assumes that customers will continue to adopt measures above baseline codes and standards into the future as they have done in the past?**

A Yes, that's correct. Yeah.

**Q And so it is not TECO's contention that the load forecast utilized by Nexant in this proceeding assumed that TECO's customers would adopt zero additional energy efficiency measures above baseline codes and standards over the next 10 years?**

A I think that's only part of it.

**Q And then TECO does contend that the load forecasts it gave Nexant were accurate?**

A Yes. Knowing the -- how, I guess, important the load forecast is to our load research and forecasting team, I would definitely say it was accurate.

**Q TECO also believes that if a measure has a**

**payback of less than two years, the customer should purchase and install that measure without any additional economic incentive?**

A Yes. Tampa Electric has actually used the two-year payback screen when we initially filed for it in 1991, when we rolled out our custom and -- our custom commercial/industrial incentive program, and it has actually been used since that time exclusively as the method to consider free-ridership.

**Q And TECO has not performed or commissioned any studies or reports to form that belief?**

A That is correct. We have not done a study for it. You know, one of the things when we run programs, we want to be good stewards of our customers' money. If we are going to conduct that complex study, you know, as I mentioned in my discovery responses, that we would outsource that just because I think that if Tampa Electric performed that study, and if it was any different than maybe a different person viewed it. So imagine if it went to a four-year simple payback, I think the discussion now would be much more kind of emphatic.

**Q And then so TECO has not conducted a customer survey to assess the percent and number of free rider customers participating in its DSM programs?**

A No.

**Q If I could direct your attention to your testimony, document No. 13, page one. This will be page -- marked as page 180 at the bottom.**

A Yes, I have it.

**Q So at the generator, the RIM based achievable potential was 165 -- I am sorry, I think I have made a --**

A That is the combined goal for the -- proposed for the company, 165 gigawatt hours at the generator.

**Q Yes. And for TRC, as reflected on the next page, that was 414.6 gigawatt hours?**

A That is correct.

**Q If I could direct your attention to document No. 17, page five of five.**

A Yes.

**Q In 2018, TECO achieved 50.8 gigawatt hours of combined energy savings?**

A That is correct.

There are some numbers to understand kind of behind there. If you look at the numbers, like in 2018, some of our participation was actually from some very large customers participating in an interruptible program, which those have significant energy savings. So when you look at, like the, you know, the 30.2 in

2017, or the 33.7 gigawatt hours in 2018, those are due to very large customers, like one-off's participating in the program, which is greatly influencing that number to be driven upward.

**Q But even looking at the residential, the percent -- the total achieved, for example, for 2018 is 280 percent higher than the Commission approved goal?**

A Yes. But to understand how the company actually accomplishes the residential goals, if you -- you know, summer peak megawatts is, I would say, relatively easy. But that winter peak goal, if you look at that, you know, we exceeded it.

Yeah, it's 123 percent, but typically the company has to work very, very hard to actually accomplish that residential winter goal. So typically that -- when you try to really hit that winter goal, that's going to bring on a whole bunch more annual energy along with it.

**Q And TECO has hit those goals?**

A Say again.

**Q And TECO has hit those goals?**

A Yes. It's actually very important to us to actually accomplish the goals as put forth by the Commission.

**Q If TECO kept doing 50.8 gigawatt hours of**

**energy -- combined energy savings per year, that would actually be greater than its TRC achievable potential of 414.6 gigawatt hours over the next 10 years?**

A Yeah, that is true. But I think there is some things to understand with -- between RIM and TRC.

You know, RIM favors programs that have high demand savings. Where we look at lost revenue, that kind of hurts you in that formula, even though there is other, you know, good things in that denominator as far as RIM, as far as the program costs, the incentives, those are actually baked in.

But I think when you look at RIM, that favors the demand side of the equation, so that you can actually defer the power plant. Where, when you look at TRC, you know -- and even in that goal, like the TRC amount is probably three times the amount as the 165, or it's close if you look at the amount of demand that's put forth by TRC.

And that's because TRC actually favors, like I will say, inexpensive type of technologies, because really what -- I say submarines, or causes cost-effectiveness to fail for TRC is the incremental costs. Okay, so what happens is you are kind of there, and you are investing all this money with TRC, but you are not really deferring the power plant, okay.

So when you look at kind of a revenue requirement, you know, your revenue requirement went up for the actual generating source, but the problem with TRC is because it favors those inexpensive -- those programs and measures, you get a boatload of energy savings.

So what happens is your revenue requirement goes up, so when you bring it over to develop your rate, now I have a much lower kilowatt hour kind of sales portion, so that actually drives the rate up, right. So when you look at Total Resource Cost, you know, that's why we say it subsidizes because, you know, if I have one customer participating, their electric bill goes down. Well, somebody is going to have to make that up, and that's going to be those nonparticipants.

**Q And I think you are anticipating my next question here, so I think that was a helpful explanation.**

**So if you look at, for example, document No. 16 of your testimony.**

A Yes, I am there.

**Q And this includes -- on this table, you have the total annual DSM portfolio costs for both RIM and TRC?**

A That is correct. 396 million for the RIM

portfolio over the 10 years, and then an additional 177 million on top of that to afford the TRC portfolio.

**Q And so that RIM portfolio of 396 million, if you divided that by the 165 gigawatt hours of the RIM achievable potential, that would be about $2.4 million per gigawatt hour of savings?**

A Yeah, I will accept your math.

**Q And similarly, doing it for TRC, with the total portfolio cost of 573,475,000 almost 476,000, dividing that by the 414.6 gigawatt hours, that would be about a little less than 1.4 million per gigawatt hour of energy savings?**

A Like I said, I will accept your math. I think the issue is when you actually look at both of those combined. So one, if I use a TRC portfolio, I am putting a lot of pressure to actually increase rates and cause cross-subsidization, where RIM, I don't have that issue.

Also in TRC, right now I have a higher portfolio cost. So now my energy conservation cost recovery clause goes up. So really I have my rates going up and clause rate going up, and it's kind of exacerbating the problem.

**Q Thank you.**

MR. MARSHALL: No further questions.

CHAIRMAN GRAHAM: Staff.

EXAMINATION

BY MS. DZIECHCIARZ:

**Q Good afternoon, Mr. Roche. This is Rachael Dziechciarz with Commission staff.**

A Good afternoon, Rachael.

**Q So I just have a few questions about TECO's use of the two-year payback screening.**

**Is it correct that -- well, we have already established that TECO used the two-year payback screening, correct?**

A Yes, ma'am.

**Q Did TECO consider using any alternative method, such as surveys or historic data, to account for free riders in this proceeding?**

A Not at this time, no.

**Q And did TECO consider using a shorter or longer payback period for screening its free riders in this proceeding?**

A In the process to get to the achievable potential for the proposed goals, we would continue the recommendation to continue with the two-year payback. We did, just as all of the other FEECA utilities, you know, do the sensitivities at the economic potential for the one- and three-year basically simple payback screen.

**Q Okay. Thank you.**

**And why does TECO believe that the two-year payback screening is the best method to address free riders?**

A Yeah, I think some of the other witnesses I thought said it really well. That it's a reasonable approach. It's effective. It doesn't cost a bunch of money. You know, a free rider is a customer that actually receives a rebate. So it actually received the rebate, but they were going to actually purchase the equipment on their own.

So the purpose of the free-ridership consideration is to try to prevent that from happening. It's not a perfect science to actually do that, but you want to limit to as much as practical. So in other words, you know, I don't want to go out there and spend, you know, $4 in conservation clause money to save a dollar over here. It just doesn't make cost-effective sense to actually do that.

**Q Okay. Thank you.**

MS. DZIECHCIARZ: Staff has no more questions.

CHAIRMAN GRAHAM: Okay, Commissioners. Commissioner Brown.

COMMISSIONER BROWN: Thank you.

Mr. Roche, excellent testimony. Really

thorough prefiled testimony. Had a lot of information in it. Thank you for that, and for your testimony here today.

THE WITNESS: Thank you.

COMMISSIONER BROWN: Question about the participation rate, and I was trying to see where it was in your -- if it was there.

Has customer participation over all in the DSM programs offered by TECO increased since the last goal setting proceeding?

THE WITNESS: Yeah. I think, for the most part, our participation has really continued on, you know, from the prior DSM goals proceeding. I think there is other programs, you know, like we recently rolled out a on-line energy audit which -- I mean, I think it was fabulous. It was, like, in the last six months, we've had 30,000 authenticated audits. So that's customers going in and actually entering, you know, a user ID and a password to actually go in and actually utilize the tool. So really, I would say it's probably been steady.

I think with our proposed goals, I don't really see a, like, a big drop projected for our participation going in the next five years either.

COMMISSIONER BROWN: One of your programs is

an R&D component, is that correct? A conservation R&D?

THE WITNESS: Yes. We are pretty active in the R&D component. You know, as you kind of asked the question about Grid Edge, or kind of like home energy management, we are looking at most likely filing in this DSM plan that will be subsequent to the, you know, the approval of the goals is an R&D project, or really a pilot program at that time, to look at solar canopy tied with batteries and to tie it with electric vehicle charging both for, like, large industrial type trucks as well as for vehicles.

We recently, about two months ago, we rolled out a home management system pilot that, you know, we use employees as kind of, I will say, the captive guinea pigs for that, just to test it out to see what they would do. But that would provide really realtime information to residential customers on, hey, is my refrigerator, you know, is my refrigerator running too often? But they would connect current transformers and the breaker on the appliances they select, and then they would get access to that information, or to put flags in there to provide warnings, et cetera.

About two years ago, we did a R&D project with the University of South Florida to look at commercial battery storage. And they did a wonderful report for that. When we got to the next phase of the project, it was really the cost of the commercial batteries that we were looking at purchasing and installing at two customer sites. Each battery was about a quarter of a million dollars, and that would exhaust our R&D budget quite rapidly. So we basically shelved that until we can say, hey, how, you know, does battery cost and that technology come down, so eventually one day we can kind of resurrect that R&D program.

COMMISSIONER BROWN: That's great. All of that sounds super exciting, and I appreciate the work that you are doing, not use just for TECO and all of its customers, but really for the whole state.

THE WITNESS: Yes, ma'am.

CHAIRMAN GRAHAM: With regard to education on conservation, Tampa Electric does a lot of different things in the community. What type of DSM programs do you do on the education front?

THE WITNESS: Yeah, education is -- probably the primarily front is our energy audits. So our

energy analysts are, they are all certified, some with some national level of energy management. So it's kind of our core, right? And they will go out and educate customers on, you know, quick paybacks, behavioral changes, even up to, like, things are much more, you know, costly than a two-year payback technology. Then it kind of gets down to our energy education program, where we will, you know, participate in trade shows. And then we also --

COMMISSIONER BROWN: And schools, you are throughout the schools.

THE WITNESS: Yeah. I was actually very excited, Commissioner Brown, that Hillsborough County school.

So one of the programs we modified during this last five years was we added a electric vehicle education to driving education in Hillsborough County. And we were actually very excited that finally the, you know, Hillsborough County actually approved the -- finally to get the electric vehicles.

So in June of this year, we actually installed the other two chargers at the other two remaining high schools. Polk and Pasco County do not have drivers ed. So we are still kind of holding on to

those two chargers. Hopefully they will resurrect their program. But we see that, the drivers education really kind of starting off here relatively quickly.

COMMISSIONER BROWN: It sounds like you all are doing a lot from your testimony.

With regard to distributed energy resources on the demand side, it appears that you are still continuing to offer PV incentives.

THE WITNESS: We don't have a -- I would say we don't have a PV program like we had during the five-year pilot. We did -- we did learn a lot during that five-year pilot, but we continued, you know, even the energy audits or energy education to educate customers on solar or renewable technologies.

We do have a renewable block program that we -- you know, it's a self-funded program that will actually fund energy education strictly on solar. It will do advertising on solar.

And then the main portion of that program funds PV arrays to be installed, whether they are at schools. We did -- the most recent array is with the Florida, I am going to call it the Fish and Wildlife kind of center down in Apollo Beach.

But we've done them at Legoland, MoSI. But really just to give our customers an opportunity to see, you know, the benefits of solar.

And it's really kind of, I would say, like, we've seen great and awesome participation without any incentives. So since 2017, so in the two-and-a-half years up until May 31st, we've had about 2,800 PV arrays installed on residential homes.

So if you look at that, that's about four PV arrays a day, which I think our next metering policy and the friendliness of our staff to kind of walk a customer through, you know, all of the steps that they need to do to actually install that array, to get the net meter, to get the disconnect switch that, you know, we fund for that, I think it's pretty incredible.

COMMISSIONER BROWN: Lastly, with regard to our statute mandate that requires utilities to encourage demand-side renewable energy, any other alternative programs that you have contemplated other than what you have mentioned?

THE WITNESS: Yeah, the unfortunate part is that, you know, both ways that we looked at PV. So we looked at PV by itself. We looked at PV coupled

with battery storage --

COMMISSIONER BROWN: That's what I am getting at.

THE WITNESS: Both of them actually failed. You know, RIM for a PV, there is nothing you can do at this time to actually get it to pass. For TRC, the current costs we are seeing is about $3. Five years ago, the cost of PV was about $3.50.

So that price is still coming down, but kind of the hard part is is that, you know, it's not really a huge demand saving technology, so it has a lot of lost revenue in there. But for TRC, the costs would have to get down to about 98 cents.

And then even to be attractive to a participant for the Participant Cost test, the costs would have to get down do $1.60 per watt to make it feasible for a customer.

COMMISSIONER BROWN: Thank you. Great testimony.

THE WITNESS: All right. Thank you.

CHAIRMAN GRAHAM: Commissioner Fay.

COMMISSIONER FAY: Thank you, Mr. Chairman.

I will echo Commissioner Brown. I thought the testimony was very informative and very helpful as you work through this. This question might be a

little out of your lane, so feel free to let me know.

But the controlling statute for these conservation goals talks about a utility's ability to work with the Commission. The term is used actually as a reward, but essentially that there is a incentive to the utility to pursue and exceed these goals. Is that something you guys have looked at as a company just looking at what you have done?

THE WITNESS: Yeah. Commissioner -- Commissioner Fay, we've always taken the position, you know, the company that -- you know, if you establish goals based upon RIM and the Participant Cost test, then you are really going for the least cost option for those aggressive DSM goals.

So just in that manner, there really should be no reason for us to come in and ask for kind of a bonus adder when, really, both participants and nonparticipants win. Even in RIM, you know, we are being made whole because the program is actually cost-effective.

COMMISSIONER FAY: Okay. Thank you.

CHAIRMAN GRAHAM: Commissioner Polmann.

COMMISSIONER POLMANN: Thank you, Mr.

Chairman.

At this point, all of my questions have been asked by my fellow Commissioners. Thank you for your testimony, sir.

CHAIRMAN GRAHAM: Redirect.

MR. MEANS: No redirect.

CHAIRMAN GRAHAM: Fantastic.

Exhibits.

MR. MEANS: We would ask that Exhibit No. 63 on the comprehensive exhibit list be entered.

CHAIRMAN GRAHAM: If no objections, we will enter Exhibit 63.

(Whereupon, Exhibit No. 63 was received into evidence.)

CHAIRMAN GRAHAM: SACE, you have the composite exhibit 345?

MR. MARSHALL: Yes. We would ask that 345 be moved into the record.

CHAIRMAN GRAHAM: We will move 345 into the record as well.

(Whereupon, Exhibit No. 345 was received into evidence.)

CHAIRMAN GRAHAM: I believe that's all the exhibits for this witness. Would you like to excuse him?

MR. MEANS: Thank you, Mr. Roche.

THE WITNESS: Thank you.

CHAIRMAN GRAHAM: Okay. SACE, your first witness.

MR. MARSHALL: SACE calls Jim Grevatt to the stand.

Whereupon,

JIM GREVATT

was called as a witness, having been first duly sworn to speak the truth, the whole truth, and nothing but the truth, was examined and testified as follows:

EXAMINATION

BY MR. MARSHALL:

**Q Good afternoon, Mr. Grevatt.**

A Good afternoon.

**Q Were you previously sworn yesterday?**

A Yes.

**Q And could you please state your name and business address for the record?**

A My name is Jim Grevatt. Business address is 10298 Route 116 in Hinesburg, Vermont.

**Q And on whose behalf are you testifying today?**

A I am here on behalf of the Southern Alliance for Clean Energy.

**Q And on June 10th, 2019, did you prepare and**

**cause to be filed direct testimony and exhibits in this case?**

A Yes.

**Q Do you have that testimony and those exhibits with you today?**

A Yes.

**Q If I asked you the same questions today, would your answers be the same?**

A Yes, they would.

**Q Do you have any changes to your prefiled testimony or exhibits?**

A I do have a couple of changes.

There was a typographical error that rippled through in a couple of spots that I would like to correct. And these changes were addressed in staff's -- response to staff's third interrogatory.

But for the record, on page 23 of my testimony, in table two, which is labeled impact of two-year payback screen on TRC economic potential, if we look at the row for TECO, the first value is 747 it should be 686. Changing that value following the row across to the one-year payback screen, that should be 86 percent instead of 71 percent. And the next value should be 160 percent instead of 139 percent.

And then also on Table 3, labeled achievable

potential as percent of economic potential with a two-year payback screen for TECO row, the same 747 should be 686. And then in the last row -- in the last column in the TECO row, it says 41 percent. It should be 44 percent.

And the corresponding changes in the text in my testimony page 22, line 19, replace 71 percent with 86 percent. Page 22, line 24, replace 139 percent with 160 percent. And page 39, line 17, replace 41 percent with 44 percent.

Also one more minor typographical error, footnote 42 references a Duke Energy Carolinas North Carolina docket. That should be a South Carolina docket.

**Q Thank you.**

MR. MARSHALL: Mr. Chairman, at this point, I would like to have Mr. Grevatt's prefiled direct testimony entered into the record as though read.

CHAIRMAN GRAHAM: We will enter Mr. Grevatt's prefiled direct testimony into the record as though read with those corrections.

(Whereupon, prefiled testimony was inserted.)

**BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

| | | |
|---|---|---|
| In re: | Commission Review of Numeric Conservation Goals Florida Power & Light Company | DOCKET NO. 20190015-EG |
| In re: | Commission Review of Numeric Conservation Goals Gulf Power Company | DOCKET NO. 20190016-EG |
| In re: | Commission Review of Numeric Conservation Goals Duke Energy Florida, LLC | DOCKET NO. 20190018-EG |
| In re: | Commission Review of Numeric Conservation Goals Orlando Utilities Commission | DOCKET NO. 20190019-EG |
| In re: | Commission Review of Numeric Conservation Goals JEA | DOCKET NO. 20190020-EG |
| In re: | Commission Review of Numeric Conservation Goals Tampa Electric Company | DOCKET NO. 20190021-EG |

# TESTIMONY OF JIM GREVATT
# ON BEHALF OF
# SOUTHERN ALLIANCE FOR CLEAN ENERGY

## June 10, 2019

## I. INTRODUCTION AND QUALIFICATIONS

**Q. Please state your name, title and employer.**

A. My name is Jim Grevatt. I am a Managing Consultant at Energy Futures Group, located at 10298 Route 116, Hinesburg, VT 05461.

**Q. Please describe Energy Futures Group.**

A. Energy Futures Group ("EFG") is an energy efficiency consulting firm established in 2010. EFG specializes in the design, implementation, and evaluation of energy efficiency, demand response, renewable energy and other distributed energy programs and policies. EFG has worked on behalf of utilities and other energy efficiency program administrators, public utility commissions, other government agencies, and environmental, low-income, and affordable housing advocacy organizations in 36 states, seven Canadian provinces, and several countries in Europe. EFG's recent work has included serving as advisors on the development of efficiency program portfolios and policies in eight of the ten highest-ranking states in the American Council for an Energy-Efficient Economy's ("ACEEE") 2018 State Energy Efficiency Scorecard.[1] In addition, EFG has authored or co-authored reports on lessons learned from leading residential retrofit programs in North America and Europe; the key pitfalls that can be encountered in performing energy efficiency potential studies; emerging practices in the use of energy efficiency to defer or entirely avoid electric transmission and distribution upgrades; a regional residential lighting strategy for the Northeast; the effectiveness of leading efficiency financing initiatives; and a national best practices manual for cost-effectiveness analysis of efficiency resources.[2]

**Q. Please summarize your professional and educational experience.**

A. I have worked in the energy efficiency industry since 1991 in a wide variety of roles. Prior to joining EFG, I served as the Director of Residential Energy Services at Efficiency Vermont and the District of Columbia Sustainable Energy Utility. I also served as the Manager of Energy Services at Vermont Gas Systems, managing both residential and commercial energy efficiency programs. I have extensive hands-on experience conducting hundreds of energy audits for Vermont's Low-Income Weatherization Assistance Program and Vermont Gas Systems' demand side management (DSM) programs.

In my current role as Managing Consultant at EFG, I have advised regulators, utilities and other energy efficiency program administrators, environmental organizations, and low-income and affordable housing advocates in numerous states, including Missouri, Mississippi, Maryland, North Carolina, Pennsylvania, Delaware, Virginia, New Jersey, Illinois, California, Vermont, Maine, Colorado, New Mexico, Nevada, Iowa, and New Hampshire, as well as British Columbia. I use my in-depth knowledge of energy efficiency program operations and management, and my experience in strategic planning, to help ensure that programs achieve their desired market impacts. I received a B.F.A. from the University of Illinois. My resume, attached as Exhibit JMG-1, provides additional detail regarding my professional and educational experience.

**Q: Have you previously testified before the Florida Public Service Commission?**

A: No, I have not.

**Q: Have you previously testified before other similar state regulatory bodies?**

A: Yes, I have provided expert witness testimony before utility commissions in North Carolina, Colorado, Nevada, Kentucky, Iowa, and British Columbia, and have authored public comments on behalf of clients in multiple proceedings in Pennsylvania. I have also appeared numerous times before the Maryland Public Service Commission.

## II. TESTIMONY SUMMARY

**Q: What is the purpose of your testimony?**

A: My testimony assesses the reasonableness of the energy efficiency savings goals proposed in this proceeding by the Florida utilities. My testimony focuses most heavily on the goals proposed by Florida Power & Light Company (FPL). However, because I address policy issues related to goal setting, as well as generic concerns regarding the methodology used to develop the efficiency potential study upon which all the utilities' goals are based, my testimony also addresses the goals of Duke Energy Florida, LLC, Gulf Power Company, Tampa Electric Company, JEA, and Orlando Utilities Commission.

**Q: Please summarize the conclusion you have reached with regard to the utilities' proposed savings goals.**

A: The utilities' proposed savings goals are unreasonably low. Specifically, the utilities' proposals would leave enormous amounts of cost-effectively achievable energy savings potential untapped. That may require them to invest in more expensive supply options, saddling their customers with higher electricity bills as a result.

**Q: What is your basis for that conclusion?**

A: There are two primary reasons I conclude that the utilities' proposed goals are unreasonably low:

**1. Misguided reliance on the Ratepayer Impact Measure (RIM) test.**

The utilities argue that the RIM test is the appropriate cost-effectiveness test for determining what efficiency measures to promote. However, the RIM test is not actually a test of cost-effectiveness. Rather, it is a test of a measure's or program's potential to cut into utility profits (i.e., lost revenue), which would only effect rates if it caused utilities to seek regulatory approval to increase rates to remain just as profitable as without the efficiency programs. Therefore, it is really just a test of whether rates, and thus bills, could go up for non-participants if a utility goes below the lower bound on their allowed return on equity and increases rates through a rate case, because participants will see bills go down even if rates increase. And, even as such a test, it is not particularly useful. That is why no other state in the country relies on the RIM test as the sole or even primary determinant of whether an efficiency measure or program merits utility investment. It is also why the RIM test is not applied to supply-side investments; if it were, many supply-side investments, such as new power plants and capacity upgrades to substations, would be routinely rejected.

That is not to say that potential rate impacts should not be a consideration in determining the level and pace of cost-effective efficiency investments. They just should not be the only factor considered. Instead, as discussed in the National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency

Resources, regulators should consider trade-offs between bill savings, participation levels, and rate impacts. For example, basing FPL's efficiency savings goals on the amount of savings the Company estimates to be cost-effectively achievable under the Total Resource Cost (TRC) test, instead of no efficiency measures (only demand response measures passed the RIM test), would increase rates by only five thousandths of a penny per kWh ($0.00005/kWh), but would reduce the cumulative net present value of revenue requirements (CPVRR) by over $100 million. Simply dismissing the opportunity to provide such benefits to customers on the basis of an almost imperceptible rate increase does not seem reasonable.

**2. Reliance on a fundamentally flawed efficiency potential study.**

The efficiency potential study significantly understates the level of energy efficiency savings that can be achieved cost-effectively under the TRC test. First, and probably most importantly, it screens out all measures that have less than a two-year payback on the grounds that is necessary to exclude free riders. That alone cuts the estimate of achievable potential roughly in half. However, the potential study had already excluded all naturally occurring savings – the savings that would be associated with free riders – before it applied the two-year payback screen. Doing this means that presumed free riders were effectively removed from the estimate of savings potential twice, thus the two-year screen inappropriately removed only non-free rider savings potential.

The potential study also artificially and arbitrarily assumed that financial incentives for efficiency measures could not be greater than the level at which the "payback" would be bought down to two years. Again, the rationale was to limit free ridership

based on the assumption that customers facing paybacks of two years or less would all invest in such measures. However, there is no empirical or analytical basis for that assumption. In fact, as discussed further in Section IV of my testimony, the utilities' own analyses suggest that limiting financial incentives to a two-year payback would dramatically reduce the number of customers who would participate in programs – directly contradicting the stated basis underlying the assumption.

Other conservatisms built into the potential study include the omission of early retirement measures; some unreasonably high assumptions regarding non-incentive costs; and various other measure-specific concerns. I discuss all of these concerns in greater detail in the following sections of my testimony.

**Q: Given these concerns, what would you recommend the utilities' savings goals be?**

A: I recommend that the utilities' savings goals be based on the amount of savings that would be cost-effectively achievable under a properly applied TRC test – i.e. one that corrected for all of the problems with the potential study that I have discussed. Unfortunately, those problems are so numerous and complex that the utilities' studies cannot be readily modified to produce appropriate goals. Thus, I recommend that the PSC examine the magnitude of the problems with the potential study, in conjunction with an examination of the actual achievements of leading southern utilities such as Duke Energy Carolinas – which achieved savings equal to 1.67% of annual sales to customers eligible to participate in its programs in 2018 – and Entergy Arkansas – which achieved savings equal to 1.44% of sales to eligible customers in 2018.

## III. PROBLEMS WITH PRIMARY RELIANCE ON THE RIM TEST

### 1. The RIM test is not a cost-effectiveness test.

**Q: Please describe the RIM test.**

A: The RIM test compares (1) utility system benefits (avoided energy costs, avoided T&Dtrm costs, avoided capacity costs, etc.) to (2) the sum of (A) utility system costs (efficiency program costs) plus (B) lost revenues. It is only a test of whether rates will go up if the utility seeks and receives rate adjustments necessary to maintain the level of profits it would have earned absent the efficiency programs. It is not a test of cost-effectiveness.

**Q: Why is it not a test of cost-effectiveness?**

A: Because it doesn't just assess changes in costs. A cost is an expense or sacrifice incurred to produce an object, service, or outcome. Efficiency program spending is a cost. However, lost revenues, which are central to the RIM test and typically dominate the so-called "cost" portion of the RIM benefit-cost test equation, are not actually a cost.

**Q: Why are lost revenues not a cost?**

A: Lost revenues can occur when efficiency programs cause total electricity sales to decline, requiring the recovery of both a utility's fixed costs (e.g. the CEO's salary, the cost of trucks and repair crews, etc.) and its past, sunk costs (e.g. a power plant built in the past for which costs – along with a rate of return to provide profits for a utility's shareholders – are still being recovered) to be spread over a smaller volume of sales. No new costs are incurred. The utility still needs to recover the same

amount of money that has been approved by regulators for its fixed costs. But because the same amount of money needs to be recovered over a smaller volume of sales, rates may need to be increased.

**Q: Isn't it important to understand the rate impacts of efficiency programs?**

A: Yes. But rate impact assessment is different from cost-effectiveness assessment. When faced with a choice between an electric bill for 1000 kWh at $0.10/kWh ($100 total) or a bill for 800 kWh at $0.11/kWh ($88 total), customers will be better off to choose the latter because it will cost them less even though the rate is higher.

The real issue with rate impacts caused by efficiency programs is that not every customer will see their bill go down; while efficiency program portfolios can be designed to be broad and diverse enough so that all customers have the opportunity to participate, not every customer will choose to take advantage of those opportunities and participate. Thus, concerns about possible rate impacts driven by lost revenues are really concerns about non-participants. Put another way, the RIM test is really a test of impact on those customers who choose not to participate in an efficiency program.

**Q: Does the RIM test have value as a test of impact on non-participants?**

A: It has some value, but even as a test of impact on non-participants it is not particularly helpful on its own. For one thing, a RIM benefit-cost ratio does not tell you by how much rates will go up or down. Further, it doesn't tell you how many customers would be adversely affected, particularly over a multi-year period. Nor does it tell you which customers would be adversely affected. Finally, it doesn't tell you

anything about the benefits you would be forgoing if you allow concerns about non-participants to determine all investment decisions.

**Q: Why do those things matter? Why isn't it reasonable to strictly adhere to RIM test results and eliminate efficiency programs that produce any rate impacts and therefore any amount of impact on those who choose not to participate?**

A: Conceptually, it is never a good idea to pursue an investment when its benefits do not exceed its costs, however any economic analysis must monetize all costs and benefits if it is to be used dispositively. One can point to examples in which regulators approve investments that nominally increase costs on the basis of benefits that are understood, but that are not precisely valued. For example, regulators regularly approve upgrades to the distribution system in order to improve reliability. Similarly, as discussed in Mr. Wright's testimony, regulators in some states approve low income efficiency programs even when they do not pass the TRC or other cost-effectiveness tests. However, in both of those examples the underlying rationales for approval are still that benefits exceed costs. In the example of distribution system investments, regulators are making a judgment that increased reliability – a benefit – is worth the cost. In the low income efficiency program example, regulators are making a judgment that the equity benefits of serving low income customers and/or other unquantified or unmonetized benefits (e.g. reduced utility credit and collection costs, health, and safety benefits, etc.) are worth the cost. Put simply, regulators are still adhering to the principle that benefits must exceed costs. It is just that some benefits have not been monetized so that they fit easily into a cost-effectiveness test, and regulators are using their informed judgment to compensate for that.

In contrast, there is no conceptual reason to always reject any and all investments that may increase rates and/or that may result in inequities between different customers. While those outcomes may in isolation (i.e. all other things being equal) be undesirable, they are often accompanied by other outcomes that are highly desirable, requiring regulatory consideration of trade-offs. Indeed, regulators approve rate increases and make decisions in other proceedings regularly that create some level of inequity between different customers. That can happen as a result of approvals of supply-side investments that increase rates (which I discuss further below), as a function of rate design decisions,[3] and probably in other ways as well. Regulators approve such investments when they conclude that the benefits associated with the investments are substantial enough to outweigh equity concerns.

Put another way, regulators routinely – either explicitly or implicitly – consider trade-offs between rate impact and/or equity concerns on the one hand, and benefits to the system as a whole or to customers as a whole on the other. That same consideration of trade-offs should apply to consideration of which energy efficiency program investments to support as well.

**2. The RIM test is not applied to supply-side investments.**

**Q: Is the RIM test typically applied to supply-side investments?**

A: No, not in my experience.

**Q: What would happen if it was?**

A: Many proposed supply side investments would fail. Put simply, because the RIM test is a test of whether rates may go up, any supply-side investment that would raise

rates, all other things being equal, would fail the RIM test.

**Q: On p. 39, lines 18-23 of his testimony, FPL witness Whitley states the following: "Because all customers on FPL's system are served by the Supply option if that option is chosen, all customers are 'participants' in the selected Supply option. Electric rates and bills for all customers move in the same 'direction', either up or down from year-to-year compared to another Supply option that could be selected. Therefore, there is no subsidization of one group of customers by another group."**
**Do you agree?**

A: No. I disagree with both the notion that all customers are "participants" when a supply investment is made and – more importantly – the assertion that there is no subsidization of one group of customers by another group when supply-side investments are made.

**Q: Why do you disagree?**

A: Consider supply-side investments that are made solely to address growing demand – either at the system-level (e.g. a new power plant) or at the local level (e.g. a substation capacity upgrade). By definition, the need for those supply-side investments is driven solely by new customers who are adding load to the system and/or existing customers whose demands are growing. If we are making an analogy to efficiency programs, they are the only "participants" in the supply-side investment. The new power plant and/or the new substation is being built to meet their needs, not the needs of customers whose demand is not growing. It is hard to understand how existing customers whose demand has remained unchanged or even declined could be

characterized as "participants" in a substation capacity upgrade driven entirely by other customers' peak demands.

More importantly, the costs of the new power plant and/or the substation capacity upgrade in this scenario will not be borne solely by the customers whose new demand or growing demand created the need for the supply-side investments. Instead, to the extent that these costs are recovered through rates, they will be borne by all customers, including those existing customers whose demand did not grow. In the case of a substation (or other distribution system) capacity upgrade, customers who are not even served by the substation being upgraded will pay some (if not most) of the cost. That is the very definition of cross-subsidization.

**Q: Are you suggesting that there is a problem with how the costs of supply-side investments are allocated?**

A: I am not offering an opinion on that subject. I am simply making the point that there may not only be rate increases, but also cross-subsidization between different customers when supply-side investments are made. Thus, strict adherence to the RIM test in order to eliminate any rate impact and any cross-subsidization between customers is imposing a very different "screen" on efficiency program investment decisions than regulators impose on supply-side investment decisions – even though efficiency programs can be a lower cost alternative to some of those supply-side investments. In supply-side proceedings, not using the RIM test requires regulators to appropriately apply their judgment in assessing benefits, whereas the use of the RIM test in energy efficiency proceedings falsely implies that such judgment is not required.

**3. Reliance on RIM test means rejecting hundreds of millions of dollars of bill savings.**

**Q: What are the implications of adopting the RIM test as the basis for determining whether an efficiency measure or program is promoted?**

A: The short answer is that rejecting all efficiency measures that fail the RIM test will result in total electric bills for the state that are hundreds of millions of dollars higher than they could have been.

**Q: What is the basis for that statement?**

A: As Table 1 shows, the cumulative present value of revenue requirements (CPVRR) for FPL's TRC plan was $104 million lower than the CPVRR for the RIM plan it has proposed instead. And that is just for FPL. Also, it is a very conservative estimate of the amount of bill reductions that could be achieved because of numerous problems with FPL's analysis of achievable TRC potential which I discuss in the next section of my testimony.

**Q: What would be the trade-off in terms of rate impact for adopting the FPL TRC plan (instead of its proposed RIM Plan) and achieving that $104 million in CPVRR savings?**

A: As Table 1 shows, the trade-off, also based on FPL analyses, would be an average increase in electric rates of about five thousandths of a penny per kWh (or less than a 0.06% increase) – if the utility sought and received approval for rate adjustments necessary to keep its profits at the same level as without efficiency programs.

**Table 1: Bill Savings and Rate Impacts of FPL TRC Plan (vs. RIM Plan)**[4]

| | CPVRR | | Levelized Rate | | |
|---|---|---|---|---|---|
| Plan | (millions $) | Difference from RIM Plan (millions $) | ($/kWh) | Difference from RIM Plan ($/kWh) | Difference from RIM Plan (percent) |
| TRC | $52,924 | -$104 | 0.096332 | $0.000054 | 0.056% |
| RIM | $53,028 | $0 | 0.096278 | $0.000000 | 0.000% |

**4. No other state relies on RIM to screen out efficiency measure or programs.**

**Q: Are you aware of any other state that relies on the RIM test to screen efficiency measures or programs out of demand-side management (DSM) portfolios?**

A: No. A number of jurisdictions consider the results of the RIM test along with the results of a variety of other tests when determining which efficiency programs to support. However, to my knowledge, no other state in the country relies on the RIM test as the sole or even primary determinant of whether individual efficiency measures or programs merit utility investment. Indeed, in 2012 the American Council for an Energy Efficient Economy published a report that showed that only one of the 41 states that relied upon one cost-effectiveness test as its "primary" test– Virginia – used RIM[5] as the primary test, and in 2018 the Virginia General Assembly passed legislation rejecting that practice.[6]

To my knowledge, there are only three notable changes with regard to the use of the RIM test since that report was published. First, in 2014, Florida shifted to relying on RIM as its primary test.[7] Second, as noted above, Virginia no longer relies on RIM as its primary cost-effectiveness test. Instead, the state currently supports any efficiency program that passes three of the following four tests: RIM, TRC, Utility Cost Test

(UCT) and Participant Cost Test (PCT).[8] Third, the state of Iowa partially applies RIM at the total portfolio level, which is notably different from the Florida utilities' proposed approach of using RIM to screen out individual efficiency measures and programs. Efficiency measures and programs that fail the RIM test are included in DSM portfolios to the extent that demand response programs that pass RIM provide enough downward pressure on rates to offset the upward pressure on rates associated with the efficiency programs. Even under this constraint MidAmerican Energy proposed an annual utility energy efficiency investment of roughly $165 million between 2019-2023.[9]

## IV. PROBLEMS WITH THE FLORIDA POTENTIAL STUDIES

### 1. Measures with paybacks of less than two years were inappropriately excluded.

**Q: How did the Florida utilities treat efficiency measures with a payback of less than two years in their assessments of efficiency potential?**

A: All such measures were removed from estimates of efficiency potential.[10]

**Q: What is the rationale put forward by the Florida utilities for excluding all efficiency measures with a payback of less than two years from their efficiency potential studies?**

A: The utilities suggest that this exclusion is necessary and appropriate to "minimize the impact of 'free riders.'"[11] The underlying rationale is explained by FPL witness Koch:

> "It simply recognizes that rational customers will act in their own economic interest and take measures to reduce energy consumption, if it is sufficiently attractive economically for them to do so without a utility incentive payment. It is also an example of a free market economy working as it should – rational economic decisions being made in one's best interest without government intervention through mandates or provision of incentives."

**Q: Do you find that argument to be persuasive?**

A: No. There are several major problems with the argument:

1. The utilities have provided no empirical evidence or data to support the notion that all efficiency measures with a payback of less than two years are or would be routinely purchased or installed by customers in the absence of utility programs.
2. The argument that customers would adopt measures with short paybacks because it is economically rational ignores the underlying premise for utility sponsored efficiency programs: that market barriers often preclude customers from investing in efficiency measures that are cost-effective.
3. Even in cases in which there are no non-financial market barriers, some customers will not buy measures with two-year paybacks because they are even more short-term focused than that. Low income customers are good examples. This is discussed further in Mr. Wright's testimony.

4. The utilities' own analyses of achievable potential – in which they assume that significant portions of potential for measures with initial paybacks of longer than two years would not be captured if financial incentives for such measures were limited to

reducing paybacks to two years – directly contradicts the premise that all or most customers would invest in measures with paybacks that short.

5. In developing estimates of technical potential – the foundation for both economic and achievable potential – Nexant already accounted for naturally-occurring efficiency. Thus, the potential effects of free ridership were already excluded from the estimates of savings potential before the application of the two-year payback screen. Thus, the two-year payback screen is a redundant adjustment for free riders that artificially makes cost-effective efficiency potential appear to be lower than it really is.

**Q: How does the application of a two-year payback screen to eliminate efficiency measures from estimates of economic and achievable potential ignore the underlying premise for utility-funded efficiency programs?**

A: The underlying premise for utility-funded efficiency programs is that such programs are necessary to address market barriers to customer adoption of cost-effective efficiency resources. Those market barriers can take many forms, including many non-financial forms. Key examples of market barriers that can stop customers from investing in measures, even those with short payback periods, include:

- Lack of awareness of a DSM measure;
- Lack of awareness of potential savings benefits – both of customers who would buy or install measures and sometimes of sales staff for retailers, contractors, or other vendors selling products;
- Concern with service or product degradation;
- Availability of a DSM measure;
- Past experiences with DSM measures;
- Competing demands for available financial resources;

- Split incentives – between the entity or individuals that must pay for a measure and the entity or individuals that would receive the benefits (e.g. between landlords and tenants and between builders and home-buyers); and
- Limited or inadequate technical expertise of trade allies (e.g. HVAC contractors, new construction design professionals, builders).[12]

**Q: Are there data to support the notion that the combination of market barriers faced by consumers leads to less than universal purchase and installation of measures with paybacks of up to two years?**

A: Yes. First, one can look at market shares for efficient products that the utilities removed from their estimates of efficiency potential because of their short paybacks. Consider, for example, Energy Star commercial griddles and Energy Star computer servers. Both measures were removed from FPL's TRC analysis because of the two-year payback screen,[13] but both have national market shares of under 20%.[14]

**Q: Can you provide examples of how the utilities' own analyses of achievable potential directly contradict the premise that all or most customers would invest in measures with paybacks of two years or less?**

A: Consider the two-speed pool pump measure. This measure passed the TRC test for FPL and had an estimated payback without any efficiency program incentives of 3.5 years. Because FPL (and the other utilities) assume that financial incentives for measures cannot buy the customer payback to less than two years, the Company assumed that its program rebates could only cover 43% of the measure cost and that the remaining 57% of the incremental cost of the measure would need to be borne by its customers. Under that assumed constraint, the Company estimated that an

efficiency program promoting this measure could only acquire 4% of the savings potential because the out-of-pocket cost to customers would still be relatively high.[15] Put another way, FPL has estimated that even with the cost bought down to a two-year payback, 96% of its customers would not buy the measure! That obviously and fundamentally contradicts the notion that the vast majority of customers considering efficiency measures with two-year paybacks would buy such measures and therefore be free riders in any utility programs promoting such measures.

**Q: How did Nexant exclude naturally-occurring efficiency from its estimates of technical potential?**

A: Nexant makes clear that it excluded two forms of naturally-occurring efficiency from its estimates of technical potential in section 5.1.1 of its potential study report:

1. savings that will materialize in the future as a result of government codes and standards; and
2. additional savings that will materialize in the future because some customers will buy products more efficient than required by such minimum standards without utility-funded efficiency programs – what Nexant calls "baseline measure adoption."

As Nexant put it, the result is an estimate of "net penetration rates" (emphasis added) which represents "the difference between the anticipated adoption of efficiency measures as a result of DSM efforts and the 'business as usual' adoption rates absent DSM intervention." This was accomplished by:

> "…discuss[ing] the assumptions included in the base sales forecast with the [utility's] load forecasting group to determine the assumptions on naturally-occurring efficiency adoption, as well as using utility-specific and regional data on current levels of efficiency adoption that were

included in the applicability factors applied to each measure."[16]

**Q: How does the fact that Nexant excluded naturally-occurring efficiency from its estimates of technical potential make the application of the two-year payback screen when estimating economic potential "redundant" as a mechanism for removing free riders?**

A: By definition, free riders are efficiency program participants that would have installed promoted measures without the program. Again, by definition, the savings from such potential free ridership are included in Nexant's estimate of naturally-occurring efficiency (baseline measure adoption) which Nexant excluded from its estimates of technical potential. In other words, Nexant's estimates of technical potential already removed any savings from customers who could be candidates to be free riders. Because economic potential and achievable potential are both subsets of technical potential, no additional adjustments are necessary to remove potential "free riders" at those stages of the analysis. Thus, the fact that Nexant and/or the utilities applied a two-year payback screen at the economic potential stage means that they have inappropriately "double-adjusted" for potential free riders.

**Q: Are you suggesting that because Nexant excluded the effects of naturally-occurring efficiency from the potential study that utility programs to promote efficiency cost-effective measures with paybacks of two years or less would not have free ridership?**

A: No. I am simply saying that the exclusion of naturally-occurring efficiency is, by itself, all that is necessary to develop estimates of net savings potential – i.e. savings after removing free riders – that is cost-effectively achievable. The next step is to

design programs to acquire that potential. Inevitably, most such programs will have some level of free ridership – from both measures with shorter paybacks and measures with longer paybacks. The level of free ridership will be a function of the market and the program design.

**Q: Do you agree that it is appropriate to address free ridership, both in setting savings goals and in the design and implementation of programs?**

A: Yes. As already discussed, if the two-year payback screen were removed from the potential study the result would be an estimate of net savings potential – i.e. excluding any savings from possible free riders. After addressing other concerns discussed below this would be an adequate basis for goal setting. Then, when the utilities design and implement programs to capture that level of savings potential, the savings they produce from such programs should be evaluated and adjusted to exclude the effects of free ridership. That is the way concerns regarding free ridership are addressed in numerous other jurisdictions.

**Q: In his deposition, witness Herndon stated that although he was unaware of any other jurisdiction that adjusted estimates of efficiency potential by removing measures with two-year paybacks or less, he was aware of programs in other jurisdictions that limit financial incentives to levels necessary to buy paybacks down to two years.[17] Doesn't that support the notion that applying a two-year payback screen is a reasonable approach to removing free riders from the potential study?**

A: No. To the contrary, it supports the alternative approach that I have suggested instead. Potential studies that already adjust for naturally-occurring efficiency do not

need and should not have another arbitrary adjustment applied to their estimates of savings potential. And no other state or potential study of which either I or Mr. Herndon are aware does that.[18] However, once savings goals are set, it is appropriate to design programs to minimize free ridership (in conjunction with other objectives). For some measures or some programs in some markets, one option that can make sense is to limit incentives to levels that are associated with customer paybacks of two years, or some other time period. For other measures, programs, and markets that would not make sense. In fact, in my experience, while payback may be one factor that is considered in the determination of incentive levels, specific financial incentive payback limits are typically only applied in other jurisdictions to custom Commercial and Industrial programs targeting larger business customers. Put simply, this is a program design issue not a potential study or goal setting issue.

**Q: What is the effect of the application of the two-year payback screen to the utilities' estimates of TRC cost-effective achievable potential?**

A: As sensitivities to their analyses, the utilities each estimated how much higher the estimates of economic potential would be if the two-year payback screen was reduced to one year. As Table 2 shows, just reducing the two-year payback screen to one year would increase estimates of economic potential by 54% for FPL and by 26% to 71% for the other utilities. Two of the utilities – TECO and Gulf – provided estimates of economic potential without a two-year payback screen. I have estimated that number for FPL by rerunning its cost-effectiveness tool. The result of eliminating the inappropriate two-year payback screen entirely is to increase the estimate of economic potential by 80% for Gulf, 139% for TECO and over 150% for FPL. Put simply, eliminating the two-year screen results in roughly a doubling – or more – of

86%

160%



Corrections input by Debbie Krick, court reporter.

cost-effective savings potential.

**Table 2: Impact of Two-Year Payback Screen on TRC Economic Potential**

| Utility | TRC Economic Energy Efficiency Potential (GWh) | | | % Increase in TRC Econ Potential vs. 2-Year Payback Screen | |
|---|---|---|---|---|---|
| | w/2-year payback screen | w/1-year payback screen | without payback screen | 1-Year Payback Screen | No Payback Screen |
| FPL | 3554 | 5490 | 8905 | 54% | 151% |
| Duke | 3117 | 3915 | n.a. | 26% | n.a. |
| TECO | 686 747 | 1275 | 1785 | 86% 71% | 160% 139% |
| Gulf | 981 | 1253 | 1762 | 28% | 80% |
| Orlando | 465 | 710 | n.a. | 53% | n.a. |
| JEA | 1024 | 1383 | n.a. | 35% | n.a. |

Corrections input by Debbie Krick, court reporter.

**2. In estimating achievable potential, incentives were inappropriately limited to levels necessary to buy customer paybacks down to two years.**

**Q: How did the utilities address the issue of payback periods for cost-effective efficiency measures whose payback without financial incentives was greater than two years?**

A: The utilities included efficiency measures that were cost-effective and had paybacks of greater than two years in their estimates of achievable potential. But when estimating how much savings was achievable from those measures, they assumed that they could not provide financial incentives greater than the amount that would be associated with buying the customer payback down to two years. Again, the rationale that they put forward for adopting this assumed limitation was that buying paybacks down to levels below two years would mean paying free riders.

**Q: Is that a reasonable conclusion?**

A: No. For reasons I have already stated, it is not reasonable to assume that all measures with a two-year payback or less will be universally purchased and installed without a utility program. Further, as I've also already discussed, the utilities own estimates of achievable potential show that they do not actually believe that buying paybacks down to two years will ensure that most customers will purchase and install such measures. If they actually did believe that, then their estimates of achievable potential would be the same as (or very close to) their estimates of economic potential; instead, as Table 3 shows, they are dramatically lower, particularly for FPL.

**Table 3: Achievable Potential as Percent of Economic Potential With a Two Year Payback Screen**

| Utility | GWh | | |
|---|---|---|---|
| | TRC Econ Potential w/2-year payback screen | TRC Achievable Potential | AP as % of EP |
| FPL | 3554 | 196 | 6% |
| Duke | 3117 | 432 | 14% |
| TECO | 686 ~~747~~ | 305 | ~~41%~~ 44% |
| Gulf | 981 | 222 | 23% |
| Orlando | 465 | 137 | 29% |
| JEA | 1024 | 262 | 26% |

Corrections input by Debbie Krick, court reporter.

**Q: What are the implications of this inappropriate assumption?**

A: By the utilities' own admission, this assumption has the effect of lowering estimates of achievable potential. In fact, as Table 3 shows, only TECO estimates that it can achieve as much as 40% of its economic potential; none of the other utilities estimate that they can achieve even 30% of their economic potential. Put simply, for measures

for which market barriers are such that it is not possible to achieve significant market penetration without driving paybacks to less than two years, the utilities' estimates of achievable savings potential have been artificially reduced.

**Q: Why is FPL's estimate of the portion of economic potential that it can achieve – 6% – so much lower than all the other utilities?**

A: I am not certain. However, it is worth noting that FPL essentially adopted a three-year payback screen. It did this by assuming that the incentives it could offer for measures with paybacks of between two and three years (when buying paybacks down to two years) were too small to have an impact on the market, so they eliminated such measures from their achievable potential estimates.[19] The result was eliminating about half of the TRC cost-effective measures that passed the two-year payback screen when estimating TRC achievable potential. I do not know if the other utilities did the same thing. If they did not, then this could be a big part of the reason FPL's estimates of achievable potential, as a percent of economic potential, is so much lower than the others.

**3. Potential study inappropriately excludes early retirement measures.**

**Q: What is "early retirement"?**

A: Early retirement is when an efficiency program successfully encourages a customer to cost-effectively replace a still functioning piece of electricity-consuming equipment before that equipment would otherwise have been replaced.

**Q: How did the potential studies exclude such measures?**

A: The potential study assumes that the only opportunity for efficient equipment measures is at the time such equipment would naturally turn over, when customers have already made a decision to replace equipment. Thus, it assumed that the portion of the market that can be affected each year is equal to the number of customers with a particular piece of equipment divided by the average measure life of that equipment. For example, if a commercial light fixture has an average life of 15 years, the potential study assumed that one-fifteenth of the existing stock of such light fixtures would get replaced each year and that efficiency upgrades could only occur at that pace.

**Q: Is it reasonable to limit estimates of savings potential to such time of turnover opportunities?**

A: No. It is usually true that the costs of efficiency savings are lower at the time of natural turnover than through early retirement. Indeed, early retirement is probably not cost-effective for many measures. However, that is not true for all measures. In fact, there are some measures for which early retirement can be quite cost-effective and from which substantial savings can be realized. Commercial light fixtures are notable examples. In fact, savings from such measures – at least in the short to medium term – can be substantially higher than savings that are achievable when waiting until time of natural turnover. This is because the baseline from which savings from early retirement measures should be initially measured (i.e. the existing equipment efficiency) can be much less efficient than the baseline for a standard new piece of equipment.[20]

**Q: Do utility efficiency programs in other states include early retirement measures?**

A: Yes. Again, not for all measures, but for some measures. In fact, early replacement is common enough that a number of states' Technical Reference Manuals (TRM), which document common assumptions and/or protocols for estimate savings, include specific reference to early retirement measures (alternatively called early replacement measures) and how to estimate savings for them. For example, the Arkansas TRM "allows for early replacement of certain measures that have been verified through a number of evaluations." It further states that such early replacement has the benefit of

> "being able to claim higher energy savings for the remaining useful life (RUL) of the equipment (the efficiency difference between the new, efficient equipment and the existing equipment), and then dropping to lower energy savings rates (under higher baselines) only for the period of the EUL that exceeds the RUL (the difference between new, efficient equipment and a code baseline)."[21]

Illinois is an example of another state whose TRM explicitly allows for calculating savings from existing equipment efficient levels for early retirement measures.[22]

**Q: What was the utilities' rationale for excluding early retirement measures from the potential study?**

A: FPL has suggested that the reason early retirement measures were not included in estimates of achievable potential is that there was a "lack of reliable information on early retirement adoption rates."[23]

**Q: Is that a reasonable explanation?**

A: No. As noted above, a number of utilities across the country run programs that include some early retirement measures. They all develop estimates of participation rates for those programs when developing plans they submit to their regulators.

**Q: What are the implications of excluding early retirement measures from the potential study?**

A: Excluding early retirement measures has the effect of reducing estimates of achievable potential, at least in the near to medium-term (e.g. in the next five years) during which the less efficient existing equipment would have been the baseline from which to measure savings.

**4. Cost-effective mid-efficiency measures excluded from economic savings potential when higher-efficiency measures – to which all savings potential was assigned when estimating technical potential – fail economic screening.**

**Q: What should happen when estimating technical potential and economic potential from end uses for which there are multiple potential "tiers" of efficiency improvement?**

A: When estimating technical potential, the most efficient measure should be assumed to be purchased and/or installed. For example, for residential pool pumps for which there are two efficiency upgrade options – two-speed pumps and variable speed pumps – the estimate of technical potential should be based on the presumption that all new pool pumps are the most efficient option, or variable speed pumps. To ensure that there is no double-counting of savings, the study should assume no market penetration of the less efficient upgrade option, or two-speed pumps.

When estimating economic potential, all of the savings should be assumed to come from the most efficient measure that passes the cost-effectiveness test, which may be a lower level of efficiency than was included in the technical potential estimate. For example, if the most efficient option on which technical potential was based – variable speed pool pumps in the example I've been using – fail cost-effectiveness screening, but the less efficient option of two-speed pool pumps pass, the economic potential should be based on the presumption that all new pool pumps purchased in the future will be two-speed pool pumps.

**Q: Is that how the utilities and their consultant estimated technical potential and achievable potential?**

A: That is how all the utilities estimate technical potential. However, it is not how they all estimated economic potential. At least FPL and TECO failed to assign economic savings potential to measures that could cost-effectively provide levels of efficiency above baseline when the most efficient alternative measure used to estimate technical potential was not cost-effective.

**Q: Can you provide an example?**

A: I will give two FPL examples, one related to the efficient pool pumps discussed above and another related to air source heat pumps as replacements for electric resistance furnaces.

I'll start with savings potential from efficient pool pumps. Because variable speed pool pumps are more efficient than two-speed pool pumps, FPL estimated technical

potential from pool pumps based entirely on the savings that variable speed units could provide. That amounted to about 58 MW of summer peak savings, 33 MW of winter peak savings and 280 GWh of annual energy savings.[24] Again, that is the appropriate way to estimate technical potential. Then, when conducting cost-effectiveness screening, FPL found that although the two-speed pool pump passed the TRC test, the variable speed pool pump did not. Once it realized that was the case, the Company should have included in its estimate of economic potential the savings that could be provided by two-speed pool pumps. However, it neglected to do that. Instead, even though the two-speed pool pump was TRC cost-effective, the Company estimated that the economic savings potential from the measure was zero.[25]

Similarly, when analyzing the savings potential by displacing electric resistance heating, the utilities analyzed two options: (1) a SEER 14 air source heat pump and a SEER 21 air source heat pump. Because SEER 21 is more efficient than SEER 14, FPL estimated technical potential from heat pumps replacing electric resistance heat based entirely on the savings that SEER 21 systems could provide. That amounted to about 77 MW of summer peak savings, 95 MW of winter peak savings and 474 GWh of annual energy savings.[26] Again, that is the appropriate way to estimate technical potential. Then, when conducting cost-effectiveness screening, FPL (and TECO) found that although the SEER 14 air source heat pump displacing electric resistance heat passed the TRC test, the SEER 21 alternative did not. Once it realized that was the case, FPL and TECO should have included in their estimate of economic potential the savings that could be provided by SEER 14 air source heat pumps displacing electric resistance heat. However, they neglected to do that. Instead, even though the SEER 14 air source heat pump displacing electric resistance heat was TRC cost-

effective, FPL and TECO estimated that the economic savings potential from the measure was zero.[27]

**Q: What is the effect of the two TRC cost-effective measures you have identified as being inappropriately excluded from FPL's estimates of economic potential?**

A: It is substantial. As Table 4 shows, just correcting the omitted savings from these two measures could increase FPL's estimate of TRC economic energy savings potential by 25%. It would also increase FPL's estimate of TRC economic winter peak savings by 33% and summer peak savings by 5%.

**Table 4: Corrected FPL Pool Pump and ASHP Economic Potential Estimates**

| | Technical Potential | | | FPL Econ Potential | | | Corrected Econ Potential | | |
|---|---|---|---|---|---|---|---|---|---|
| **Measure Name** | **GWh** | **S-MW** | **W-MW** | **GWh** | **S-MW** | **W-MW** | **GWh** | **S-MW** | **W-MW** |
| Two-Speed Pool Pump | 0 | 0 | 0 | 0 | 0 | 0 | 92 | 29 | 28 |
| Variable Speed Pool Pump | 280 | 58 | 33 | 0 | 0 | 0 | 0 | 0 | 0 |
| SEER 14 ASHP vs elec res heat | 0 | 0 | 0 | 0 | 0 | 0 | 223 | 0 | 46 |
| SEER 21 ASHP vs elec res heat | 474 | 77 | 95 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Totals for Both Measure Groups** | **754** | **135** | **128** | **0** | **0** | **0** | **316** | **29** | **74** |
| FPL Total for Other Residential | | | | | | | 1251 | 618 | 228 |
| **% Increase from Correction** | | | | | | | **25%** | **5%** | **33%** |

**Q: How did you develop those estimates of corrected economic potential?**

A: I compared FPL's estimates of the per unit savings of the lower tier efficiency measure to the higher tier alternative. For example, two-speed pool pumps produce only 33% of the energy savings, 50% of the summer peak savings and 87% of the winter peak savings that a variable speed pool pump would produce.[28] I then multiplied those ratios by the technical potential of the higher tier measure to estimate the economic potential of the lower tier measures.

**Q: Have you identified and quantified the impact of all measures for which this problem occurs within FPL's estimates of economic potential?**

A: No. That would require a substantial amount of analysis which, given the range of issues I have had to address, I was not able to undertake as part of drafting this testimony. Nor have I assessed the extent to which this may be a problem for the other utilities.

**5. Some non-incentive cost assumptions are unreasonably high.**

**Q: How did the utilities apply non-incentive costs when estimating achievable savings potential?**

A: The utilities made assumptions about average program costs per measure and included those costs when assessing which measures were cost-effective for estimates of potential.[29]

**Q: Have you reviewed those assumptions?**

A: Only for FPL.

**Q: Did you find FPL's non-incentive cost assumptions to be reasonable?**

A: Some appear to be unreasonably high. For example, FPL assumes that the average non-rebate cost for promoting investment in residential LED light bulbs is $29 per light bulb! That is unfathomably high. By way of comparison, Commonwealth Edison, the electric utility serving the Chicago metropolitan area, rebated approximately 11.25 million light bulbs in its 2018 Residential Lighting Discounts program.[30] Its non-incentive costs for the program were $5.98 million[31] – or about

$0.53 per light bulb. In other words, FPL assumed a non-rebate cost per light bulb that was on the order of 55 times higher than ComEd's actual program experience.

Similarly, FPL assumes that the non-incentive costs per low flow showerhead and per faucet aerator are $29, or more than four times the total cost of the showerhead and nearly ten times the cost of the aerator. Again, that is unfathomably high.

**Q: What are the implications of using such unreasonably high assumptions for non-incentive costs?**

A: It depends. To the extent that the measures with problematic non-rebate cost assumptions were excluded from the estimates of achievable potential because they had paybacks of less than two years, as appears to be the case with low flow showerheads, there is no effect because FPL had already (inappropriately) excluded such measures from its estimate of achievable potential. However, it appears that some measures with potentially high savings potential (e.g. residential LED light bulbs) may have been excluded from TRC economic potential, and therefore TRC achievable potential as well, because of the unreasonably high non-incentive costs.

**6. Assorted other potential study conservatisms contribute to underestimation of achievable cost-effective savings potential.**

**Q: Have you identified any other problematic assumptions with the utilities' efficiency potential studies?**

A: Yes, though I have not exhaustively reviewed every assumption in the studies. There are literally at least tens of thousands of different assumptions, so reviewing every one of them, as well as how they all interact, would have been an enormous

undertaking which I did not have the resources to pursue and for which this kind of proceeding is not well-suited given the amount of back-and-forth questioning that would be required. However, I have selectively examined a number of assumptions and identified more granular concerns. Examples are as follows:

Understating residential heat pump water heating savings per unit. In estimating savings for residential heat pump water heaters, the utilities make a couple of problematic assumptions that lead to understating savings. First, the Energy Factor assumed for a heat pump water heater – 2.5[32] – is at the low end of the range for available models. Indeed, of the 58 models with capacities of less than 55 gallons that are Energy Star rated, only two had Energy Factors of below 2.8; the average was 3.3 – or about 25% more efficient than assumed by the utilities.[33] In addition, the utilities inappropriately used a "manufactured home square footage adjustment" to reduce estimated savings potential for heat pump water heaters installed in manufactured homes by 41%.[34] There is no basis for reducing water heater savings down by the size of the home. Water heater savings are primarily a function of the number of occupants in the home; the utilities' savings formula for heat pump water heaters had already accounted for the fact that manufactured homes have fewer occupants than single family homes.[35]

- Artificial cap on measure lives of 20 years. Nexant appears to have assumed that measures cannot have lives of longer than 20 years.[36] That is too short for a number of measures such as attic insulation or wall insulation added to homes, whole house fans, and centrifugal chillers. Other jurisdictions assume lives for such measures of 25 years[37] or even longer. Capping measures at 20 years results in understating of the cost-effectiveness of some measures.

- Use of average line loss rates rather than marginal line loss rates to convert savings at the customers' meters to savings at the generator.[38] Efficiency programs' impact on line losses are – by definition – equal to marginal loss rates. This is important because line losses grow (largely) exponentially with load,[39] meaning that marginal line loss rates are much higher than average line loss rates. Thus, by using average loss rates the utilities are understating the economic value of efficiency savings.
- Failure to include all participant benefits in TRC test. It appears as if the utilities included only electric system benefits in the calculation of the TRC test. They exclude a number of additional participant benefits such as other fuel savings (e.g. natural gas savings that can occur when insulating a home with central air conditioning and gas heat), water savings (e.g. associated with low flow showerheads), or any of a range of non-energy benefits. The utilities suggest that is appropriate because inclusion of such benefits is "inconsistent with the test's purpose which is to evaluate DSM measures from an all resource perspective." However, other fuel savings and water savings are "resource benefits." More importantly, the utilities have misconstrued the conceptual purpose of the TRC test, which is to assess cost-effectiveness from the combined perspective of the utility system and program participants.[40] By including all participant costs, but not all participant benefits, the utilities' TRC analyses violate one of the fundamental principles of cost-effectiveness analysis, with the result being a bias against efficiency resources.[41]

**7. Combined effect of potential study conservatisms is dramatic understating of achievable potential.**

**Q: What is the combined effect of all of the conservatisms in the utilities' potential studies on the bottom line estimates of achievable savings?**

A: That is very difficult to precisely quantify without essentially conducting a new analysis in which all assumptions are re-examined and revised (as needed), which I did not have the resources to do and for which this kind of proceeding is not well-suited. However, the impact is huge. As noted earlier, just eliminating the inappropriate two-year payback screen would have the effect of increasing TRC economic potential by roughly half.

An alternative way to approach this question is to compare what the Florida potential studies suggested was economically achievable under the TRC test to what utilities in other leading states in the South have recently achieved. As Table 5 below shows, Duke Energy Carolinas (DEC) achieved savings equal to approximately 1.67% of sales to eligible customers in 2018.[42] That is at least 7.5 times greater than what any of the Florida utilities have suggested is TRC achievable and more than 90 times what FPL has suggested is TRC achievable – even though DEC was not implementing a plan designed to achieve all cost-effective savings. Similarly, Entergy Arkansas achieved savings equal to approximately 1.44% of its 2018 sales to eligible customers.[43] That is at least 6.5 times what any of the Florida utilities have suggested is TRC achievable and about 80 times what FPL has suggested is TRC achievable – again, even though Entergy Arkansas was not implementing a plan designed to achieve all cost-effective savings.

**Table 5: Florida TRC Achievable Estimates vs. Leading Southern Utility Actuals**[44]

| Utility | State | Study or Actual? | Year(s) | Annual TRC Achievable Savings (GWh) | Total Eligible Sales (GWh) | Savings as % of Eligible Sales |
|---|---|---|---|---|---|---|
| FPL | FL | Study | 2020-2029 | 20 | 108,514 | 0.02% |
| Duke | FL | Study | 2020-2029 | 43 | 38,024 | 0.11% |
| TECO | FL | Study | 2020-2029 | 31 | 19,187 | 0.16% |
| Gulf | FL | Study | 2020-2029 | 22 | 10,809 | 0.21% |
| Orlando | FL | Study | 2020-2029 | 14 | 6,568 | 0.21% |
| JEA | FL | Study | 2020-2029 | 26 | 11,825 | 0.22% |
| **Duke Energy Carolinas** | **NC/SC** | **Actuals** | **2018** | **811** | **48,454** | **1.67%** |
| **Entergy** | **AR** | **Actuals** | **2018** | **256** | **17,730** | **1.44%** |

## V. RECOMMENDATIONS

**Q: What cost-effectiveness test would you propose that the Public Service Commission (PSC) rely upon in setting the utilities' energy efficiency savings goals?**

A: As I stated earlier in this testimony, I strongly recommend against relying on the RIM test, as it is not a test of cost-effectiveness, has limited value in assessing potential impacts on non-participants, and is not used when assessing the reasonableness of supply-side resources for which energy efficiency can be a lower cost alternative. Conceptually, a properly executed TRC test – one that fully accounts for all utility system and participant impacts – is a much better gauge of the value of efficiency. The PSC could also consider a separate assessment of potential rate impacts, along with estimates of how many customers may participate over a 10-year period, to determine whether any constraints on acquisition of all TRC cost-effective efficiency potential may be warranted in order to balance concerns about impacts on any customers who choose not to participate.

**Q: Are you suggesting that the PSC base the utilities' energy efficiency savings goals on their current estimates of TRC cost-effective achievable potential?**

A: No. As I also discussed above, the TRC test as used by the utilities does not account for all utility system benefits or all participant benefits and therefore understates what is cost-effective. Perhaps even more importantly, there are numerous other problems with the utilities' efficiency potential studies' methodologies and assumptions that lead to significant underestimation of cost-effective potential, even under their definition of the TRC.

**Q: How would you suggest the PSC establish efficiency savings targets for the utilities in this proceeding?**

A: If the PSC does not order that the Utilities conduct a properly executed TRC Test, and given the absence of a defensible empirical analysis of cost-effective efficiency potential in the state, one approach would be to make an attempt at partially correcting the utilities' TRC economic potential results as I discuss below. This would be a very conservative approach as many issues leading to lower TRC results would remain unaddressed (such as FPL assigning zero economic potential to certain measures). Another approach would be to base energy efficiency targets on what the leading utilities in the South are already achieving. Specifically, the PSC could require each Florida utility to ramp up to 1.50% incremental annual savings per year – a level comparable to the 1.67% Duke Energy Carolinas achieved in 2018 and the 1.44% achieved by Entergy Arkansas in 2018.

**Q: Couldn't comprehensive corrections be made to the utilities' potential studies to address the problems you have identified?**

A: Yes, conceivably. However, the problems are numerous, complicated, and interactive. Moreover, it is likely that there are others that I have not been able to identify given the limited time available to review numerous assumptions for literally thousands of efficiency measure permutations for six different utilities. Put simply, it would be an enormous undertaking to comprehensively address the issues I raised in my testimony, as well as ensure that there are no others that need addressing.

**Q: Can you illustrate the magnitude of the impact of correcting for any of the problems you have identified?**

A: Yes. I have estimated the impacts of correcting just two of the many problems noted: (1) the double-adjustment for free riders resulting from the application of a two-year payback screen; and (2) unreasonably low expectations by most of the utilities (the one possible exception being TECO) regarding the portion of economic potential that is achievable. As Table 6 shows, just correcting those two problems – by not using any payback screen and assuming that about half of economic potential is achievable instead of the 6% assumed by FPL and the 14 to 29% assumed by all but one of the other utilities (TECO assumed 44%) – would suggest that at least average annual savings ranging from 0.4% to 0.8% of annual electricity sales, depending on the utility, would be cost-effectively achievable over the 2020 to 2029 period.

**Corrections input by Debbie Krick, court reporter.**

**Table 6: Results of Eliminating Two-Year Payback Screen and Assuming 50% of Economic Potential is Achievable**

| Utility | 2017 Annual Sales (GWh) | Utility Estimates of Average Annual Achievable Potential (GWh) | Utility Estimates of Achievable Potential as Percent of Sales | 10-Year TRC Econ Potential without 2-Year Payback Screen (GWh) | Average Annual TRC Econ Potential without 2-Year Payback Screen (GWh) | Partially Corrected Average Annual Goal at 50% of Econ Potential (GWh) | Partially Corrected Average Annual Savings as Percent of Sales |
|---|---|---|---|---|---|---|---|
| FPL | 108,514 | 20 | 0.02% | 8905 | 891 | 445 | 0.4% |
| Duke | 38,024 | 43 | 0.11% | 5599 | 560 | 280 | 0.7% |
| TECO | 19,187 | 31 | 0.16% | 1785 | 179 | 89 | 0.5% |
| Gulf | 10,809 | 22 | 0.21% | 1762 | 176 | 88 | 0.8% |
| OUC | 6,568 | 14 | 0.21% | 835 | 84 | 42 | 0.6% |
| JEA | 11,825 | 26 | 0.22% | 1839 | 184 | 92 | 0.8% |

**Q: How did you estimate economic potential without a two-year payback screen?**

A: As discussed above, both TECO and Gulf provided their own estimates of TRC economic potential without any payback screen. I have used their estimates. For FPL, I computed the amount of TRC cost-effective savings without a two-year payback screen using all of FPL's measure assumptions and the confidential analytical tool provided by the Company. I did not have such a tool for Duke, Orlando, or JEA, so I assumed that their TRC economic potential without a two-year payback screen would be approximately 80% higher than their own estimates of TRC economic potential with such a screen. The 80% increase is equivalent to Gulf Power's increase, the lowest of the three increases either made available by the utilities themselves or which I was able to compute.

**Q: Why did you assume that half of the economic potential would be achievable?**

A: That is a level consistent with several efficiency potential studies I have reviewed. For example, a recent efficiency potential study conducted for DTE, one of the two large investor-owned utilities in Michigan, estimated that the utility could achieve savings equal to 15.1% of its sales – about 46% of the estimated economic potential of 32.5% – over an 11-year period.[45] Similarly, a 2015 Arkansas efficiency potential study estimated that roughly 50% (2282 GWh out of 4594 GWh) of the savings the study found to be "economic" was achievable over the 2016 to 2025 period.[46] And a 2018 study for the city of New Orleans found that maximum achievable potential over ten years – 25% of sales – was 56% of the economic potential.[47]

**Q: What would the utilities annual savings goals be if they were based on TRC cost-effective and achievable savings potential, as corrected for the two problems you just discussed (i.e. eliminating a two-year payback screen and assuming 50% of economic potential is achievable over ten years)?**

A: Assuming that the utilities could ramp up energy savings at the pace of at least 0.3% of sales per year (e.g. a utility whose goals are to ramp up to 0.6% of sales per year would take two years to get to that point),[48] and assuming that the peak savings to energy savings ratios in the economic potential would be reflective of the ratios in achievable potential,[49] the savings would be as shown in Tables 7, 8, and 9 below. Comparable tables broken down into Residential and Non-Residential values are provided as Exhibit JMG-2 to my testimony.

**Table 7: GWh Savings Based on Partially Corrected TRC Achievable**

| Utility | Annual Sales | Incremental Annual Energy Savings (GWh) | | | | | | | | | | 10-Year Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | |
| FPL | 108,514 | 326 | 445 | 445 | 445 | 445 | 445 | 445 | 445 | 445 | 445 | 4,333 |
| Duke | 38,024 | 114 | 228 | 280 | 280 | 280 | 280 | 280 | 280 | 280 | 280 | 2,582 |
| TECO | 19,187 | 58 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 861 |
| Gulf | 10,809 | 32 | 65 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 802 |
| Orlando | 6,568 | 20 | 39 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 393 |
| JEA | 11,825 | 35 | 71 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 842 |

**Table 8: Summer MW Savings Based on Partially Corrected TRC Achievable**

| Utility | TRC kWh/kW | Summer Peak MW | | | | | | | | | | 10-Year Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | |
| FPL | 3889 | 84 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 1114 |
| Duke | 2935 | 39 | 78 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 880 |
| TECO | 5475 | 11 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 157 |
| Gulf | 5063 | 6 | 13 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 158 |
| Orlando | 5299 | 4 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 74 |
| JEA | 5381 | 7 | 13 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 156 |

**Table 9: Winter MW Savings Based on Partially Corrected TRC Achievable**

| Utility | TRC kWh/kW | Winter Peak MW | | | | | | | | | | 10-Year Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | |
| FPL | 6650 | 49 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 652 |
| Duke | 5625 | 20 | 41 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 459 |
| TECO | 6736 | 9 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 128 |
| Gulf | 5933 | 5 | 11 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 135 |
| Orlando | 7802 | 3 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 50 |
| JEA | 7858 | 5 | 9 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 107 |

However, because these tables reflect savings estimates based on only partial corrections to the utilities' analyses, they significantly underestimate what is really cost-effectively achievable. Again, since it is not possible to make all the needed corrections to the utilities' analyses in this proceeding, I recommend that the PSC consider what the leading Southern utilities have achieved as being what is cost-effectively achievable – i.e. ramping up to energy savings equal to approximately 1.5% of sales per year.

**Q: What would be a reasonable ramp up period for getting to a 1.50% per year savings goal?**

A: Assuming (as above) that the utilities could ramp up at a rate of 0.3% energy savings as a percent of sales per year, it would be reasonable to ramp up to the 1.50% per year level over a five-year period. Table 10 shows the resulting trajectory of savings assuming a baseline level of sales consistent with 2017 sales levels. That may be conservatively low if sales increase over time.

**Table 10: Proposed Energy Efficiency Savings Goals (GWh)**

| | Incremental Annual Energy Savings (GWh) | | | | | | | | | | 10-Year |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Utility | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | Total |
| All | 0.30% | 0.60% | 0.90% | 1.20% | 1.50% | 1.50% | 1.50% | 1.50% | 1.50% | 1.50% | 12.00% |
| FPL | 326 | 651 | 977 | 1,302 | 1,628 | 1,628 | 1,628 | 1,628 | 1,628 | 1,628 | 13,022 |
| Duke | 114 | 228 | 342 | 456 | 570 | 570 | 570 | 570 | 570 | 570 | 4,563 |
| TECO | 58 | 115 | 173 | 230 | 288 | 288 | 288 | 288 | 288 | 288 | 2,302 |
| Gulf | 32 | 65 | 97 | 130 | 162 | 162 | 162 | 162 | 162 | 162 | 1,297 |
| Orlando | 20 | 39 | 59 | 79 | 99 | 99 | 99 | 99 | 99 | 99 | 788 |
| JEA | 35 | 71 | 106 | 142 | 177 | 177 | 177 | 177 | 177 | 177 | 1,419 |

**Q: If the PSC adopted a 1.50% per year savings goal, what would you recommend with regards to summer and winter peak demand savings goals for energy efficiency programs for each utility?**

A: I cannot recommend specific peak demand savings targets because I arrived at these energy savings targets from a "top down" perspective on what is reasonable rather than from a "bottom up" approach to estimating savings. As discussed above, this top down approach was necessitated by the numerous problems with the utilities' efficiency potential studies that rendered them completely insufficient as a reference for the magnitude of cost-effectively achievable savings potential. If the studies'

estimates of the ratios of TRC economic potential for summer and winter peak savings to TRC economic potential for energy savings would be applicable to the much more realistic and substantial 1.50% per year energy savings goals, the results would be as shown in Table 11 below. Comparable tables of peak savings by sector, as well as energy savings by sector, are provided in Exhibit JMG-3 of my testimony. However, I would suggest additional analysis be undertaken to determine whether those ratios would hold under an effective set of programs designed to achieve the energy savings goals. Thus, I would recommend that the PSC initiate a process to more carefully assess peak demand savings potential, perhaps even as part of the utilities' energy efficiency program plan filings, in order to establish such goals.

**Table 11: Peak Savings Based on Florida Studies' TRC kW/kWh Ratios**

| Utility | TRC kWh/kW Ratio | Summer Peak MW | | | | | | | | | | 10-Year Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | |
| FPL | 3889 | 84 | 167 | 251 | 335 | 419 | 419 | 419 | 419 | 419 | 419 | 3349 |
| Duke | 2935 | 39 | 78 | 117 | 155 | 194 | 194 | 194 | 194 | 194 | 194 | 1555 |
| TECO | 5475 | 11 | 21 | 32 | 42 | 53 | 53 | 53 | 53 | 53 | 53 | 421 |
| Gulf | 5063 | 6 | 13 | 19 | 26 | 32 | 32 | 32 | 32 | 32 | 32 | 256 |
| Orlando | 5299 | 4 | 7 | 11 | 15 | 19 | 19 | 19 | 19 | 19 | 19 | 149 |
| JEA | 5381 | 7 | 13 | 20 | 26 | 33 | 33 | 33 | 33 | 33 | 33 | 264 |

| Utility | TRC kWh/kW | Winter Peak MW | | | | | | | | | | 10-Year Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | |
| FPL | 6650 | 49 | 98 | 147 | 196 | 245 | 245 | 245 | 245 | 245 | 245 | 1958 |
| Duke | 5625 | 20 | 41 | 61 | 81 | 101 | 101 | 101 | 101 | 101 | 101 | 811 |
| TECO | 6736 | 9 | 17 | 26 | 34 | 43 | 43 | 43 | 43 | 43 | 43 | 342 |
| Gulf | 5933 | 5 | 11 | 16 | 22 | 27 | 27 | 27 | 27 | 27 | 27 | 219 |
| Orlando | 7802 | 3 | 5 | 8 | 10 | 13 | 13 | 13 | 13 | 13 | 13 | 101 |
| JEA | 7858 | 5 | 9 | 14 | 18 | 23 | 23 | 23 | 23 | 23 | 23 | 181 |

**Q: Do you have any other recommendations?**

A: Yes. To address concerns about equity, I would recommend that the PSC also adopt goals specifically for savings from low income customers. Mr. Wright's testimony has more specific suggestions in that regard.

**Q: Does that conclude your testimony?**

A: Yes, it does.

BY MR. MARSHALL:

**Q And did you have any exhibits attached to your testimony?**

A Yes, I do.

**Q And those would be Exhibits JMG-1 through JMG-20?**

A Correct.

MR. MARSHALL: And just for the record, those would be Exhibits 64 through 83 on staff's comprehensive exhibit list.

CHAIRMAN GRAHAM: Duly noted.

BY MR. MARSHALL:

**Q Mr. Grevatt, did you prepare a summary of your testimony?**

A Yes, I did.

**Q Would you please go ahead and give us your summary?**

A I would be happy to. Thank you.

Good afternoon, Mr. Chairman and Commissioners. Based on my review of the petitions filed by the companies, I recommend that the Commission reject the utilities' proposed goals and, instead, require the utilities to achieve significantly more energy efficiency so that customers are not deprived of hundreds of millions of dollars in cost-effective

benefits. My technical analysis of the utility proposed goals identified two foundational reasons for the remarkably low and unsupportable savings goals proposed by the utilities.

First, in spite of generation efficiency, increased codes and standards and other market changes, customer bills are high, indicating that the RIM is no longer reliable as the primary test to protect customers. Limiting programs to those that pass RIM ignores enormous cost-effective customer benefits.

For example, in FPL's TRC plan, it has a revenue requirement that is $104 million less than the RIM plan, but the rate impact of the TRC plan is only five/one-thousandths of a cent per kilowatt hour more, five-one-thousandths of a cent per kilowatt hour.

So just on the CPVRR basis alone, TRC makes more sense. And that's not even considering the enormous potential for bill savings that participating customers will receive.

So RIM is really a measure of lost revenues, and that is really about utility profits more than anything else; because to the extent to which rates are going to go up based on lost revenues depends on whether the Commission determines that the utility is earning within its allowed band of return, and whether the

Commissioner determines that those lost revenues should be authorized to be collected or not.

RIM may indicate directionally whether rates will go up. If utilities are allowed to collect lost revenues, then they may suggest whether nonparticipant costs will increase. But when that increase is barely measurable, it's not worth sacrificing hundreds of millions of dollars in benefits.

Secondly, the utility's assessment of achievable potential is deeply flawed with a profound bias towards underestimating potential. Free riders are accounted for in Nexant's baseline measure adoption forecast in the technical potential estimate.

So the utility used subsequent to that of a two-year payback screen to remove free riders from economic potential, I believe, is indefensible. It's removing the same group of free riders twice. It does not make any sense.

Further, the assumption that all customers will install measures that have a two-year payback has no empirical basis, defies experience and common sense, and it contradicts the utility's own projections for participation.

So I attempted to address these and other flaws in the potential study, and provided a partially

corrected estimate of TRC achievable potential, but I found that because there were deficiencies that were really rampant throughout the utility models, this still greatly underestimates a TRC achievable savings. Therefore, I recommend that the utilities' ramp up to one-and-a-half percent annual savings over a multiyear period. And the one-and-a-half percent number is based on consistency with several leading utilities in the southeast, the achievements that they are making.

In short, the combination of the flaws that I found in my analysis leads to insupportably low goal proposals that appear to be based on maximizing utility profits rather than on serving customers.

Thank you.

**Q Thank you.**

MR. MARSHALL: We tender the witness for cross-examination.

CHAIRMAN GRAHAM: Thank you.

OPC?

MS. FALL-FRY: No questions.

CHAIRMAN GRAHAM: Ms. Wynn?

MS. WYNN: No questions.

CHAIRMAN GRAHAM: Kelley?

MS. CORBARI: No questions.

CHAIRMAN GRAHAM: JEA?

MR. PERKO: No questions.
CHAIRMAN GRAHAM: Any questions? Anybody down this line?
MR. LAVIA: No questions.
MR. BERNIER: No questions.
MR. MEANS: No questions.
MR. COX: No questions.
CHAIRMAN GRAHAM: Staff?
MS. DUVAL: No questions.
CHAIRMAN GRAHAM: Commissioners?
I guess there is no redirect?
MR. MARSHALL: I guess not.
CHAIRMAN GRAHAM: Hold on a second. Commissioner Polmann decided he needed to ask a question.
COMMISSIONER POLMANN: Good afternoon, sir.
THE WITNESS: Good afternoon.
COMMISSIONER POLMANN: I understand from your summary remarks that your recommendation is to ramp up to one-and-a-half percent of sales?
THE WITNESS: Correct.
COMMISSIONER POLMANN: I had some, I don't want to say difficulty, but I read a number of different things in your direct testimony, so I just wanted to clarify that that is your actual

recommendation, among many other things that were written?

THE WITNESS: It is.

COMMISSIONER POLMANN: Okay. So that's a single number that you are recommending?

THE WITNESS: Yes.

COMMISSIONER POLMANN: Okay. Thank you very much. Thanks for the clarification.

Thanks, Mr. Chairman.

CHAIRMAN GRAHAM: Redirect?

FURTHER EXAMINATION

BY MR. MARSHALL:

**Q Just to be clear, but you did present a partially -- you did present a separate set of TRC achievable potential goals as well in your testimony, in addition to the 1.5 percent goals?**

A I did, indeed. And those -- the partially corrected TRC achievable is higher -- you know, considerably higher than the goals -- certainly than the RIM goals proposed by the utilities, especially those utilities that proposed goals of zero, but not as high as one-and-a-half percent.

The one-and-a-half percent certainly represents the high end of what utilities in the southeast are achieving, but, you know, as an

alternative approach, making the corrections, at least to the most fundamental flaws that I identified in the potential study, and supporting those TRC achievable goals would be, I think, a great step forward.

**Q Thank you.**

MR. MARSHALL: No further questions.

CHAIRMAN GRAHAM: Exhibits?

MR. MARSHALL: We would move that Exhibits 64 through 83 be entered into the record.

CHAIRMAN GRAHAM: 64 through 83, is there any objections to entering those into the record? Seeing none, we will enter Exhibits 64 through 83.

(Whereupon, Exhibit Nos. 64-83 were received in evidence.)

CHAIRMAN GRAHAM: Would you like to excuse this witness?

MR. MARSHALL: We would. We ask that the witness be excused.

CHAIRMAN GRAHAM: Thank you, sir, for your testimony.

THE WITNESS: Thank you, Commissioners.

(Witness excused.)

CHAIRMAN GRAHAM: Okay. Next witness.

MR. MARSHALL: SACE would call Forest Bradley-Wright to the stand.

Whereupon,

FOREST BRADLEY-WRIGHT

was called as a witness, having been previously duly sworn to speak the truth, the whole truth, and nothing but the truth, was examined and testified as follows:

EXAMINATION

BY MR. MARSHALL:

**Q Good afternoon. Were you previously sworn yesterday?**

A Yes, I was.

**Q And could you please state your name and business address for the record?**

A Forest Bradley-Wright. 3804 Middlebrook Pike, Knoxville, Tennessee, 37921.

**Q And on whose behalf are you testifying today?**

A The Southern Alliance for Clean Energy and the League of United Latin American Citizens.

**Q On June 10th, 2019, did you prepare and cause to be filed direct testimony and exhibits?**

A Yes, I did.

**Q And do you have that testimony and those exhibits with you today?**

A I do.

**Q If I asked you the same questions today, would your answers be the same?**

A They would.

**Q And do you have any changes to your prefiled testimony or exhibits?**

A I do have one small change. On page four of my testimony, referring to a figure related to energy burden, on lines 12 through 13, there is a parenthetical statement that states that the energy burden includes both household and transportation costs. That parenthetical statement can be struck. This refers only to household costs, which are germane to this testimony.

MR. MARSHALL: Mr. Chairman, at this point, I would like to have Mr. Bradley-Wright's prefiled direct testimony entered into the record as though read.

CHAIRMAN GRAHAM: We will enter Mr. Wright's prefiled direct testimony with that correction into the record as though read.

(Whereupon, prefiled testimony was inserted.)

**BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

| | | |
|---|---|---|
| In re: | Commission Review of Numeric Conservation Goals Florida Power & Light Company | DOCKET NO. 20190015-EG |
| In re: | Commission Review of Numeric Conservation Goals Gulf Power Company | DOCKET NO. 20190016-EG |
| In re: | Commission Review of Numeric Conservation Goals Duke Energy Florida, LLC | DOCKET NO. 20190018-EG |
| In re: | Commission Review of Numeric Conservation Goals Orlando Utilities Commission | DOCKET NO. 20190019-EG |
| In re: | Commission Review of Numeric Conservation Goals JEA | DOCKET NO. 20190020-EG |
| In re: | Commission Review of Numeric Conservation Goals Tampa Electric Company | DOCKET NO. 20190021-EG |

# TESTIMONY OF FOREST BRADLEY-WRIGHT ON BEHALF OF SOUTHERN ALLIANCE FOR CLEAN ENERGY

## June 10, 2019

## I. Introduction

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

**A.** My name is Forest Bradley-Wright. I am the Energy Efficiency Director for Southern Alliance for Clean Energy ("SACE"), and my business address is 3804 Middlebrook Pike, Knoxville, Tennessee.

**Q. On whose behalf are you testifying in this proceeding?**

**A.** I am testifying on behalf of SACE.

**Q. Please summarize your qualifications and work experience.**

**A.** I graduated from Tulane University in 2001 and in 2013 received my Master of Arts degree from Tulane in Latin America Studies with an emphasis on international development, sustainability, and natural resource planning.

My work experience in the energy sector began in 2001 at Shell International Exploration and Production Co., where I served as Sustainable Development Team Facilitator.

From 2005 to 2018, I worked for the Alliance for Affordable Energy. As the Senior Policy Director, I represented the organization through formal intervenor filings and before regulators at both the Louisiana Public Service Commission and the New Orleans City Council on issues such as integrated resource planning, energy-efficiency rulemaking and program design, rate cases, utility acquisition, power plant certifications, net metering, and utility scale renewables. As a consultant, I also prepared and filed intervenor comments on renewable energy dockets before the Mississippi and Alabama Public Service Commissions. In 2014, I was a runoff candidate for the Louisiana Public

Service Commission First District seat.

Since 2018, I have been the Energy Efficiency Director for SACE. My responsibilities include leading dialogue with utilities and regulatory officials on issues related to energy efficiency in resource planning, program design, budgets, and cost recovery. This includes formal testimony, comments, presentations, and/or informal meetings in the states of Georgia, Florida, North Carolina, South Carolina, Mississippi, and in jurisdictions under the Tennessee Valley Authority.

A copy of my resume is included as Exhibit FBW-1.

**Q: Have you been an expert witness on energy-efficiency matters before regulatory commissions?**

A: Yes, I have filed expert witness testimony in Georgia related to Georgia Power Company's 2019 Demand Side Management application and in North Carolina related to the Duke Energy Carolinas DSM/EE Recovery Rider. This is my first time submitting testimony to the Florida Public Service Commission ("Commission").

**Q: Please summarize your testimony and key findings.**

A: I have reviewed the utility filings as they relate to evaluation of low-income efficiency opportunities and came to the following conclusion:

- With a low-income population totaling more than 5 million individuals (36.8%) across their combined service territories, and a prevalence of high energy burdens that cause financial vulnerability, there is an enormous need for energy efficiency that matches the unique characteristics of this important customer segment.

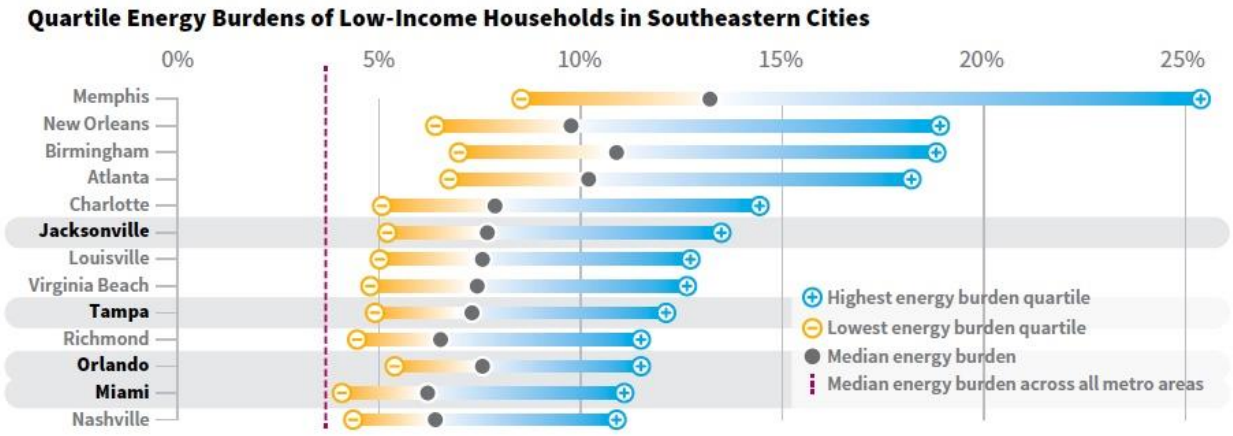
- Due to fundamental flaws in applicability of the Ratepayer Impact Measure ("RIM") test and the two-year screen, the Commission should establish evaluation standards for low-income efficiency based primarily on the Total Resource Cost ("TRC") test.
- I offer a methodology for calculating the low-income targets, provide specific savings levels for each utility, and suggest they be incorporated into the overall savings goals set by the Commission in this proceeding.
- I recommend the Commission set an expectation that all low-income customers will have access to relevant efficiency programs going forward, through both neighborhood deployment and deeper savings programs.

## II. Specific Energy Efficiency Targets Should Be Established For Serving Low-income Customers

**Q: Why is addressing energy burden for low-income customers an important consideration for Commission action in this Florida Energy Efficiency Conservation Act ("Energy Efficiency Act") proceeding?**

A: For millions of Floridians living on limited income, paying the monthly energy bill presents a significant financial challenge, one that can lead to difficult tradeoffs against other essential needs. Research by the American Council for an Energy Efficient Economy[1] shows that families with high energy burdens often struggle to move out of poverty, may face increased economic hardship, and are at greater risk of negative health effects related to respiratory diseases and increased stress. The National Association for the Advancement of Colored People has recognized that advancing energy efficiency and clean energy is essential to decreasing depending on harmful energy production practices while preserving health and livelihoods of community members.[2]

**Figure 1. Quartile Energy Burdens of Low-Income Households in Southeastern Cities**




**Low-income households in Florida cities in this study face high energy burdens. On average, half the low-income households in Jacksonville, Tampa, Orlando, and Miami have an energy burden greater than 7.2%, and a quarter of them, over 12%. The national average is 3.5%.**

Corrections input by Debbie Krick, court reporter.

Figure 1 above shows that total energy burdens (both household and transportation) in major Florida cities are far above the threshold for unaffordability for households in the top quintile.

According to U.S. Census data, more than 5 million people served by the utilities in this proceeding live on incomes that are at or below 200% of the federal poverty levels, the threshold used for determining eligibility for federally funded low income weatherization assistance. In each of the utility service areas, this represents more than a third of the population, ranging from 35% for Gulf Power Company ("Gulf") to 43% for Orlando Utilities Commission ("OUC").

Table 1 below uses U.S. Census data to calculate the percentage of population in each utility service territory that is at or below 200% of the federal poverty level.

**Table 1. Service Territory Population At or Below 200% of the Federal Poverty Level [3]**

| | Total Population | Population Below 200% Poverty Level | % Below 200% Poverty Level |
|---|---|---|---|
| **Florida Power & Light** | 8,648,817 | **3,171,934** | 36.7% |
| **Duke Energy Florida** | 3,099,509 | **1,158,262** | 37.4% |
| **Tampa Electric** | 1,414,898 | **511,709** | 36.2% |
| **Jacksonville Electric** | 777,039 | **289,477** | 37.3% |
| **Gulf Power** | 524,860 | **183,894** | 35.0% |
| **Orlando Utilities Comm.** | 169,278 | **73,238** | 43.3% |
| **Total** | 14,634,402 | **5,388,514** | 36.8% |

Energy efficiency is widely recognized as the best strategy for reducing high energy burdens. Its deployment should be scaled in both breadth and depth to truly and effectively improve conditions for the millions of families and individuals struggling to pay high monthly electric bills.

**Q: How do energy efficiency programs address energy burden?**

**A:** Utility energy efficiency programs that are designed to serve the unique needs of low-income customers address energy burdens at their root source. These programs strive to provide assistance to the neediest customers, like the elderly, disabled, struggling families, the working poor, and others for whom unaffordable energy bills can be the difference between their ability to make rent or afford medicine, food, or other

necessities.

Many low-income households reside in older homes, which are often poorly insulated, have outdated appliances, and use heating and cooling systems that are less efficient. During times of extreme hot or cold weather, these inefficient homes have much higher energy bills, which can lead to difficult decisions between reducing or forgoing food or medicine in order to pay energy costs, leaving the home at unhealthy temperatures, or having their electricity service disconnected.[4] According to a recent report by the Federal Reserve, nearly 40 percent of Americans would struggle to cover an unexpected $400 expense, such as a car repair or appliance replacement, and 12% wouldn't be able to pay their current monthly bills,[5] while others resort to high-interest short-term lending (e.g. payday loans), which can lead to even greater financial risk.[6]

Energy efficiency improvements would substantially reduce energy bills for these families, both in general and especially during periods of extreme hot or cold temperatures. But without efficiency programs directed to serve low-income households, the same financial constraints that make energy bills unaffordable will also make efficiency improvements inaccessible, thus perpetuating a cycle of high electricity bills and energy insecurity. In recognition of this, utility efficiency programs for low-income customers typically provide the improvements for free, rather than covering just a portion of the incremental cost like standard efficiency rebate offerings.

**Q: Has the Commission emphasized a need for utilities to provide energy efficiency to low-income customers?**

**A:** The Commission made energy efficiency for low-income customers a key policy priority in the 2014 Energy Efficiency Act target-setting proceeding. Support of energy efficiency for low-income customers is a notable area of rare common interest between Florida's major utility companies and public interest advocates, like the Southern Alliance for Clean Energy. I believe further growth and formalization of low-income energy efficiency in this Energy Efficiency Act proceeding will be an important step forward, one that will make a significant difference in the lives of those customers who most need it.

In the 2014 Energy Efficiency Act final order, the Commission stated its concern for low-income customers and the need for energy efficiency assistance.

"During the hearing, we voiced our concerns regarding how the FEECA Utilities' goals-setting analyses affected the low income customer base and questioned the FEECA Utilities regarding the types of programs each utility marketed to their low income customers."[7]

Unfortunately, when the RIM test and two-year payback screen were applied, the most affordable measures with some of the highest impacts had been removed from the target setting process. This included measures that commonly make up low-income efficiency program offerings. However, the Commission's Order indicated that flexibility was warranted when it came to incorporating measures with a short payback period, stating generally:

"Using a two-year criterion to screen for potential free riders in the goals-setting stage is not so rigid as to prevent low-cost measures from being included in carefully crafted utility programs."[8]

The Commission was even more specific with their guidance to utilities with regard to addressing the two-year payback issue in their DSM implementation plans:

"When the FEECA Utilities file their DSM implementation plans, each plan should address how the Utilities will assist and educate their low income customers, specifically with respect to the measures with a two-year or less payback."[9]

**Q: What actions has the Commission taken since to ensure this policy priority is enacted?**

A: In responding to each utility's 2015 DSM Plans, the Commission further reinforced and specified their expectations regarding efficiency offerings for low-income customers. Most significant was the Commission's acceptance of measures and programs without the RIM test and two-year payback screening requirements. The Commission addressed each of these issues in their Order approving Tampa Electric Company's ("TECO") 2015 DSM Plan:

"In the goal-setting proceeding, we established a two-year payback methodology to account for free riders, but that educational and low-income programs, including those with measures with a less than two-year payback, were encouraged."[10]

"The only programs in TECO's DSM Plan to fail the RIM test were programs that target eligible low-income ratepayers. These programs did pass the TRC test, and comply with the requirements established in Order No. PSC-14-0696-FOF-EU, to assist and educate low-income customers."[11]

In approving Florida Power & Light's ("FPL") 2015 DSM Plan, they again stated that the utility's low-income efficiency program had met the Commission's requirements by passing the TRC test, rather than the RIM test, and specifically noted inclusion of measures for the low-income program without the two-year screen:

"The only program in FPL's DSM Plan to fail the RIM test is the Residential Low Income program, which targets eligible low income ratepayers for assistance with weatherization, air conditioning, and water heating. The program does however pass the TRC test, and complies with the requirements established in Order No. PSC-14-0696-FOF-EU to assist and educate low-income customers."[12]

"FPL has incorporated the two-year payback methodology into the design of its DSM Plan, and only includes savings from measures with a less than two-year payback in its residential low income program."[13]

The Commission similarly approved the program plans for all Energy Efficiency Act utilities that followed these guidelines.

**Q: Have the Utilities spoken to inclusion of low-income efficiency in their 2019 Energy Efficiency Act applications?**

A: Yes, each utility has indicated their intention to continue offering specialized low-income efficiency programs while including accommodations like those described above.

FPL stated in testimony that efficiency has been an important form of assistance for low-income customers and indicated that addressing it is a requirement from the Commission's 2014 Energy Efficiency Act target-setting Order. The Company went further this time, requesting a specific target for low-income efficiency that is notable for being approximately 34 times larger than the entire target they propose for all other customers.

"As previously discussed, in the decades since FEECA was enacted, the marketplace has evolved dramatically. While utility-provided incentives for traditional EE measures no longer make sense because they are not cost-effective,[14] they have been one of the sources of assistance to low income customers. In recognition of these changes, FPL is proposing to retain and expand its existing Low Income program. Although this program is not cost-effective, FPL believes continuing to provide assistance to this vulnerable group is appropriate and warranted to replace eliminated EE program options that will no longer be available. This proposal is consistent with the Commission 2014 Goals docket Order No. PSC-14-0696-FOF-EU, wherein the Commission recognized the importance of supporting these customers. If approved, the estimated ten-year amounts of 14 Summer MW, 4 Winter MW and 34,000 MWh associated with this proposal should be added to FPL's currently proposed 2020-2029 DSM Goals."[15]

TECO reiterated that there is additional flexibility for incorporating measures into low-income programs, which they intend to continue:

"[TECO] is not limited to using any measures that could be utilized in a cost-effective DSM Program. For example, the company is planning to retain its current weatherization and energy education programs that include energy-efficiency kits which are made up of both cost-effective and not cost-effective measures which focus on gaining participation of low-income customers in the company's DSM programs portfolio."

OUC made a point of highlighting the higher than average level of households living in poverty in their service territory. They describe the specific challenge these customers face when attempting to access efficiency without specific utility programs. For example, issues caused by use of the RIM test, which they note have "special weight" in light of their low-income population.

"Approximately 40 percent of OUC's residential customers have household incomes less than $35,000, which is approximately 1.4 times the federal poverty level for a family of four."[16]

"The fact that so many OUC residential customers are low-income and renters presents challenges to the effective implementation of DSM measures and programs for OUC, and particularly for this potential target population. Briefly, low-income customers simply do not have the discretionary income to pay the customer's cost to participate in a DSM program, and renters have little if any control over such expenditures and investments by their landlords."[17]

"The negative RIM results for the 278 measures studied by Nexant have special weight for OUC's consideration because of the relatively high portions of low income customers and renters we serve."[18]

**Q: Should formal goals be established for each utility to delivering efficiency savings to low-income customers?**

A: I strongly encourage the Commission to formalize targets for low-income efficiency as part of this Energy Efficiency Act proceeding. Their scale of need is large, with more than 5 million households (approximately 36.7%) in Energy Efficiency Act utility service territories living on incomes that are at or below 200% of the federal poverty line - a standard by which eligibility for low-income efficiency programs is commonly measured. This need is even greater at a time when utilities are seeking to scale back standard residential efficiency offerings, which are already less accessible to low-income customers. As a matter of policy, further direction from the Commission on setting low-income efficiency targets would bring additional clarity in evaluation standards, consistency between utilities, and lead to greater savings impact for low-income customers. As discussed later in this testimony, the superior performance results achieved by some Energy Efficiency Act utilities demonstrate that substantially higher savings attainment should be possible for their peers. By setting specific low-income efficiency savings targets, the Commission can raise the bar to ensure all utilities deliver optimal performance through their low-income efficiency programs.

**Q: Should the evaluation of DSM potential and the setting of overall efficiency savings targets for each utility incorporate and reflect the low-income efficiency savings goals?**

A: Yes, efficiency for low-income customers should be part of the broader efficiency potential analysis required in this proceeding, and the results for low-income standard efficiency offerings should be incorporated together into the total Energy Efficiency Act savings targets authorized by this Commission. Later in this testimony, I discuss a number of specific considerations that are needed for evaluating the low-income efficiency potential upon which targets can be set.

## III. Formal Standards Are Needed for Evaluating Energy Efficiency Potential for Low-income Customers

**Q: Why is use of the RIM test problematic with evaluating low-income efficiency?**

A: The Commission has authorized utilities to proceed with low-income programs without a requirement for passing RIM. I believe this is the right approach for several reasons. In his testimony (relevant portions of which I summarize below), Mr. Grevatt raises a number of significant concerns with use of the RIM test.

- RIM is not actually a test of cost-effectiveness, it indicates whether rates will be impacted, which is at best an imperfect test of impact to non-participants.
- Lost revenues are not an added cost of energy efficiency.
- Potential rate impacts alone are not sufficient for regulatory decision-making, they must be balanced with a consideration of benefits.
- Limiting measures only to those that pass RIM greatly constrains the savings targets and reduces total financial benefit.
- No other state uses RIM as the sole or primary test.

Application of the RIM test is even more problematic when it comes to evaluating efficiency for low-income customers. The central policy consideration emphasized by the Commission in the previous Energy Efficiency Act cycle related to low-income customers concerned the additional barriers (primarily financial) that limit their access to efficiency and their vulnerability to high energy bills and rate increases.[19] However, the RIM test and the two-year screen, discussed below, caused many of the most common and impactful measures for low-income customers to be cut. Most of the measures that remained required significant up-front out-of-pocket expenditures that would likely be out of reach for low-income customers.

In addition to limiting specific measures, screening with RIM results in much smaller total budgets for energy efficiency than alternative screening methodologies. With less investment, fewer customers are able to participate, further eroding low-income customer access to efficiency. Without policy to ensure low-income efficiency programs are provided at sufficient scale, customers with limited financial means would lose a critical tool for controlling their energy costs and thereby remain vulnerable to the financial risk of high energy bills.

I'm aware of no program that uses RIM for screening of low-income at the measure, program, or portfolio level. As noted in the section above, since the 2014 Energy Efficiency Act proceeding, the Commission and utilities do not require low-income efficiency measures and programs to pass the RIM test.

**Q: Why is use of the Total Resource Cost Test the appropriate method for evaluating low-income efficiency?**

A: For all the deficiencies of the RIM test noted above, there is clearly still a value in screening low-income energy efficiency measures to ensure the investments will yield net benefits. The Total Resource Cost test is the natural choice, since it is already statutorily recognized[20] and its use is well established for this purpose.

The TRC test has several key advantages for screening low-income energy efficiency. First, it is one of the most respected industry standard cost effectiveness tests for evaluating energy efficiency.

Second, the utilities in this proceeding already calculated the TRC in their analysis of technical, economic, and achievable potential, though Mr. Grevatt identified a number of important technical issues. Third, the TRC can be applied effectively for screening individual measures, setting savings goals, and developing programs. Fourth, analysis with the TRC is not impacted by levels of utility incentives offered, meaning it can be used to evaluate savings potential regardless of the portion of cost paid by the participant or utility. Finally, use of the TRC test is the dominant method for evaluating cost effectiveness for low-income energy efficiency across the country, imparting both validity to its use and opportunities to learn from the practices employed in other jurisdictions.[21]

**Q: Would use of the Participant Cost Test be a viable alternative?**

A: Use of the Participant Cost Test, while also statutorily recognized, would not be appropriate as the primary test. Because low-income energy efficiency programs are generally provided at no cost to customers, any measure that produces savings will automatically pass, even if the cost of implementing the measure exceeds the value of its

energy savings potential. Moreover, just because something passes the Participant Cost Test, low-income customers still may not be able to afford it.

**Q: Why is use of the two-year payback screen inconsistent with the energy efficiency needs of low-income customers?**

A: As with RIM, there are a number of problems with the two-year screen that result in double counting and suppression of targets based on assumptions that are at odds with existing conditions and customer decision-making practices. The effect the two-year screen has on reducing portfolio level savings for standard energy efficiency measures is significant. But the problems with use of the two-year payback screen are even more problematic when considering low-income efficiency because the free ridership assumptions underpinning the screen simply do not apply to this group of customers.

As noted in Mr. Grevatt's testimony, the leading issue is that naturally occurring energy efficiency adoption is already factored into the Nexant technical potential analysis, thereby accounting for free ridership prior to application of the two-year payback screen. This includes accounting for future government codes and standards, and identifies customers who will purchase products that exceed those requirements without utility efficiency programs. Because Nexant already accounted for free ridership at the technical potential level, "the two-year payback screen is a redundant adjustment for free riders that artificially makes cost-effective potential appear to be lower than it really is."[22]

Mr. Grevatt also points out that no empirical evidence has been shown to validate the claim that measures with payback shorter than two years are routinely implemented across the customer base without utility incentive programs.[23] Mr. Grevatt additionally

identifies a number of market barriers in his testimony that can prevent customers from adopting efficiency measures, including those with payback of two years or less.[24]

For low-income customers, their financial constraints and housing conditions significantly reduce their ability to purchase higher efficiency measures in the absence of utility programs. For this reason, free ridership for low-income energy efficiency programs is reasonably assumed to be zero or near-zero.

**Q: How do the measure screening results of the RIM test and two-year payback screen compare to the measures used in utility low-income EE programs?**

A: The RIM and two-year payback screen have a profound impact on measure selection. Four utilities – FPL, Gulf, OUC, and JEA – use these screening tests to eliminate literally every single residential measure, including all measures included in their respective low-income efficiency programs. By contrast, after applying the RIM and two-year screen both TECO and DEF retain an array of residential measures including several that are part of their low-income efficiency programs. As noted above, the Commission has authorized utilities to deploy low-income efficiency programs regardless of whether they pass the RIM and two-year screen. However, the utilities' own analysis clearly shows that the RIM and two-year screen are deeply and fundamentally flawed as tools for evaluating low-income efficiency potential.

**Q: How do the measures screening results of the TRC test compare to the measures used in utility low-income energy efficiency programs?**

A: As with the RIM and two-year screen analysis discussed above, significant inconsistencies exist between the various utilities with regard to TRC screening.

However, in contrast to RIM and the two-year screen, at least a portion of the differences in TRC analysis between utilities appear to be related to fairly discrete issues that can be corrected by addressing specific input assumptions and calculation methodologies.

When low-income efficiency potential is analyzed using the TRC with the two-year payback screen removed, the list of measures for most utilities looks far more applicable.

For instance, separate from any other screening factors, all of the following residential measures pass TRC for Duke Energy Florida ("Duke"). In this list, the starred items appear to generally align with the measures included in Duke's two low-income efficiency programs. The first group of measures, in purple, pass TRC, RIM, and the two-year screen in Duke's analysis. The second group of measures, in green, pass both TRC and the two-year payback screen, but not RIM. The third group of measures, in blue, would have also been removed by the two-year screen. Notably, CFL and LED lights, faucet aerators, low flow showerheads, hot water pipe insulation, and water heater temperature setbacks are all standard components of Duke's largest and most impactful low-income efficiency program, the Neighborhood Energy Saver, but would have been removed by the two-year payback screen.

**Duke Residential TRC Economic Potential ("EP")**:

- * 14 SEER ASHP from base electric resistance heating
- * 15 SEER Air Source Heat Pump (only for single family homes)
- 15 SEER Central AC (only for single family homes)
- * 16 SEER Central AC (only for single family homes)
- * Air Sealing-Infiltration Control (only for existing homes)

- * Ceiling Insulation (R12 to R38)
- * Ceiling Insulation (R19 to R38) (only for single family homes)
- * Ceiling Insulation (R2 to R38)
- * Duct Repair (only for existing homes)
- Energy Star Windows (only for existing homes)
- Home Energy Management System
- Spray Foam Insulation (Base R2) (only for single family homes)
- Wall Insulation (only for existing single family and manufactured homes)
- Thermostatic Shower Restriction Valve
- Two Speed Pool Pump
- Variable Speed Pool Pump
- * LED Specialty Lamps – 5W Chandelier
- * LED – 9W Flood
- * CFL – 13W
- High Efficiency Induction Cooktop
- Energy Star Clothes Washer
- ENERGY STAR Room AC
- * CFL – 15W Flood (Exterior)
- * CFL - 23W
- * LED – 14W
- * LED – 9W Flood (Exterior)
- * LED – 9W
- * Linear LED
- * Low Wattage T8 Fixture
- Energy Star Dehumidifier

- Heat Pump Pool Heater
- Removal of 2nd Refrigerator-Freezer
- * Faucet Aerator
- * Hot Water Pipe Insulation
- * Low Flow Showerhead
- * Water Heater Thermostat Setback
- Smart Power Strip

Using the same delineations and color coding, significant differences can be seen in FPL's screening breakdown, but the general point is the same that RIM and the two-year screen must be removed to produce common low-income efficiency measures, including those offered by FPL. One more category has been added to this list in red, indicating measures that FPL additionally removed using an administrative cost screen on top of the RIM and two-year payback screen. It is notable that many measures that are included in Duke and TECO's existing low-income programs are not currently offered by FPL, so those measures are not starred.

- No residential measures pass RIM in FPL's analysis
- Ceiling Insulation (R2 to R38)
- ENERGY STAR Certified Roof Products
- 14 SEER ASHP from base electric resistance heating
- * Duct Repair (only for existing multi-family and manufactured homes)
- Smart Thermostat (EE only) (only for new single family homes)
- Two Speed Pool Pump
- ENERGY STAR Air Purifier

- ENERGY STAR Clothes Washer
- Removal of 2nd Refrigerator/Freezer
- ENERGY STAR Certified Roof Products
- * Duct Repair (only for existing single family homes)
- ENERGY STAR Dehumidifer
- ENERGY STAR Room AC
- Programmable Thermostat (only for new single family homes)
- Heat Pump Pool Heater
- * Low Flow Showerhead (only for multi-family and single family homes)
- ENERGY STAR Dishwasher
- ENERGY STAR Imaging Equipment
- Programmable Thermostat (only for new multi-family and manufactured homes)
- CFL – 23W
- CFL – 15W Flood (Exterior)
- LED – 14W
- LED – 9W
- LED – 9W Flood (exterior)
- Linear LED
- Low Wattage T8 Fixture (Bulb)
- * Faucet Aerator (all homes except for new manufactured homes)
- * Hot Water Pipe Insulation
- * Low Flow Showerhead (only for manufactured homes)
- Water Heater Thermostat Setback

**Q: Are there issues with the administrative cost screen?**

A: The primary problem with the administrative cost test is that FPL appears to assign highly unreasonable administrative costs to some of their residential measures; so even the most cost effective and fastest payback measures are removed. For instance, the administrative cost assigned to a CFL lightbulb is $29. The same $29 is added to the cost of a single faucet aerator.[25] These costs are indefensible for any reasonable delivery mechanism and suggest a heightened level of scrutiny is warranted on administrative costs in these analyses going forward.

Mr. Grevatt provides context using administrative costs in other jurisdictions and adds additional detail to the problem with the administrative cost test in his testimony.

**Q: Are there other factors in the utility modeling that would lead to overly-conservative estimates of low-income potential?**

A: Because low-income free ridership is zero or near-zero, use of standard baselines likely underestimates actual savings by a considerable degree. Additionally, deeper efficiency programs for low-income customers can include early replacement for large energy using equipment such as heating, air conditioning, water heaters, and refrigerators, but the analysis in this proceeding appears not to appropriately capture this savings potential. Additional instances of unreasonably high administrative costs could not be fully reviewed prior to filing this testimony and reflect another factor that could result in a potentially large underestimation of actual low-income efficiency savings potential.

## IV. Calculation of Specific Low-income Energy Efficiency Targets for Each Utility

**Q: What methodology do you propose be used to evaluate low-income energy efficiency savings potential as part of the Energy Efficiency Act goal setting process?**

A: I propose starting with the residential portion of each utility's achievable TRC potential, with the following three adjustments described in Mr. Grevatt's testimony:

- Remove the two-year payback screen.
- Add the 14 SEER Air Source Heat Pump from base electric resistance heating[26] (FPL only).[27]
- Reduce Economic Potential by 50% to determine Achievable Potential.

This corrected Achievable Potential is then multiplied by the percentage of population for each utility that is at or below 200% of the federal poverty level. This provides the total 10 year efficiency savings potential for low-income customers.

**Q: What are the total residential Achievable Potential savings used for these calculations?**

Table 2 below has the residential Achievable Potential savings from Mr. Grevatt's testimony used for calculating the low-income efficiency targets below. These figures were drawn from Exhibit JMG-2 and FPL's were additionally adjusted to reflect the addition of SEER 14 ASHP as per Grevatt Testimony Table 4.

**Table 2. Residential Achievable Potential Savings from Grevatt Testimony**

| | 10-Year Total | Summer Peak (MW) | Winter Peak (MW) |
|---|---|---|---|
| FPL | 1,077 GWh | 337 | 187 |
| Duke | 1,530 GWh | 663 | 303 |
| TECO | 323 GWh | 64 | 51 |
| Gulf | 381 GWh | 83 | 79 |
| OUC | 155 GWh | 37 | 19 |
| JEA | 336 GWh | 80 | 49 |

**Q: What is the low-income energy efficiency savings potential for each Energy Efficiency Act utility?**

Table 3 below identifies the energy saving potential for each utility's low-income customers for 2020-2029.

**Table 3. Energy Saving Potential for Utilities' Low-Income Customers (2020-2029)**

| | 10-Year Total | Summer Peak MW | Winter Peak MW |
|---|---|---|---|
| FPL | 395 GWh | 124 MW | 69 MW |
| Duke | 572 GWh | 248 MW | 113 MW |
| TECO | 117 GWh | 23 MW | 18 MW |
| Gulf | 133 GWh | 29 MW | 28 MW |
| OUC | 67 GWh | 16 MW | 8 MW |
| JEA | 125GWh | 30 MW | 18 MW |

**Q: How does the actual performance of Energy Efficiency Act utilities from 2015-2018 compare to these targets?**

A: A wide disparity can be seen between the low-income efficiency program performances of these utilities since the start of the past Energy Efficiency Act cycle.

By a large degree, the top performers have been TECO, Duke, and Gulf. They have served vastly more households and delivered far more energy savings, both in absolute terms and in proportion to their relative size. Truly these utilities are to be commended for the difference they are making in their communities and clearly they set the standard by which the performance of the other utilities in Florida should be evaluated. However, even these utilities have significant room for improvement.

FPL and OUC had by far the worst performance in both absolute and proportionate terms. Adjusted for their respective total residential customer counts, Duke and Gulf both delivered more than 20 times the low-income energy savings of FPL and OUC – while TECO delivered nearly 50 times the savings of these lowest performing utilities. Notably OUC dramatically reduced their kWh savings from its high point in 2015, down to serving just 6 customers with their low-income program in 2018.

Table 4 below is a comparison between the average annual low-income efficiency targets I recommend for years 2020-2029 and the actual four-year average low-income program performance of each utility from 2015 – 2019, as reported annually by the utilities to this Commission.

**Table 4. Recommended Average Annual Low-Income Efficiency Targets (2020-2029) Compared to Actual Four-Year Average Low-Income Program Performance**

| | 2020-2029 Ave Annual Target (GWh) | 2015-2018 Ave Annual Performance (GWh) |
|---|---|---|
| FPL | 39.5 | 0.9 |
| Duke | 57.2 | 7.9 |
| TECO | 11.7 | 7.5 |
| Gulf | 13.3 | 1.9 |
| OUC | 6.7 | 0.05 |
| JEA | 12.5 | 1.1 |

**Q: How do these proposed targets for FPL compare to the company's historic levels and their 2020-2029 proposed low-income target?**

A: FPL has poverty levels that are similar to their peers in percentage terms (36.7%), but far larger in absolute terms (over 3 million). By contrast, as noted above, their historic performance (5,989 customers served) has lagged far behind their two next largest peers in Florida, Duke (22.9 times higher kWh saved, 65,284 customers served)[28] and TECO (51.6 times higher kWh saved, 27,346 customers served).[29] Their proposed low-income savings target, averaged over the next ten years, is just 3.8 times higher than their 2015-2018 performance, which would still lag behind the actual performance by Duke (6 times higher) and TECO (13.6 times higher) over the past four years. To their credit, FPL was the only utility to request Commission approval for a specific low-income efficiency target. Unfortunately, what they proposed falls far below what their peers have already accomplished and even farther below the target I recommend.

## SECTION V: ADDITIONAL COMMISSION GUIDANCE FOR PROGRAM PLANNING

**Q: Could additional Commission direction to the utilities prior to their development of DSM Plans lead to deeper savings, improved access for eligible customers, and increased overall savings achieved?**

A: Yes. Direction from the Commission provides the utilities, intervenor parties, and the public with clarity on the Commission policy goals and expectations. In the last proceeding, Commission guidance focused Energy Efficiency Act utilities on deploying energy efficiency programs for low-income customers, while affording them the flexibility to offer some of the most impactful measures that otherwise would have been screened out by the RIM test and two-year payback screen.

In this Energy Efficiency Act proceeding, I have recommended that the Commission specify the TRC test as the standard for evaluating low-income efficiency potential and formalize targets for each utility. I also believe there are two additional subjects that warrant Commission guidance as part of its decision-making in this proceeding.

**Q: Please describe your first recommendation for each utility to offer distinct delivery channels for far-reaching and deeper-savings efficiency programs.**

A: I recommend the Commission direct each of the FEECA the utilities to offer two distinct delivery channels for efficiency programs.

One program delivery channel should aim to reach large numbers of customers quickly and at relatively low cost. These neighborhood-style programs have a valuable role in serving large numbers of low-income customers relatively inexpensively.

But the level of savings that come from a handful of minor efficiency measures do not, in of themselves, reduce bills enough to significantly eliminate high energy burdens. Lighting, faucet aerators, and minor air sealing projects are common features of Florida utility programs targeting customers in low-income neighborhoods; but larger scale improvements like HVAC equipment replacement, insulation, water heaters, and appliances upgrades, and comprehensive air sealing for ductwork and building envelopes do more to address the root causes of high energy burdens by eliminating significantly more energy waste and therefore substantially reduce monthly energy bills. Therefore, the other program delivery channel should strive to capture deep savings for each participant, sufficient to reduce electric bills enough to materially improve the financial standing of the low-income customers served every month for many years to follow.

Duke, TECO, and FPL each offer both of these delivery channels, albeit there is currently a wide chasm between these utilities in both program performance and transparency.[30] Gulf and JEA each have only broad-based neighborhood-style programs, while OUC has historically just offered a deeper savings program. By offering both types of programs, the utilities should be able to reach relatively large portions of their low-income customers within a short number of years. The reach of these programs can be quite impressive within a few years. From 2015-2018, Duke reached 15% of eligible customers,[31] while TECO reached 23.4%.[32]

While the deeper-savings program could have its own intake system, the broad-based neighborhood-style programs could also help identify candidate customers while in the field, thereby leveraging administrative resources and helping identify otherwise hard to

reach customers that are in great need. Struggling families, the elderly, disabled individuals, veterans, and otherwise hard to reach customers who are in need could all benefit from this kind of pro-active outreach and deep savings projects. Separate tracking and reporting on program performance for both the neighborhood-style program and the deeper savings program should be standard practice going forward. TECO and Duke already do this in their annual efficiency reporting to the Commission.

**Q: Please describe your second recommendation for each utility to ensure participation opportunities for residents across all categories of housing.**

A: My second recommendation is to direct the utilities to provide meaningful program participation opportunities for customers in all types of housing, including small and large multifamily housing, manufactured homes and renters, as well as single-family owner-occupied homes. Table 5 below shows the relative proportion of each housing type by utility service territory. Exhibit FBW-5 also shows geographically where in the state manufactured homes are located. Different housing types, physical conditions, location and whether a customer owns or rents are all factors that should inform low-income efficiency offerings and all low-income customer have the opportunity to participate. For some utilities, many low-income customers are excluded from participation because they live in a housing type that the utility does not serve, like multi-family and manufactured homes in FPL's service territory.[33]

**Table 5. Relative Proportion of Housing Type by Utility Service Territory [34]**

| Residential Housing Stock | DEF | FPL | GPC | JEA | OUC | TECO |
|---|---|---|---|---|---|---|
| Single Family | 65.1% | 58.5% | 68.2% | 65.7% | 50.4% | 63.6% |
| Small/Medium Multifamily | 16.3% | 18.7% | 15.4% | 20.5% | 31.3% | 19.3% |
| Large Multifamily | 7.7% | 17.4% | 6.9% | 8.7% | 16.3% | 8.2% |
| Manufactured | 10.8% | 5.4% | 9.3% | 5.1% | 1.9% | 8.7% |
| Estimated # of Units | 1,420,331 | 3,842,475 | 247,773 | 343,443 | 78,700 | 606,805 |

**Q: Why should this guidance be given during this proceeding, rather than after the utilities file their 2020 DSM Plans?**

A: Making these priorities known to the utilities prior to developing their DSM Plans will lead to better outcomes for all low-income customers and provide the utilities with assurances that developing such programs will be supported by the Commission. Ultimately, this should lead to greater certainty and consistency among the utilities, greater access to program participation for low-income customers, and deeper savings for the customers who most need it – all while increasing overall savings impact for low-income customers, which is a goal all parties to this proceeding should be able to get behind.

**Q: Does this conclude your testimony?**

A. Yes, it does.

[1] American Council for an Energy Efficient Economy ("ACEEE"), 2016 "Lifting the High Energy Burden in America's Largest Cities." https://aceee.org/research-report/u1602, Exhibit FBW-2.
[2] National Association for the Advancement of Colored People ("NAACP") 2017 "Just Energy Policies: Model Energy Policies Guide." https://www.naacp.org/wp-content/uploads/2014/03/Just-Energy-Policies_Model-Energy-Policies-Guide_NAACP.pdf, Exhibit FBW-3.

[3] U.S. Census Bureau, 2013-2017 American Community Survey (ACS) 5-Year Estimates Tables S1701 Poverty Status in the Past 12 Months; B25033 Total Population in Occupied Housing Units by Tenure by Units in Structure; S0103 Population 65 Years; B25127 Tenure by Year Structure Built by Units in Structure via American Fact Finder: https://factfinder.census.gov.
[4] U.S. Energy Information Administration, Household Energy Insecurity, released October 2017, revised May 2018: https://www.eia.gov/consumption/residential/data/2015/hc/php/hc11.1.php
[5] Board of Governors of the Federal Reserve System, "Report on the Economic Well-Being of U.S. Households in 2018." 2019 https://www.federalreserve.gov/publications/files/2018-report-economic-well-being-us-households-201905.pdf, Exhibit FBW-4.
[6] Center for Financial Services Innovation.2012. "A Complex Portrait: An Examination of Small-Dollar Credit Consumers." www.fdic.gov/news/conferences/consumersymposium/2012/a%20complex%20portrait.pdf.
[7] Florida Public Service Commission, Order No. PSC-14-0696-FOF-EU, issued December 16, 2014 in Docket Nos. 130199-EI, 130200-EI, 130201-EI, 130202-EI, 130203-EM, 130204-EM, 130205-EI, at p. 27.
[8] *Id.*
[9] *Id.*
[10] Florida Public Service Commission, Order No. PSC-15-0323-PAA-EG, issued August 11, 2015 in Docket No. 150081-EG, at p. 9.
[11] *Id.* at 6.
[12] Florida Public Service Commission, Order No. PSC-15-0331-PAA-EG, August 19, 2015 in Docket No. 150085-EG, at p. 6.
[13] *Id.*
[14] FPL appears to assert here that efficiency programs are not cost-effective without a RIM score greater than 1.0, a subject discussed in greater detail further in my testimony.
[15] Testimony of Tom Koch on behalf of Florida Power & Light, at 37, April 12, 2019.
[16] Testimony of Kevin Noonan on behalf of OUC, at 11, April 12, 2019.
[17] *Id.* at 12.
[18] *Id.* at 29.
[19] Florida Public Service Commission, Order No. PSC-14-0696-FOF-EU, issued December 16, 2014 in Docket Nos. 130199-EI, 130200-EI, 130201-EI, 130202-EI, 130203-EM, 130204-EM, 130205-EI, at p. 27.
[20] *Id.* at 22; *see also* section 366.82(3)(b), Fla. Stat.

[21] ACEEE "State-Level Strategies for Tackling High Energy Burdens: A Review of Policies Extending State- and Ratepayer-Funded Energy Efficiency to Low-Income Households" 2018. https://aceee.org/files/proceedings/2018/node_modules/pdfjs-dist-viewer-min/build/minified/web/viewer.html?file=../../../../../assets/attachments/0194_0286_000404.pdf#search=%22drehobl%22, Exhibit FBW-6.
[22] Testimony of Jim Grevatt on behalf of Southern Alliance for Clean Energy, at 17, June 10, 2019.
[23] *Id.*
[24] *Id.*
[25] *Id.* at 32.
[26] *Id.* at 29-31.
[27] TECO's economic potential analysis also contains the same issue, but I have not corrected for it in the following calculations.
[28] Duke Energy Florida Demand Side Management Annual Report for 2018. Filed March 1, 2019, Exhibit FBW-7.
[29] TECO Demand Side Management Annual Report for 2018. Filed March 1, 2019, Exhibit FBW-8.
[30] Note: As noted above, DEF and TECO's performance greatly exceeds FPL and FPL does provide disaggregated data on their two delivery channels, while both DEF and TECO do.
[31] Duke Energy Florida Demand Side Management Annual Report for 2018. Filed March 1, 2019 (NOTE: this is counting only Duke's Neighborhood Energy Savers program. There are additional participants in Dukes Low Income Weatherization program that are not include here), Exhibit FBW-7.
[32] TECO Energy Florida Demand Side Management Annual Report for 2018. Filed March 1, 2019, Exhibit FBW-8.
[33] Florida Public Service Commission, Order No. PSC-15-0331-PAA-EG, issued August 19, 2015 in Docket No. 150085-EG, at p. 3.
[34] U.S. Census Bureau, 2013-2017 ACS 5-year Public Use Microdata Samples (PUMS) Florida Housing Units Records (January 17, 2019), https://www2.census.gov/programs-surveys/acs/data/pums/2017/5-Year/csv_hfl.zip; 2013-2017 ACS 5-year Estimates Table B25024 Units in Structure via American Fact Finder https://factfinder.census.gov ; *see also* Platts Electric Power Data, Electric Utility Service Territories, U.S. Census Bureau, ACS 5-Year Census Tract Estimates Units in Structure.

BY MR. MARSHALL:

**Q And do you have any exhibits attached to your testimony?**

A I do.

**Q And those would be identified as FBW-1 through FBW-8?**

A That's right.

MR. MARSHALL: And for the record, those would be Exhibits 84 through 91 on staff's comprehensive exhibit list.

CHAIRMAN GRAHAM: Duly noted.

BY MR. MARSHALL:

**Q Mr. Bradley-Wright, did you prepare a summary of your testimony?**

A I did.

**Q Would you please go ahead and give us your summary?**

A Thank you for the opportunity to speak this afternoon.

More than five million people served by the utilities in this proceeding live on low incomes. These are families with children, the elderly, disabled and the working poor who struggle to pay high electric bills and still afford their basic needs. They often live in older homes of lesser construction, which contribute to

a vicious cycle of energy waste and high energy bills. For these customers, even one unexpected $400 expense can be financially disastrous. Robust low income energy efficiency programs are the best solution to lower these bills because they cut energy waste at the source.

In 2014 and '15, the Florida Public Service Commission directed these utilities to develop efficiency programs to meet the particular needs of low income customers, leading to nearly 20 gigawatt hours of energy savings per year. But now the utilities are seeking to dramatically reduce their overall energy savings, with many proposing to eliminate savings targets entirely. Not only is this heading in the wrong direction, it slams the doors in the face of people who struggle to pay their energy bills.

Preserving low income efficiency programs is a critical priority during this targe setting proceeding. Your leadership on this issue sends an important signal to the public that provides clarity to the utilities regarding your expectations going forward.

To this end, I strongly urge you to establish clear targets for low income energy savings, without which there is no enforcement mechanism for the Commission to hold the utilities accountable.

In my testimony, I offer such targets for your

consideration, recognizing that the RIM test and two-year screen would eliminate all low income energy efficiency program offerings, including those that had been previously approved by the Commission. I present a set of targets based on the Total Resource Cost test, which is also authorized by statute for use in FEECA target settings.

The targets are higher than those captured in the past few years, reflecting the opportunity to not only reach more low income customers, but also capture enough savings to improve energy affordability in a household's overall financial well-being.

I also propose the Commission direct the utilities to ensure all low income customers have access to these programs, whether they rent or own, live in a single family residence, mobile home or apartment complex.

Finally, I suggest you direct the utilities to pursue both high levels of participation, as well as deeper levels of savings per household. Right now, Florida's major utilities are in a race to the bottom with energy efficiency, and it literally could not get worse than what many of them have proposed.

To put it plainly, zero is not a goal, and it is up to this commission to ensure Florida does better.

Like every other resource, there is a cost for energy efficiency, but today it is the cost of inaction that we cannot afford. Five million people, the working poor, children, the disabled and our elderly depend on you to stand up for enforceable efficiency savings targets to ensure low income customers can reduce their high energy bills. It is the right thing to do. It is the least we can do, and now is the time for action.

Thank you for the opportunity to speak on this important issue.

MR. MARSHALL: We tender the witness for cross-examination.

CHAIRMAN GRAHAM: Thank you.

We'll start at the end with OPC.

MS. FALL-FRY: No questions.

CHAIRMAN GRAHAM: We'll scan down. Raise your hand if you have questions.

Staff?

Commissioners?

I guess there is no redirect.

MR. MARSHALL: There would be not be at this time.

CHAIRMAN GRAHAM: Exhibits?

MR. MARSHALL: We would move Exhibits 84 through 91 into the record.

CHAIRMAN GRAHAM: If there is no objections, we will move Exhibits 84 through 91 into the record.

(Whereupon, Exhibit Nos. 84-91 were received in evidence.)

MR. MARSHALL: And we would ask, therefore, that Mr. Bradley-Wright be excused.

CHAIRMAN GRAHAM: Mr. Wright, thank you very much. Travel safe, please.

(Witness excused.)

CHAIRMAN GRAHAM: Okay. That's the end of our direct witnesses. Let's take a five-minute break before we start rebuttal, so 10 minutes till, six-minute break.

(Brief recess.)

(Transcript continues in sequence in Volume 6.)

CERTIFICATE OF REPORTER

STATE OF FLORIDA )
COUNTY OF LEON )

I, DEBRA KRICK, Court 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 22nd day of August, 2019.

DEBRA R. KRICK
NOTARY PUBLIC
COMMISSION #GG015952
EXPIRES JULY 27, 2020